USER GUIDE

Cheetah

PERC2000
SYSTEM CONTROLLER
HARDWARE AND SOFTWARE
INSTALLATION AND OPERATION

Publication: 81-9059-0605-0, Rev. C
January, 2012

www.pesa.com
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SERVICE AND ORDERING ASSISTANCE
PESA
103 Quality Circle, Suite 210
Huntsville AL 35806 USA
www.PESA.com

MAIN OFFICE
Tel: 256.726.9200
Fax: 256.726.9271

SERVICE DEPARTMENT
Tel: 256.726.9222 (24/7)
Toll Free: 800.323.7372
Fax: 256.726.9268
Email: service@PESA.com

Printed in the United States of America.

January, 2012

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Chapter 1 About This Manual

1.1 Documentation and Safety Overview

This manual provides instructions for installation and operation of the PERC2000 System Controller hardware and software application for the Microsoft Windows® operating system, designed and produced by PESA.

It is the responsibility of all personnel involved in the installation, operation, and maintenance of the equipment to know all the applicable safety regulations for the areas they will be working in. ***Under no circumstances should any person perform any procedure or sequence in this manual if the procedural sequence will directly conflict with local Safe Practices. Local Safe Practices shall remain as the sole determining factor for performing any procedure or sequence outlined in this document.***

1.2 Cautions, and Notes

Throughout this document, you should notice various Cautions and Notes. These addendum statements supply necessary information pertaining to the text or topic they address. It is imperative that audiences read and understand the statements to avoid possible loss of life, personal injury, and/or destruction/damage to the equipment. These additional statements may also provide added information that could enhance the operating characteristics of the equipment (i.e., Notes). Examples of the graphic symbol used to identify each type of statement and the nature of the statement content are shown in the following paragraphs:

1.2.1 Caution

	**Caution statements identify conditions or practices that can result in personal injury and/or damage to equipment if the instructions contained in the statement are not complied with.**

1.2.2 Note

	**Notes are for information purposes only. However, they may contain invaluable information important to the correct installation, operation, and/or maintenance of the equipment.**

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FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) this device must accept any interference received, including interference that may cause undesired operation.

Chapter 2 – Introduction

2.1 PRODUCT DESCRIPTION

PESA's Ethernet Router Control, PERC2000, is a versatile system controller for PESA routing system installations to coordinate and control operation of router components contained in the signal transport infrastructure. Collectively, PERC2000, or simply P2K, identifies a circuit card assembly (mounted in either a stand-alone rack frame with power supply or a Cheetah Video Matrix Switcher) and an associated control software application installed on a host computer running the Microsoft Windows 2000, XP Professional, Vista or Windows 7 operating system.

The hardware (circuit card) portion of the PERC2000 system, Figure 2-1, can interface with system components over either an Ethernet connection or the PESA proprietary PRC bus. It uses the PRC bus to communicate bi-directionally with a Cheetah Matrix Frame Controller or other PESA routers that use the PRC control bus as an interface protocol; and can simultaneously communicate over an Ethernet link with PESA network-compatible devices such as the PERC1000 (P1K) Frame Controller. The P2K CCA also interfaces and communicates with, and configures a wide variety of PESA remote control panels used to operate switcher frames within the system.

Configuration and operation of the PERC2000 system controller is performed using control software such as PESA's Cattrax, a multi-purpose control application. PERC2000 system controller hardware operating with firmware prior to Version 5.0 (Main App V 5.0) may also be controlled with the dedicated P2K graphical user interface (GUI) application. Regardless of which application is used, the software is run on a host PC communicating with the system controller over an Ethernet link.

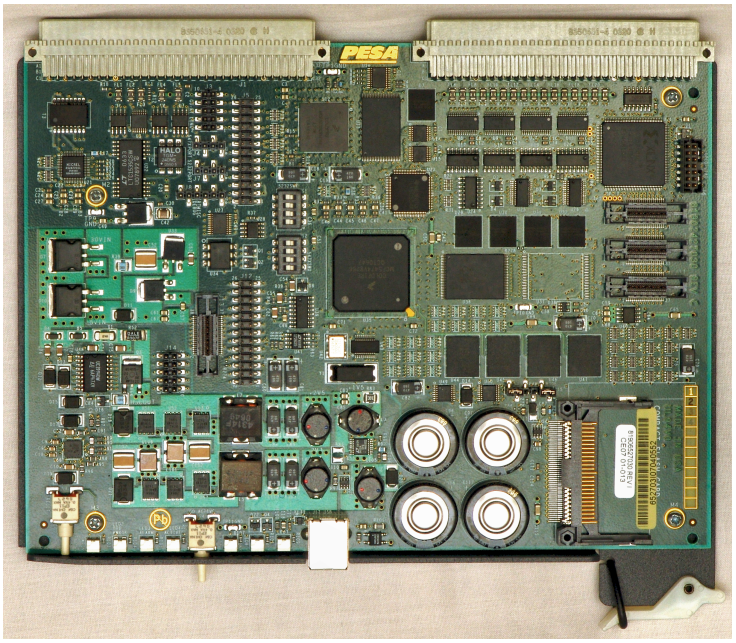


Figure 2-1 PERC2000 System Controller Circuit Card

In order for the system controller to operate, it must be programmed by downloading a *configuration file* to it using the host PC and a control software application. Configuration files are written by the user to tailor all operational aspects of the router system. Files may be named and saved for easy retrieval. Multiple configuration files may be written, stored and loaded as needed to allow quick access of different operational set-ups for the routing system.

2.2 PERC2000 System Controller with Firmware V 5.0 or Later

PERC2000 system controllers programmed with operating firmware version 5.0, or later, offer some additional functions and capabilities that are not present in previous firmware releases; these are listed below and discussed in detail in Paragraph 7.15:

- Re-structured switching level and component creation process
- Adds the capability for one additional switching level
- Adds the capability for twice the number of source and destination names as previous versions
- Adds user-definable numbering to source and destination entries
- Provides support for PESA's Enterprise DRS high-capacity audio routing system

These changes are implemented on PERC2000 system controller hardware loaded with operating software ***OS Main App 5.0,*** and later. Control and menu functions compatible with the operating software changes are available through Cattrax ***Release 3.0***, and later.

2.3 Controller System Communication Protocols

In the Cheetah family the core control system components are the system controller hardware/software, individual frame controllers contained in each router frame, a host PC to run the control software; plus remote control panels, or a third party controller interface as needed for an individual installation.

Cheetah video router frames are equipped with a frame controller device called the Matrix Frame Controller that uses a PESA proprietary protocol for bi-directional communication with the system controller called the PESA Routing Control Bus, or simply the PRC bus. Many legacy router products, such as the Ocelot and Cougar, can also integrate into a larger routing system by communicating with the system controller over the PRC bus. This proprietary serial bus protocol eases installation of multiple router frames by allowing a single control bus for all components – you can even daisy-chain the frames from a single controller connection.

Several PESA router models such as the Cougar 3 and Jaguar 3, as well as the PERC1000 Frame Controller, used in the DRS audio router, communicate with PERC2000 over a standard 10/100 Ethernet connection. Ethernet connectivity between system components allows command and control functions over a facility network, or a local intranet. Networking capability greatly reduces cabling requirements and allows efficient communications between all system components.

Regardless of size or number of system components, or number of frame controllers, PESA router installations typically function under a single system controller to coordinate and oversee operation of the entire system. The P2K system controller is capable of supervising multiple frame controllers such that the entire system is controlled by a common set of control devices.

Figure 2-2 illustrates a typical PERC2000 controller installation using a mix of PRC-based devices, Ethernet control devices and remote control panels using the PESA proprietary RCP control bus.

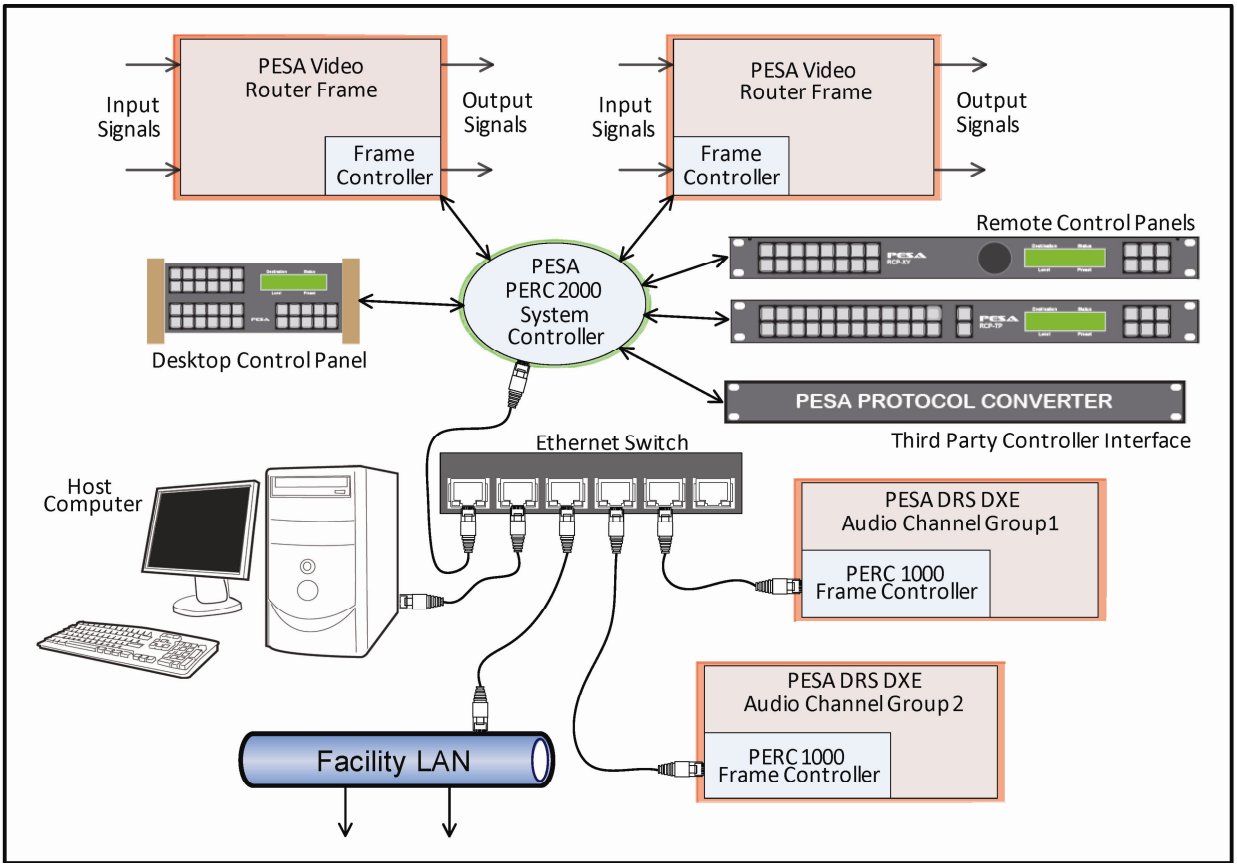


Figure 2-2 Typical PERC2000 System Controller Installation

2.4 PERC2000 INSTALLATION OPTIONS

PESA offers three models of the PERC2000 controller as identified by Table 2-1.

When used in an installation containing one or more Cheetah video matrix routers, controller hardware is usually mounted in one of the video router frames. All Cheetah video routers offer mounting slots for up to two system controller cards – serving as primary and redundant controllers. Mounting the controller card in the video frame saves rack space and simplifies installation. Power is derived from router power distribution and all system controller connection ports, such as Ethernet, remote control panel buses and the PRC bus for system expansion, are available on the rear panel of the router frame. Figure 2-3 illustrates a typical controller hardware installation in a video router frame.

Some router installations do not include a Cheetah video router, or in some applications it may be desirable to have the system controller located external to the router frame. For those facilities, PESA offers the PERC2K-S and PERC2K-D controllers, both contained in a 1RU rack frame with built-in power supply. Each frame supports up to two controller cards and two power supply modules for full system redundancy. PERC2K-S models may be easily in-field upgraded for system or power redundancy by adding an additional controller card or power module. All connection ports are available through rear panel connectors. Figure 2-4 illustrates the stand-alone controller chassis.

Table 2-1 PERC2000 System Options

Model Identifier	System Description
PERC2000	System Controller circuit card assembly for installation in a Cheetah Video Router chassis.
PERC2K-S	Single PERC2000 System Controller circuit card installed in a 1RU rack chassis with a single power supply module installed. Controller connections are made through connectors on the rear panel of the chassis.
PERC2K-D	Fully redundant controller system with two PERC2000 System Controller circuit cards installed in a 1RU rack chassis with two power supply modules installed. Controller connections are made through connectors on the rear panel of the chassis.

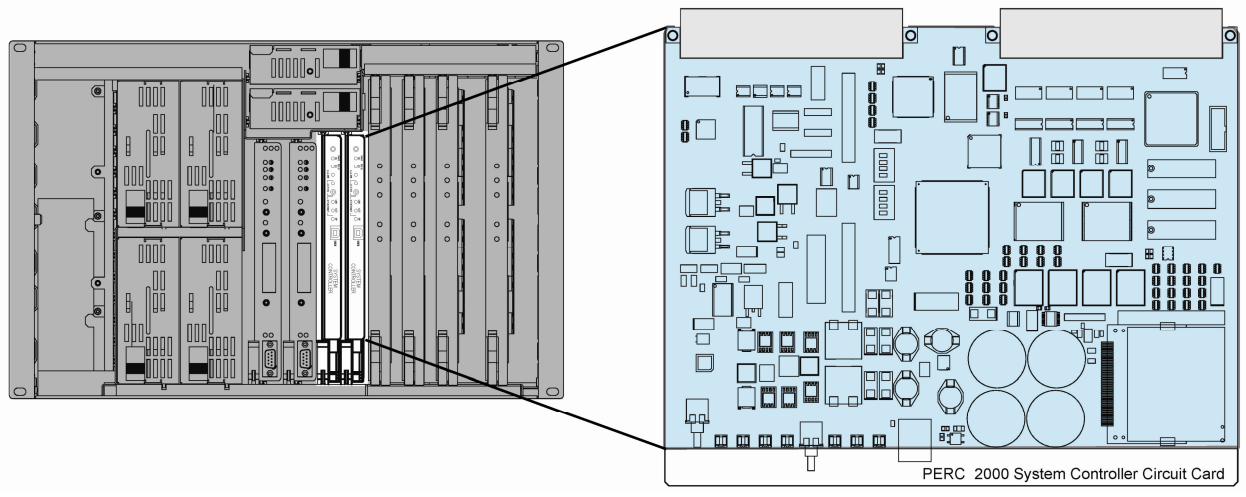


Figure 2-3 Typical Video Router Frame Installation

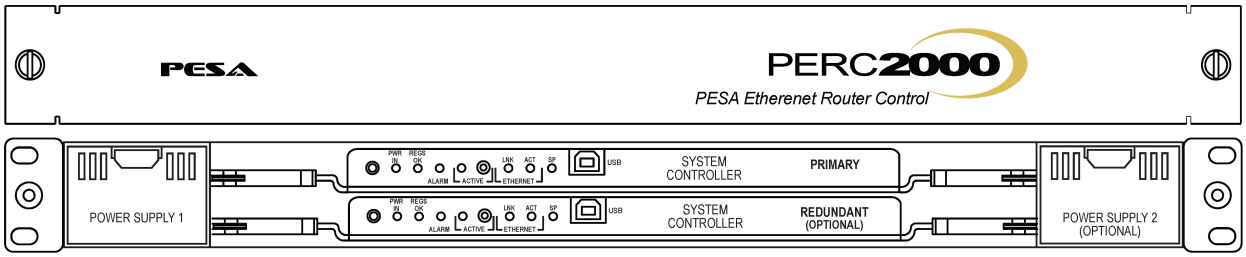


Figure 2-4 Stand-Alone Chassis Installation

2.5 FEATURES

PESA offers a large variety of remote control panels for use with the system controller; plus a selection of protocol converters that allow PESA routing products to be controlled by virtually any third party control system. Our ClikControl application offers TCP/IP control software that allows virtually any PESA router installation to be controlled from anywhere in the world over the internet.

