NV9608 and NV9616 Control Panels

User's Guide

NV9616 Control Panel — User's Guide

- **Revision**: 1.0

- **Software Version**: 6.0.8

- **Part Number**: UG0046-00

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All of the equipment described in this manual has been designed to conform with the required safety and emissions standards of the European Community. Products tested and verified to meet these standards are marked as required by law with the CE mark. (See Symbols and Their Meanings on page v.)

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- Main telephone: 530-265-1000 (9 am to 9 pm PST)
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  In the Americas, call toll-free: +1-800-224-7882 (9 am to 9 pm EST)
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  In France, call +33 1 55 86 87 88 (9 am to 5 pm, GMT + 1)
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- Website: http://www.miranda.com

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Note	Return Material Authorization (RMA) required for all returns.

Change History

The table below lists the changes to the Control Panel User's Guide.

- User's Guide Part # UG0046-00

- Software version: 6.0.8

Rev	Date	ECO	Description	Approved By
1.0	05 Nov 10	17286	Initial release. Conforms to SE version 6.0.8	D. Cox

Restriction on Hazardous Substances (RoHS)

Miranda is in compliance with EU Directive RoHS 2002/95/EC governing the restricted use of certain hazardous substances and materials in products and in our manufacturing processes.

Miranda has a substantial program in place for RoHS compliance that includes significant investment in our manufacturing process, and a migration of Miranda product electronic components and structural materials to RoHS compliance.

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1-800-719-1900 (toll-free) or
1-530-265-1000 (outside the U.S.).

Important Safeguards and Notices

This section provides important safety guidelines for operators and service personnel. Specific warnings and cautions appear throughout the manual where they apply. Please read and follow this important information, especially those instructions related to the risk of electric shock or injury to persons.

Warning

> Any instructions in this manual that require opening the equipment cover or enclosure are for use by qualified service personnel only. To reduce the risk of electric shock, do not perform any service other than that contained in the operating instructions unless you are qualified to do so.

Symbols and Their Meanings

The lightning flash with arrowhead symbol within an equilateral triangle alerts the user to the presence of dangerous voltages within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle alerts the user to the presence of important operating and maintenance/service instructions.

The Ground symbol represents a protective grounding terminal. Such a terminal must be connected to earth ground prior to making any other connections to the equipment.

The fuse symbol indicates that the fuse referenced in the text must be replaced with one having the ratings indicated.

The presence of this symbol in or on Miranda equipment means that it has been designed, tested and certified as complying with applicable Underwriter's Laboratory (USA) regulations and recommendations.

The presence of this symbol in or on Miranda equipment means that it has been designed, tested and certified as essentially complying with all applicable European Union (CE) regulations and recommendations.

General Warnings

A warning indicates a possible hazard to personnel which may cause injury or death. Observe the following general warnings when using or working on this equipment:

- Heed all warnings on the unit and in the operating instructions.

- Do not use this equipment in or near water.

- This equipment is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting the equipment inputs or outputs.

- Route power cords and other cables so they are not likely to be damaged.

- Disconnect power before cleaning the equipment. Do not use liquid or aerosol cleaners; use only a damp cloth.

- Dangerous voltages may exist at several points in this equipment. To avoid injury, do not touch exposed connections and components while power is on.

- Do not wear rings or wristwatches when troubleshooting high current circuits such as the power supplies.

- To avoid fire hazard, use only the specified fuse(s) with the correct type number, voltage and current ratings as referenced in the appropriate locations in the service instructions or on the equipment. Always refer fuse replacements to qualified service personnel.

- To avoid explosion, do not operate this equipment in an explosive atmosphere.

- Have qualified service personnel perform safety checks after any service.

General Cautions

A caution indicates a possible hazard to equipment that could result in equipment damage. Observe the following cautions when operating or working on this equipment:

- When installing this equipment, do not attach the power cord to building surfaces.

- To prevent damage to equipment when replacing fuses, locate and correct the problem that caused the fuse to blow before re-applying power.

- Use only the specified replacement parts.

- Follow static precautions at all times when handling this equipment.

- This product should only be powered as described in the manual. To prevent equipment damage, select the proper line voltage on the power supply(ies) as described in the installation documentation.

- To prevent damage to the equipment, read the instructions in the equipment manual for proper input voltage range selection.

- Some products include a backup battery. There is a risk of explosion if the battery is replaced by a battery of an incorrect type. Dispose of batteries according to instructions.

- Products that have (1) no on/off switch and (2) use an external power supply must be installed in proximity to a main power output that is easily accessible.

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1. Preface

Chapter 1 is an introduction to the NV9608 and NV9616 User's Guide. It presents the following topics:

- Chapter Structure
- The PDF Document
- Terms, Conventions and Abbreviations

Chapter Structure

The following chapters provide detailed information regarding the NV9616 Control Panel:

- Chapter 1, Preface, (this chapter) outlines ways to use this guide.
- Chapter 2, Introduction, provides a functional description of the NV9616.
- Chapter 3, Installation, provides installation, connection, and initialization instructions.
- Chapter 4, Configuration, provides configuration instructions.

  This chapter is for configurers, primarily.

- Chapter 5, Operation, provides operating instructions.

  This chapter is for operators, primarily.

- Chapter 6, Technical Details, provides electrical, mechanical, and environmental specifications, product drawings, and default settings.
- Chapter 7, Misc. Topics, presents a glossary and miscellaneous instructions and information.
- An Index is also provided for your reference.

The PDF Document

This guide is provided in PDF format, allowing you to use Acrobat's "bookmarks" to navigate to any desired location. You can also easily print a hardcopy. Please note:

- Use the Table of Contents or the bookmarks page to jump to any desired section.
- Many hyperlinks are provided within the chapters.
- Use the Index to jump to specific topics within a chapter. Each page number in the index is a hyperlink.
- Use Acrobat's 'Go to Previous View' and 'Go to Next View' buttons to retrace your complete navigational path.

- Use the 'First Page', 'Previous Page', and 'Next Page', and 'Last Page' buttons to go to the first, previous, next, or last page within a PDF file.

Note	To display the navigation buttons, right-click the Tool Bar area, and check 'Navigation'.

- Use Acrobat's extensive search capabilities, such as the 'Find' tool and 'Search' tool to perform comprehensive searches as required.

Terms, Conventions and Abbreviations

The following conventions are used throughout this guide:

- The symbol ▲ denotes either an example or a special message.
- Entries enclosed in single quotation marks or <u>C</u>apital <u>L</u>etters denote physical control panel buttons, configuration buttons, or menu items.
  - Click 'Apply' to ...
  - Press the SRC 12 button ...

The following terms and abbreviations are used throughout this guide:

- The terms "panel" and "control panel" refers to the NV9616 and NV9608 control panels and to NV96xx control panels, in general.
- "High tally" means that a button is brightly illuminated. High-tally usually means that the button function is selected or active.
- "Low tally" means that a button is illuminated at low intensity. Most buttons assume a low tally state until selected.
- "SE" is an abbreviation used in this document for NV9000-SE Utilities.

Other Documentation and Software

You should read and be familiar with the material presented in the following documents:

- NV9000 Quickstart Guide.
- NV9000-SE Utilities User's Guide (or NV9000-SE Utilities help files).
- The router manuals for whatever routers you have in your system.

You should also be familiar with the NV9000-SE Utilities software and NV9000 or NV915 router control systems.

Notice

Certain features of the NV9616 and NV9608 are not supported in NV915 control systems:

- Saving presets and loading presets.
- Local salvos.

These features are fully supported in NV9000 control systems.

1. Preface

Notice

2. Introduction

Chapter 2 provides a functional description of the NV9616 and NV9608 control panels. It presents these topics:

- Summary
- Panel Organization
- Modes of Operation
- Other Panel Functions

Summary

The NV9616[1] and NV9608 are 2RU control panels, 9.25″ deep. The NV9616 has 16 LCD buttons whereas the NV9608 has 8 LCD buttons. Otherwise, they are functionally identical. (The NV9608 is less expensive.)

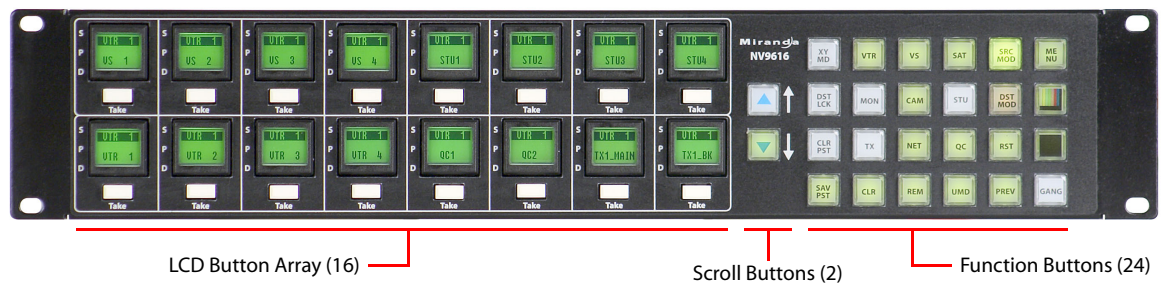The panels are organized as shown in figures 2-1, 2-2, and 2-3:

LCD Button Array (16)　　Scroll Buttons (2)　　Function Buttons (24)

Figure 2-1. NV9616 Front Views

LCD Button Array (16)　　Scroll Buttons (2)　　Function Buttons (24)

Figure 2-2. NV9608 Front Views

The panels can operate in one of 2 modes:

- X-Y mode.
- Multidestination mode.

The panels can be configured so that either mode is selectable by the operator. The panels can also operate in several secondary modes, including salvo mode and menu mode.

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1 An equivalent NV9616V — a GUI that is called a "virtual panel"— is available. It emulates the NV9616. There is no NV9608V.

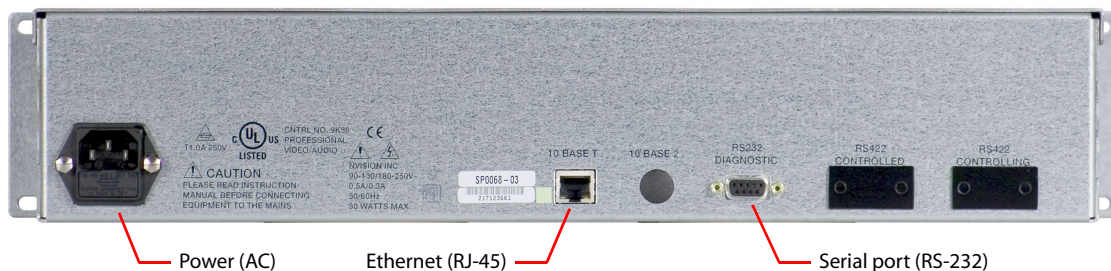At the rear are power, serial, and network connectors:


Figure 2-3. NV9616 and NV9608 Rear

The ports labeled 10base2 and RS-422 are non-operational and are covered. Only the serial port and the Ethernet port are available.

▲ The AC connector has a compartment in which you can find a spare fuse.

(The Ethernet port is 10baseT. The NV9000 supports 10baseT as well as 100baseT.)

Panel Organization

LCD Button Array

The NV9616 has 16 LCD button units. The NV9608 has 8. Each unit comprises a large LCD button and a small 'Take' button below the LCD button. The LCD buttons each have 3 lines of text (up to 8 characters per line). The lines of the button are labeled "S," "P," and "D" on the panel:
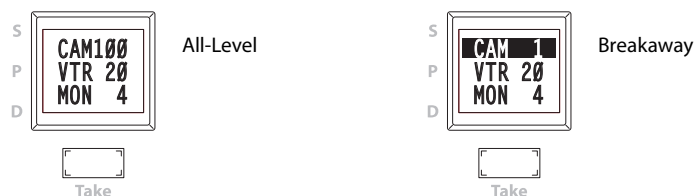
In multi-destination mode, the 3 lines of text display status (S), preset (P), and destination (D), respectively. If breakaway applies to that destination, the status apppears in reverse text. A button can display other messages in other contexts.

Under each LCD button is a smaller white 'Take' button. Pressing the take button executes a take for the selected destination. The methods for selecting destinations and sources for the take are different in X-Y mode and multi-destination (MD) mode.

The LCD button array represents:

• Destinations (in multi-destination mode). The panels provide support for up to 512 MD destinations. You can select different "pages" of destinations using the scroll buttons.

• Levels (in X-Y mode). The button at the top left represents the selected destination. The remaining 15 buttons (or 7 buttons on the NV9608) buttons represent the levels of the selected destination.

• Menu functions (in menu mode). Some of the LCD buttons execute menu functions.

• Salvos (in salvo mode). The panels provide support for system salvos and local salvos on multiple pages of salvo buttons. You can select a "page" of salvos using the scroll buttons.

Scroll Buttons

There are two scroll buttons (called 'Page Up' and 'Page Down' in the configuration software).

These buttons scroll either through pages of MD destinations or through pages of salvos. The scroll buttons page through levels if you have more than 15 (or 7) levels defined.

Scrolling of MD destinations wraps around at the ends of the MD destination list if 'Use Continuous Scrolling' is enabled. At the head of the list, 'Page Up' causes the last page to display. At the end of the list, 'Page Down' causes the first page to display. If 'Use Continuous Scrolling' is not enabled, the pages stop scrolling at the ends of the list.

Continuous scrolling is a panel default.

Continuous scrolling does not apply to the salvo list and does not apply to levels in X-Y mode.

Shortcut

In MD mode, the panel's category buttons allow you to enter a page number for multi-destination devices, instead of scrolling. This is a convenience—a shortcut that lets you avoid 'Page Down' or 'Page Up' button presses when you know the number of the page you want.

Note:

- The shortcut is available only when no category device selection is pending (in MD mode).
- Only category buttons that have single-digit suffixes are enabled.
- The shortcut is not available for salvo pages.

Function Buttons

The NV9616 and NV9608 have an array of 24 function buttons on the right.

Of those, 10 buttons, arranged like a telephone keypad, have fixed functions. These 10 buttons are "category" buttons, representing category mnemonics or category suffixes or both:
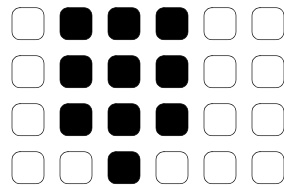
The ordering of suffixes and mnemonics on these fixed buttons is arbitrary. See Category Selection on page 35 for more information.

The other 14 function buttons can be assigned any available function.

The set of available functions (28) is the same in X-Y mode and MD mode.

Modes of Operation

The panels can operate in one of 2 modes:

- X-Y mode.
- Multi-destination (MD) mode.

The panels can be configured so that either mode is selectable by the operator.

Multi-Destination Mode

The panel supports up to 512 MD destinations. The NV9616 displays 16 at a time on the LCD buttons. The NV9608 displays 8 at a time.

Operators perform a take by (optionally) scrolling to an MD page, pressing an LCD button to select a destination, selecting a source, and pressing the take button under the selected LCD button. The operator uses the function buttons to select a source. See Category Selection on page 35 for more information.

In MD mode, the LCD buttons are generally green—and high-tally when selected. They become yellow when you have selected a source and red when you have locked or protected a destination.

Breakaway is not directly possible in MD mode, but when the operator performs breakaway in X-Y mode and then switches to MD mode, the destination(s) for which breakaway occurred show the device name in reverse text.

X-Y Mode

The LCD buttons represent a single selected destination and the levels for that destination.

The destination appears on the top left LCD button (for the NV9616). On the NV9608, it is simply the left button. This button is generally *amber*. It also displays the text "X - Y" and "Dest" to remind operators that the panel is in X-Y mode. The button is red when the destination is locked.