PESA's PERC2000 gives you the ability to make limited modifications to the router configuration file during normal system operation using the **Incremental Add/Edit** function. Using this feature you can add or modify source and destination entries, make changes to many configuration key lists and add or modify remote control panel lists and data. Configuration changes you make with Incremental Add/Edit are written to system controller memory and remain a part of the active configuration until the file is re-loaded or further modified.

PERC2000 provides diagnostics, matrix segmentation, virtual matrix mapping and field-updates via Ethernet. The graphical user interface is highly intuitive, allowing quick and easy operator access to every feature in the system.

When used with PESA's DRS distributed audio routing system, the P2K control software provides a wide range of configuration options including control of audio delay on input channels and/or output channels, audio phase inversion, or dual channel summing. Built-in test functions allow assignment of audio silence, white noise, 1 kHz tone, or a discrete tone sweep, to any DRS output channel. The PERC2000 provides three selectable RS232/RS422 serial ports, a dedicated RS422 port for PRC bus communication, plus Ethernet communication interfaces.

- Full featured microprocessor-based control hardware
- Full Ethernet connectivity and support
- Full redundancy control option
- Operates with most PESA RCP-type control panels
- RS232/422 interface for many third-party control systems
- Available as internal matrix module, single control chassis,

  or dual control chassis
- Up to 16 switching levels
  (17 switching levels with firmware V5.0 and later)

- Allows up to 256 tieline interconnects
- Up to 256 salvos
- Up to 2400 source and destination names
  (4800 source and destination names with firmware V5.0 and later)
- Easy to use GUI interface
- Off-line configuration capabilities
- Virtual matrix mapping
- Software re-entry
- Full on-line diagnostics
- Matrix breakup/segmentation

2.6 OPERATIONAL ENVIRONMENT

Temperature ..... 0-40°C

Operational Humidity ..... 0-90% Non-Condensing

Chapter 3 – PERC2000 System Description

3.1 Introduction to PERC2000 Hardware

Regardless of whether the hardware is installed in a Cheetah video router frame or the stand-alone chassis, the P2K circuit card assembly is functionally identical. When the card is installed in the 1RU stand-alone chassis, it is attached to an extender tray to allow it to fit the chassis card guides and midplane connectors.

3.2 PERC2000 System Controller Circuit Card Assembly

During normal operation there is no user interface required with the PERC2000 circuit card assembly. Figure 3-1 illustrates a typical P2K controller card and highlights two exploded areas showing detail of two DIP switch devices and a 6-pin header connector for jumper shunts. For ALL normal applications of the PERC2000, the switches and jumpers must be in the positions shown by the figure:

- All switch elements for DIP switch devices S1 and S2 must be in the **OFF** position as shown.
- Install one end of a jumper shunt to J15 pin 1 and leave the other end open. This jumper is not connected to any other pin during normal P2K operation – but should be readily available for use if ever directed by PESA Customer Service.
- J15 pins 2, 3, and 4 should all be left open.
- J15 pins 5 and 6 must be jumpered as shown.

3.3 Card Edge Controls and Indicators

Figure 3-2 illustrates the indicators and controls located along the front edge of the circuit card assembly. Each is discussed in the following paragraphs:

3.3.1 Reset

As viewed from the front of the card, there is an unlabeled, recessed push button Reset switch on the left-hand end behind the metal panel. This momentary pushbutton switch is used during factory testing and configuration, and should not be used in the field unless directed by a PESA service technician.

3.3.2 Power (PWR) IN

When lit, this LED indicates that the system controller is receiving input power from the frame power supply.

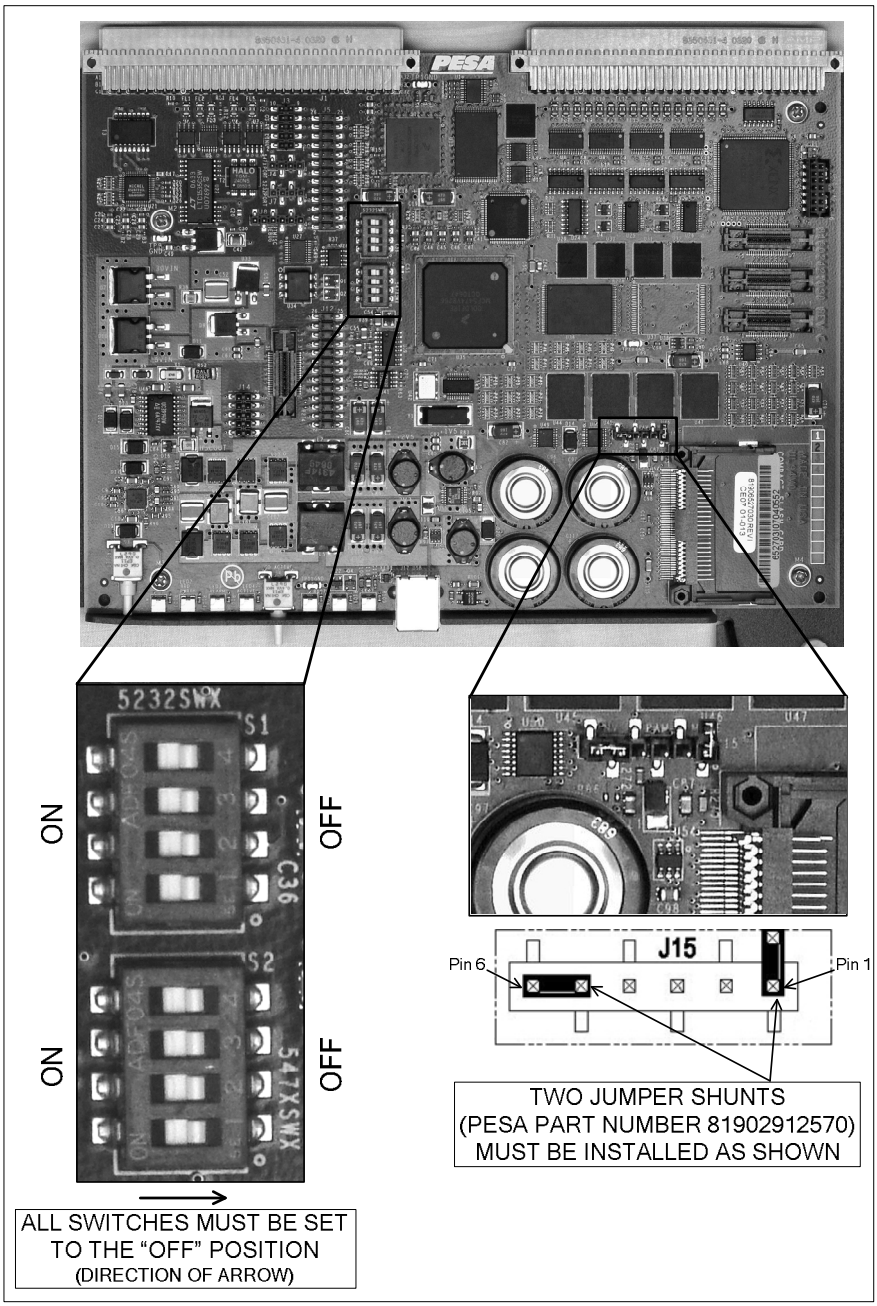


Figure 3-1 PERC2000 Jumper and Switch Locations

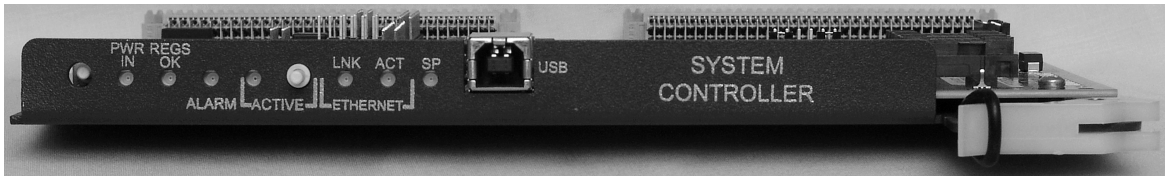


Figure 3-2 PERC2000 System Controller Board Assembly Front View

3.3.3 REGULATORS (REGS) OK

When lit, this LED indicates that the on-board power regulators are functioning correctly and the operating voltage rails are present.

3.3.4 ALARM

When lit, this LED indicates a fault condition within the system controller card; or, if a redundant controller card is present, a fault with communication activity between controllers.

3.3.5 ACTIVE

The panel section labeled *ACTIVE* contains a pushbutton switch and an LED indicator. In systems with dual controllers, the **Active LED** indicates which controller is the active controller (LED lit) and which is the backup controller (LED not lit). Pressing the pushbutton switch on the **standby** controller card immediately causes the cards to toggle function and swap the active and backup status of the controllers. In a single controller system, the Active LED is lit when the controller hardware is functioning, and the pushbutton switch has no effect.

3.3.6 ETHERNET LEDS

These two LED indicators provide a visual status of the Ethernet connection as follows:

- **Link (LNK)** – When lit, indicates an Ethernet link is established
- **Activity (ACT)** – LED flashes as Ethernet data traffic is exchanged over the link

3.3.7 SP LED

This LED is for factory testing and configuration only and is not used during normal operation of the controller.

3.3.8 USB CONNECTOR

This edge-mounted connector is for future product use, and is not used in current PERC2000 applications

3.4 STAND-ALONE CHASSIS FRAME ASSEMBLY

The 1RU PERC2000 stand-alone rack chassis allows you to mount the P2K system controller independent of a Cheetah video router frame. Figure 3-3 illustrates the chassis frame with the front cover in place and removed. To gain access to internal components, loosen the two captive thumbscrews on each end of the cover and pull the cover away from the chassis frame. Rear panel connections are illustrated and discussed in Chapter 4 of this user guide.

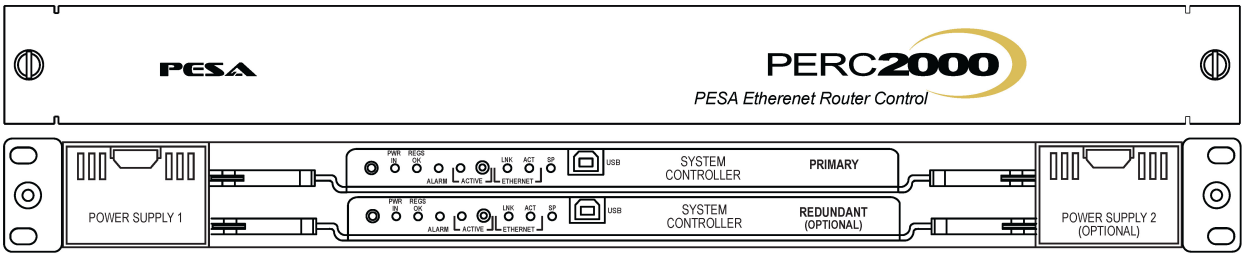


Figure 3-3 Stand-Alone Frame Chassis

Up to two PERC2000 circuit cards and two power supply modules may be installed in the chassis. Remember that the Ethernet connectors on the rear panel are slot specific and the power supply connectors are module specific – refer to Chapter 4.

3.4.1 Circuit Card Removal and Installation

Remove either system controller board as follows:

1. Pull the locking tabs on either side of the card tray assembly toward you to unseat the card from its mating connectors.
2. Carefully slide the card tray assembly out of the chassis

Install a system controller board as follows:

1. Align the card tray assembly with the card guides in the chassis.
2. Carefully, insert the board into the chassis until the connectors on the board make contact with the connectors on the backplane.
3. Firmly, push the board into the chassis until the board connectors are fully mated with the backplane connectors.

3.4.2 Power Supply Module

Power Supply modules slide into one of two available slots in the chassis frame. In redundant power supply applications, a power supply module is used in both slots of a chassis frame. A typical power supply module is shown in Figure 3-4. Power modules are hot-swappable.

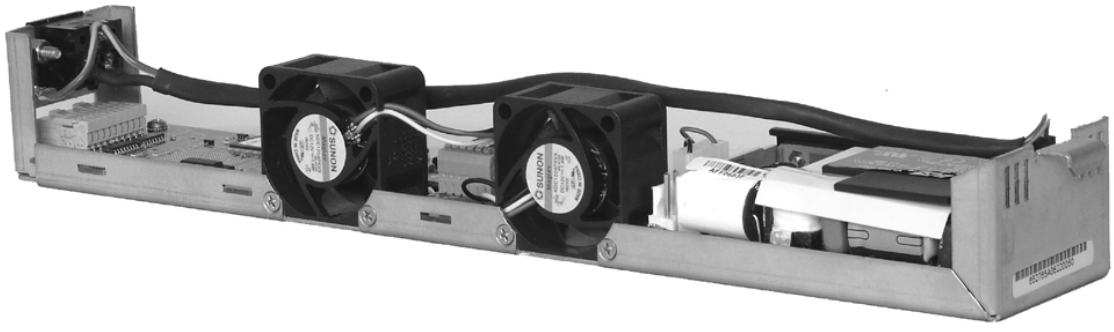


Figure 3-4 Power Supply Module (Typical)

NOTE	**A PERC2000 stand-alone chassis with power redundancy contains two power supply modules. Either power supply is capable of powering both system controller boards, with the second power supply serving as a backup for the first. One power supply may be removed and replaced while the other is connected to the power source, and the system controller is operational.**

3.4.3 POWER SUPPLY MODULE REMOVAL AND INSTALLATION

Remove either power supply module as follows:

1. Disconnect the power cord of the power module you wish to remove from its source of primary power.
2. On the rear panel of the chassis frame, remove the power cord from the module.
2. Using the small handle on the front, pull the power module toward you to unseat it from its mating connector.
2. Carefully slide the module assembly out of the chassis

Install either power supply module as follows:

1. Align the module assembly with the guides in the chassis slot.
2. Carefully, slide the module into the chassis until the rear connector makes contact with the connector on the backplane.
3. Firmly, push the module into the chassis until the connectors are fully mated.
4. Install the power cord plug onto the mating module power pins accessible through the rear panel cutout.
5. Connect the power cord to a source of primary power.

3.5 NETWORK CONFIGURATION

Control software, whether the PERC2000 GUI or Cattrax, communicates with the system controller hardware through the host PC over an Ethernet link using the IP address of the PC. When either software application is started, it immediately begins searching the network for all PESA products intended to communicate with it that might be connected to the net – including the system controller card. In order for the control software to communicate with PESA equipment, the network interface device used through the host PC must be actively connected to the subnet containing the equipment. In some installations, PESA devices may reside on a subnet different from that currently configured for the host PC. Either control software application allows you to easily select both the network interface device it uses and the subnets on which it communicates.

3.6 NETWORK ADDRESSING

In order for the host PC and P2K controller hardware to communicate, the IP address of the controller card must be set to a subnet and address value that allows the software to "discover" the controller. This may require assigning and, in some applications, changing the IP address of the system controller. In many installations, you will need to consult your facility network administrator when adding hardware to the network or when the default IP address for any hardware must be changed.

With any new P2K installation, the controller card is set to an initial *base IP address*. If two cards are installed for a redundant control system both cards must be initially set to the same base IP address.

All PERC2000 system controllers are shipped from the factory with a programmed IP address of 192.168.1.220 and subnet mask of 255.255.255.0.

On system start-up each controller card performs a boot-up procedure on its processor circuitry. As part of initialization, it determines into which module slot it is installed. This determination is made whether the card is installed in a Cheetah router frame or a stand-alone rack chassis. Based on its position, an individual controller can identify whether it is installed and initialized as the primary or secondary controller in the system, and it also determines and assumes it own *unique* operating IP address by adding an offset value, defined by its identity in the system, to its programmed base IP address. This offset value is applied as follows:

- Primary card slot or card slot A in a router frame – Offset value is 0 (zero), and the primary controller retains its set base IP address
- Secondary card slot – or card slot B in a router frame – Offset value is 1, and the secondary controller assumes the IP address of base IP address + 1

On completion of boot-up, each system controller assumes an individual identity based on the following characteristics:

- Its unique IP address on the network
- Whether it is installed in the primary or secondary card slot of the chassis or router frame
- Whether it is functioning as the primary or redundant system controller

3.7 CHANGING INITIAL NETWORK PARAMETERS

In many installations, the IP address setting from the factory may be used for initial "discovery" of the card by the GUI, and if the address needs to be changed this can easily be done through menus of the control software – once the controller card and the host PC are communicating.

If the factory programmed address causes a conflict, or the host PC can not communicate with the card due to different subnet settings, it will be necessary to create a direct Ethernet connection between a PC that has been isolated from the network and the controller card. Set the isolated PC to an IP address range that allows it to communicate using the default base IP address of the controller card and use the Microsoft Windows® configuration function to change the base IP address of the controller to an address that allows it to be discovered on the facility Ethernet. If you are installing two controller cards for redundancy, use this process to set **both** controller cards to the **same** base IP address.

3.8 DUAL (REDUNDANT) P2K SYSTEM CONTROLLERS

When a router system is equipped with dual P2K controllers, one is always functioning as the active controller and the other is the standby controller. Installation position in the frame is not an indicator of which is the active controller. During operation, the standby controller monitors the health of the active controller and will automatically become active and take over control of the system if it detects a problem. A standby controller can become active for any of the following reasons:

- User presses the **Active** button on the front edge of the circuit board in the frame.
- User requests the standby P2K become active by a command from the control software.
- Standby P2K loses serial communication with the active P2K.
- Active P2K controller is removed from its frame slot.

Chapter 4 – Installation

4.1 INTRODUCTION

Configuring a PERC2000 (P2K) control system requires you to install and set up the hardware, install the control software and then establish communication between the controller hardware, host PC and PESA routing equipment in the facility.

PERC2000 system controller hardware with firmware prior to Version 5.0 is shipped with the P2K GUI control software application. PERC2000 hardware can also be controlled using Cattrax, a software application that allows unified control of a wide range of PESA routers and signal processors.

PERC2000 system controller hardware operating with firmware Version 5.0, or later, requires Cattrax Version 3.0, or later for configuration.

While both applications provide full control for creating and editing configuration files and other P2K operating functions, the user interface is different. Full operation and configuration procedures pertinent to each control application are presented in Chapter 6 (PERC2000 GUI) and Chapter 7 (Cattrax) of this User Guide.

Whether installed in a video router frame or stand-alone chassis, the P2K hardware is functionally identical. When installed in the 1RU stand-alone chassis, the card is attached to an extender tray to allow it to fit the chassis card guides and midplane connectors.

4.2 SHIPPING DAMAGE INSPECTION

Immediately upon receipt, all shipping containers should be inspected for damage caused in transit. If any damage is noted, save all packing material and contact both PESA and the carrier as soon as possible.

4.3 UNPACKING

	**This equipment contains static sensitive devices. A grounded wrist strap and mat should be used when handling the P2K System Controller.**

Carefully unpack the equipment and compare the parts received against the packing list. If any parts appear to be missing, please contact PESA immediately.

4.4 INSTALLING STAND-ALONE PERC2K-S OR PERC2K-D CONTROLLER

Rack mount models of the PERC2000 controller are designed for installation in a standard 19-inch equipment rack. Each unit should be located as close as possible to its associated equipment to minimize cable runs. Sufficient space must be provided behind the equipment racks to allow for control and power cables. All panel mounting holes should be utilized and mounting hardware tightened securely.

Install the equipment into the rack as follows:

1. Insert the panel assembly into the equipment rack and support the bottom of the panel assembly until all mounting hardware has been installed and properly tightened.
2. Install the bottom two panel-mounting screws.
3. Install the top two screws.
4. Install any remaining screws.
5. Tighten all panel-mounting screws until they are secure.

Components internal to the rack chassis are illustrated in Figure 4-1. If only one controller card is installed, it is located in the upper card slot. If the chassis is equipped with only one power supply it should be installed in the module slot located on the left side of the chassis – as viewed from the front.

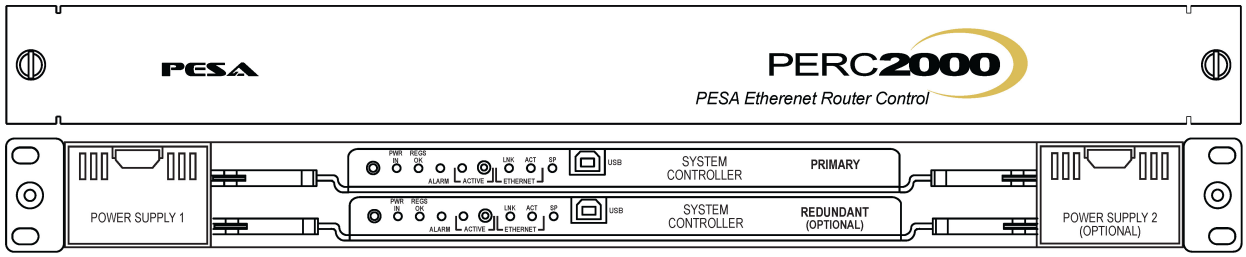


Figure 4-1 Stand-Alone Chassis Front View

Rear panel power connectors and network connectors are chassis-slot specific as shown by Figure 4-2. In redundant control systems, with two controller cards installed, all rear panel control signal input/output ports are in parallel with both cards. In the illustration, connectors are grouped by function and indexed with a number to identify the group. Connector functions are discussed in Paragraph 4-6.

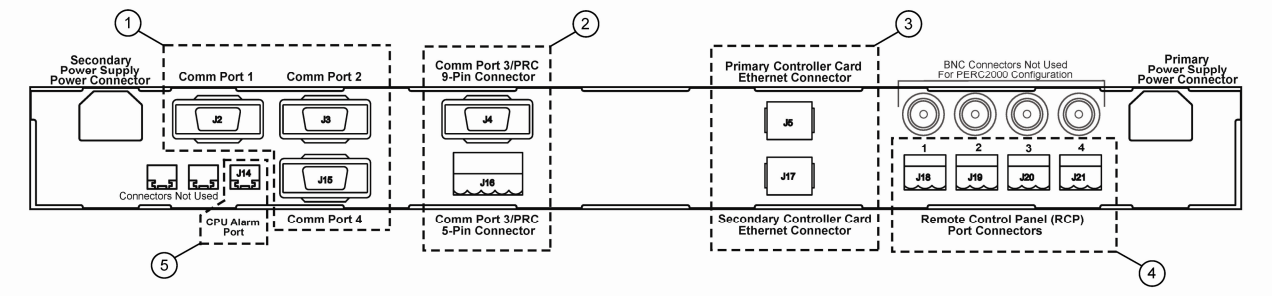


Figure 4-2 Stand-Alone Chassis Rear View

4.5 PERC2000 Installation Within a Cheetah Video Matrix Switcher

PESA's Cheetah Series Video Matrix Switcher frames provide slots for up to two P2K controller cards. When installed in a Cheetah router, communication with the Matrix Frame Controller is made through internal connections within the frame. All outboard equipment, such as a DRS audio router, that you wish to control with the installed PERC2000 is interconnected through rear panel connectors on the router chassis.

One or two (for control redundancy) PERC2000 system controllers can be installed in any of the Cheetah Series video routers. System controller card locations vary depending on the Cheetah router frame type. Refer to the Product Manual or Technical Addendum supplied with your router for proper installation location. Power for the P2K controller is derived through the video frame power distribution system.

Figure 4-3 is a representative illustration of a pair of PERC2000 controllers mounted in a Cheetah video router frame. Actual placement of the controller card(s) within a specific frame type depends on the chassis used – refer to frame documentation for a particular router. If only one controller card is installed, it may be installed in either slot (A or B) – but remember that the rear panel *System Controller* connectors for Ethernet connection are card-slot specific.

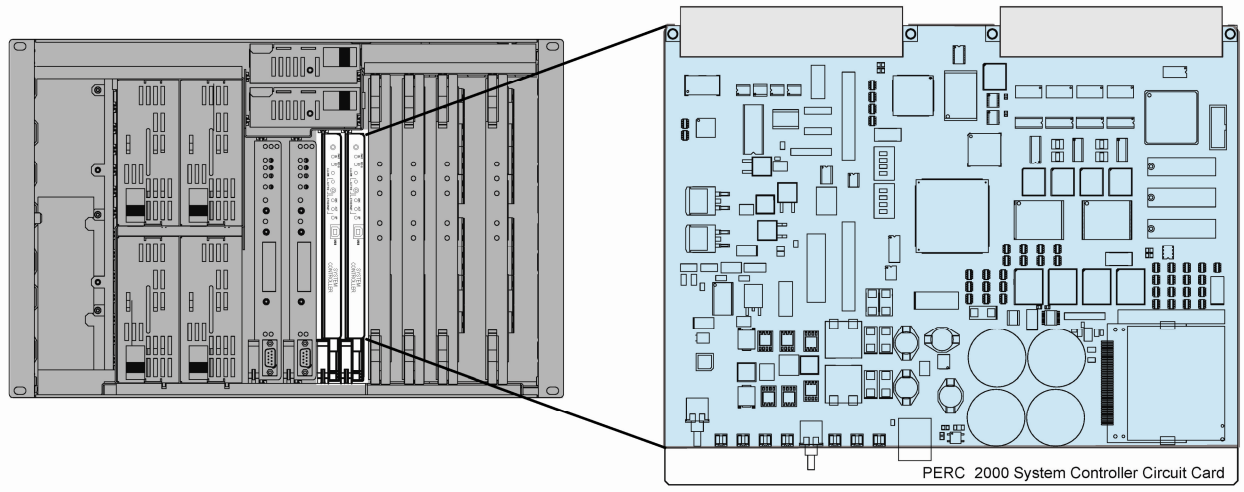


Figure 4-3 Typical Video Router Installation

For reasons of personal safety, and to prevent damage to the equipment or cables, the following guidelines should be followed when connecting cables to Cheetah video router equipment.

1. Install the equipment in the rack before connecting cables.
2. All cables should be carefully strain relieved to prevent connector separation.
3. To the extent possible, separate control, signal, and power cables to minimize crosstalk and interference.

4. Use of nylon cable ties to secure cables to the rack is encouraged. This minimizes the amount of force transmitted to the equipment and help route cables away from hazardous areas.
5. Route cables away from walk areas to avoid creating a safety hazard.

In Figure 4-4, the system connector panel found on the Cheetah 864XR video frame is used as an example; the layout of the system connector panel on your frame may be different than the example shown here. Not all connectors shown in this example are present on all system connector panels; however, the information presented here applies to all connectors of like-nomenclature on any system connector panel, regardless of physical layout.

PESA recommends that you make a layout plan and connection drawing to document system connections to the router and follow them when attaching cabling to the rear panel connectors. Retain this documentation in a safe place in the event that service to the router should ever be needed. PESA also recommends that you label each cable to identify its source or destination.

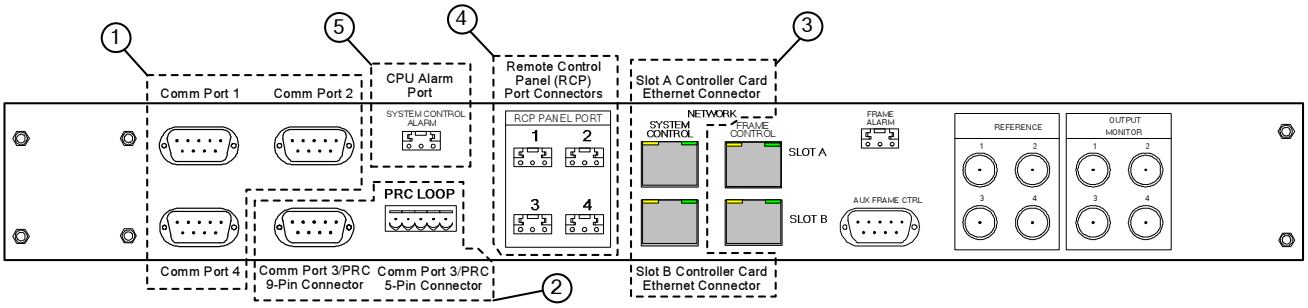


Figure 4-4 – Typical Video Frame Connector Panel

4.6 PERC2000 EXTERNAL I/O CONNECTIONS

Regardless of whether the PERC2000 controller hardware is mounted in a router chassis or stand-alone chassis, the I/O connections to interface the controller with external equipment are the same. Figure 4-2 identifies the rear panel connections for a stand-alone chassis. Figure 4-4 identifies rear panel connections for a typical Cheetah router connector panel. Regardless of panel layout configuration, the connector nomenclature is the same for all Cheetah router rear panels.

External I/O connections for a PERC2000 installation are introduced in the following paragraphs. The number shown in parenthesis in each paragraph header corresponds to the index numbers in Figures 4-2 and 4-4 to identify connector location.

4.6.1 SERIAL PORTS COM 1, COM 2 AND COM 4 (INDEX 1)

Connectors COM1, COM2 and COM4 are male DB9 connectors that provide serial communication ports for interfacing the P2K with external devices through a user-selectable choice of PESA CPU Link protocols, at a selectable baud rate of either 9600 or 38400. Each port may also be assigned as RS-232 or RS-422 compatible through a control application set-up screen.

PERC2000 supports two PESA proprietary protocols as an interface communication protocol between the system controller and a MODEM or other external devices. Description, command set and syntax for each protocol are presented in the PESA documents identified by Table 4-1. These documents are contained on the product documentation CD supplied with your controller or router. You may also contact PESA Customer Service to obtain these documents.

Table 4-1: PESA CPU Link Protocols

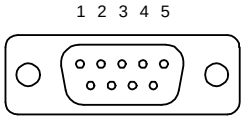
Protocol	Document No.
CPU Link Protocol No. 1 Extensions (P1E)	81-9062-0408-0
Unsolicited Status Protocol (USP)	81-9062-0409-0

If you choose to interface the PERC2000 to an external device using an RS-232 compliant serial data bus, connect the two devices using a null modem cable (PESA Part No. 81-9028-0393-0). You may also connect any of the three serial data ports to an external MODEM using an AT Serial Modem cable (PESA Part No. 81-9028-0400-0). RS-232 bus cable runs can be up to 50 feet in length. Obtain serial bus cables from PESA or fabricate your own, using the pin-out data provided by Table 4-2 and Figures 4-5 through 4-7.

Using the RS-422 serial bus configuration allows for longer cable runs, up to 4000 feet in length. You may obtain serial bus cables from PESA or fabricate your own, using the connector pin diagram shown by Figure 4-5 and pin-out diagram provided by Figure 4-8.

Table 4-2 RS-232 Serial Port Pin-Out Data

Pin	Signal	In/Out
1	CD	Input
2	RX	Input
3	TX	Output
4	DTR	Output
5	Ground	---
6	DSR	Input
7	RTS	Output
8	CTS	Input
9	RI	No Connect



Contact locations when viewed from rear of chassis.