The remaining LCD buttons show the levels. The level buttons are generally *green*—and high-tally when selected. Level buttons turn yellow when you have selected a source on those levels. If there are fewer levels than available buttons, the extra buttons are blank. If there are more levels than available buttons, the operator can scroll through the pages of levels using the scroll buttons. The destination button remains in its fixed position regardless of the page.

Breakaway is possible in X-Y mode. Operators may select the levels for which the take is to occur by pressing the individual LCD buttons that represent the levels. (Scrolling might be necessary to view all the levels.)

Operators perform a take by selecting a destination, (optionally) selecting levels, selecting a source, and pressing the take button under any of the selected LCD buttons. The operator uses the function buttons to select a source and to select a destination. See Category Selection on page 35 for more information.

Secondary Modes

Additional but secondary modes of panel operation are:

- Setup mode — where the panel is freshly powered up, but disconnected from the network. In this mode, you can preset the panel ID and perform a few diagnostic tasks.

- Salvo mode — pressing a salvo button places the panel in salvo mode, where it is expected that the operator will choose a salvo on the LCD button, possibly scrolling to find the salvo. (The duration of a salvo is indeterminate, but usually short.)

- Menu mode — pressing a menu button places the panel in "menu" mode. In menu mode, the buttons lose their normal functions and become part of a menu that changes as needed during menu operation.

- Source mode — pressing a source mode button places the panel temporarily in source mode, where the operator can use category and suffix buttons to select a *source*.

- Destination mode — pressing a destination mode button places the panel temporarily in destination mode, where the operator can use category and suffix buttons to select a *destination*.

- Hold mode — when hold mode is active in X-Y mode, a breakaway level selection remains in effect until the operator turns hold mode off. In MD mode, when hold mode is active, the operator may select multiple destinations.

- Save preset mode and load preset mode — pressing a 'Save Preset' button places the panel in a temporary mode in which you can name and save a preset selection. Pressing a 'Load Preset' button places the panel in a temporary mode in which you can select a saved preset selection.

When the panel is not in setup mode, salvo mode, or menu mode, we say it is in *normal mode*.

Other Panel Functions

The NV9616 and NV9608 can be configured to perform the following additional functions:

- Previous source and free source.
- System salvos and local salvos.
- Lock/protect/release for destinations.
- Multiple- and single-level breakaway.
- Broadcast data routing.
- "Gang" takes.

Additional Control Panel Features

The panel supports gang switching in multi-destination mode. The operator may route single or multiple sources to multiple destinations in a single operation.

The LCD buttons can be green (for sources), amber (for destinations), yellow, or red. Each button provides three levels of tally: off, low, and high. Through the menu, high tally can be set at high or medium brightness and low tally can be set at low or medium brightness, where high tally is constrained to be brighter than low tally.

The panel's 24 function buttons and two scroll buttons are backlit. The buttons can be green or amber. Each button provides three levels of tally: off, low, and high. (You can adjust the levels of

low and high tally, through the menu. LED brightness levels range from 0% to 100%, in 10% increments, with high tally constrained to be brighter than low tally.)

If you assign an X-Y/Multi-Destination button on your panel, it is a toggle: press it once to place the panel in X-Y mode and press it again to place the panel in multi-destination mode. (It turns green for X-Y mode and amber for multi-destination mode.)

3. Installation

Chapter 3 provides installation and connection instructions. It presents the following topics:

- Package Contents
- Installation
- Installing Software and Documentation
- Installation
- Testing

Package Contents

If you have ordered one or more NV9616 or NV9608 control panels from Miranda, inspect the shipping container for damage. If you find any container damage, unpack and inspect the contents. If the contents are damaged, notify the carrier immediately.

As you unpack the shipping container, look for the packing slip and compare it against the contents to verify that you received everything as ordered. If anything is missing (or if you find equipment damage unrelated to shipping), please contact technical support. Refer to Technical Support Contact Information on page iii.

Depending on your order, the items that can ship include:

- One or more NV9616 or NV9608 control panels.
- An AC power cord.

The package does not contain network cables, serial cables, or mounting screws.

You do not need to take any special precautions regarding ESD.

This document does not address the shipment or installation of any other equipment or software that can be used in conjunction with the NV9616 (including the NV9000 system controller, NV915 system controller, other NV96xx control panels, EC9700 GUI, EC9710 GUI, and configuration programs such as UniConfig or NV9000-SE Utilities).

This document does briefly address the use of NV9000-SE Utilities and the Panel IP Configuration Utility as they pertain to panel configuration.

Installation

Follow these steps to install a NV9616 or NV9608 control panel:

1 Mount, and secure, the panel in the rack.

The NV9616 and NV9608 are designed to mount in a 19″ rack. Rack-mounting is not a requirement.

2 We assume that you have an Ethernet switch connected to the "Panel and Router Network" port of your system controller. Connect an Ethernet cable from that switch to the RJ-45 port at the rear of the panel.

3 Connect power.

Installing Software and Documentation

This document is available through the Miranda web site.

You must use NV9000-SE Utilities to configure the NV9616 or NV9608 control panel. Contact Miranda if you need to obtain the latest version of this NV9000 configuration software.

You may use the Panel IP Configuration Utility if you want to your panel to have a static IP address (with respect to the NV9000) or to use DHCP. The panel, as it comes from the factory, defaults to DHCP.

Initialization

Before your NV9000 system controller can communicate with your panel, you must give it a panel ID. Follow these steps for each NV9616 you are installing:

1 Power up the panel. Do **not** connect its Ethernet cable. (Disconnect it if it is connected.)

After a few seconds, the LCD buttons will show 'Acquire IP Address' on the seond button and the panel's current panel ID on the first button. The right-hand button is designated the menu button:
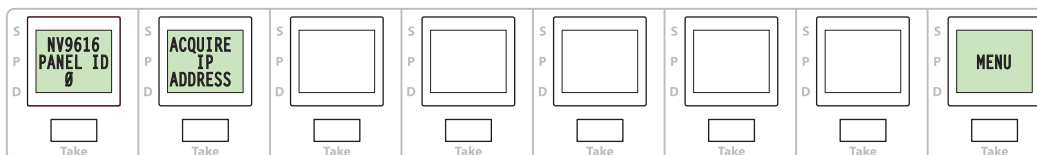
2 Press the menu button. The menu appears:
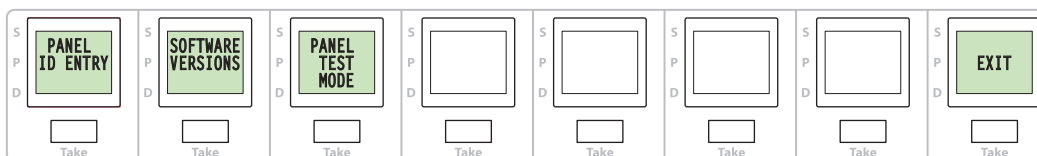
The menu has three submenus. Press the 'Panel ID Entry' button.

3 The panel now allows you to enter the panel ID using the panel's standard numeric keypad (the same as the fixed category buttons when the panel is operating under the NV9000 system). The ID you enter is displayed on the first button:

The numbers of the keypad are shown here
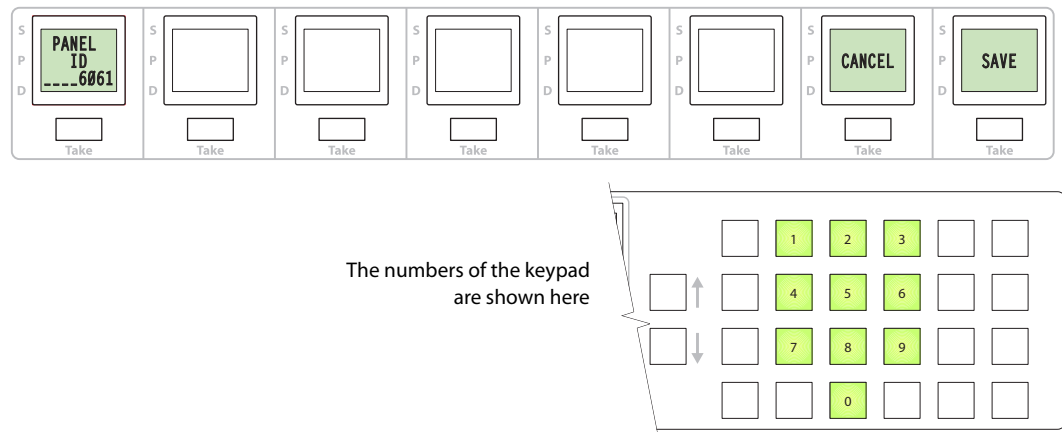
After you enter the panel ID using the keypad, press 'Save'. You can press 'Cancel' if you make a mistake.

The panel returns to the menu, at which point you should click 'Exit'.

4 The second LCD button should display 'Acquire IP Address' once again as in step 1.

5 When you finish, reconnect the Ethernet cable. The NV9000 system controller will detect your panel in a few seconds. (*All* panel IDs must be unique.)

You can now prepare an NV9616 or NV9608 configuration in NV9000-SE Utilities and upload the configuration to the NV9616 or NV9608. You need the panel ID to create a panel configuration. When you upload the configuration, the panel ID you entered in NV9000-SE Utilities designates the actual panel to which the upload will occur. If no actual panel has that ID, the upload cannot occur.

Testing

A panel test function is available when the NV9616 or NV9608 is disconnected from the system controller. Run the test to determine the health of your panel. See Setup Mode on page 54 for detail. You can also view the software version numbers under setup mode.

These are points to consider after you install your control panel(s):

1 Do the buttons illuminate? When an NV9616 or NV9608 powers up, one or more of its buttons are supposed to turn green or amber. Does it pass the panel test mentioned above?

2 When the NV9616 or NV9608 powers up and it is connected to the system controller, it should initialize completely. (That takes a few seconds.) The NV9000 system should load whatever configuration exists for that panel and the buttons appropriate for its configuration should light.

If you continue to see "No Server," "Acquire IP Address," or "Locating Network," you have a problem. Reboot everything and try again.

▲ The panel, by default, acquires its IP address through DHCP on the NV9000's panel/router network. You can use the Panel IP Configuration Utility to force the panel to have a static IP address.

If (in setup mode) you do not see your designated panel ID on the first LCD button, you have either not initialized the panel or no configuration has been created for your panel in NV9000-SE Utilities.

3 Is the NV9000 system controller actually running? With the typical noise levels in a facility, it can sometimes be difficult to tell. Use the 'System' pages of NV9000-SE Utilities to make the determination.

4 Is NV9000-SE Utilities installed and operating? If so, can you upload a configuration to the specified panel?

5 Does the configuration actually work? Is it useful? Can the operator perform takes and perform other operations?

You might want to consider how well your operator interface works in addition to the basic question of whether it works.

4. Configuration

Chapter 4 provides configuration instructions for the NV9616 or NV9608. It presents the following topics:

- Summary
- Adding a Panel to an NV9000 Configuration
- NV9616 Panel Configuration Page
- Commitment Buttons
- Panel Options
- Button Definitions

This chapter addresses configurers. Operators and other persons not interested in NV9616 configuration need not read this chapter.

Summary

The NV9616 and NV9608 are relatively complex panels. Both have 24 configurable function buttons and 2 dedicated scroll buttons. The NV9616 has 16 LCD button units; the NV9608 has 8.

Among the function buttons is a fixed set of 10 category buttons. You cannot configure these buttons as any other type of button. You can create additonal category buttons however. Category buttons provide category mnemonics or category suffixes, or both, and support device selection using categories and suffixes for sources and for destinations.

The panels have dedicated take buttons. The NV9616 has 16 and the NV9608 has 8. The take buttons are part of the LCD button units. They operate differently in X-Y mode and MD mode.

NV9000-SE Utilities is the software with which to configure the NV9616. Figure 4-1, following, shows the default NV9616 panel configuration page from NV9000-SE Utilities.

Adding a Panel to an NV9000 Configuration

You must create configurations for the NV9616 and NV9608 using NV9000-SE Utilities. We assume that you are familiar enough with NV9000-SE Utilities that you can understand the following material. It is not difficult material, but some of the concepts might not be familiar to everyone.

It takes only a few seconds to add a new panel configuration.

4. Configuration

Adding a Panel to an NV9000 Configuration

After launching NV9000-SE Utilities, choose 'Control Panels' from the Configuration pane in the navigation area. The 'Control Panels' configuration page appears:

Click 'Add Control Panel' at the bottom of the page. The 'Add Control Panel' page appears:

Choose "NV9616" or "NV9608" from the 'Type' field. This illustration shows the addition of an NV9616. In the ID field, enter the panel ID you assigned to the panel while it was in setup mode. (You can change the panel ID in NV9000-SE Utilities.) Give a name to the panel in the name field and select a user.

When you are creating a panel configuration you have 3 options. These options are presented in the 'Configuration Options' area:

1 Make a copy of an existing configuration file, giving it a new file name.

2 Use an existing configuration file. (This allows several panels to share a single configuration.)

3 Create an entirely new configuration file.

In the first and third cases, you will create a new configuration file whose name you designate. The file extension for an NV9616 configuration file is `.616`. The file extension for an NV9608 configuration file is `.608`. Click 'Next' or 'Finish' to proceed. Click 'Previous' to go back the previous page. Click 'Cancel' to terminate the entry operation.

▲ There are 2 other buttons, 'Suffix' and 'Navigate', both dim (disabled). These do not apply to the NV9616 or NV9608.

Return to the 'Control Panels' page to view your new entry. To edit an NV9616 or NV9608 configuration, double-click its list entry. This illustrates the addition of an NV9616:

Panel ID	Panel Name	Panel Type	Configuration Name
6021	D602	NV9602	\nvision\envy\usersys\live\D602.602
6421	D642	NV9642	\nvision\envy\usersys\live\D642.642
616100	D616	NV9616	\nvision\envy\usersys\live\D616.616

Control Panels ✕

Panel ID Filter: [ ] Control Panel Name Filter: [ ] Panel Type Filter: [ ] User Filter: [All ▼]

Edit Selected Control Panels   Add Control Panel   Delete Control Panel

You will then see the panel configuration page for the selected panel.

The following section of this guide discusses using the panel configuration page in which you configure an NV9616 or NV9608.