Figure 4-5: (COM 1, COM 2 and COM 4) Connectors

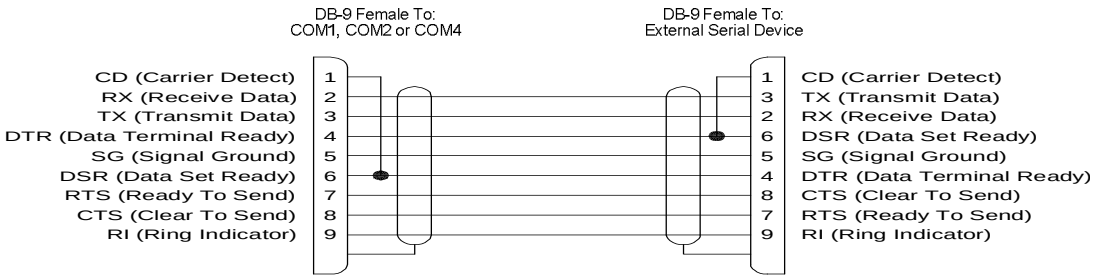


Figure 4-6: RS-232 CPU Link (Null Modem) Cable

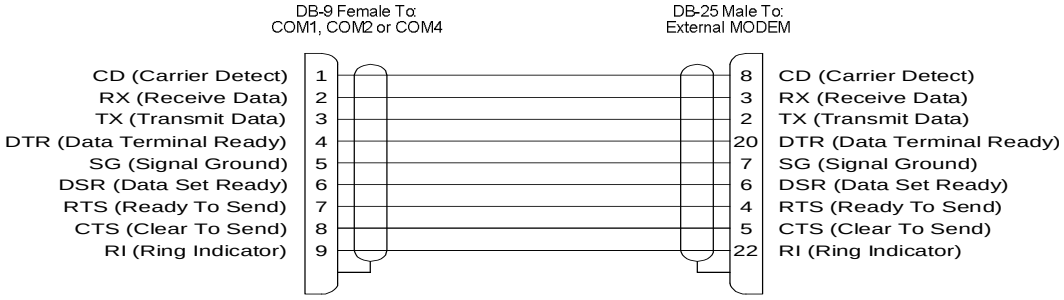


Figure 4-7: RS-232 CPU Link (AT Serial Modem) Cable

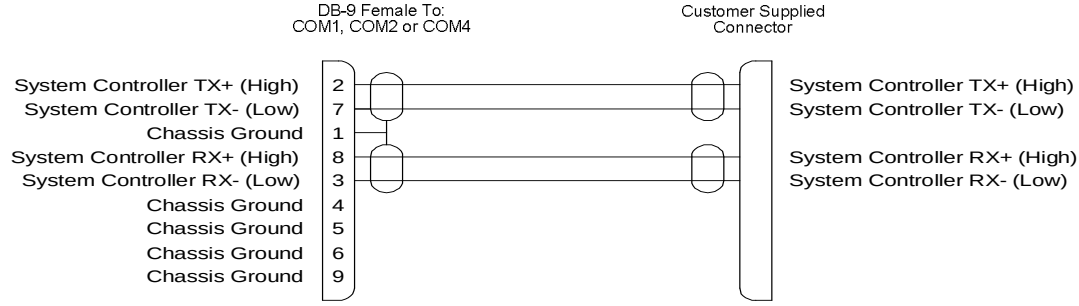


Figure 4-8: RS-422 CPU Link Cable

4.6.2 COM 3/PRC BUS (INDEX 2)

Serial port COM 3 is dedicated as a system control communications interface with other PESA routing switchers within the facility using the PESA Router Control (PRC) protocol, and is connected between PESA PRC-compatible routers using an RS-422 serial control cable. This port is unique in that it has a 5-pin connector wired in parallel with the DB9. In most applications the 5-pin connectors on all system frames are interconnected in a daisy-chain fashion. The DB9 (COMM 3) connector is also active, if you wish to use it. Note that the 5-pin connector scheme is a legacy from previous PESA controller systems.

When using the DB9 RS-422 serial bus connector, you may obtain cables from PESA or fabricate your own, using the connector pin diagram shown by Figure 4-9 and pin-out diagram provided by Figure 4-10.

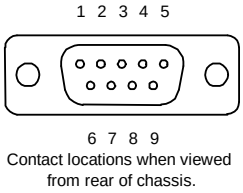


Figure 4-9: COM 3/PRC Connector

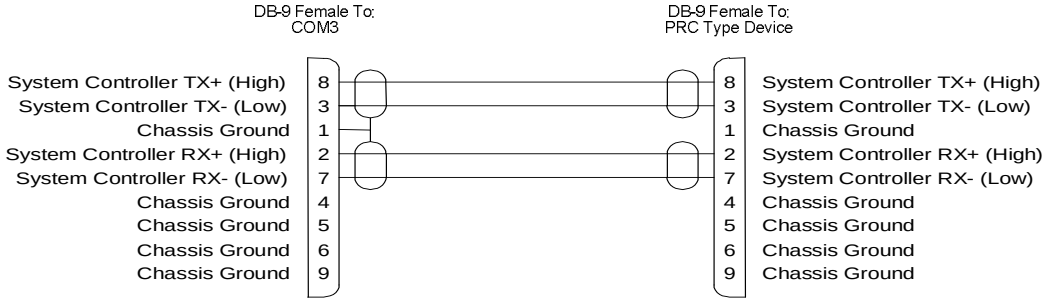


Figure 4-10: RS-422 Serial Cable for PRC Bus

A five-pin PESA Router Control (PRC) Loop Connector, Figure 4-11, is wired in parallel with the DB-9-Male PRC Loop connector, and also provides an RS-422 serial communication interface for the PRC Protocol. Either connector may be used for frame-to-frame interface communications. Contact locations are illustrated in Figure 4-11. The PRC Loop may be connected to PESA PRC compliant routers with a cable assembly constructed as shown in Figure 4-12.

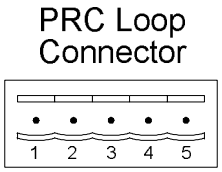


Figure 4-11 5-Pin Connector Pin-Out

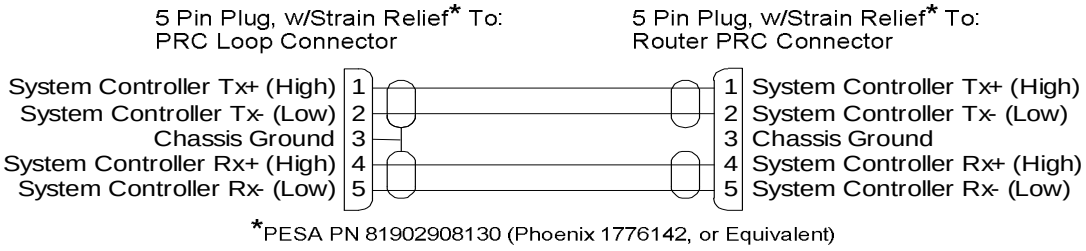


Figure 4-12 - RS-422 System Expansion Cable

4.6.3 NETWORK CONNECTORS (INDEX 3)

Each rear panel RJ-45 Ethernet connector is card-slot specific interface between its associated PERC2000 controller card and an Ethernet connection.

When the stand-alone rack chassis is used, non-redundant systems are configured with a single controller card installed in the upper slot of the chassis frame that connects to the Ethernet through the upper RJ-45 connector, J5. If the chassis is equipped with a second controller card for redundancy, it is installed in the lower slot and interface with the Ethernet through J17.

When installed in a Cheetah video router frame, non-redundant systems are configured with a single P2K card installed in controller card Slot A that connects to the Ethernet through the rear panel RJ-45 connector labeled *System Control Slot A.* If the chassis is equipped with a second controller card for redundancy, it is installed in controller card Slot B and interface with the Ethernet through the rear panel RJ-45 connector labeled *System Control Slot B.*

All communication activities between the PERC2000 and other external components follow standard Ethernet protocol. Using a standard RJ-45 Ethernet cable, connect the Ethernet jacks to a 10/100BASE-T hub or switch on the TCP/IP network.

Set the IP address, Subnet mask and Gateway address to values assigned or approved by the Network Administrator in accordance with procedures in Chapter 6 (P2K GUI) or Chapter 7 (Cattrax) of this guide.

Two LED indicators associated with each rear-panel connector provide a visual status of link activity as shown by Figure 4-13 and Table 4-3.

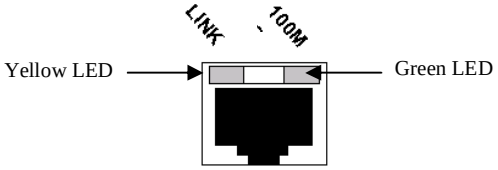


Figure 4-13 - Ethernet Connector

TABLE 4-3 - ETHERNET LED INDICATORS

Link	ON = Ethernet LINK established
100M	ON = Ethernet connection speed is 100Mb/s OFF = Ethernet connection speed is 10Mb/s

4.6.4 REMOTE CONTROL PANEL PORTS RCP 1- RCP 4 (INDEX 4)

With both stand-alone chassis frame or Cheetah video router frame installations, these 3-contact connectors are wired in parallel, and provide RS-485 serial communication interface ports using the PESA Remote Control Panel (RCP) Protocol (Document No. 81-9062-0300-0).

	**Connector styles and pin-outs for RCP connectors used on stand-alone chassis and Cheetah video router frame are different!!** **Pay very close attention to use proper pin-outs, as shown by illustrations in Figure 4-14, for type of chassis in which your controller card is mounted!!**

Any of the connectors may be used to originate an RCP bus which is connected to RCP protocol compatible PESA Remote Control Panels with daisy-chained cables constructed with 3-contact connectors (PESA Part No. 81-9029-0780-0) and shielded, twisted-pair audio cable (PESA Part No. 81-9028-0043-2, Belden 8451, or equivalent) as shown in Figures 4-14 and 4-15. The connector body has an integral strain relief, which requires the use of a nylon cable tie included with the connector. If this cable tie is not available, PESA Part No. 81-9021-0028-8, or equivalent, may be used.

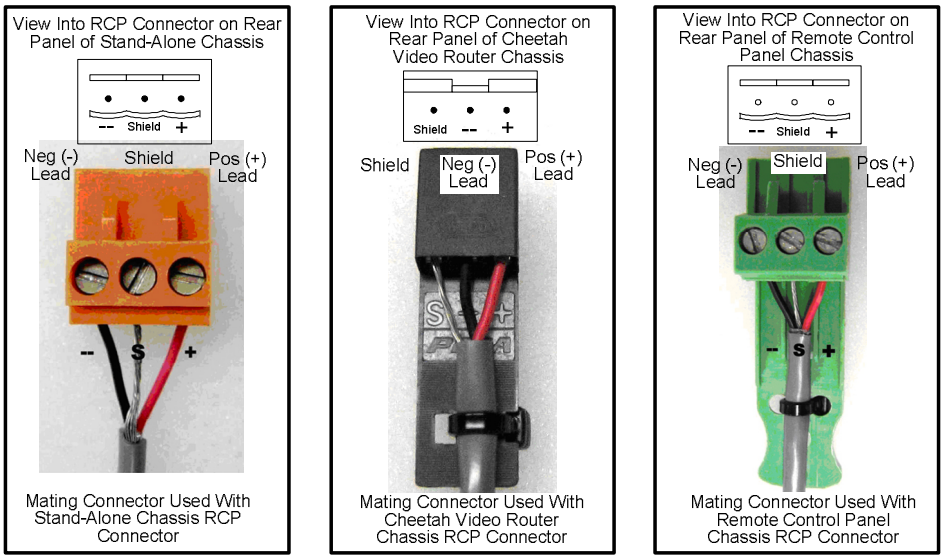


Figure 4-14 RCP Connector Pin-Out Diagrams

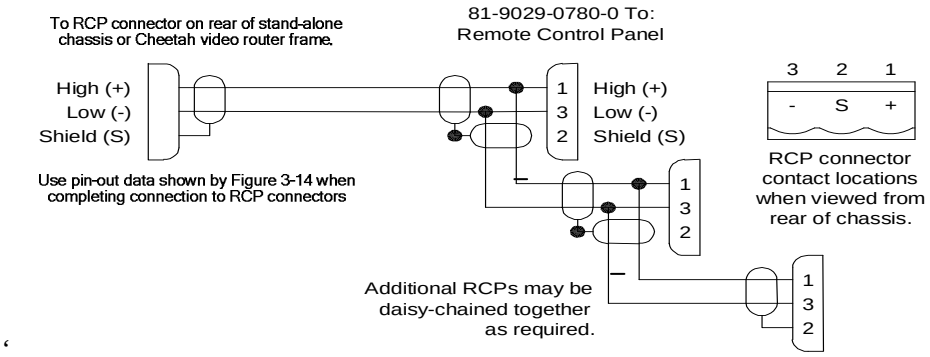


Figure 4-15 RS-485 Serial Cable Wiring for RCP Bus

4.6.5 CPU ALARM (INDEX 5)

This 3-contact connector provides rear panel interface with the CPU alarm.

PERC2000 operating software determines when an alarm condition is declared. During an alarm condition, an optically isolated, closed circuit exists between contacts 1 and 3. A customer supplied external alarm circuit may be connected with a cable constructed as shown in Figures 4-16 and 4-17.

The mating 3-pin connector body (PESA Part Number 81-9029-0780-0) has an integral strain relief, which requires the use of a nylon cable tie included with the connector. If this cable tie is not available, PESA Part No. 81-9021-0028-8, or equivalent, may be used.

	**Alarm circuit connected to this connector must not exceed 12VDC or 10mA.**

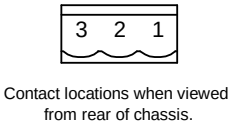


Figure 4-16: CPU ALARM Connector Pin-out

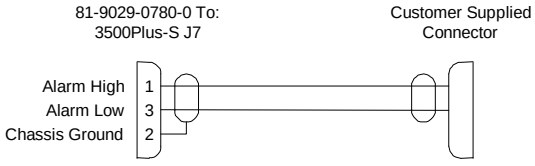


Figure 4-17: CPU Alarm Cable Fabrication

Chapter 5 – Maintenance and Repair

5.1 PERIODIC MAINTENANCE

No periodic maintenance is required.

5.2 PESA CUSTOMER SERVICE

If you are experiencing any difficulty with the PERC2000 system controller, please contact PESA's Customer Service Department. PESA technicians are available to assist you 24 hours a day, every day of the year.

5.3 REPAIR

Before attempting to repair this equipment, please consult your warranty documents and PESA's Customer Service Department. Unauthorized repairs may void your warranty.

	**PC boards in this equipment contain Surface Mount Technology (SMT) components. Special tools and skills are required to replace these components without causing damage to adjacent areas.** **Failure to consult with Customer Service before attempting to repair these boards may void your warranty.**

5.4 REPLACEMENT PARTS

Only parts of the highest quality are used in the design and manufacture of your PESA equipment. If the inherent stability and reliability are to be maintained, replacement parts must be of the same high quality. Please consult our Customer Service Department before installing any parts not purchased from PESA.

5.5 FACTORY SERVICE

Before returning any equipment to PESA for service or repair, please contact our Customer Service Department for an RMA number.

Chapter 6 – PERC2000 Operation Using P2K GUI Control Software

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 or later, you must use the Cattrax control software application, Version 3.0, or later, to communicate with the controller hardware. Procedures in this chapter are not applicable to your controller. Skip to Chapter 7 of this User Guide.**

6.1 INTRODUCTION

PERC2000 system controllers loaded with operating firmware prior to Version 5.0 were supplied from the factory with the P2K graphical user interface (GUI) software application for installation on a standard PC running the Microsoft Windows 2000, XP, Vista or Windows 7 Operating System. The PC serves as a "host" computer for the router installation. The PC must have a CD-ROM drive for installation of the P2K GUI, and must have wired or wireless local area Ethernet network access to connect with PESA devices communicating over the network.

All control aspects of the P2K system are executed through the software application. Tools and routines provided allow you to build and upload controller configuration files, perform system status polling and also perform certain maintenance and diagnostics routines. A mouse with scroll-wheel is recommended for precise control of device parameter values using slider controls, and a monitor size of 19 inches or larger is also recommended.

Designing and configuring a routing switcher system requires working knowledge of the hardware components and the router operational modes and functions. This discussion of the P2K software application assumes the user has knowledge of switching functions and terminologies required to configure a system using the various commands and screens introduced in the following paragraphs.

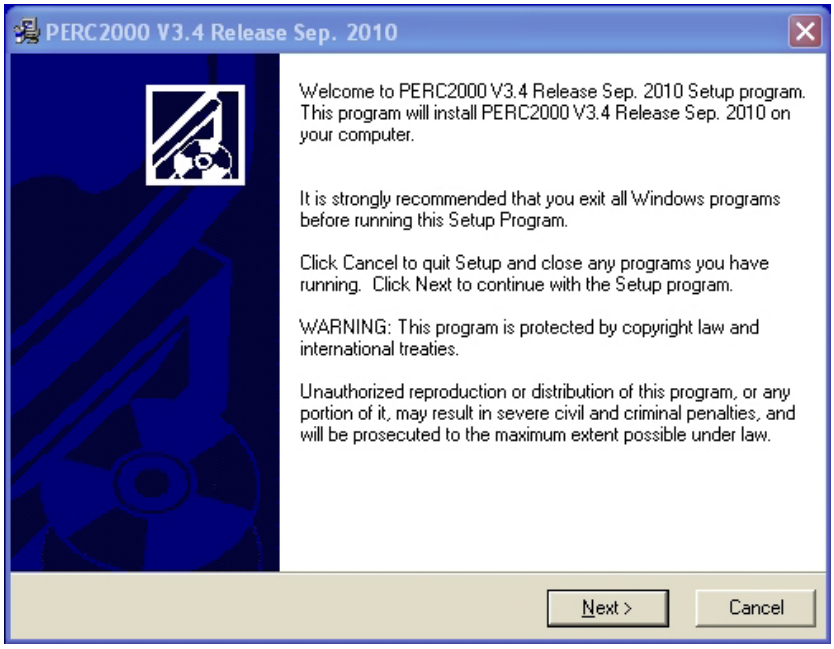
Be aware that system changes you can make through the commands and screens discussed in the following paragraphs configure virtually all operational aspects of the system. Mistakes or erroneous entries made in many of the following programming steps can cause serious problems ranging from incorrect sources being switched to total shutdown of the entire system. Be sure you know exactly what you want to do before you make changes to the system configuration.

6.2 INSTALLING PERC2000 GUI CONTROL SOFTWARE APPLICATION

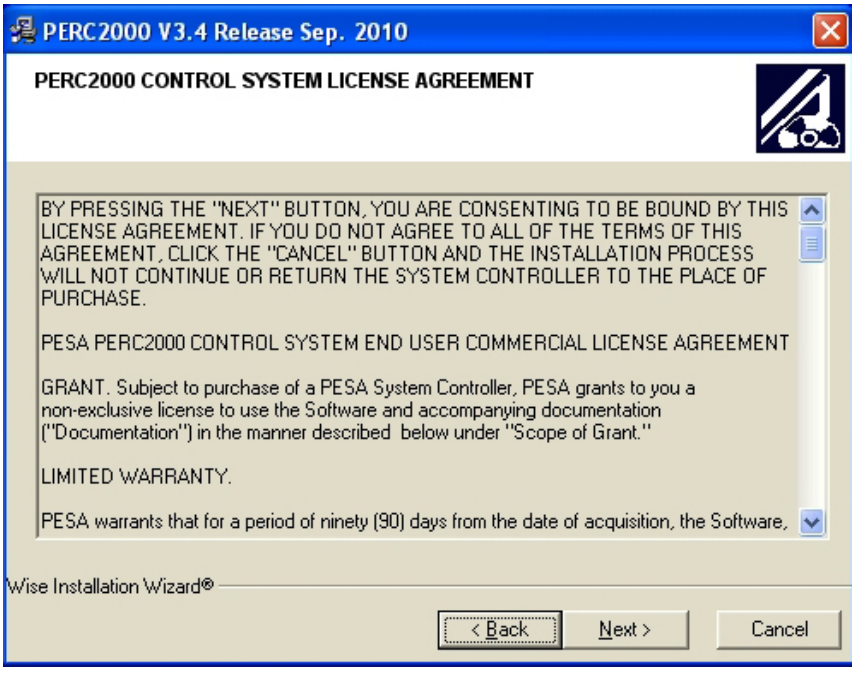
Your PERC2000 installation disk contains an auto-run file that guides you through the installation process. Examples of the pop-up screens you will see are shown below with the appropriate step. During installation the release number of P2K software you are installing is displayed.

Install the PERC2000 software application as follows:

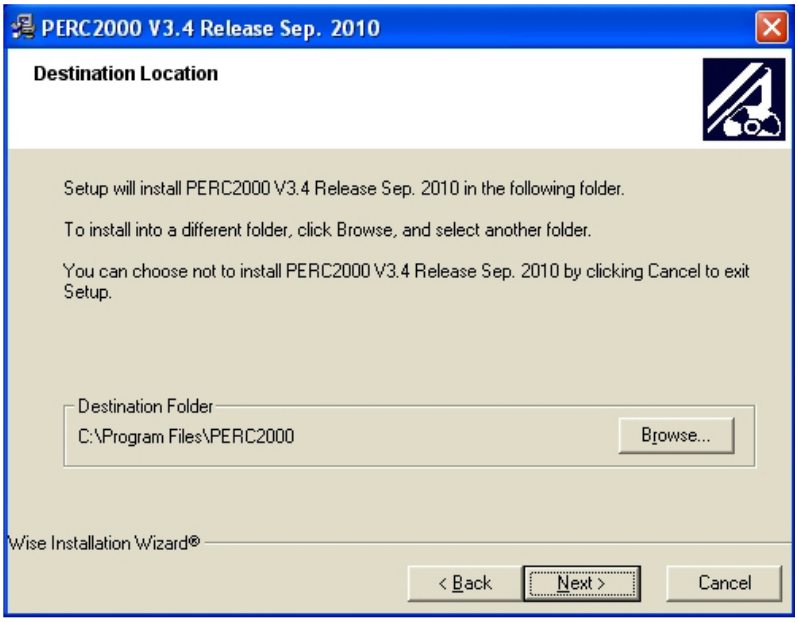
1. Insert P2K installation CD into drive of host PC.
2. Allow the disk to initiate the auto-run function. When initialization is complete, the following banner is displayed on the desktop. Click **Next** to begin installation of the software.



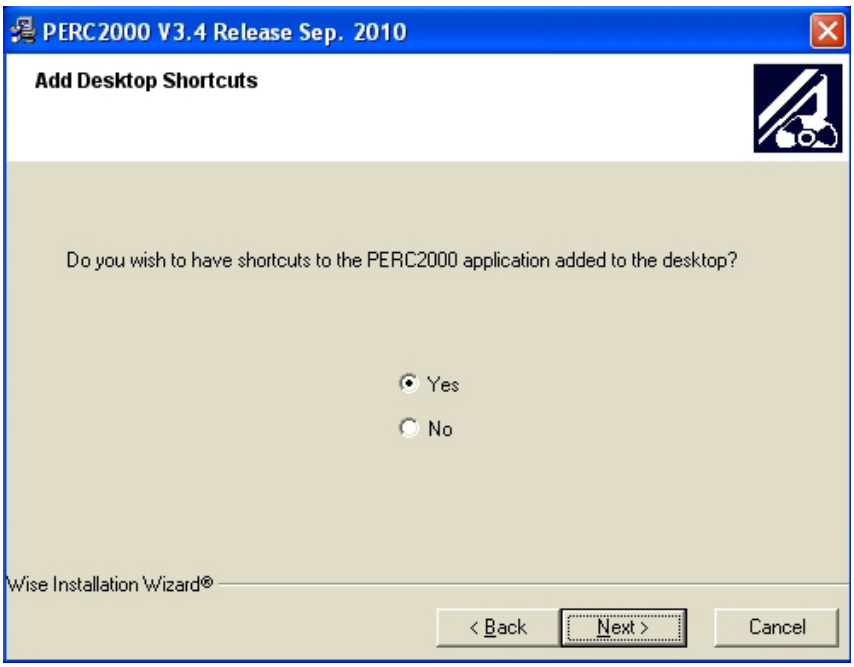
3. If the auto-run function does not automatically launch, navigate to the directory of the disk drive containing the installation CD and double click the **PERC2000Vx.xInstall.exe** file. The banner shown above should be displayed on the desktop. Click **Next** to begin installation.
4. Read the license agreement and click **Next** to continue, as shown below.



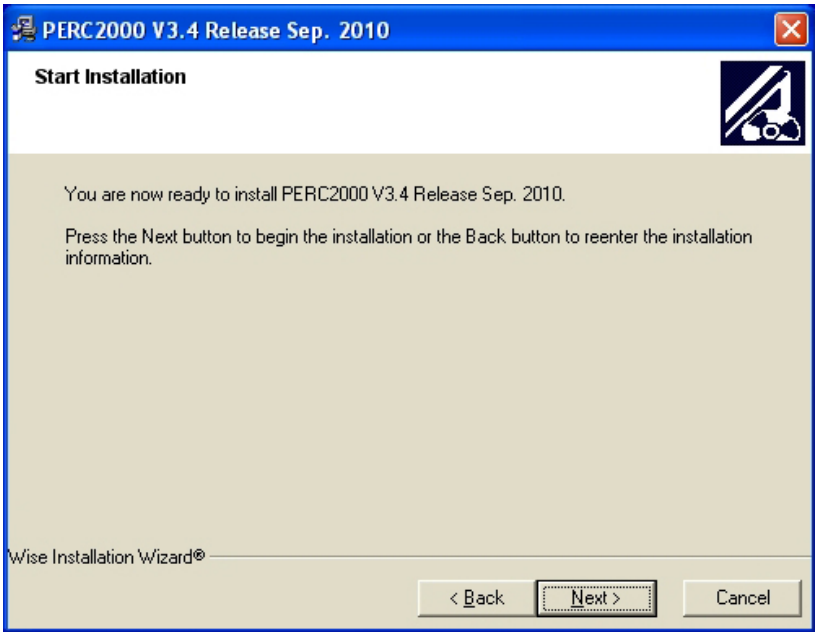
5. By default auto-install creates the folder shown below for the PERC2000 application. If you wish to install the software in a directory or folder other than the default, click **Browse** and navigate to the destination. Click **Next** to continue installation.



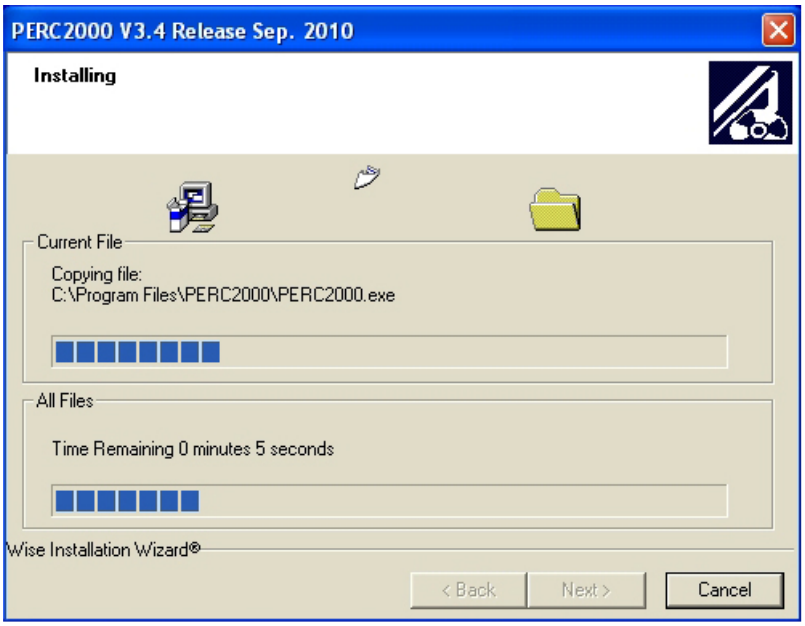
6. By default auto-install creates desktop shortcuts for the PERC2000 application, as shown in the following example screen. If for some reason you do not want the shortcuts created, click the **"No"** radio button. Click **Next** to continue installation.

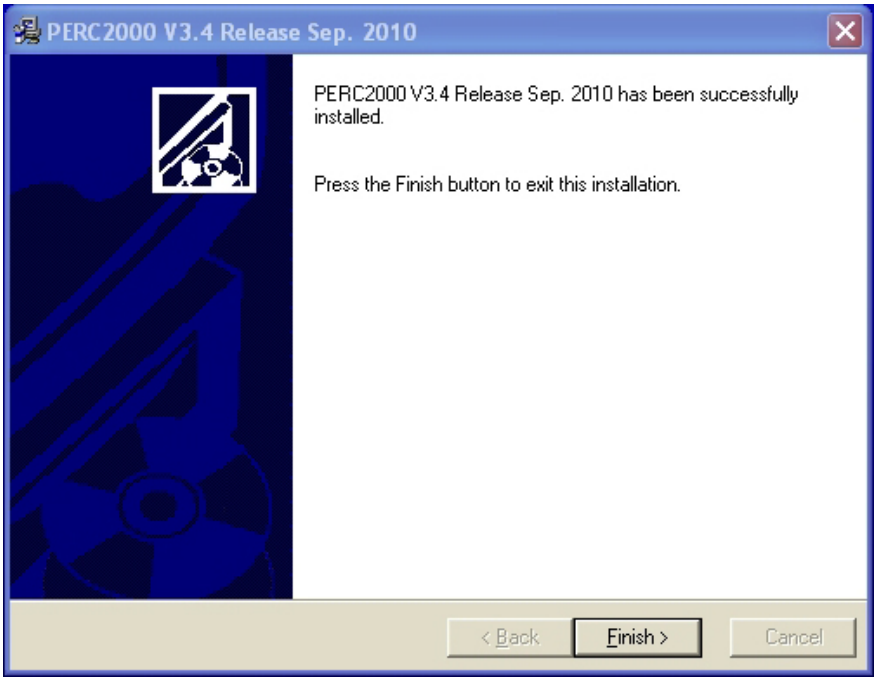


7. The auto-installer now has the required inputs to begin software installation as prompted by the screen shown below. Click **Next** to continue the installation process.



8. During installation, an indicator bar tracks progress of software load. Upon completion of installation, an "Installation Complete" prompt is displayed. An example of each screen is shown below.

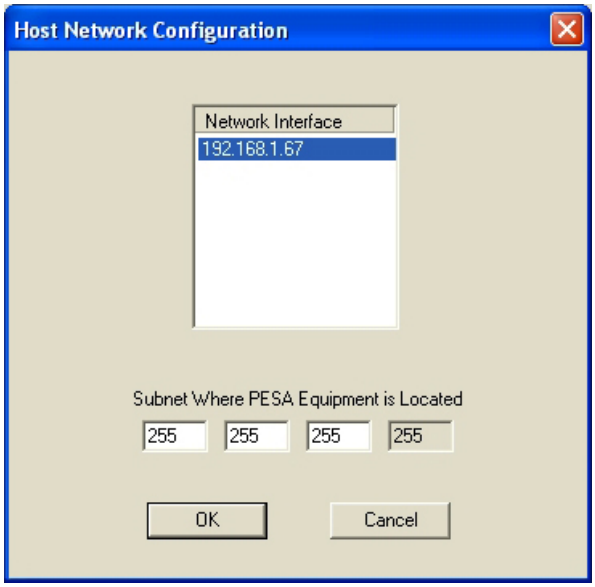




9. Click **Finish** to exit the installation process; and, if you chose to do so, place a shortcut icon to launch PERC2000 from the desktop.

6.3 NETWORK CONFIGURATION

To view or modify current network communication parameters, click the ***Network Preferences*** tab under the *Edit* menu in the menu bar to open the Host Network Configuration screen as shown here.



The upper area displays by IP address and name the network interface devices available to the control application. In many installations there is only one entry in the window and by default this would be the device used. If there are multiple entries, as would be the case, for example, if the host PC contains both an Ethernet NIC and a wireless adapter, the device the host PC is currently communicating through is shown highlighted. You may select the network interface device you wish to use by double-clicking the entry in the listing. Be sure that the network interface device you select is communicating over the subnet containing all PESA devices you wish to control.

The subnet currently selected is listed in area below the IP address box. If you need to modify subnet address parameters, enter the first three octets of the subnet address by typing new addressing data into the proper box. The fourth octet is by default entered as 255 to allow discovery of all possible PESA devices within the subnet. When you have the network parameters properly configured, click the **OK** button to select the new configuration and exit the dialog box, or click **Cancel** to exit the box without making changes.

6.4 NETWORKED HOST PC AND SYSTEM CONTROLLER

Once you have the PERC2000 software loaded and the system controller hardware configured to communicate on the network, start the application by double-clicking on the desktop PERC2000 icon. The main screen, as shown by Figure 6-1, is displayed. When the software is started, it immediately begins the discovery process to locate PESA controller devices on the network. Discovered devices are listed by category under the Maintenance/Diagnostics Menu entry as shown by Figure 6-2.