NV9616 Panel Configuration Page

This is the default NV9616 panel configuration page in NV9000-SE Utilities:

Panel Image:

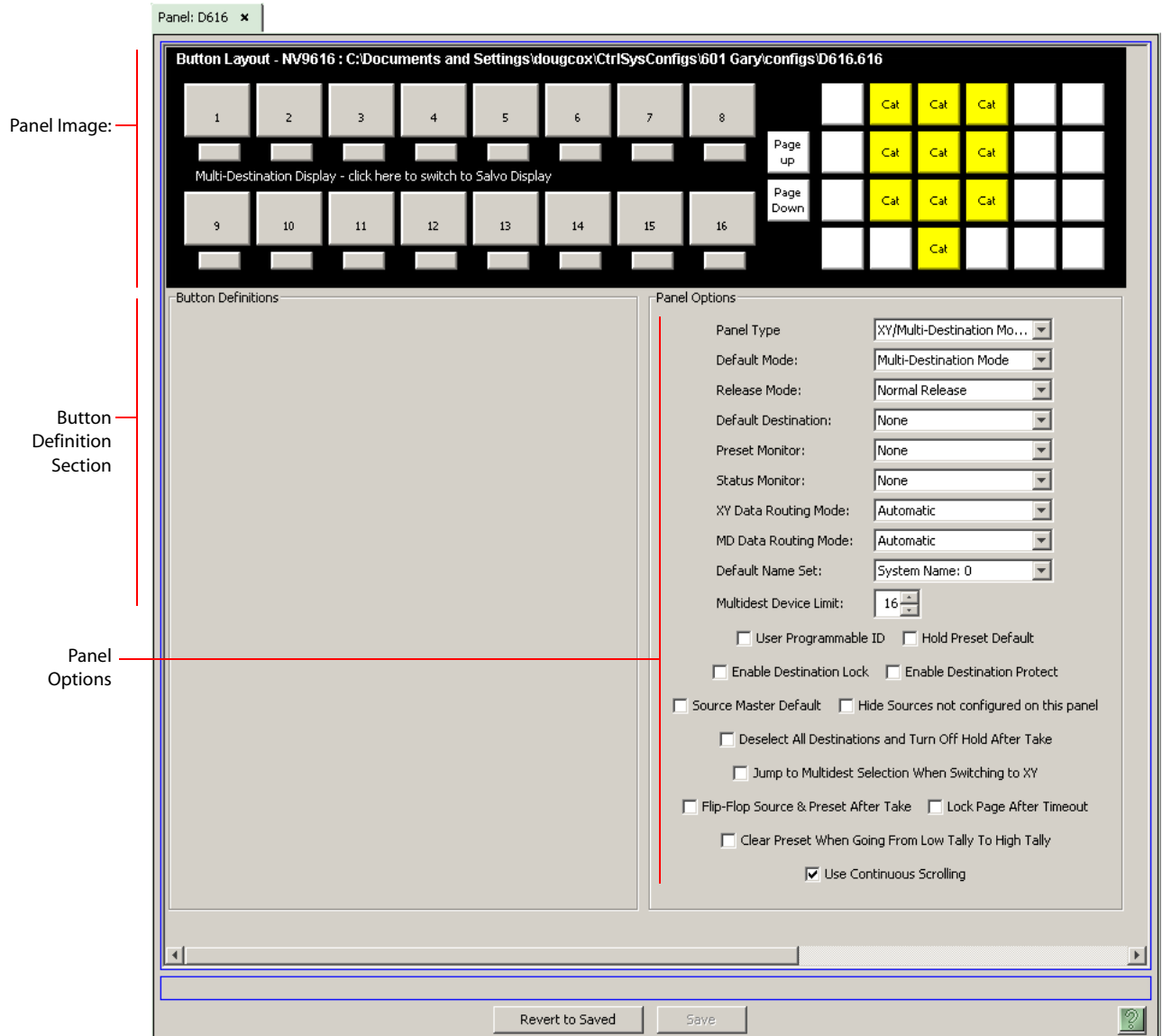Button Definition Section

Panel Options

Figure 4-1. NV9616 Configuration Page (Default)

The NV9608 configuration page is functionally identical, but instead of showing 16 LCD button proxies, it shows only 8.

After you configure buttons the appearance of the panel buttons will have changed. The panel buttons on the configuration page will show legends, determined from the button type assigned to the button. (The actual panel's 26 small buttons have removable clear plastic keycaps under which you can insert button legends, graphic or text, of your own design.)

At the bottom of the page are two important configuration buttons: 'Revert to Saved' and 'Save'. The 'Save' button commits modifications you have just made. The 'Revert to Saved' button restores the last saved version of the panel configuration, canceling any changes you just made.

Regions of the Configuration Page

Above the 'Revert to Saved' and 'Save' buttons (always present) there are 4 main regions:

- A graphic representation of the panel (NV9616 or NV9608).

  Configurers must click a button "proxy" to select the button for configuration.

  At the left are the 16 (or 8) LCD button proxies. These represent either MD destinations or salvos. You can click the line of text in the middle of this section to toggle between MD destination entry and salvo entry. The text changes accordingly:

  `Multi-Destination Display - click here to switch to Salvo Display`

  `Salvo Display - click here to switch to Multi-Destination Display`

  If you are configuring more than 16 (or 8) MD destinations, you must click the 'Page Up' and 'Page Down' button proxies to scroll to a different page to select those MD destinations. Similarly you can scroll through pages of salvo button definitions.

  At the right are the 24 function buttons. The 10 yellow buttons are fixed category buttons. You cannot change the button type of these buttons. The other 14 function buttons are completely configurable.

- Button definitions.

  In this section, configurers make button assignments, using its pull-down menus and text fields. See Button Definitions, following.

- Panel options.

  In this section, configurers may specify the behavioral characteristics of the panel. See Panel Options, following.

Configuration Tasks

The person configuring an NV9616 or NV9608 panel will want to consider how best to use the buttons to support the devices and routers in the router control system at hand. The task is non-trivial.

In support of that effort, the configurer will do the following:

- Select panel options.
- Assign functions to buttons.

Commitment Buttons

Two buttons at the bottom of the configuration page are self-explanatory and appear on most configuration pages:

- Revert to Saved. Press this button if you want to discard any recent changes you have made.
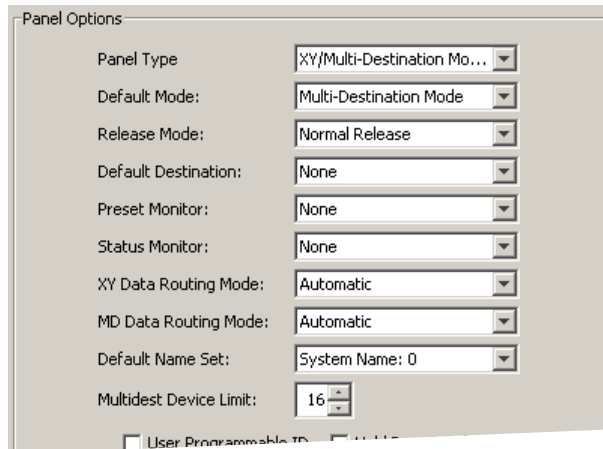- Save. Press this button to commit all your recent changes.

Neither of these actions is reversible.

Panel Options

The panel options section, at the right of the configuration page, has two parts: drop-down menus and checkbox options. These are the drop-down menus:


These are its drop-down menu options:

Panel Type	XY/Multi-destination Modes	The panel configuration allows the operator to switch between X-Y mode and multi-destination mode at any time.
	XY only	The panel configuration is restricted to X-Y mode.
	Multi-destination only	The panel configuration is restricted to multi-destination mode.
Default Mode	X-Y Mode	Starts the panel in X-Y mode after a reset.[a]
	Multi-Dest Mode	Starts the panel in multi-destination mode after a reset.
Release Mode	Normal Release	This panel can release "locks" and "protects" set by the designated user (at this panel or any other panel).
	Force Release	This panel can release locks and protects set by any user.
Default Destination	None	After a reset, the panel displays no destination device. (This is not recommended.)
	‹device›	The Panel uses the specified device as the destination after a reset. (The 'Default State' button also returns the panel to this destination.)
Preset Monitor	None	The preset source video is not sent to a monitor.
	‹device›	The preset source video for the selected destination appears on the specified monitor (device).
Status Monitor	None	The current source video is not sent to a monitor.
	‹device›	The current source video for the selected destination appears on the specified monitor (device).

XY Data Routing Mode	Automatic	If a machine control (data) level is involved in the route, make the route on the control level even if the control port is in use on the source or destination device.
	Semi-automatic (recommended)	If the machine control port is in use on the source or destination device, take all levels except control and allow the user to perform the control level route by pressing 'Take' a second time. If 'Take' is not pressed again, the route is cancelled.
		If the control port is not in use, the control level take occurs automatically.
	Manual	A take on the data level must be performed manually as a breakaway on the control level. The control level will never switch as part of a multi-level take.
MD Data Routing Mode	Automatic	If a data level is involved in the multi-destination route, connect the source to the destinations, regardless of who is currently using the devices. (Recommended.)
	Manual	All multi-destination takes on the data level must be performed manually as breakaways. The data level will never switch as part of a multi-level take.
Default Name Set	System Name	A list of "name sets" appears in the drop-down menu. The name sets can be defined under the System Management pane of NV9000-SE Utilities. Choose 'System Name' in this list if you do not want, or do not care about, device name aliases. Do *not* choose 'System Name' if you are configuring any 'Name Set Toggle' buttons.
Multidest Device Limit	16 (or 8)	This scroll box allows you to specify the maximum number of MD devices, up to 512. The values increment or decrement by 16 for the NV9616 and by 8 for the NV9608. The default value is the minimum value which is 16 for the NV9616 and 8 for the NV9608.

a.   See Defaults on page 77.

Checkbox Options

The checkbox options section is at the bottom of the panel options section:
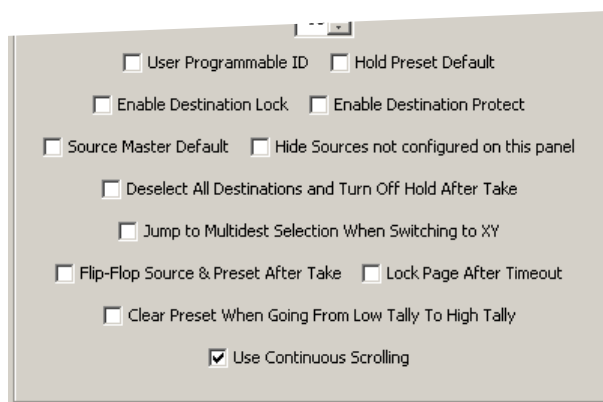
A check in the box enables the option. Clearing the checkbox disables the option.

By default, all the check box options are clear except 'Use Continous Scrolling'.

The following items are the checkbox options:

- User-programmable ID.

  Allows the Panel ID to be changed locally at the control panel (in menu mode).

- Hold preset default.

  Makes "hold" mode active when the panel reverts to its default state (after a 'Default State' button is pressed, or when the panel is restarted).

  ▲ **Note:** a 'Hold' button is needed only when you want the operator to be able to view or change the mode.

- Enable destination lock.

  Check 'Enable Destination Lock' so that any 'Destination Lock' button on the panel will function.

- Enable destination protect.

  Check 'Enable Destination Protect' so that any 'Destination Protect' button on the panel will function.

- Source master default.

  Makes a machine-control-level source the *controlling* device (or master device) by default. Otherwise, the destination is the master device by default. (The option is specifically for use with NVISION series machine control routers.)

  "Source is master" is used for duplication, or broadcast routing, on a machine control level. "Destination is master" is for machine-to-machine editing. Regardless of the default, you can place a 'Source is Master' button on the panel.

  ▲ **Note:** a 'Source is Master' button is a toggle that reverses the direction of data routing for devices used in data level (machine control) takes.

- Hide sources not configured on this panel.

  Causes the names of source devices that are not presently configured for this particular panel to be effectively hidden. When another panel changes the source to one not configured for this panel, this panel displays asterisks instead.

- Deselect all destinations and turn off hold after take.

  After selecting many MD destinations (with 'Hold' mode on), it can be time-consuming to find them all (and no others) to deselect them after a take. When you enable this option, the NV9616 does exactly that (and turns off hold mode).

  You should not check this option unless you configure the panel with a 'Hold' button so the operator can turn hold mode back on.

- Jump to multi-dest selection when switching to XY.

  Makes the currently selected multi-destination device the preset destination when you switch from MD mode to X-Y mode.

  ▲ The X-Y destination chosen is unpredictable when the panel is in MD "hold" mode and multiple destinations are selected.

- Flip-flop source to preset after take.

  Swaps the preset source and the currently routed source for this destination.

- Lock page after timeout.

  If you check this box, the panel will lock the current MD destination page after the panel is idle for the timeout period.

  To clear the lock, operators can press any enabled function button.

  See Setting the Timeout Value on page 65.

- Clear preset when going from low tally to high tally.

  If you check this box, the panel lets the operator clear a preset (in MD mode only) by deselecting and reselecting a destination. When you deselect the destination, it goes low-tally, and when you reselect it, it goes high-tally.

  This method does the same thing a 'Clear' button does, but it does not require a 'Clear' button. This might be advantageous if you want some other button in place of a 'Clear' button.

- Use continuous scrolling.

  If you check this box, the panel scrolls MD destinations continuously. That is, the MD destination pages wrap around at the beginning and at the end of the page list.

  The LCD buttons will show the first page in the list following the last when you are scrolling down, and will show the last page following the first if you are scrolling up.

  If you uncheck this box, the panel will stop scrolling when it reaches either the beginning or end of the page list.

  This option does *not* affect scrolling of salvos when the panel is in salvo mode or levels when the panel is in X-Y mode.
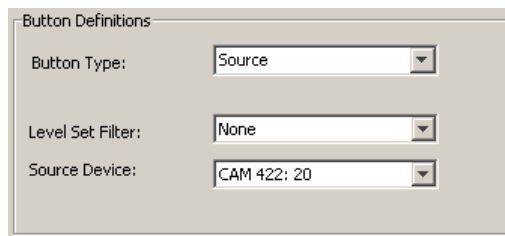
Button Definitions

There are three classes of button functions:

- Dedicated functions, such as 'Default State' or 'Chop'.
- Variable functions, such as 'Category' or 'Source'. With this type of button, additional selections are needed to complete the button configuration.
- Special functions, such as 'Menu' and 'Salvo'.

Button Specification

The button definition section configures the button you have selected in the image of the panel:

When you choose a button type, additional drop-down menus can appear, depending on the button type, allowing you to further specify the button's behavior. Available options and selections vary from button type to button type.

Note	During configuration, certain button fields contain a colon (:) and a number after the data in the field. The number is the record ID of the object in the NV9000 configuration database. The record IDs can be ignored but might be of some use when the configurer is searching for items in the configuration database.

Button Types

These are the button types available for NV9616 and NV9608 configurations:

Type | Description

Broadcast | On the data level (i.e., machine control level), the button enables a broadcast take to an *additional* controlled device, after a broadcast route has been initiated with a "source is master" control-level take to the *first* controlled device.

The button definition has no fields to configure.

A broadcast button is useful in dubbing applications or when a backup (redundant) device is in use. See Broadcast Routes on page 46.

See also the Source Master button, following.

Category | The button selects a device category. When the panel is in source mode, a category button (partially) selects a source. When the panel is in destination mode, a category button (partially) selects a destination.

During operation, a sequence of category button presses is required to select a source or a destination. The first press selects the actual category (e.g., CAM, VTR, MON) and subsequent presses select either alphanumeric suffixes or digits in a numerical suffix.

During configuration, you can specify a source category for the button, a destination category, and a suffix. Any of those fields can be 'None'. When the field is 'None', the button is inapplicable in that context.

Thus, when the panel is in source mode, category buttons that are not configured with a source category become disabled. When the panel is in destination mode, category buttons that are not configured with a destination category become disabled. Category buttons configured with both source and destination categories are not disabled in either mode. Category buttons that have only a suffix configured are disabled until a category becomes selected.

After a category button has been pressed, the operator must then press number or suffix buttons to perform a device selection within the category. Only those suffixes or digits that can apply to the present selection remain enabled.

The 24 function buttons include 10 fixed category buttons. You cannot configure these as any other button type. You can create additional category buttons however.

The names of devices in categories are composed of the category name followed by one or more suffices. (Device names are limited to 8 characters, however.)

NV9000-SE Utilities allows configurers to designate a separator character which is inserted between the parts of the device name.

▲ Category buttons also allow you to enter a page number for multi-destination devices as an alternative to scrolling. This is a convenience, but it is available only when no category device selection (in MD mode) is pending. The convenience is not available for salvos. See Shortcut on page 7.

Chop | When a chop function is supported by a router, the button is a toggle that enables and disables rapid switching of the selected destination device between the current source and the preset source. This chop function is used to test system timing.

The button definition has no fields to configure.

Type	Description
Clear	The button reverts to the most recent action. You may also think of this as a "backspace key." It erases the suffixes entered under category selection in reverse order. If the operator continues to press the 'Clear' button during category selection, it will erase the entire selection, including the category mnemonic.
	(If the operator has placed the panel in salvo mode, 'Clear' brings the panel back to normal mode, without executing a salvo.)
Clear preset	The button removes the preset source from a pending take.
	The button definition has no fields to configure.
Default state	The button returns the panel to its most recent power-up state. That is called the *default state*.
	The button definition has no fields to configure.
Destination Lock	The button sets or removes a "lock" on the currently selected destination device(s). The lock can be removed only by the user that originally set the lock, or by a panel that has "Force Release" enabled.
	The button definition has no fields to configure.
	In X-Y mode, the panel turns the destination button (the top left LCD button) red whne the destination is locked..
	In MD mode, the panel turns the buttons for locked destinations red. It also displays "Locked by ‹user›" on the buttons of locked destinations (where ‹user› is one of the user names defined in the NV9000 system).
Destination Mode	The button places the panel in destination mode. Category selections in destination mode select destination devices. Category buttons that are not configured with destination categories become disabled.
	Categories that include both source and destinations remain enabled in both source mode and destination mode.
	The button definition has no fields to configure.
Destination Protect	The button sets or removes a "protect" on the current destination device. The protect can be removed only by the user that originally set the protect, or by a panel that has "Force Release" enabled.
	Note: a protect prevents *others* from routing to a destination; a lock prevents *anyone* — even the user who issued the lock — from routing to the destination.
	The button definition has no fields to configure.
	In X-Y mode, the panel provides no explicit indication, during operation, whether a destination is protected or unprotected.
	In MD mode, the panel turns the buttons for protected destinations red. It also displays "Protect by ‹user›" on the buttons of protected destinations (where ‹user› is one of the user names defined in the NV9000 system).
Free Source	The button selects a pre-defined phantom device that can be used to release or "free" devices on the data (machine control) level. A free source is also used with tielines to free the tieline for others to use. The free source is defined in the *Level Set Details* page of NV9000-SE Utilities.
	The button definition has no fields to configure.

Type	Description
Gang Take	When the panel is in MD mode, the gang take button allows operators to select and preset multiple MD destinations and execute a take for all of them simultaneously.
	When the panel is in X-Y mode, the gang take button acts like an ordinary take button.
	The button definition has no fields to configure.
Hold	In multi-destination mode, Hold retains destination selections after a take. In X-Y mode, Hold retains breakaway levels after a take.
	The button definition has no fields to configure.
Information	Although an information button is present in the drop-down menu for button types, you should not configure an information button on the panel, because an information button does nothing.
Level Map	Cross-connects levels (in the same physical router). The function is typically used to shuffle audio channels, for example, to connect AES1/2 to AES3/4.
	The level map mode is cancelled when the next normal take is performed involving the selected destinations.
	The button definition has no fields to configure.
Load Preset	The 'Load Preset' button creates a preset for MD destinations using one of the presets the operator saved with a 'Save Preset' operation. See Saving and Loading Presets on page 46.
	The button does not operate in X-Y mode.
	The button definition has no fields to configure.
	▲ The 'Load Preset' button and 'Save Preset' button are not supported in an NV915 system. They are fully functional in an NV9000 system.
Menu	This button puts the NV9616 panel in menu mode and displays a menu on the LCD buttons that provides access to a variety of panel functions. Without the button, the operator has no access to the menu functions.
	Using the menu, the operator chan change the panel ID (if the configuration permist it) or change button brightness values. Administrators could use the menu to determine the panel's software revision, IP address, user ID, or configuration name. See Menu Mode on page 49.
	The button definition has no fields to configure.
Name Set Toggle	The button toggles the panel between its *default name set* and the "system name" set. One or the other becomes the active name set.
	The button definition has no fields to configure.
	If the default name set is the system name set, the button would be a no-op. Therefore configurers should not create a 'Name Set Toggle' button if the default name set is 'System Names'.
	The status, preset, or destination displays use the active name set — either the default name set (aliases) or the system name set. However, that when the panel is displaying aliases, and a device does not have an alias, the panel displays the system name.

Type	Description
Panel Lock	The button prevents accidental changes to the panel settings, especially router cross-spoints. When the panel is locked, the button array becomes blank except for the Panel Lock button which becomes high tally amber. Pressing the panel lock button again reverts the panel to its previous state.
	The button definition has no fields to configure.
Preset Release	The button removes locks and protects from preset source devices. This button is not needed if source locks and protects are not used in your system.
	The button definition has no fields to configure.
Previous Source	The button presets the previously routed source to the currently selected destination. The operator must next press 'Take' to restore the previous route. This function is useful when an operator makes a route in error.
	The button definition has no fields to configure.
	The button does **not** restore the previous destination. If the user changed the destination and presses 'Previous Source', the take will not restore the previous route.
Salvo	The salvo button places the panel in *salvo mode* where the operator can scroll through pages of system salvos and local salvos. Salvo names appear on the panel's LCD buttons. The operator might need to scroll to find the salvo of interest. When the operator finds the salvo of interest, he or she presses the button for the salvo to select the salvo and presses the take button under the salvo button to execute the salvo. After the salvo executes, the panel returns to its normal mode.
	The operator must press the salvo button again (while the panel is still in salvo mode) to return to normal mode.
	▲ Local salvos are not supported in an NV915 system. They are fully functional in an NV9000 system.
Save Preset	The 'Save Preset' button becomes enabled, in MD mode only, when you have selected a preset for a destination (or multiple presets for multiple destinations). When the operator presses 'Save Preset' the panel enters a "save preset" mode where the operator may enter an name under which the preset will be saved and which can be used later if the operator presses a 'Load Preset' button. See Saving and Loading Presets on page 46.
	The button does not operate in X-Y mode.
	The button definition has no fields to configure.
	▲ The 'Save preset' button and 'Load Preset' button are not supported in an NV915 system. They are fully functional in an NV9000 system.
Source	The button selects a pre-defined source. The source name appears in the 'Preset' display.
	During configuration, when you assign a source button, a drop-down menu appears: 'Source Device'. Choose a device from the list. The 'None' entry is merely a placeholder. Do not choose 'None'.

Type	Description
Source Master	Means "the source is the master" and makes the source device the master. Otherwise, the destination device is the master. This button (and these concepts) apply only to machine control routes only.
	The button definition has no fields to configure.
	The button is a toggle: Press it once to make the source the master (it goes high-tally); press it again to make the destination the master (the button is low-tally).
	A panel option allows you to make "source is master" the default. In this case, the button still toggles between "source is master" and "destination is master," and the button, if present, is high-tally by default.
	The 'Source is Master' button is also used to initiate "broadcast" machine control routes. See Broadcast Routes on page 46.
Source Mode	The button places the panel in source mode. Category selections in source mode select source devices. Category buttons that are not source categories become disabled in source mode.
	Categories that include both source and destinations appear in both source mode and destination mode.
	The button definition has no fields to configure.
Src/Dst Mode	The button toggles between source and destination modes. Category selections in source mode select source devices. Category selections in destination mode select destination devices.
	If you place this button on a panel, the panel does not need a 'Source Mode' button or a 'Destination Mode' button.
	The button definition has no fields to configure.
XY/MD Mode	The button toggles the panel between X-Y mode and multi-destination mode.
	The button definition has no fields to configure.
Undefined	This button type is a placeholder: during configuration, it makes the button undefined and inactive. On the actual panel, the undefined button remains unlit (dark).

4. Configuration
Button Definitions

5. Operation

Chapter 5 provides operating instructions for the NV9616 and NV9608 control panels. It presents these topics:

- Summary
- Operating Concepts
- Salvo Mode
- Menu Mode
- Setup Mode

This chapter is intended specifically for the NV9616 panel *operator*.

Summary

As an NV9616 or NV9608 operator, you will be confronted initially with a relatively complex panel—16 (or 8) LCD button units, 24 backlit function buttons, and 2 backlit scroll buttons.

The panel's function buttons can have arbitrary legends (using plastic inserts under the button caps). A button's legend should indicate its function. Some buttons can be applied differently in other modes (such as menu mode). Operators and configurers will have to communicate about the meaning of the buttons.

The LCD buttons show the status of takes (pending or completed) under normal circumstances. The LCD buttons present information or menu items in certain cases.

At any particular time, some of the buttons are enabled or disabled. Some are high-tally; some are low-tally; and some might be undefined. Active function buttons are of two colors, green and amber. Active LCD buttons are green, amber, yellow, or red. (Red indicates a lock or a protect.)

▲ Please refer to the *NV9000-SE Utilities User's Guide* (or the NV9000-SE Utilities help files) if you are unfamiliar with the concepts used in this chapter.

Modes of Operation

The panels can operate in one of 2 modes:

- X-Y mode.
- Multidestination mode.

The panels can be configured so that you can select either mode.

5. Operation

Multi-Destination Mode

The panel supports up to 512 MD destinations. The NV9616 displays 16 at a time on the LCD buttons. The NV9608 displays 8 at a time.

Operators perform a take by (optionally) scrolling to an MD page, pressing an LCD button to select a destination, selecting a source, and pressing the take button under the selected LCD button. The operator uses the function buttons to select a source.

In MD mode, all the LCD buttons are normally green — and high-tally green when selected. When you preset a source for an MD destination, then the button turns yellow.

Breakaway is not directly possible in MD mode, but when the operator performs breakaway in X-Y mode and then switches to MD mode, the destination(s) for which breakaway occurred show the source name in reverse text.

You can preset multiple MD destinations each, with its own source, and press 'Gang Take' to execute a simultaneous route to all selected destinations.

▲ The panel might be configured so that it becomes locked after a timeout period in MD mode. If your panel times out, simply press any active function button to release the lock.

X-Y Mode

The LCD buttons represent a single selected destination and the levels for that destination.

The destination appears on the top left LCD button (for the NV9616). On the NV9608, it is simply the left button. This button is usually *amber*. It usually displays the text "X - Y" and "Dest" to remind you that the panel is in X-Y mode. It is red when the destination is locked (or when someone else has protected it).

The remaining LCD buttons show the levels. When the panel is in source mode, all the level buttons are *green* — and high-tally when selected. The level buttons turn yellow if you have preset a source for those levels. If there are fewer levels than available buttons, the extra buttons are blank. If there are more levels than available buttons, the operator can scroll through the pages of levels using the scroll buttons. The destination button remains in its fixed position regardless of the page.

When the panel is in destination mode (i.e., you are selecting a destination) all the LCD buttons are amber and high-tally when selected. This is a fairly obvious indication that the panel is in destination mode. In addition, the destination button (at the left or top left) shows the destination you are selecting on the top line of text. Because destination selection uses categories and suffixes, the pending destination name will appear partially completed as you continue to "build" the destination name using category/suffix buttons.

Breakaway is possible in X-Y mode. You may select the levels on which the take is to occur by pressing the individual LCD buttons that represent the levels. (Scrolling might be necessary to view all the levels.) You cannot select a level that does not apply to the selected destination.

Operators perform a take by selecting a destination, (optionally) selecting levels, selecting a source, and pressing the take button under any of the selected LCD buttons. The operator uses the function buttons to select a source and to select a destination.

Secondary Modes

Secondary modes are:

- Source mode—exists briefly while you are choosing a source.
- Destination mode—exists briefly while you are choosing a destination.
- Setup mode—where the NV9616 is freshly powered up, but *disconnected from the network*. In this mode, the configurer can preset the NV9616's panel ID and perform a few diagnostic tasks.

  Usually, only configurers need be concerned with setup mode.

  See Setup Mode on page 54.
- Salvo mode—pressing a salvo button places the NV9616 in salvo mode, where it is expected that you will choose a salvo and then press the 'Take' button to execute the salvo. (The duration of a salvo is indeterminate, but usually short.)
- Menu mode—pressing a menu button places the NV9616 in "menu" mode. In menu mode, the buttons lose their normal functions and become part of a menu that changes as needed during menu operation.

  There is nothing in the menu that concerns operators except button brightness. An operator may use the menu to set button brightness. Administrators and configurers may use the menu to view or change the panel ID, or to determine the software and firmware revisions.

  See Menu Mode on page 49.
- Hold mode—when hold mode is active in X-Y mode, a breakaway level selection remains in effect until the operator turns hold mode off. In MD mode, when hold mode is active, the operator may select multiple destinations.
- Save Preset mode—pressing a 'Save Preset' button, in MD mode, while you have a preset source pending, places the panel in "save preset" mode in which you can name, and save, a the current presets. You can then retrieve a named preset by pressing a 'Load Preset' button. See Saving and Loading Presets on page 46.
- Load preset mode—pressing a 'Load Preset' button places the panel in a temporary mode in which you can select a saved preset selection.

When the panel is not in setup mode, salvo mode, menu mode, we say it is in *normal mode*. Normal mode might or might not include level mode.

Button Legends

There are about 26 different button functions. Typically, function buttons have graphic or textual legends that are plastic inserts placed under the clear button caps.

There are button templates available. Use these or your own to create button graphics. Print the graphics on clear plastic, cut the button graphics apart and insert these under the button caps.

Buttons are also color-coded to a limited degree. Green represents sources. Amber represents destinations. Those colors are used for other functions, however. High-tally (bright) buttons are those that are selected; low-tally (dim) buttons are those that are not selected. Dark buttons are those that are disabled.

The legends on the LCD buttons change dynamically and represent different things in different contexts:

- In MD mode, the LCD buttons each represent a destination. All the LCD buttons work the same way. The top line of text is the current source for the destination. The middle line of text is the

preset source for the destination. The middle line of text is blank when you have not preset a source. The bottom line of text is the destination name.

- In X-Y mode, the top left button of the NV9616 represents the selected destination. Similarly, the left button of the NV9608 represents the selected destination. Any remaining buttons represent levels. Not all levels necessarily apply to the selected destination. Those that do apply can be selected and those that are selected are high-tally.

  The text on the destination button varies. The top two lines usually read "X - Y" and "DEST" respectively. The bottom line is the destination name.

  The top line of buttons that represent levels is the current source for that level. The middle line is the preset source for that level. The middle line of text is blank when you have not preset a source. The bottom line is the level name.

- In menu mode, the button text varies according to the button function.

- In salvo mode, the button text is the salvo name.

Operating Concepts

Levels

In the NV9000-SE Utilities and in the NV9000 router control system, routes occur on *levels*. A level is typically SD, HD, analog video, AES, analog audio, or machine control. Various devices are defined as sending and receiving signals on certain levels. The set of levels handled by a device belong to what is called a *level set*.

A source can be routed to a destination if it has the same set of levels, i.e., it belongs to the same named level set. A source can be routed to a destination in a different level set if the NV9000 configuration has the appropriate level mapping.

The effect of this is that when you, the operator, choose a destination, the NV9000 recognizes which source devices are allowed to be routed to the destination and limits your selection to those sources.

Breakaway

Routes can be all-level in which case they are taken on all levels defined for the destination. The acceptable sources for a route have the same levels as, or some configured mapping to, the levels of the destination.

A breakaway is where you take different sources to the same destination—on different levels.

It is not possible to take different sources to the destination on the same level. For instance, you cannot take SD from two different sources. The outcome would be noise even if you could do it. (That is because routers are not mixers.)

Hold

Hold mode (and hold buttons) apply in both X-Y mode and multi-destination mode.

A hold button is also called a 'Hold Preset' button.

Breakaway

In X-Y mode, a hold button retains breakaway levels after a take.

Simply press the hold button at any time before the take.

A hold button is a toggle. Press it once to put the panel in hold mode; press it again to remove hold mode.

Multi-Destination Mode

In multi-destination mode, Hold retains destination selection(s) after a take.

Category Selection

Your panel has 10 fixed category buttons and perhaps other optional category buttons. The fixed category buttons are arranged like a telephone keypad:
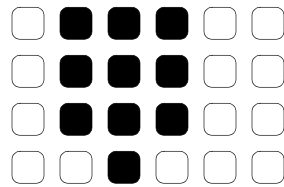
Although their position is fixed, their functions are not.