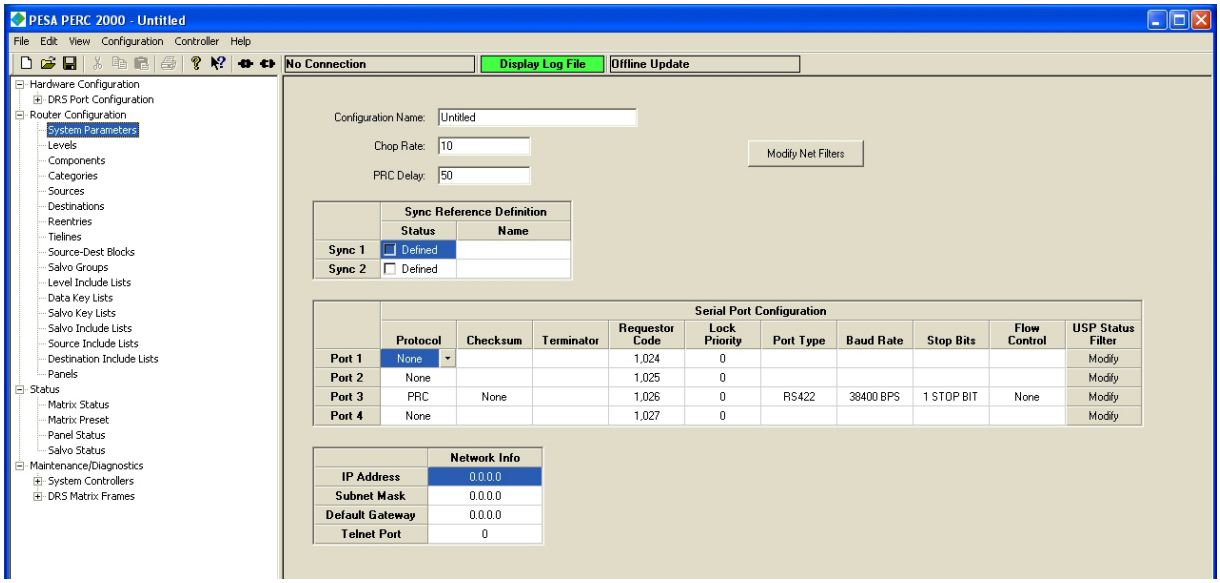


Figure 6-1 PERC2000 Main Screen

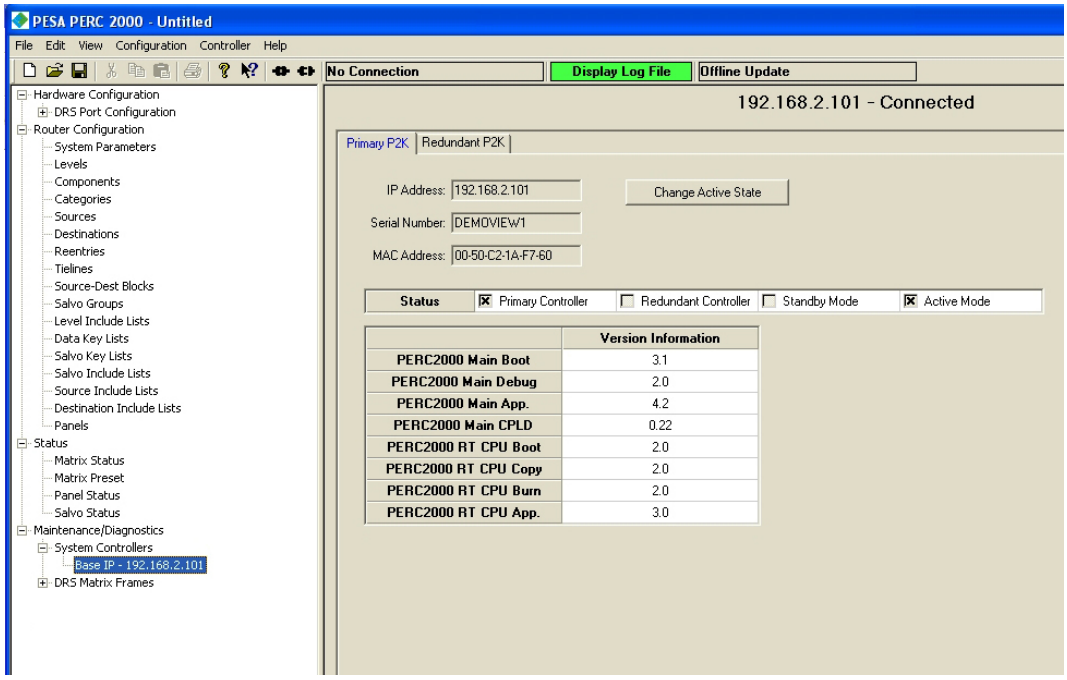


Figure 6-2 System Controllers Configuration Screen

Locate and expand the **Maintenance/Diagnostics** tree in the left pane of the GUI display, then expand the **System Controllers** tree; this action expands the tree to display a listing of PERC2000 controllers discovered on the network, identified by the *base IP address* of the controller device(s). In most installations, there is only one controller for the entire PESA routing system, and therefore only one entry under the System Controllers menu. If for some reason your installation does contain multiple, independent PESA routers controlled by separate PERC2000 system controllers, the base IP address of each controller installation is listed under this menu entry.

Click on the list entry to select and highlight the system controller. The main display screen shows real-time status and setup information for the selected controller. For our example screen, the system controller resides at base IP address 192.168.2.101.

The base IP address of the controller is displayed at the top of the pane, along with a notation that the GUI is **connected** to and communicating with the PERC2000 hardware. The main display area has tabs at the top for each controller hardware device associated with the base IP address. Note in our example screen from left to right there are tabs for a *Primary P2K* circuit card and a *Redundant P2K* circuit card. The display presented when a tab is highlighted provides operating parameters for the selected device. As an example we have highlighted the tab for the Primary P2K controller operating at the base IP address 192.168.2.101.

The displayed data identifies the system controller hardware by its *operating* IP address (which for the primary controller is the same as the base IP address), serial number and MAC address. Just beneath the serial number and MAC address display is a box labeled *Status* which identifies the location and operational status of the selected controller. In our example screen, status identifies the selected controller as the P2K installed in the Primary Controller slot of the frame and shows it is currently the ***active*** system controller. The *Version Information* box displays the revision numbers of the currently loaded firmware modules for the selected system controller device.

6.5 CHANGING THE BASE IP ADDRESS OF A PERC2000 SYSTEM CONTROLLER MODULE

Remember the base IP address is the address programmed into the P2K system controller(s) – either from the factory or, if the factory address is totally out of range, through a Microsoft Windows® IP configuration operation - and it becomes the nomenclature used to identify the system controller on the network.

In some applications it may be necessary to set the base IP address of the PERC2000 controller to a value other than the factory assigned address to accommodate your particular installation; this is easily accomplished through the P2K GUI. Changing the IP address may be required for a number of reasons; for example, in new installations the IP address of system components, such as the PERC2000, occasionally need to be set differently from the factory ship configuration to avoid addressing conflicts with other network hardware.

Assume you are installing a new PERC2000 system, with a redundant controller card, and wish to use the IP addresses 192.168.5.101 and 192.168.5.102 for the controllers, rather than the default values set by the factory. Using the P2K GUI you would change the base address to 192.168.5.101. When the “new” address is saved to the controllers, it is simultaneously written to both the primary and redundant controllers in the system. Saving the new address causes the system controllers to re-boot and thereby assume their “new” operating address derived from the changed base address.

The base IP address of the P2K system controllers may be set to virtually any value that best suits your network, with a few caveats:

- You may set the first three octets of the IP address to any values needed for your installation.
- You may assign any valid value (1 thru 254) to the fourth octet, keeping in mind numbers 0 (zero) and 255 are not valid for use.
- When determining the number for the fourth octet you must dedicate a block of 2 consecutive numbers if a secondary controller is used, or if you plan on installing a secondary controller in the future. The number you assign as the base IP address becomes the operating IP address of the primary system controller, and is incremented by one when assigning the operating IP address to the redundant system controller.

The following steps guide you through the procedure to enter a new base IP address value to your P2K system controllers:

- Launch the P2K GUI application from the desktop icon or browse to the PERC2000.exe file and double click to open the application.
- Open the *Help* menu in the Microsoft Windows® menu bar and select the *IP Config Utility* option from the menu as shown in Figure 6-3.

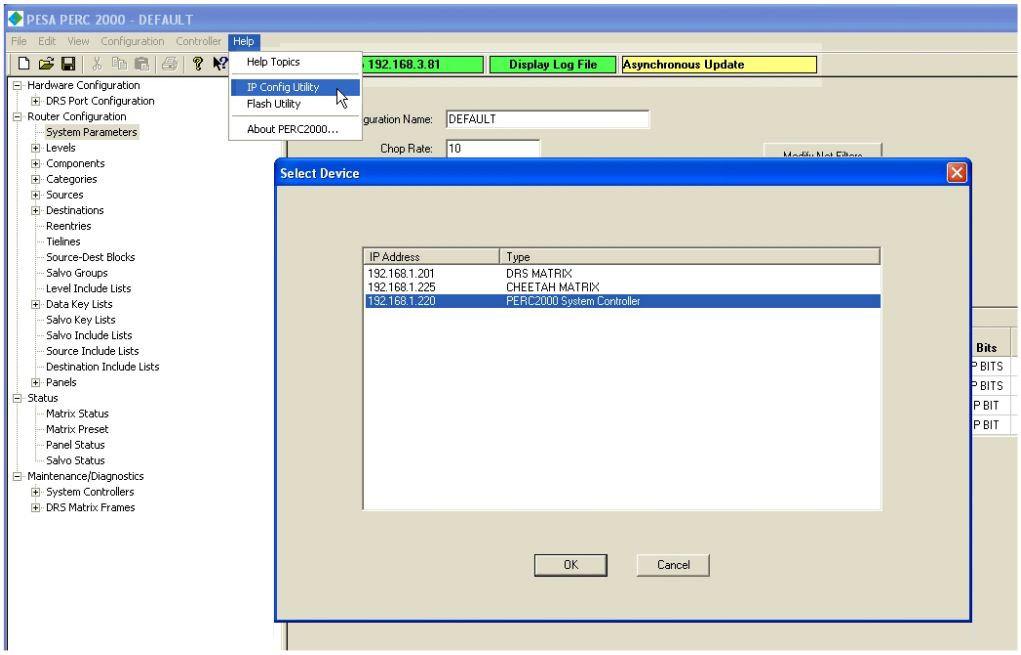


Figure 6-3 "IP Config" Utility Command Location and Select Device Window

- This brings up the *Select Device* window as shown in Figure 6-3. Select the P2K system controller, by its current base IP address shown in the listing and click the entry to select the device. With the entry highlighted, click the **OK** button to continue.
- The Select Device box clears and the *IP Parameters Config* box, Figure 6-4, is displayed. Note when the box initially appears, the IP address listed is the current base IP address of the system. Click in the **IP Address** block, remove the currently listed IP address and enter the "new" IP address you have selected as the base IP address for the system controller. Remember that the numbers 0 (zero) and 255 are not valid for the fourth octet of the IP address. If, based on your network requirements, you also need to assign a "new" subnet mask or default gateway setting, enter the desired values in the **Netmask** and **Default Gateway** boxes. Default values for these settings are:
  - Netmask: 255.255.255.0
  - Gateway: 0.0.0.0
- Click **Save Changes** to write the new address data simultaneously to all P2K controllers in the system.

CAUTION	**If you make changes to IP configuration parameters, you MUST click the *Save Changes* button to write the new data to the controllers. If you simply click *OK* without first saving the changes, the data you entered is not written to the controllers and will be lost.**

- If you wish to change the address of other PESA systems on the network, click the **Select New Device** button to return to the Select Device box and select the address you wish to change from the list.
- Clicking **OK** closes the IP Parameters Config box, but DOES NOT save data changes you make to the controllers.

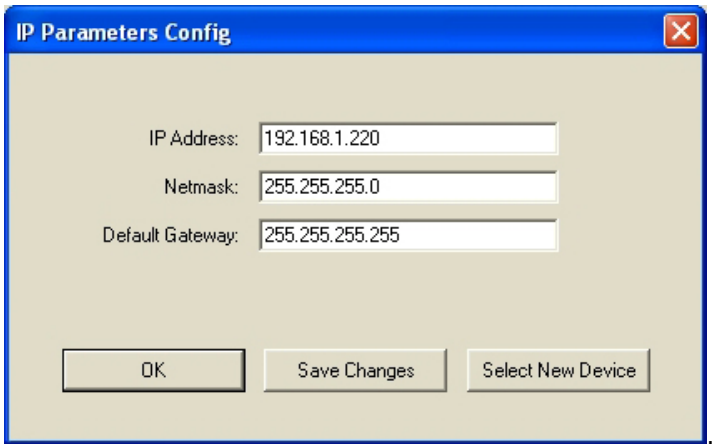


Figure 6-4 IP Address Data Entry Box

- Once the new address is assigned, allow a few seconds for the system controller(s) to reboot. Click on the IP Config command and verify that the base IP address listed for the controller reflects the desired change.

6.6 HARDWARE CONFIGURATION AND ROUTER CONFIGURATION

Configuration files are created through user screens and menus of the P2K GUI. Through user input and design, these files define all operational aspects for various control system components within a router installation. Once created, a configuration file can be stored, edited or downloaded to a hardware controller device. A router system is essentially non-functional until a configuration file is created and downloaded to the controller hardware.

We've already discussed that the PERC2000 system controller hardware must be loaded with a configuration file in order to operate. Matrix Frame Controllers used in Cheetah video routers receive all commands from the system controller and require no special configuration file for operation.

PESA DRS audio routers use one or more frame controllers called the PERC1000, or P1K. Each DRS channel group contains at least one P1K frame controller that must be loaded with a hardware configuration file defining, among other parameters, the specific DRS hardware components contained within the channel group it controls. P1K uses a 10/100 Ethernet protocol for communication and must be paired with a PERC2000 system controller to complete the DRS control system requirements. Although operational parameters and setup for the PERC1000 Frame Controller are defined through user screens and menus of the P2K GUI application and hardware configuration data is stored as part of a saved system configuration file, the PERC2000 system controller hardware has no real intervention in this procedure.

During installation of a PESA routing system containing DRS audio routing components, there are two distinct sets of data that must be defined when creating a system configuration file – hardware configuration and router configuration data:

- **Hardware** configuration defines the DRS system hardware components attached to each channel group DXE frame in a DRS audio router system. It is performed through operator screens and menus of the P2K GUI, and the resulting configuration file is downloaded to the PERC1000 Frame Controllers.

- **Router** configuration is where the actual signal switching functions for the entire router system, such as signal input/output assignments, signal names and aliases, switching levels, components and other special router functions are defined in the system configuration file and downloaded to the PERC2000 system controller.

These are two very distinct data entry operations when creating a system configuration file for a router installation, although both are performed through screens of the P2K GUI application. Since hardware configuration pertains only to DRS audio router installations, the procedure for generating hardware data for a system configuration file is presented in the DRS Technical Manual. If your system does not contain a DRS audio router, you will not use the Hardware Configuration menu items when creating a configuration file.

Once created, a system configuration file containing both hardware and router configuration data may be named and saved allowing it to be retrieved to the host PC for future modification or use. Multiple configuration files may be written, stored and loaded as needed to allow quick access of different operational set-ups for the routing system. Remember, however, that the act of generating or saving a file does not download configuration data to either the system controller or the P1K frame controller(s).

	**Anytime configuration data of *either* type is written or modified using the P2K GUI and saved to storage media, *both* hardware and router configuration data is always stored with the file. If your router system contains DRS audio routing components, you must always either upload from the system controller or retrieve a stored config file with valid hardware and router config data entries on which to make desired modifications.**

6.7 NAVIGATING THE PERC2000 SYSTEM SCREEN

Before proceeding, ensure that the P2K operating software is properly installed on the host PC. Launch the software from the Microsoft Windows® Start Button or the desktop icon. Once the program executes, the screen shown in Figure 6-5 should be on the PC display. Note from the figure that the screen is displayed in a familiar Microsoft Windows® format, divided into five major functional areas: Menu Bar, Tool Bar, Status Bar, Command Tree Window and Main Display Screen.