Every category button can represent up to three items: a source category, a destination category, and a suffix. By pressing category buttons in succession, you can construct a device name.

A category button selects a source category immediately after you place the panel in source mode by pressing a 'Source Mode' button (or a 'Src/Dst' button).

A category button selects a destination category immediately after you place the panel in destination mode by pressing a 'Destination Mode' button (or a 'Src/Dst' button).

After you select a category, the category name appears as the first part of a device name you are building. The category buttons you press subsequently select suffixes which are appended to the device name you have built so far. As you continue to append suffixes, the category buttons that no longer apply to the name you are building become disabled. In fact, at some point all the category buttons might become disabled.

Suffixes may be numeric or alphanumeric, and up to 4 characters in length. Any device may have up to 8 suffixes. However, device mnemonics are limited to 8 characters. Therefore, the usual—and default—suffixes are just the numerals 0–9.

Example: you want to select the source device `CAM_12`.

1 Press 'Source Mode' or 'Src/Dst'
2 Press the category button that selects category `CAM`. The LCD button for this source shows `CAM_____`.
3 Press the category button for suffix 1. The LCD button for this source shows `CAM__1` or a similar name.
4 Press the category button for suffix 2. The LCD button for this source now shows `CAM_12`.

At this point, you could press a 'Clear' button—as you would a backspace key—to erase the most recent entries in the name. If you press 'Clear' once, it would erase the "2" you just entered.

5 The desired source is selected.

▲ Category buttons also allow you to enter a page number for multi-destination devices. This is a convenience, but it is available only in MD mode when no category device selection is in progress.

Lock, Protect, and Release

In a multi-user system, routes made by one user can be made safe from being accidentally or maliciously change by another user.

Definitions

Owner	The user ID of a panel where a lock or protect was issued.
Source lock	No one can use the source.
Source protect	No one but the owner can use the source.
Destination lock	No one can route to the destination.
Destination protect	No one but the owner can route to the destination.
Release	To remove a lock or protect.

Some control panels can lock or protect both sources and destinations. However, *The NV9616 provides locks and protects for destinations only.*

A forced release is when the lock or protect is removed by someone other than the owner. A forced release can be performed at any panel configured with release mode set to "forced release."

The 'Destination Lock' and 'Destination Protect' buttons are toggles. Press the lock (or protect) button to lock (or protect) a destination. Press the button again to release the lock (or protect).

In X-Y mode, a destination *lock* disables destination *protect* for a particular destination.

In X-Y mode, the destination button turns red when the destination is locked or when the destination is protected by someone else. If you have protected the current destination, there is no color change.

In MD mode, the button for a destination that is locked or protected turns high-tally red, and the phrase "Locked by ‹user›" or "Protect by ‹user›" appears on the button when it is selected. When the locked destination is not selected, it is low-tally red and shows the source and destination names. In MD mode, the lock button does not disable the protect button, but nevertheless, you cannot protect a locked destination.

Takes

Following are brief instructions on how to perform a take under different scenarios.

Scenario 1 — X-Y Mode, All Level

1 (If required) switch to X-Y mode.

2 (If required) select a destination.

Press 'Destination Mode' to begin selection of a destination. Then press a category button to choose a destination category. Then press additional category buttons to append a suffix to the category mnemonic to generate the destination name.

The name you generate appears on the left (or top left) LCD button on the panel.

3 Select a source

Press 'Source Mode' to begin selection of a source. Then press a category button to choose a source category. Then press additional category buttons to append a suffix to the category mnemonic to generate the source name.

You can also press a dedicated source button if you have one for that source.

The selected LCD buttons turn yellow. The name of the source appears in the preset line of those LCD buttons. All levels of the destination you chose are selected by default.

4 Press a 'Take' button. You can press the take button under the destination button or you can press the take button under any of the buttons for selected levels.

You could also press a 'Gang Take' button (among the function buttons) if you have one.

Scenario 2 — X-Y Mode, Breakaway

1 (If required) switch to X-Y mode.

2 (If required) select a destination.

Press 'Destination Mode' to begin selection of a destination. Then press a category button to choose a destination category. Then press additional category buttons to append a suffix to the category mnemonic to generate the destination name.

The name you generate appears on the left (or top left) LCD button on the panel.

3 When you have selected a destination, its levels appear high-tally on the LCD buttons used for levels. The level names are displayed on the bottom line of text on the buttons.

Initially all levels are selected (unless hold mode is on). Press one or more level buttons to select and deselect levels until you have the selection you want.

4 Select a source

Press 'Source Mode' to begin selection of a source. Then press a category button to choose a source category. Then press additional category buttons to append a suffix to the category mnemonic to generate the source name.

You can also press a dedicated source button if you have one for that source.

The LCD buttons for preset source levels turn yellow. The name of the source appears in the preset line of those LCD buttons.

5 Press a 'Take' button. You can press the take button under the destination button or you can press the take button under any of the buttons for selected levels.

You could also press a 'Gang Take' button (among the function buttons) if you have one.

Scenario 3 — Multi-Destination Mode, One Destination

1 (If required) switch to MD mode.

2 Select a destination.

(Optionally) scroll the MD pages to locate the destination of choice.

Press the destination's LCD button.

▲ After pressing the destination's LCD button, you can optionally assign a new destination to that button. To do so, press 'Destination Mode' to begin selection of a destination. Then, press a category button to choose a destination category. Then press additional category buttons to append a suffix to the category mnemonic to generate the destination name. The name of the new destination appears on the LCD button.

3 Select a source

If necessary, press 'Source Mode' to begin selection of a source. Then press a category button to choose a source category. Then press additional category buttons to append a suffix to the category mnemonic to generate the source name.

You can also press a dedicated source button if you have one for that source.

The LCD buttons for preset source levels turn yellow. The name of the source appears in the preset line of those LCD buttons.

4 Press the 'Take' button under the destination button.

You could also press a 'Gang Take' button (among the function buttons) if you have one.

Scenario 4 — MD Mode, Multiple Destinations

This scenario requires that your panel have a gang take button.

1 (If required) switch to MD mode.

2 Select a destination.

(Optionally) scroll the MD pages to locate the destination of choice.

Press the destination's LCD button.

▲ After pressing the destination's LCD button, you can optionally assign a new destination to that button. To do so, press 'Destination Mode' to begin selection of a destination. Then, press a category button to choose a destination category. Then press additional category buttons to append a suffix to the category mnemonic to generate the destination name. The name of the new destination appears on the LCD button.

3 Select a source

If necessary, press 'Source Mode' to begin selection of a source. Then press a category button to choose a source category. Then press additional category buttons to append a suffix to the category mnemonic to generate the source name.

You can also press a dedicated source button if you have one for that source.

The LCD buttons for preset source levels turn yellow. The name of the source appears in the preset line of those LCD buttons.

4 Repeat steps 2 and 3 until you have selected, and preset, all the destinations you want.

5 Press the 'Gang Take' button (among the function buttons).

The take buttons under the LCD buttons do not perform gang takes.

Gang Takes

Gang takes occur in MD mode only. However, the 'Gang Take' button will perform ordinary takes when your panel is in X-Y mode.

In MD mode, the 'Gang Take' button performs takes to multiple MD destinations (which have presets) simultaneously. The gang take is the only way to perform simultaneous takes.

In X-Y mode, the gang take button acts like an ordinary take button. It just executes the take that any of the dedicated take buttons in the LCD button array would execute.

Buttons

The NV9616 has 3 classes of button functions:

- Dedicated functions, such as 'Default State' and 'Chop'.

- Variable functions, such as 'Category', 'Source', or 'Destination'. A category button identifies a specific category. A source button identifies a specific source. A destination button identifies a specific destination.

- Special functions, such as 'Menu', 'Page Up', and 'Page Down'.

At present, there are 26 button types, not including "undefined" which is not a true button type:

Broadcast	Free Source	Preset Release
Category	Gang Take	Previous Source
Chop	Hold	Salvo
Clear	Information	Save Preset
Clear Preset	Level Map	Source
Default State	Load Preset	Source is Master
Destination Lock	Menu	Source Mode
Destination Mode	Name Set Toggle	Src/Dst Mode
Destination Protect	Panel Lock	XY/MD Mode

These button types are available in both X-Y mode and MD mode.

Broadcast

A broadcast button applies to a data (or machine control) level only. The button assigns one controlling device (the master) to multiple controlled devices (the slaves). The function is useful in dubbing applications. See Broadcast Routes on page 45 for more information.

▲ Pressing the 'Broadcast' button turns off the 'Source is Master' button and vice versa.

The default button text is "Broadcast" but a broadcast button can have any legend.

Category

A category button selects either a category mnemonic or a category suffix. Category buttons exist for the purpose of selecting (naming) either a source or a destination device.

When you have not started a device selection, pressing a category button (1) chooses a category mnemonic as the beginning of a device name and (2) starts the device selection.

Thereafter, pressing a category button appends the suffix represented by the button to the device name. When you have constructed the device name of choice, you simply stop pressing suffix buttons.

A category button operates in source mode or destination mode. In source mode, it selects a source category or a suffix for the source category. In destination mode, it selects a destination category or a suffix for the destination category.

When the panel is in source mode, category buttons that are not configured with a source category become disabled. When the panel is in destination mode, category buttons that are not configured with a destination category become disabled. Category buttons configured with both source and destination categories are not disabled in either mode. Category buttons that have only a suffix configured are disabled until a category becomes selected.

There are *fixed* and *optional* category buttons. The fixed category buttons form a keypad within the array of function buttons:
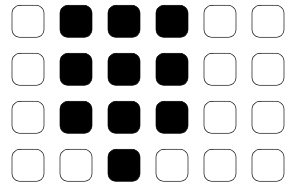
The keypad is also used under menu mode and under setup mode.

▲ You cannot perform a name set change using a 'Nameset Toggle' button while a category selection is in progress.

Chop

When a "chop" function is supported by a router, the button is a toggle that enables and disables "chop." Chop is a rapid switching of the selected destination device between the current source and the preset source.

The chop function is used to test system timing and would ***not*** be used during normal operation.

The default button text is "Chop" but a chop button can have any legend.

Select a preset source and press 'Chop' to start the chop function. Press 'Chop' again to stop the chop function.

Clear

The 'Clear' button reverts the panel to the most recent preset. (It does not cause any changes to the routers, control system, or its signals.)

You may think of this as a "backspace" or "cancel" key. During category/suffix device selection, it erases the suffixes you entered in reverse order.

(If you are in level mode or in salvo mode, 'Clear' brings you back to normal mode.)

Clear Preset

The 'Clear Preset' button removes the preset source from a pending take. (It does not cause any changes to the routers, control system, or its signals.)

The preset source names appear on the middle line of text of applicable LCD buttons. When you press 'Clear Preset', the middle line of text becomes blank.

Default State

The 'Default State' button returns the panel to its most recent power-up state. That is called the *default state*. (It does not cause any changes to the routers, control system, or its signals.)

Destination Mode

The button places the panel in destination mode. Category selections in destination mode select destination devices. Category buttons that are not configured with destination categories become disabled.

Destination devices are represented on the 'Destination' display.

Categories that include both source and destinations appear in both source mode and destination mode.

Destination Lock

This button is a toggle that sets or clears a *lock* on the current destination. The lock can be removed at the panel that originally set the lock, at a panel that has the same user ID, or by a forced release at any panel.

In X-Y mode, the destination button (left or top left) turns red when you lock the destination. You must select at least one level on which to lock the destination. To unlock a destination, select exactly those levels and press 'Destination Lock' again. The button reverts to amber when it is unlocked on all levels.

▲ The panel provides no explicit indication, in X-Y mode, which levels are locked or unlocked.

In MD mode, the lock affects all selected MD destinations. The buttons for those destinations turn red and their legends read "Locked by ‹user›" where ‹user› is the user name assigned to your panel.

The button representing that destination on other users' NV9616s or NV9608s turns red with the same legend.

Destination Protect

This button is a toggle that sets or clears a *protect* on the current destination device. The protect can be removed at the panel that originally set the protect, at any panel that has the same user ID, or by a forced release at any panel.

In X-Y mode, the destination button (left or top left) does not change color *on your panel* when you protect the destination. The same destination does however turn red on other users' NV9616s or NV9608s (and on certain other panels in your NV9000 system). You must select at least one level on which to protect the destination. To unprotect a destination, select exactly those levels and press 'Destination Protect' again. The button reverts to amber *on other panels* when it is unprotected on all levels.

▲ The panel provides no explicit indication, in X-Y mode, of which levels are protected or unprotected and in fact no indication of which destinations you have protected or unprotected.

In MD mode, the protect affects all selected MD destinations. The buttons for those destinations turn red and their legends read "Protect by ‹user›" where ‹user› is the user name assigned to your panel. The button representing that destination on other users' NV9616s or NV9608s turns red with the same legend.

▲ **Note:** a protect prevents *others* from routing to a destination; a lock prevents *anyone* — even the user who issued the lock — from routing to the destination.

▲ You may lock a protected destination, but you cannot change a locked destination to a protected destination directly. You must first unlock it.

Free Source

The button selects a pre-defined phantom device that can be used to release or "free" devices on the data (machine control) level. A free source is also used with tielines to free the tieline for others to use. The actual free source used is defined in the NV9000 configuration.

Use this button as if it were a source button.

Gang Take

When the panel is in MD mode, the 'Gang Take' executes a simultaneous take for all selected MD destinations.

When the panel is in X-Y mode, the gang take button acts like an ordinary take button.

Hold

The button is a toggle; press it once to place the panel in "hold mode." Press it again to cancel "hold mode." (The panel might or might not be configured to power up in hold mode.)

In single-destination mode with breakaway, this button retains breakaway levels after a take.

In limited X-Y mode, this button allows you to perform a gang (or "dub") switch. In hold mode, destination selections are cumulative, and not mutually exclusive. See Hold on page 34.

The 'Destination' field of the display shows the most recently selected destination under hold mode.

The button definition has no fields to configure.

Information

An 'Information' button does nothing.

Level Map

The 'Level Map' button cross-connects levels (typically in the same physical router). The function is typically used to shuffle audio channels, for example, to connect AES1/2 to AES3/4.

Level mapping is possible only in X-Y mode.

Follow these steps to create a level mapping:

1 Select a destination and preset a source. The 'Level Map' button becomes enabled.

2 Press 'Level Map'. The button goes high-tally and the destination button tells you to "Select Source Level."

   Press a level button.

3 The destination button now reads "Select Dest Level."

   Press another level (selection) button.

4 At this point, the level mapping is complete. The source level is mapped to the destination level. The source level appears in the preset line of the button assigned to the destination level.

5 Finally, press 'Take'.

You can create multiple level mappings. Level mappings are typically used for AES levels.

The level map mode is cancelled when the next normal take is performed involving the selected devices.

Load Preset

The 'Load Preset' button creates a preset for MD destinations using one of the presets the operator saved with a 'Save Preset' operation. See Saving and Loading Presets on page 46.

The button does not operate in X-Y mode.

Menu

This button puts the panel in menu mode and produces a menu on the LCD buttons that provides access to a variety of panel functions.

Without the button, the operator has no access to the menu functions.

By pressing certain buttons, you makes menu selections and enter data (such as panel ID) or change brightness values. When the panel is in menu mode, you must press the 'Menu' button to cycle through the functions of the menu. See Menu Mode on page 49.

Name Set Toggle

An 'Name Set Toggle' button toggles the panel between its default name set and the "system name" set. Whichever name set you select becomes the "active" name set.

▲ 'Name Set Toggle' buttons are disabled while a category selection is in progress.

▲ The panel requires that category/suffix device selection be performed using the names in the system name set. However, it displays the device you selected using the active name set. We recommend that you switch to the system name set prior to category/suffix device selection and return to your preferred name set afterward.

Panel Lock

The button prevents accidental changes to the panel settings, especially router crosspoints. When the panel is locked, the button array becomes blank except for the Panel Lock button which becomes high tally amber.

The button is a toggle: press the panel lock button again to revert the panel to its previous state.

Preset Release

The button presets the previously routed source to the currently selected destination. To restore the previous route, you must next press 'Take' assuming you have not changed the destination. This function is useful when you make a route in error.

Previous Source

The button presets the previously routed source to the currently selected destination. To restore the previous route, you must next press 'Take' assuming you have not changed the destination. This function is useful when you make a route in error.

The button does *not* restore the previous destination. If you changed the destination and press 'Previous Source', the take will not restore the previous route.

Salvo

The salvo button places the panel in *salvo mode*. In salvo mode, most buttons become disabled. In salvo mode, you can scroll through the salvo list assigned to the panel. When you find the salvo of your choice, press the 'Take' button to execute the salvo. After the salvo executes, the panel returns to its normal mode.

Pressing the salvo button again while the panel is in salvo mode to reset the salvo selection. Press any other button (such as 'Clear') while the panel is in salvo mode to return the panel to its normal mode.

Save Preset

The 'Save Preset' button becomes enabled, in MD mode only, when you have selected a preset (or multiple presets) for a destination (or multiple destinations). When the operator presses 'Save Preset' the panel enters a "save preset" mode where the operator may enter a name under which the preset will be saved and which can be used later if the operator presses a 'Load Preset' button. See Saving and Loading Presets on page 46.

The button does not operate in X-Y mode.

Source

The button selects a specific source. The source name appears in the 'Preset' display.

Selecting a source activates the 'Take' button, which you must press to complete the route.

Source Mode

The button places the panel in source mode. Category selections in source mode select source devices. Category buttons that are not source categories become disabled in source mode.

Categories that include both source and destinations appear in both source mode and destination mode.

In source mode, a category selection appears at the beginning of the 'Preset' display.

Source is Master

Means "source is the master" and makes the source device the master. Otherwise, the destination is the master. This button (and these concepts) apply only to machine control routes.

The button is a toggle: Press it once to make the source the master (it goes high-tally); press it again to make the destination the master (the button is low-tally).

The 'Source is Master' button is also used to initiate "broadcast" machine control routes. See Broadcast Routes on page 45.

During data level (i.e., machine control) takes, this button makes the source device the master. Otherwise, the destination is the master.

The button is a toggle that reverses the direction of data routing. For example, if the destination is the master and the source is the slave, pressing a 'Source is Master' button reverses their roles. Pressing the button again reverses the roles.

The 'Source is Master' button is used to initiate "broadcast" control routes. See Broadcast Routes on page 45.

The panel can be configured so that "source is master" is the default state or so that "destination is master" is the default. The button still toggles between "source is master" and "destination is master."

▲ Pressing the 'Source is Master' button turns off the 'Broadcast' button and vice versa.

Src/Dst Mode

The button toggles between source and destination modes. Category selections in source mode select source devices. Category selections in destination mode select destination devices.

XY/MD Mode

The button toggles the panel between X-Y mode and MD mode.

Undefined

An undefined button cannot be used and appears dark (unlit) on the panel. The term "undefined" has meaning primarily to the configurer.

Name Sets

NV9000-SE Utilities allows configurers to define multiple *name sets*. Each name set contains aliases (alternate names) for any and all devices in the NV9000 system. The aliases can appear in the displays of your panel.

Further, your panel can have a 'Name Set Toggle' buttons that allows you to switch between the "default" name set and the "system name" set. Whichever name set you are currently using is the *active* name set.

There is always a 'System Name' set. That name set includes the device names defined within the NV9000 configuration. Any other name sets are optional.

Device selection using categories and suffixes requires that you enter device names using the *system name set*. However, the display shows the device name as it is represented in the *active name set*.

For example, suppose the system name for a destination is "VTR_42" and its alias is "Prod_A." Follow these steps to select the device using category selection:

1 Switch to destination mode if necessary.

2 Press a VTR category button. (Suffix buttons become enabled.)

3 Press 4, then 2. The device is selected, but the name appearing in the destination display is "PROD_A."

In this example, you could press the 'Name Set Toggle' button a number of times to see that PROD_A and VTR_45 are, in fact, the same device.

If you are using aliases, we recommend that you switch to the system name set during device selection and switch back to your preferred name set afterward.

Note that when the panel is displaying aliases, and a device does not have an alias, the panel displays the system name.

Broadcast Routes

It is easy and normal to route a source to multiple destinations for audio and video routers. In contrast, machine control routes are typically point-to-point. Therefore, to control multiple machines requires that you perform a "broadcast" operation using a 'Broadcast' button.

During broadcast, the source device controls one or more destination devices.

Making Broadcast Routes

Follow these steps to broadcast control signals:

1 Ensure that the panel is in "source is master" mode. It is either in "source is master" mode by default or you must press a 'Source is Master' button to activate the mode. The mode is active when the 'Source is Master' button is high-tally.

2 Select a destination and preset a source. Then press the 'Take' button.

3 Press the 'Broadcast' button.

4 Select another destination and preset the same source. Then press the 'Take' button.

5 Repeat steps 3 and 4 to add other machines to the set of controlled devices.

Implicit in the 'Broadcast' button is the "source is master" mode. It is not necessary to press 'Source is Master' repeatedly. The reason you must press 'Source is Master' the first time is that "broadcast mode" is not yet active.

Removing Broadcast Routes

To cancel a route, route the source to another destination normally.

To remove a destination from the set of broadcast destinations, route another source (e.g., the free source) to the destination.

Saving and Loading Presets

▲ This capability is not available for the NV915, although it is fully supported by the NV9000.

The NV9616 and NV9608 allow you to save complex multi-destination presets and retrieve them when needed. The 'Save Preset' and 'Load Preset' buttons are available for this purpose.

The concept of saving and reloading presets applies to MD mode only.

The 'Save Preset' button is enabled when you have selected at least one preset for at least one destination. Press the button to enter "save preset" mode in which you can name and save the presets.

When you press a load preset button, you can select the name of a saved preset and it will "load." That means that all the destinations which you had selected and saved become selected once again and the sources that you had preset for these destinations become preset once again.

How to Save a Preset

1 (If required) switch to MD mode.

2 Select a destination and preset a source. Repeat, for any other destinations.

3 Press 'Save Preset'. The panel enters "save preset" mode and the LCD buttons display the following functions:
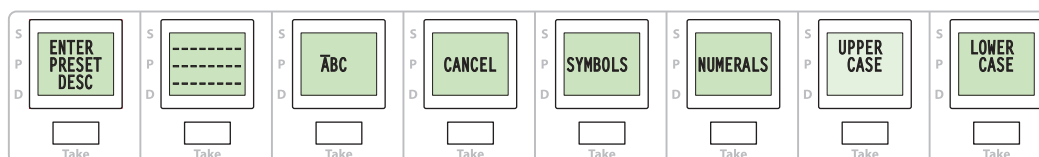
Enter a preset description using the functions provided. See Using the Save Preset Buttons, following. The description is an identifier that you will use later when loading the preset.

4 When you finish entering the description, press the button that reads 'Press When Finished':
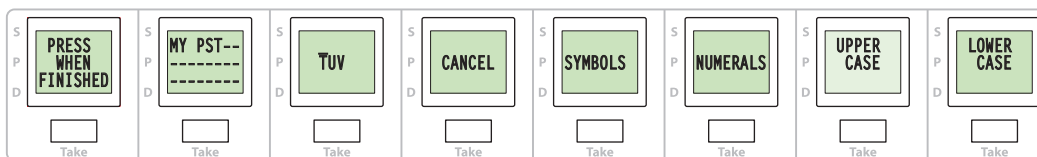
The preset will be saved.

Using the Save Preset Buttons

These are the 8 functions displayed:

Button 1   The button reads 'Enter Preset Desc' if you have not entered anything yet. It reads 'Press When Finished' if you have entered at least one character.

Button 2   Initially, this button displays all dashes. This button will display the preset identifier you are creating.

Button 3   This is a character entry button. The characters that appear on this button are controlled by the keypad (i.e., fixed category buttons) at the right. This is the mapping:

1   space character
2   ABC
3   DEF
4   GHI
5   JKL
6   MNO
7   PQRS
8   TUV
9   WXYZ

The characters on this button are also controlled by the buttons labeled 'Upper Case', 'Lower Case', 'Symbols', and 'Numerals'.

Button 4   The button reads 'Cancel' if you have not entered anything yet. It reads 'Back' if you have entered at least one character. As a cancel button, pressing it takes you out of save preset mode and returns you to MD mode. As a back button, it erases the most recently entered character, as a backspace button does on your keyboard.

Button 5   The button reads 'Symbol'. Press this button to be able to enter special symbols with the character entry button (button 3).

There are 16 special symbols from which to choose. Two of the keypad buttons apply here too:

1   #, (space), _, &, (,), $
0   *, @, (period), !, ^, +, −, ?

Button 6   The button reads 'Numerals'. Press this button to be able to enter numerals. The character entry button reads 'Use Keypad Directly'. Thus, to enter numerals, press the keypad buttons.

Button 7   The button reads 'Upper Case'. Press this button to switch to upper case letters (especially if you have been entering symbols or numerals).

Button 8   The button reads 'Lower Case'. Press this button to switch to lower case letters (especially if you have been entering symbols or numerals).

When you are entering letters, several letters appear on the character entry button. You can select one of those characters by repeatedly pressing the keypad button that corresponds to those characters. A line appears over the selected character. Repeatedly pressing the keypad button will cycle

through all the letters. When you have selected the letter you want, press the character entry button to append the character to the preset identifier.

Similarly, when you are entering symbols, 8 symbols appear on the character entry button. You can select one of those symbols by repeatedly pressing the keypad button (1 or 0) that corresponds to those characters. A line appears over the selected symbol. Repeatedly pressing the keypad button will cycle through all the symbols. When you have selected the symbol you want, press the character entry button to append the symbol to the preset identifier.

The preset identifier may have up to 24 characters.

Your panel may have up to 8 saved presets.

Once entered, you cannot delete the saved presets. You can, however, redefine any of them.

How to Load a Preset

1 (If required) switch to MD mode.

2 Press 'Load Preset'. The panel enters "load preset" mode and the LCD buttons display a set of 8 preset identifiers. Some buttons might be blank:
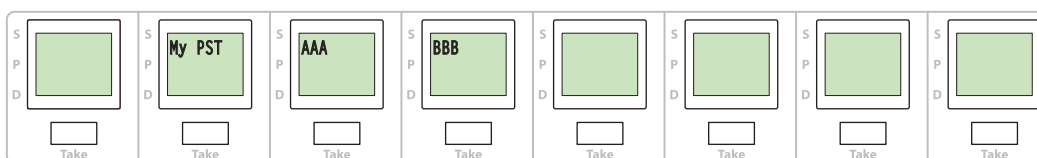
Choose a named preset and press its button. The preset will load.

Salvo Mode

Pressing a 'Salvo' button puts your panel in salvo mode, where a page of salvos appears. You can choose a salvo to execute. If there are more salvos than will fit on a page (16 salvos for the NV9616 and 8 salvos for the NV9608) you can scroll to find the salvo of interest.

When you enter salvo mode, all function buttons except the 'Salvo' button become disabled.

You can define "local salvos" (in the menu, if your panel has one) by recording actions performed at the panel. Both system salvos and local salvos appear on salvo pages, inter-mixed:
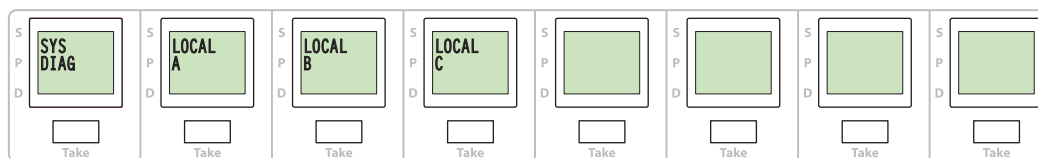
There is no way to distinguish system salvos from local salvos, unless you use a naming convention.

To execute a salvo, scroll to the appropriate page, press the LCD button for the salvo, and press the take button below the LCD button.

To leave salvo mode and return to normal mode, press the 'Salvo' function button again.

▲ Local salvos are not supported in NV915 systems, although they are fully supported in NV9000 systems.

Menu Mode

The NV9616 enters menu mode if it has a menu button and you press it. The menu appears on the top row of LCD buttons. This is the main menu:

SOFTWARE VERSIONS	USER	PANEL	LED CONTROL	LCD CONTROL	LOCAL SALVOS		EXIT
Take	Take	Take	Take	Take	Take	Take	Take
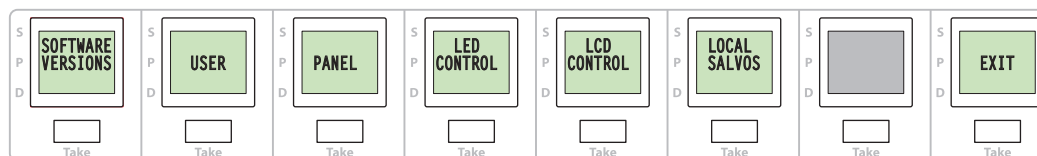
The menu has 6 submenus:

- Software versions
- Panel name and ID
- LCD button illumination
- User name and ID
- Function button illumination
- Local salvos

The 'Exit' button at the right terminates menu mode and returns the panel to its normal mode.

Software Versions Submenu

Press the first menu button to display the software versions:

BOOT SV0546-030001	APP SV0000-000000	SERVER SV0921-06					EXIT
Take	Take	Take	Take	Take	Take	Take	Take
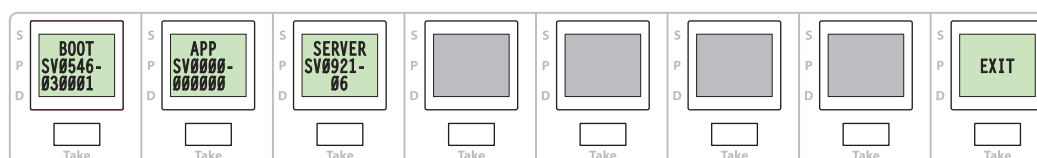
Press 'Exit' to return to the main menu.

User Submenu

Press the second menu button to display the user submenu:

USER ENVYUSER	USER ID 01						EXIT
Take	Take	Take	Take	Take	Take	Take	Take
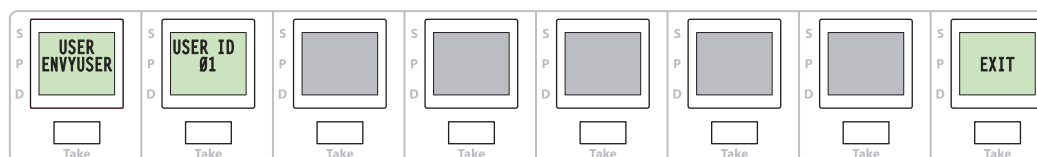
The user submenu shows the user name and the user ID assigned to the panel.

Panel Submenu

Press the third menu button to display the panel submenu:

PANEL NAME D616	Panel ID 616100	IP ADDR 192.168.2.42	SVR_NAME NVCONFIG	CFG FILE D616			EXIT
Take	Take	Take	Take	Take	Take	Take	Take
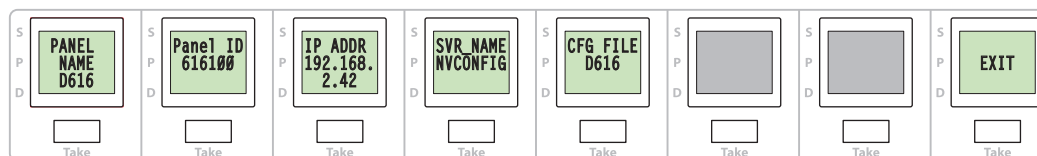
The panel submenu shows the panel name, the panel ID, its IP address on the NV9000's panel and router network, the server name (almost always NVCONFIG), and the panel's configuration name.