The Menu Bar, Tool Bar and Status Bar all function in a similar manner to other Microsoft Windows® based software applications. Some of the pull-down menus in the menu bar contain application specific commands and these are discussed in detail where appropriate in the operating guide paragraphs.

All commands for system configuration, monitoring and diagnostics are contained in the command tree located on the left side of the screen in the Command Tree Window. There are four top-level (parent) command headers: Hardware Configuration, Router Configuration, Status and Maintenance/Diagnostics. As in most Microsoft Windows® applications each parent header may be expanded to reveal sub-headers and commands by clicking the + box next to the item.

When a command is selected from the command tree, the data entry or status screen associated with the command appears in the Main Display Screen window.

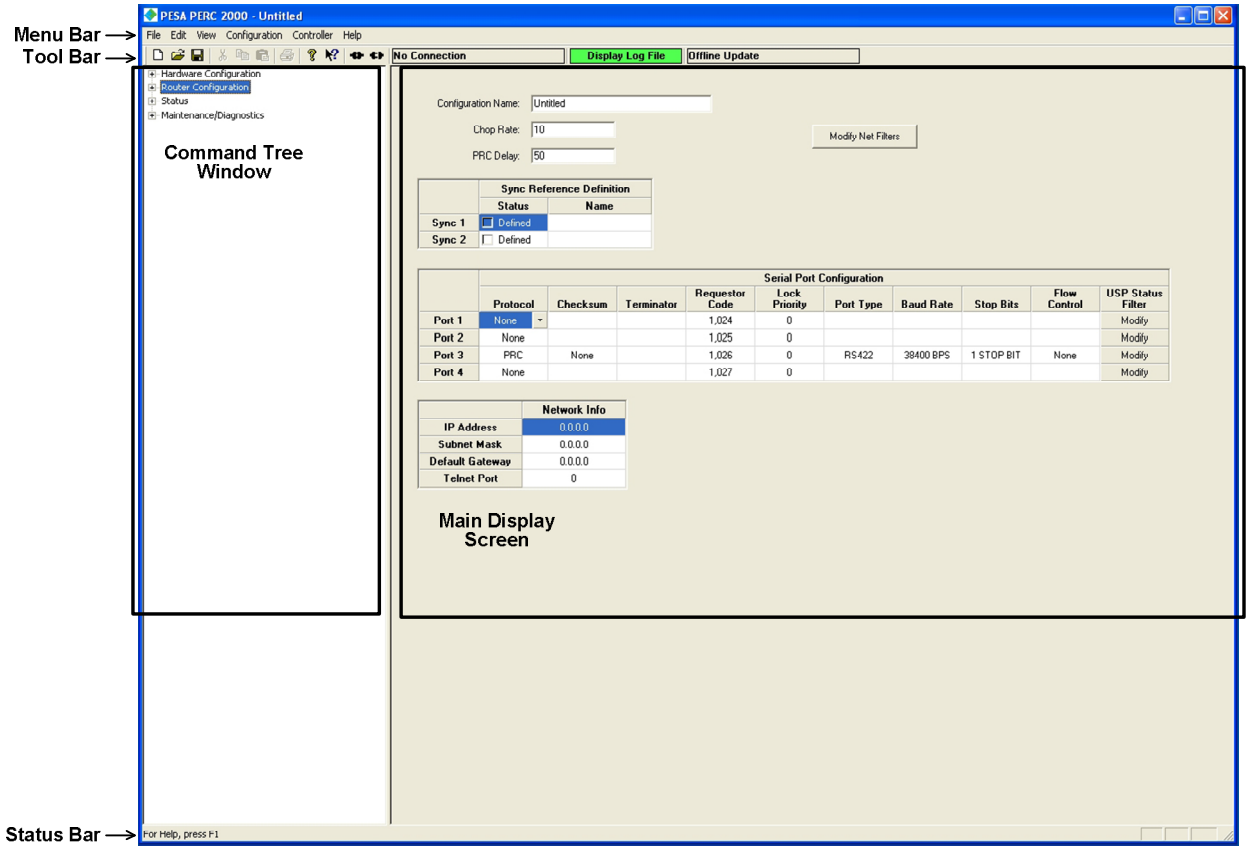


Figure 6-5 PERC2000 GUI Display Layout

6.8 COMMON RIGHT MOUSE CLICK FUNCTIONS

As with most other applications based on the Microsoft Windows® operating system, certain functions for various command or data entry operations are accessed by clicking the right mouse button and selecting the desired operation. Functions and commands presented on the right click menu vary greatly between screens and data entry cells or fields. Figure 6-6 illustrates a typical menu for data entry editing and short-cut functions. Not all commands shown below appear on every right-click menu.

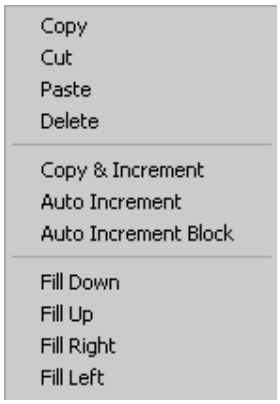


Figure 6-6 Typical Right-Click Mouse Commands

6.8.1 COPY, CUT, PASTE, DELETE

Copy, Cut, Paste and Delete Commands in P2K function exactly as the standard Microsoft Windows® functions.

6.8.2 QUICK DATA ENTRY TOOLS

For many fields that require you to enter repetitive information, such as Inputs, Outputs, etc., there are additional commands available from the right mouse click menu. These commands vary depending on the system screen and grid column you are working with:

- **Copy & Increment**

  Copy & Increment allows you to quickly fill fields of a configuration grid by duplicating the text and incrementing the numerical value of a starting entry into fields selected by a user-defined data block. Copy & increment always fills in all valid fields of the data grid lines within the selected block, but it behaves differently depending on where from the grid you select the starting values fields.

  If you choose a starting field from any of the name columns of the grid, and do not include any of the numerical entry fields in the switching level columns when defining the size of the fill block, as shown by Figure 6-7, the text entry of the name will be duplicated in each field of the defined block, and the numerical value associated with the *name fields only* will be incremented by one in each successive field of the fill block. All of the numerical values in the switching level columns will be filled with zeros, as shown.

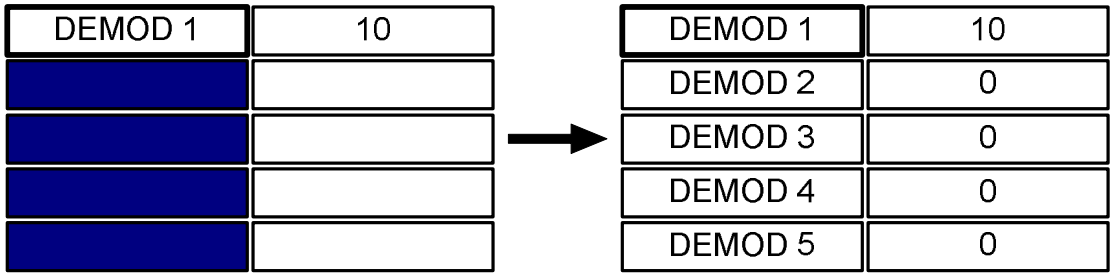


Figure 6-7 Copy and Increment Example 1

If you choose a starting field from the name columns of the grid, and you do include numerical entry fields under the switching level columns when defining the fill block, as shown by Figure 6-8, the text entry of the name will be duplicated in each field of the defined block, and the numerical value associated with the name will be incremented by one in each successive field of the fill block. All of the numerical values in the switching level columns included in the data block will be incremented by one in each successive field, as shown. Numerical fields NOT included in the defined data block will be filled with zeros.

There are a couple of rules you need to be aware of when using the copy and increment function:

- The fill block you define with the mouse must include at least one of the name columns, and the name entry in the starting field must end in a numerical value, such as DEMOD1, DEMOD2, etc.
- Numerical values under any of the switching level columns will be incremented by one *up to the maximum number of physical inputs or outputs defined for the level*. If the fill block contains additional lines after any level column reaches the maximum number, any successive fields in that column will be filled with zeros.

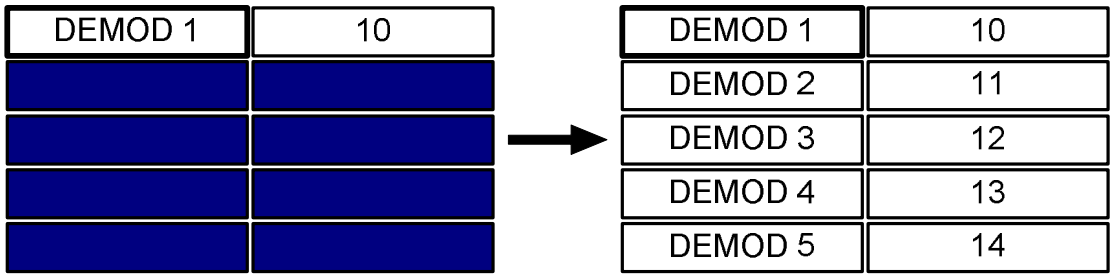


Figure 6-8 Copy and Increment Example 2

- **Auto Increment**

  The Auto Increment function increments the numerical value of a starting entry into the fields of a user-defined fill block located below and in the same column as the starting entry. You must choose a starting field from a numerical entry field in any of the switching level columns when defining the fill block, as shown by Figure 6-9. Numerical values in the selected column will be incremented by one in each successive field, as shown. Auto Increment only adds numerical values if every line of the fill block already has a name, such as assigned to a source or destination, associated with the level.

  Numerical values under the selected switching level column will be incremented by one *up to the maximum number of physical inputs or outputs defined for the level*. If the fill block contains additional lines after any switching level column reaches the maximum number, any successive fields in that column will be filled with zeros.

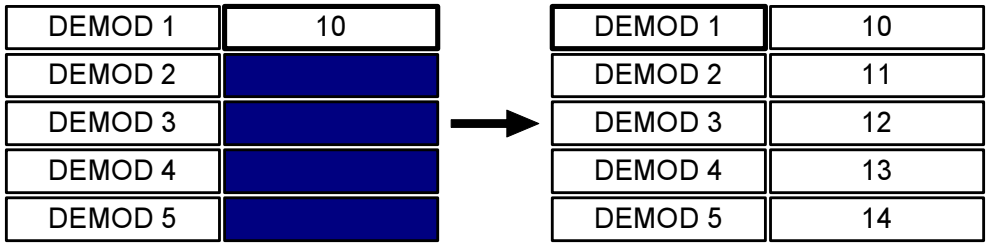


Figure 6-9 Auto Increment Function

- **Auto Increment Block**

  Auto Increment Block is very similar to the Auto Increment function, the difference being that it allows the fill block to consist of multiple switching level columns, as shown by Figure 6-10. Auto increment block always uses the field in the upper left corner of the fill block as the starting value entry, and fills successive fields with numerical values, incremented by a value of one, from left to right and top to bottom. Auto Increment Block only adds numerical values if every line of the fill block already has a name, such as assigned to a source or destination, associated with the level.

  Numerical values filled in the switching level columns will be incremented by one *up to the maximum number of physical inputs or outputs defined for the level in the starting entry field.* If the fill block contains additional fields after any field in the block reaches the maximum number, any successive fields in the remainder of the fill block will be filled with zeros.

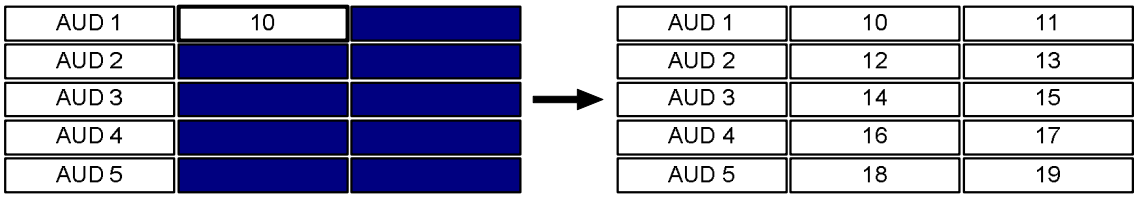


Figure 6-10 Auto Increment Block Function

- **Fill-Down**

  Fill-Down fills in the fields below a selected field with the selected number. First, select the field with the number you want to duplicate and then, select the fields below it. Right-click and select **Fill-Down** to fill in the fields with the selected number, Figure 6-11.

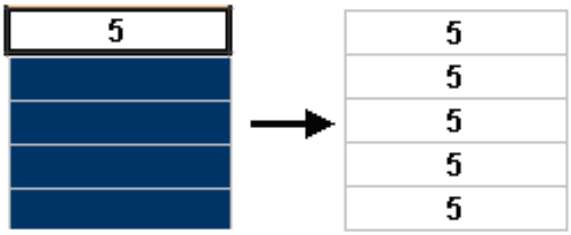


Figure 6-11 Fill-Down Command

- **Fill-Up**

  Fill-Up fills in fields above a selected field with the same information. First, select the field with the number you want to duplicate and then, select the fields above it. Right-click and select **Fill-Up** to fill in the fields with the selected information, Figure 6-12.

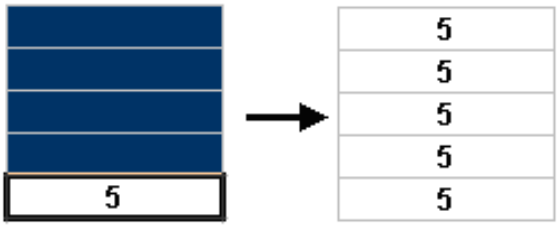


Figure 6-12 Fill-Up Command

- **Fill-Right**

  Fill-Right fills in the fields to the right of a selected field with the selected number(s). First, select the fields with the numbers you want to duplicate and then, select the fields to the right. Right-click and select **Fill-Right** to fill in the fields with the selected numbers. You can select either one field or several fields with this function, Figure 6-13.

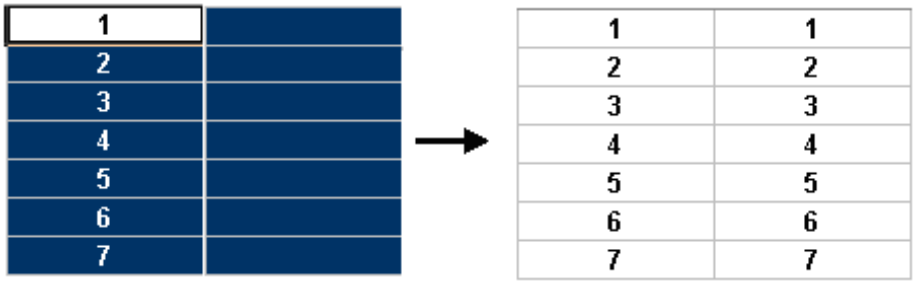


Figure 6-13 Fill-Right

- **Fill-Left**

  Fill-Left fills in the fields to the left of a selected field with the selected number(s). First, select the fields with the numbers you want to duplicate and then, select the fields to the left. Right-click and select **Fill-Left** to fill in the fields with the selected numbers. You can select either one field or several fields with this function, Figure 6-14.

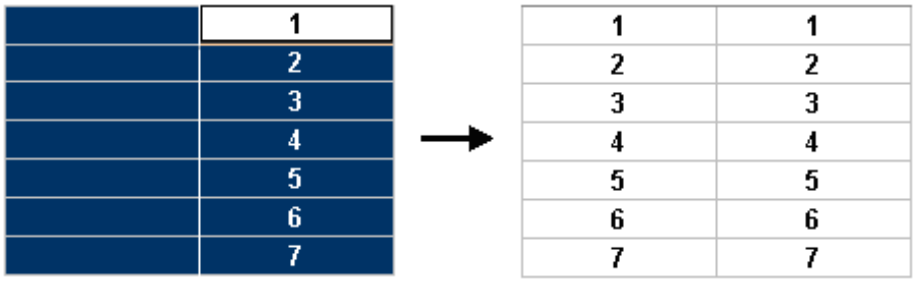


Figure 6-14: Fill-Left

6.9 GETTING STARTED

When the P2K GUI application is started on the host PC there is no configuration file loaded. You have three options from which to choose when the GUI application is first started:

1. Treat the screens as a "clean slate" and generate a new configuration file by entering hardware and router configuration data for download to the controllers, or save the "new" file to a storage media such as a hard drive of the host PC or other memory device.
2. Load an existing configuration file from a previously saved and stored file.
3. Upload the currently active configuration file stored in flash memory on the system controller card.