If the panel has been configured to allow it, you can change the panel ID. Press the 'Panel ID' button to do so. The 'Panel ID' button goes high tally and the keypad (i.e., the fixed category buttons) become illuminated:
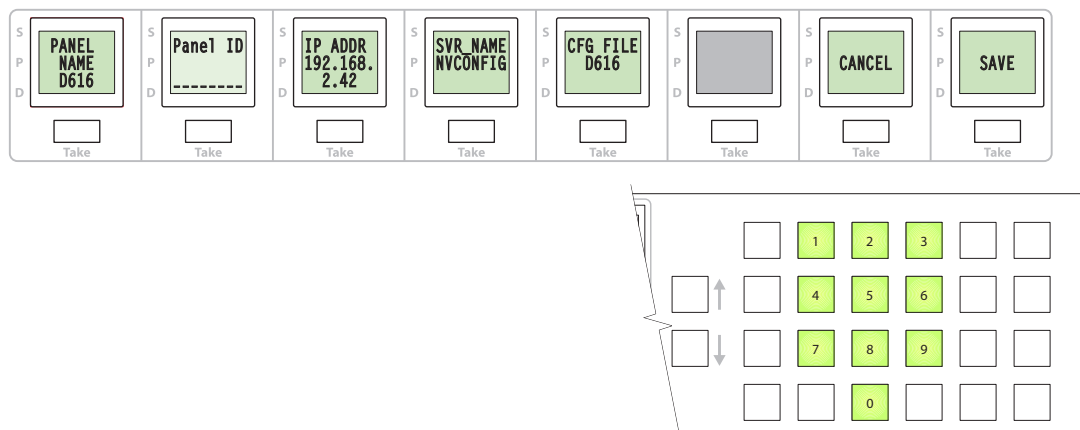
You can now enter the panel ID using the keypad. Press 'Cancel' to cancel the entry or press 'Save' to save the new panel ID.

▲ To use the keypad, you might have to disregard whatever legends are on the buttons.

Press 'Exit' to return to the panel menu. Press 'Exit' again to return to the main menu.

Function Button Illumination

Press the fourth menu button to display the function button illumination submenu:
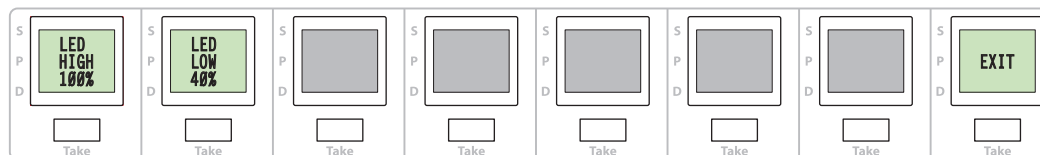
This submenu is labeled 'LED Control' because the function buttons are illuminated with LEDs.

Press 'LED High' to change the high-tally level; press 'LED Low' to change the low-tally level.

After you press either of these buttons, all the function buttons illuminate with the current illumination level. Use the scroll buttons to increase or decrease the illumination level in steps of 10%.

The illumination may vary between 0 and 100%, but the high level is always constrained to be greater than the low level.

Press 'Exit' to return to the main menu.

LCD Button Illumination

Press the fifth menu button to display the LCD button illumination submenu:
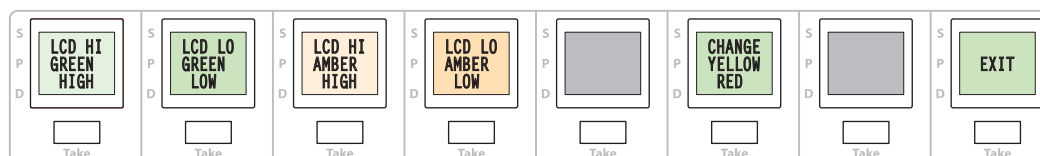
This submenu is labeled 'LCD Control'.

When they are lit, LCD buttons can be green, amber, yellow, or red and high- or low-tally. There are 3 levels of illumination: high, medium, and low. The LCD button illumination is constrained so that high-tally is brighter than low tally. If, for instance, low-tally green is *medium*, then high-tally green must be *high*.

When you first view the submenu it shows controls for green and amber. If you then press the 'Change Yellow Red' button, the second submenu—for red and yellow—appears:
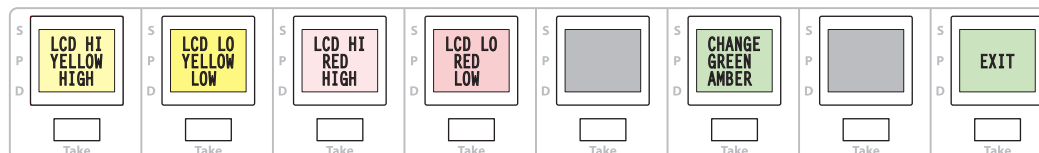
Then you can press 'Change Green Amber' to get back to the first submenu.

In either case, to change a setting, press the desired button (e.g., 'LCD Hi Amber') to select the color setting and use the scroll buttons to increase or decrease the setting's value.

The chosen value appears in reverse text while you are making changes.

Press 'Exit' to return to the main menu.

Local Salvos Submenu

▲ Local salvos are not supported in NV915 systems. They are fully supported in NV9000 systems.

Press the sixth menu button to display the local salvos submenu:
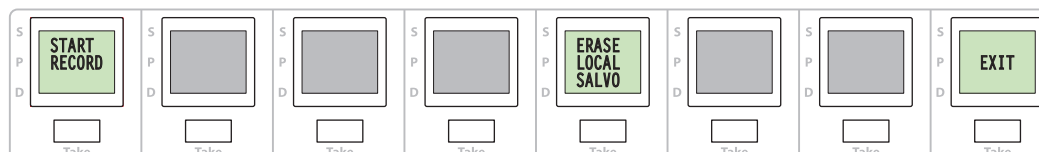
This submenu has two function buttons: 'Start Record' and 'Erase Local Salvo'.

To define a local salvo, you record a series of button presses at your panel. To do so, press 'Start Record'. The panel returns to normal mode, where you can carry out a series of tasks that is to be the salvo.

When you have completed the series of tasks, press the menu button again, and then press the 'Local Salvos' button again.

The local salvos submenu now has a different appearance:
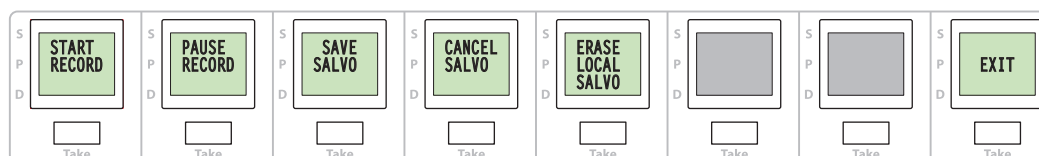
The functions that are available now are:

- Stop Record
- Save Salvo
- Erase Local Salvo
- Pause Record
- Cancel Salvo

The 'Exit' button returns to the main menu.

Stop Record

Press 'Stop Record' to terminate the recording of the salvo. You cannot save the salvo until the recording is stopped.

Pause Record

Press 'Pause Record' to pause recording of the salvo, in anticipating of resuming the recording later. After you press 'Pause Record', the button changes to 'Resume Record'.

Save Salvo

Press 'Save Salvo' to name and save the salvo. When you press 'Save Salvo', a salvo page appears in which you may select an unused button (or a button that shows an existing local salvo) to use for the salvo.
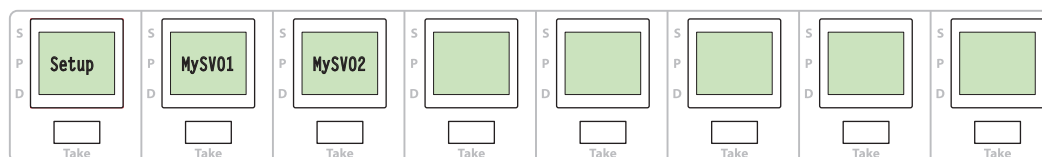
When you select that button, the salvo naming submenu appears:
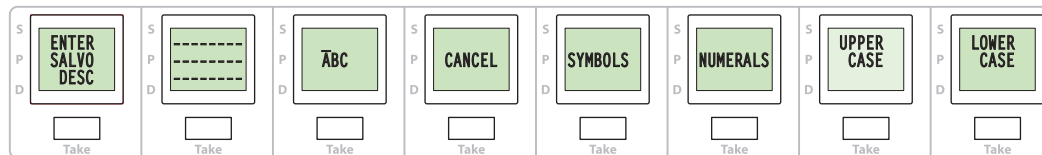
Enter a salvo name using the functions provided. See Using the Salvo Naming Buttons, following.

When you finished entering the name, press the button that reads 'Press When Finished':
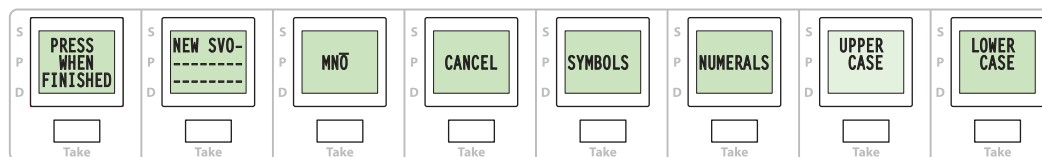
The salvo will be saved.

Cancel Salvo

Press 'Cancel Salvo' to return to the local salvos menu without saving the salvo you just recorded.

Erase Local Salvo

Press 'Erase Local Salvo' to show a salvo page. You might need to scroll to find the salvo you want to erase.

Press the button representing the salvo to erase the salvo.

Press 'Clear' to return to the local salvos menu without erasing a salvo. (Your panel must have a 'Clear' button.)

Using the Salvo Naming Buttons

These are the 8 functions displayed:

Button 1   The button reads 'Enter Salvo Desc' if you have not entered anything yet. It reads 'Press When Finished' if you have entered at least one character.

Button 2   Initially, the button displays all dashes. This button will display the salvo name you are creating.

Button 3   This is a character entry button. The characters that appear on this button are controlled by the keypad (i.e., fixed category buttons) at the right. This is the mapping:

1   space character
2   ABC
3   DEF
4   GHI
5   JKL
6   MNO
7   PQRS
8   TUV
9   WXYZ

The characters on this button are also controlled by the buttons labeled 'Upper Case', 'Lower Case', 'Symbols', and 'Numerals'.

Button 4   The button reads 'Cancel' if you have not entered anything yet. Reads 'Back' if you have entered at least one character. As a cancel button, pressing it returns you to the local salvos menu.. As a back button, it erases the most recently entered character, as a backspace button does on your keyboard.

Button 5   The button reads 'Symbol'. Press this button to be able to enter special symbols with the character entry button (button 3).

There are 16 special symbols from which to choose. Two of the keypad buttons apply here too:

1   #, (space), _, &, (,), $
0   *, @, (period), !, ^, +, −, ?

Button 6   The button reads 'Numerals'. Press this button to be able to enter numerals. The character entry button reads 'Use Keypad Directly'. Thus, to enter numerals, press the keypad buttons.

Button 7   The button reads 'Upper Case'. Press this button to switch to upper case letters (especially if you have been entering symbols or numerals).

Button 8   The button reads 'Lower Case'. Press this button to switch to lower case letters (especially if you have been entering symbols or numerals).

When you are entering letters, several letters appear on the character entry button. You can select one of those characters by repeatedly pressing the keypad button that corresponds to those characters. A line appears over the selected character. Repeatedly pressing the keypad button will cycle through all the letters. When you have selected the letter you want, press the character entry button to append the character to the preset identifier.

Similarly, when you are entering symbols, 8 symbols appear on the character entry button. You can select one of those symbols by repeatedly pressing the keypad button (1 or 0) that corresponds to those characters. A line appears over the selected symbol. Repeatedly pressing the keypad button will cycle through all the symbols. When you have selected the symbol you want, press the character entry button to append the symbol to the preset identifier.

The salvo name may have up to 24 characters.

Your panel may have many local salvos. When you are defining local salvos, the salvo pages that appear include both system salvos and local salvos. You might need to scroll the pages to find a blank salvo button or an existing local salvo that you want to overwrite.

If you are viewing a full salvo page and wish to return to the local salvos menu, press 'Clear'

▲ It is advisable not to overwrite system salvos. The panel does not indicate which salvos are system salvos.

Setup Mode

Setup mode occurs when the NV9616 is disconnected from its network and is freshly powered up. In setup mode, you can set or change the panel ID, identify the software version, and perform a test of the panel's buttons. It is in setup mode that you must initially set the panel ID.

After a few seconds, the LCD buttons will show 'Acquire IP Address' on the seond button and the panel's current panel ID on the first button. The right-hand button is designated the menu button:
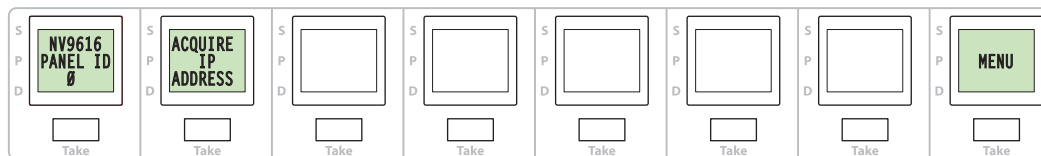
Press the menu button to proceed to the setup menu:
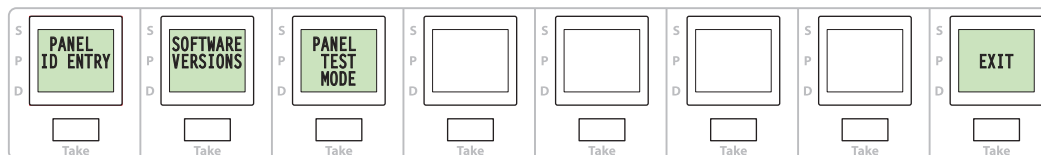
There are 3 submenus: panel ID entry, software versions, and panel test mode.

Press the menu button to proceed to the first part of setup which is to set the panel ID:
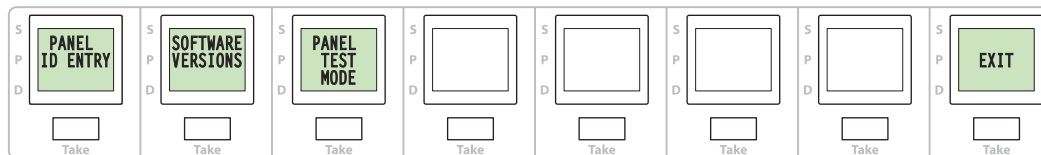
Setting the Panel ID

The keypad buttons on the right become enabled. Enter a panel ID (up to 8 digits):
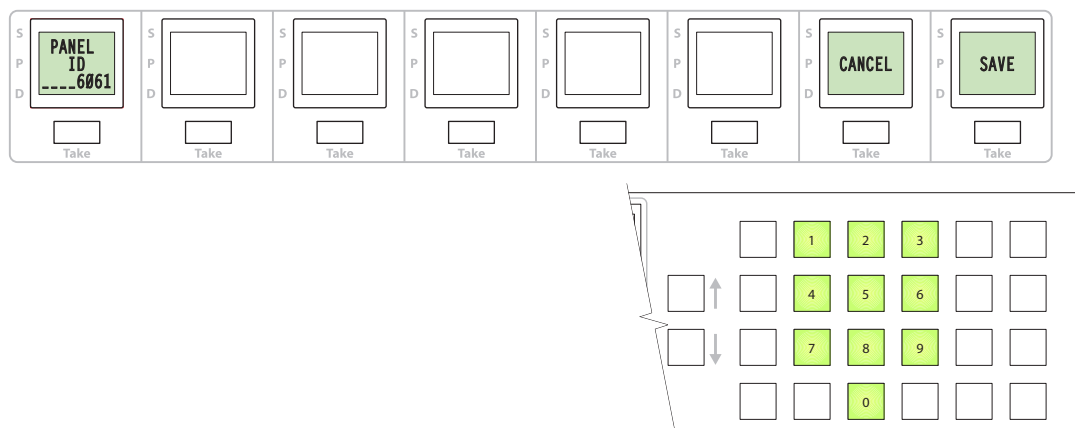
Press 'Cancel' to cancel the entry or press 'Save' to save the new panel ID. In either case, the panel returns to the setup menu.

Viewing the Software Versions

Press 'Software Versions' to view the software versions:
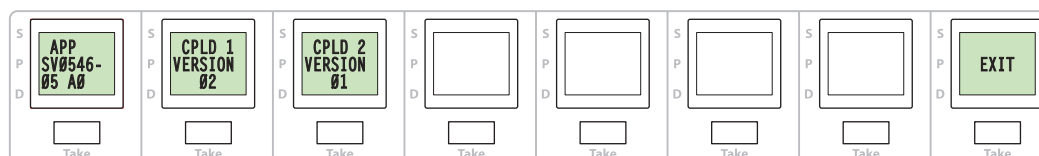
Press 'Exit' to return to the setup menu.

Panel Test Mode

Press 'Panel Test Mode' to enter panel test mode:
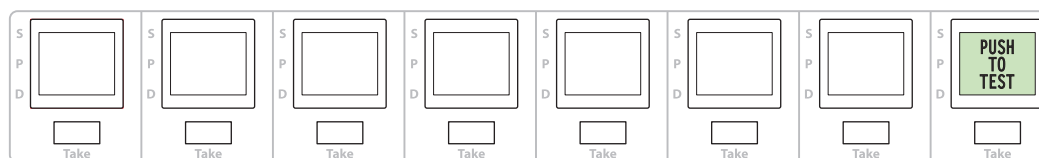
There are two parts to the panel test: a color test and a button test.

Press 'Push to Test' to start the color test. The panel first illuminates all the LCD buttons in high-tally green. As you continue to press 'Push to Test', the panel will show low-tally green, high-tally amber, low-tally amber, high-tally yellow, low-tally yellow, high-tally red, and low-tally red.

Press 'Push to test' to continue to the button test:
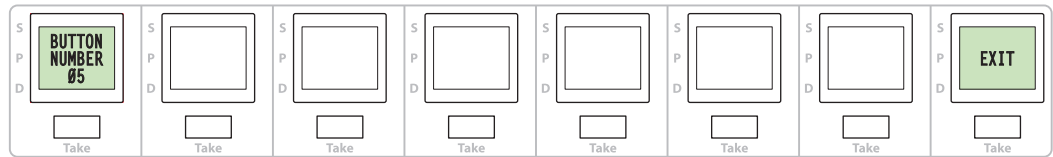
Press any LCD button, any function button, or either of the scroll buttons. The button number will display on the left-hand button and the button will flash momentarily. You can press as many buttons as you want to test.

Press 'Exit' to return to the setup menu.

6. Technical Details

Chapter 6 provides electrical and mechanical specifications for the NV9616. It discusses these topics:

- Power Specifications
- NV9616 and NV9608 Specifications
- Environmental Specifications
- Defaults
- Drawings

Power Specifications

Table 6-2 provides power specifications for the NV9608 control panel.

Table 6-1. NV9608 Power Specifications

Specification	Detail
AC power	90–250 VAC, 50–60 Hz, auto-sensing.
	Inrush current < 50 A at 230 VAC, cold start, at 25°C, Input current < 2.0 A rms at 115 VAC; < 1.0 A at 230 VAC.
Power consumption	≤ 18 W
Regulatory	UL listed and CE compliant.

Table 6-2 provides power specifications for the NV9616 control panel.

Table 6-2. NV9616 Power Specifications

Specification	Detail
AC power	90–250 VAC, 50–60 Hz, auto-sensing.
	Inrush current < 50 A at 230 VAC, cold start, at 25°C, Input current < 2.0 A rms at 115 VAC; < 1.0 A at 230 VAC.
Power consumption	≤ 20 W
Regulatory	UL listed and CE compliant.

NV9616 and NV9608 Specifications

Table 6-3 provides specifications for both the NV9616 and NV9608.

Table 6-3. NV9616 and NV9608 Physical Specifications

Specification	Detail
Dimensions	Height: 3.47″ (88.1 mm), fits EIA 2 RU (3.5″ or 88.9 mm), Width: 19.0″ (482.6 mm).
Depth	8.61 ± 0.01″ (218.7 mm), enclosure. 9.25″ (235.0 mm) overall.
Weight	NV9608 9.35 lb (4.24 kg). NV9616 9.6 lb (4.35 kg).
Connectors	Power: AC. Ethernet: 1 connector, 10 baseT, RJ-45 jack. RS-232: 1 connector, 9-pin D type, for diagnostics and upgrades.
Grounding terminal	None.

The RS-232 connector has this pinout:
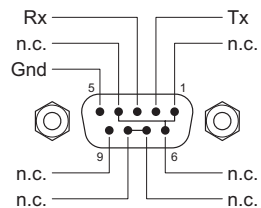
Pins 1, 4, and 6 are tied together and pins 7 and 8 are tied together. None of those pins are connected to any circuitry.

Environmental Specifications

Table 6-4 provides environmental specifications for the NV9608 and NV9616.

Table 6-4. Environmental Specifications

Specification	Detail
Operating temperature	0–40°C, ambient.
Relative humidity	0 to 90%, non-condensing.
Cooling	No fan required.

Defaults

Initial Panel State

Destination: the configured default.

Buttons: low-tally is 40% brightness by default and stays at its most recent setting.

Configuration Page

The initial NV9616 or NV9608 configuration has no buttons defined. The default panel options are:

Panel type:	X-Y/Multidestination.
Default mode:	Multi-destination.
Release mode:	Normal.
Default destination:	None.
Preset monitor:	None
Status monitor:	None
XY data routing:	Automatic.
MD data routing:	Automatic.
Default name set:	System names
Multi-dest device limit:	16
Use continuous scroll:	Enabled (check box checked)
All other options:	Disabled (check boxes clear).

DHCP

The panel is set up to respond to DHCP from the factory. It is possible to assign the panel a fixed IP address using the Panel IP Configuration Utility.

Drawings

The drawings that follow identify features and provide overall and critical dimensions.

6. Technical Details
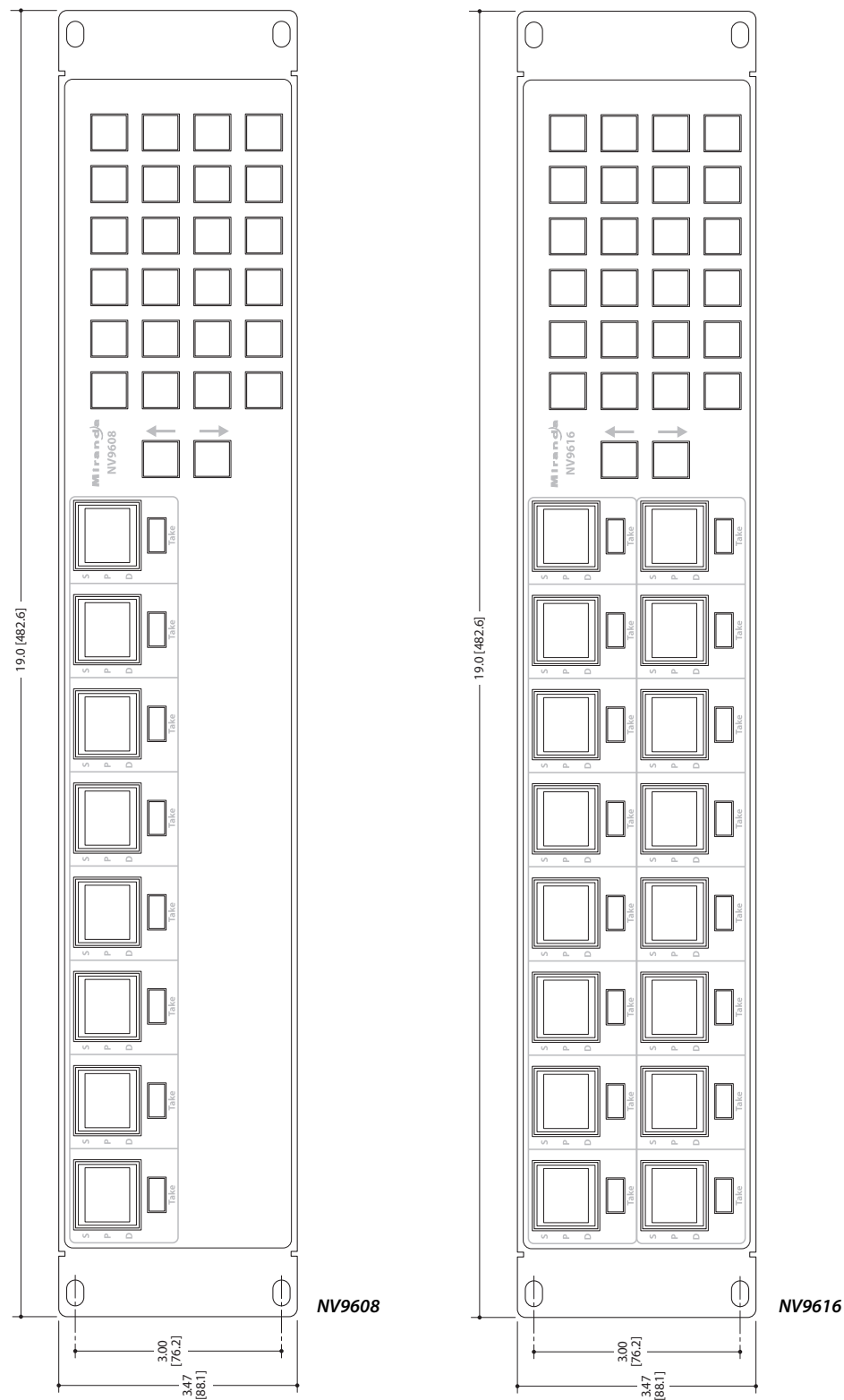
Drawings

Figure 6-1. Front Views of the NV9608 and NV9616

Figure 6-2. Rear and Top Views of the Either the NV9608 or NV9616

6. Technical Details

Drawings

7. Misc. Topics

Chapter 7 provides the following:

- Glossary
- Setting the Timeout Value

Glossary

AES/EBU	(Audio Engineering Society/European Broadcasting Union). AES and EBU are standards organizations.
Breakaway	A condition where a destination has multiple sources on different levels.
Category	A category represents a set of devices. (The concept of categories exists to make it easier to select devices at a control panel.) A category can contain sources, destinations, or devices that are both sources and destinations. Each device in the category has a unique selection index within that category. Each category has a mnemonic ID associated with it.
Data Routing	Data routing (a.ka., machine control routing) is a bidirectional form of routing. Routes are characterized by a controlling device and controlled device(s). The NV9616 provides certain data routing options including a 'Broadcast' button.
Device	A "device" is a grouping of input and output ports that define a logical entity. (The logical entity often represents a real device, but it does not have to be a real entity.) For example, a system might have 3 levels: video, AES, and time code. A hypothetical device in this system is Camera 1, which consists of video on input port 1 of the video router, AES on input port 5 of the AES router, and time code on input port 8 of the time code router.
GPIO	General Purpose Input and Output. A generic term for the NV9616's tally interface. The tally interface is called the "GPI Interface" at the rear of the NV9616.
Level set	A level set is a group of virtual levels that are commonly used together when switching devices. A level set also defines the mapping of each virtual level within the level set to a single physical level. All levels in a level set have a unique display index within that level set.
Multi-Destination (Mode)	A mode on an NV9000 control panel that presents many destinations at once, in contrast to X-Y mode. An operator may route sources to multiple destinations in a single take. Multi-destination mode does not permit the selection of breakaway levels.
Operator	The term operator (a.k.a. user) usually refers to users other than the system administrator or configurer. An operator is responsible for making the routes.
Physical Level	Multiple routers provide different "physical levels" on which to switch the signals of devices. Any particular device might send or receive HD, SD, AES, time-code, or machine-code signals.
PIN	The system administrator may create a single "super user" personal identification number (PIN) that functions as a passcode. A PIN is 4–6 digits in length. The PIN allows certain operators to per-

	form functions such as (1) forced release on a control panel that is configured for normal release or (2) changing the ID of a control panel.
Port	A port is the physical connection on a router. A port can only be an input port or an output port.
Primary level	The primary level is the virtual level on a device with the lowest display index in the level set. Note that virtual levels that do not exist on a device cannot be the primary level for that device.
Salvo	A salvo is a stored group of commands that can be recalled and executed at a NV9000 control panel.
Source/ Destination	The term "source device" is used interchangeably with "source" and the term "destination device" is used interchangeably with "destination." A source is a device that is connected to one or more input ports. A destination is a device that is connected to one or more output ports. An example of such a device would be a monitor.
	A device can be both a source and destination. An example of such a device is a VTR.
Suffix	Suffixes are an optional extension to the category/index device selection mechanism. A device can be selected in two steps:
	1 Selecting a category
	2 Keying in a sequence of suffixes.
	Each suffix consists of 1–4 alphanumeric characters. The NV9000 router control system allows up to 8 suffixes in a single device selection.
Synchronous	As it applies to the AES routers, "synchronous" means switched in relation to the sync obtained from a video reference signal. The AES routers perform certain functions when in "synchronous" mode, namely (1) outputting an AES stream at 48kHz, and (2) switching mono channels.
System admin-istrator	The system administrator is the person responsible for installing, configuring, and maintaining a router control system.
Tally	(1) High or low button illumination.
	(2) Tally interface *to be defined*.
Virtual level	Virtual levels allow the system administrator to define a single physical router level as multiple levels. Within a physical level, any port can be mapped to any virtual level. For example, an AES matrix could be divided into AES 1/2 and AES 3/4 *virtual* levels.
X-Y (mode)	A mode on a control NV9000 control panel that switches one destination at a time, in contrast to multi-destination mode. In X-Y mode, some panels can display the virtual levels for the selected destination. Operators using those panels can perform breakaway level selection and level mapping.

Setting the Timeout Value

The NV9616 has panel options that use a timeout value. You can set the timeout value in NV9000-SE Utilities. Choose the 'SysParams' table from the 'Tables' folder under the 'Views' navigation pane. Click 'Add' and enter a timeout value as shown:

	ID	Name*	Value	Description
1	1	PANEL_PRESET_TIMEOUT	30	Timeout delay in seconds for preset blanking o…
2	219	NV_LAST_WRITE_TIME	2009-12-23 13:52:58.804	dcox:Garys Config

Figure 7-1. SysParams Table (in NV9000-SE Utilities)

The name of the parameter must be exactly as you see it here. The timeout value (expressed in seconds) must be a non-negative value. A suggested value is 120 seconds (two minutes) or more. The default timeout value is 30 seconds.

▲ The timeout value applies to all panels in your NV9000's panel and router network.

▲ If you do not add a timeout value to the 'SysParams' table, the timeout period will be the default of 30 seconds.

7. Misc. Topics

Setting the Timeout Value

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