Either of the last two options allow you to view or modify an existing configuration file.

Regardless of which option is chosen, as configuration data is entered or modified on the GUI screen, it is stored by the GUI application on the host PC – and only on the host PC. Changes entered do not get saved to a file, written to either the system controller or frame controller, or become active, until the operator issues a command from the GUI to either save or download the configuration data.

It is not necessary to have an active connection between the host computer and the P2K hardware to create and save a configuration file. But in order to download a configuration, upload the current configuration file from the controller or to perform any status monitoring or maintenance/diagnostics procedures the host PC and system controller hardware must have a viable communication link.

6.10 ESTABLISH COMMUNICATION WITH THE SYSTEM CONTROLLER CARD

Once the GUI application is launched you may establish a communication connection between the GUI and the P2K hardware system controller card as follows:

- Click on the "Connect to Controller Symbol," Figure 6-15, to bring up a box with all P2K controllers listed by IP address. In most applications there is only one controller listed.
- Select the P2K controlling the router system from the list, by IP address, and click to activate the connection between the GUI and the controller.
- Once activated, and communication is established, the IP address of the P2K appears in the box to the right of the connection symbols and the box is highlighted green to indicate the connection is functional.
- In order to disconnect the GUI from the P2K, click on the "Disconnect from Controller Symbol" as shown in Figure 6-15. The display box returns to a non-highlighted background and the message "No Connection" is displayed.

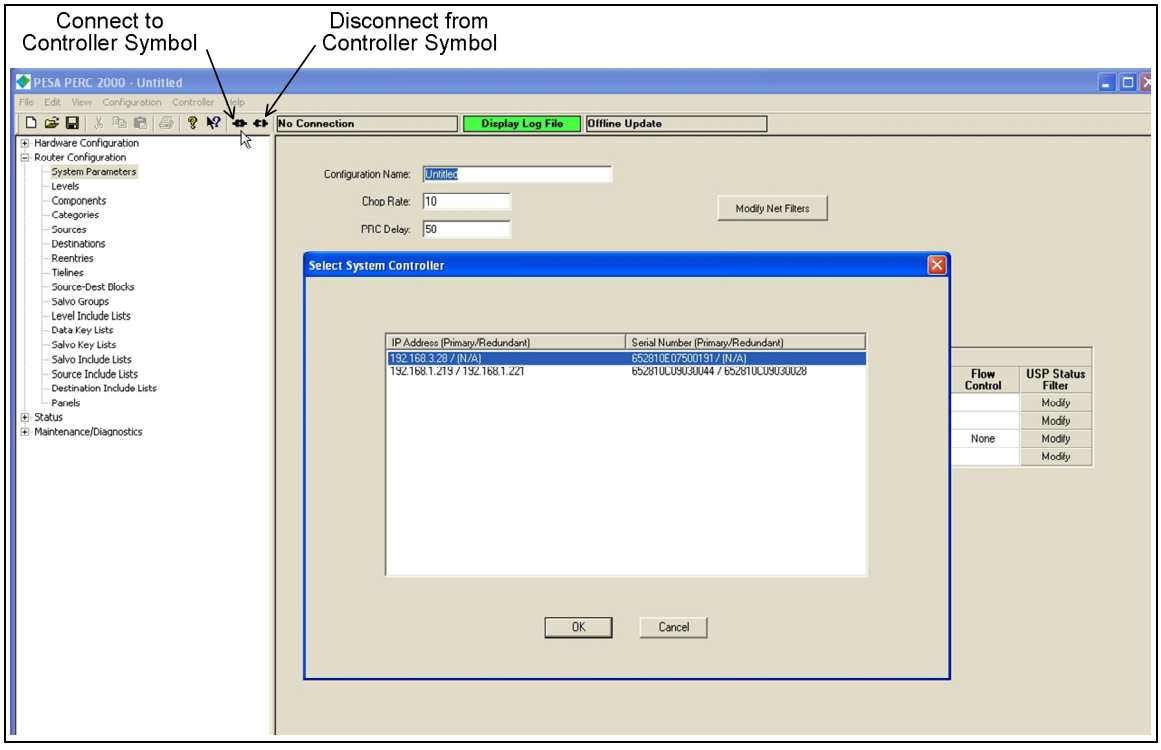


Figure 6-15 System Controller Selection

6.11 HARDWARE CONFIGURATION COMMANDS

Commands and screens contained under the **Hardware Configuration** parent header in the Command Tree Window allow you to enter the DRS hardware data portion of a system configuration file that can be saved or downloaded to the DRS P1K Frame Controller(s). Figure 6-16 illustrates the location of the hardware configuration header. Commands under this header do not directly affect operation of the PERC2000 system controller, and are discussed in detail in the DRS Technical Manual.

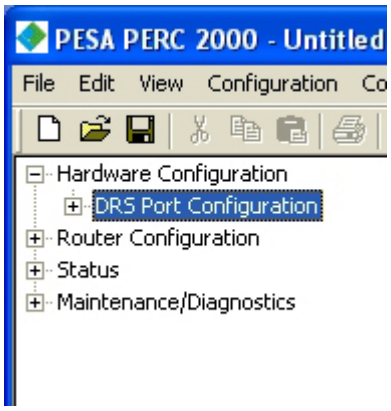


Figure 6-16 Hardware Configuration Header

6.12 PERC2000 SYSTEM CONTROLLER CONFIGURATION FILES

Carefully plan your system or particular application before creating a configuration file. Once a file is generated, use the **"Download to Controller"** command in the File menu to download the file to the system controller hardware. It is also possible to read the configuration file currently loaded into the system controller so that you can edit or save the file, as desired. Use the **"Upload from Controller"** command (File menu) to upload the current file.

Each unique configuration file satisfies a specific system application. However, the following are some basic steps that are common to creating each router configuration file.

1. Assign System Operating Parameters to configure serial port and Ethernet network properties.
2. Set up Levels and Components for the application.
3. Define and assign Sources and Destinations for each level that interface external equipment connected to the router.
4. Define special application functions such as Reentries or Tie-Lines, Source-to-Destination Blocks and Salvo Groups.
5. Define and assign lists of Levels, Salvos, Sources and Destinations available to various control panels.
6. Configure system Remote Control Panels and define specific application functions to configurable control panel keys.

6.13 ROUTER CONFIGURATION COMMANDS

Commands and screens contained under the **Router Configuration** parent header in the Command Tree Window allow you to create a router configuration that can be saved or downloaded to the P2K Controller Card. Figure 6-17 lists the command headers contained under the Router Configuration parent. Each command is discussed in the following paragraphs.

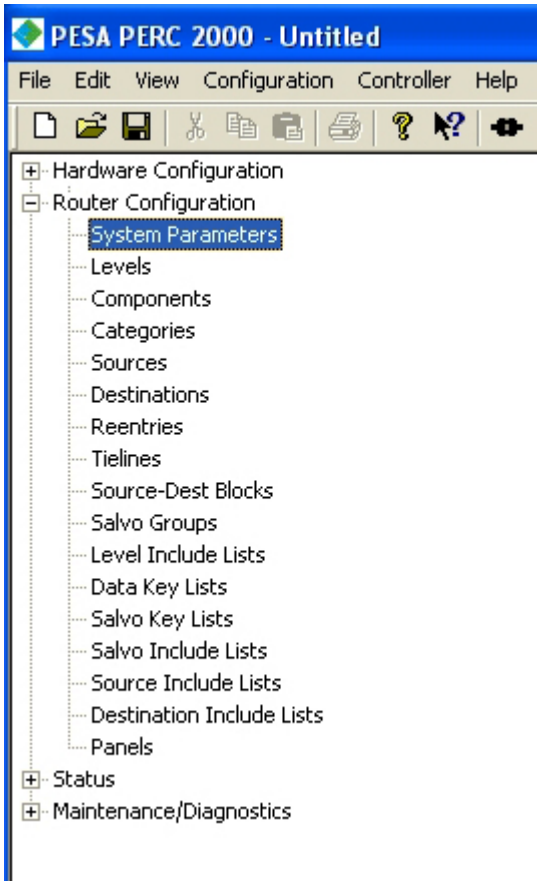


Figure 6-17 Router Configuration Tree Commands

6.13.1 SYSTEM PARAMETERS

The System Parameters Screen, Figure 6-18, is the top-level default screen of the Configuration Command Tree.

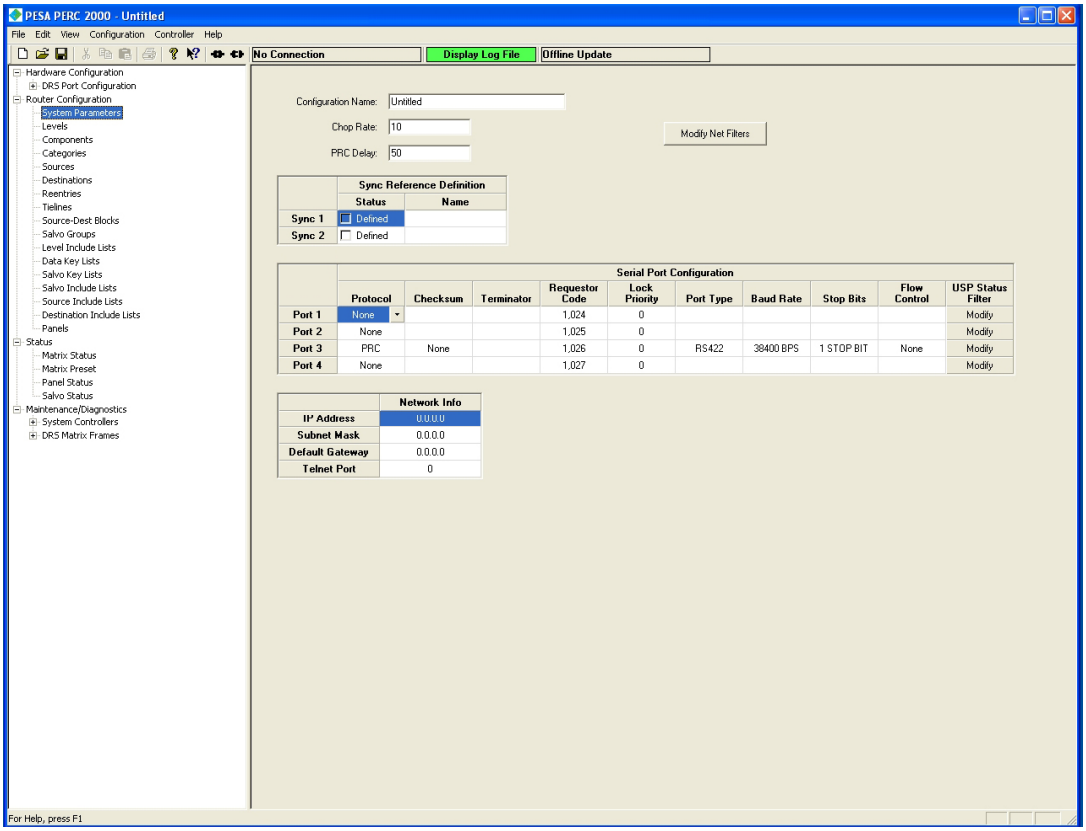


Figure 6-18 System Parameters Screen

From the System Parameters Screen, you configure the serial ports and other operational parameters of the configuration. Each area of the System Parameters screen is introduced in the following paragraphs:

- **Configuration Name**

  This field allows you to name the configuration file. Type the desired name in the Configuration Name box. Configuration names may have up to 32 alphanumeric characters. You can query this name from the P2K system controller.

NOTE	**Configuration Name may be different from File Name.**

- **Chop Rate**

  Chop Rate indicates the frame rate of switches used by the Chop mode of operation. To change the chop rate, enter the desired value in the Chop Rate box. Any desired Chop Rate between 1 and 255 frames is supported by the P2K Control System. Default value of this parameter is 10 frames.

- **PRC Delay**

  This option specifies the time delay between data messages sent over the proprietary PESA Router Control (PRC) bus. It applies to PRC, Tiger (TGR), and external (XTN) types of components. PRC delay values can range from 50 to 100 ms; the default value is 50 ms.

- **Modify Net Filters Button**

  Functions contained on the Modify Net Filters Button are not used in the current configuration of the P2K and no data entry is required. This functional area is reserved for future use.

- **Serial Port Configuration**

  The Serial Port Configuration portion of the System Parameters Window allows you to configure the serial ports on the P2K system controller. The entry in the left-most column of the configuration table identifies the port (1 thru 4) defined by the entries in the associated row.

  The following data fields are used for port configuration:

  - **Protocol -** This entry identifies the protocol, defining the format used when sending data through the serial ports on the P2K system controller. Enter the desired data protocol from the pull-down menu associated with the table cell. There are currently three protocols available for use:

    - CPU Link Protocol 1 with Extensions (P1E) (81-9062-0407-0)
    - Unsolicited Status Protocol (USP) (81-9062-0409-0)
    - PESA Routing Control (PRC) (81-9062-0316-0)

    The number in parenthesis identifies the PESA document that describes the data protocol.

NOTE	**Selection box associated with Port 3 contains only the PRC serial data protocol. Current revision of the P2K GUI Software has Port 3 fixed as a PRC Port.** **A fourth protocol option is listed in the selection box pull-down list for ports 1, 2 and 4, labeled P2-Serial. This protocol is not used in the current revision of the P2K GUI Software, and is reserved for future P2K implementations.**

  - **Checksum -** A checksum determines how the validity of transmitted data is confirmed. There are three available checksum types:

    - **NONE -** No validity checking.
    - **PESA -** Data validity is checked using PESA's standard method. (See Protocol documentation.)
    - **HEX -** Data validity is checked using a standard HEX-ASCII checksum.

- **Terminator –** Terminator identifies the character(s) used to denote the end of a data packet or command string. Three terminators are available:
  - **CR -** A carriage return.
  - **LF -** A line feed.
  - **CRLF -** A carriage return followed by a line feed.

- **Requestor Code -** A Requester Code is used in conjunction with Lock Priority to determine if a lock or protect function can be removed. When a lock or protect has been assigned by a port (or panel), it can only be removed by another port (or panel) with a higher lock priority or with the same lock priority and same requester code.

  Requester codes not explicitly defined automatically default to 1024, 1025, and 1026 for Ports 1, 2, and 4 respectively.

  Permitted range of requester codes is 1 - 65535.

- **Lock Priority -** Lock Priority is used in conjunction with Requester Code to determine if a lock or protect function can be removed. When a lock or protect has been assigned by a port or panel, it can only be removed by another port or panel with a higher lock priority, or with the same lock priority and same requester code. The lower the lock priority number, the higher the priority.

  Port lock priorities not explicitly defined automatically default to "0" which gives absolute authority to clear any lock or protect on the system. Permitted range of lock priorities is 0-255 ("0" is Highest Priority).

- **Port Type -** This pull down menu allows you to assign either the RS-422 or RS-232 operational protocol to the bus being configured.

- **Baud Rate** - Baud rate is the data transfer rate through the serial port measured in Baud (bits per second). A baud rate of either 9600 or 38400 may be assigned to any of the serial buses.

- **Stop Bits -** In asynchronous communications, a stop bit indicates that a byte of data has just been transmitted. Every byte of data is preceded by a start bit and followed by a stop bit.

  Either 1 or 2 stop bits may be selected for each of the serial ports.

- **Flow Control -** Flow Control is a serial data stream parameter that specifies a control method for data transmission. Flow control options available through a pull-down menu in PERC2000 include RTS/CTS, XON/XOFF or NONE.

NOTE	**Selection boxes associated with Port 3 all are fixed to configure a PRC Port.**

- **USP Status Filter -** The USP Status Filter determines which events are reported when a port is defined as a USP Port. Figure 6-19 illustrates the Status Filter Selection Screen and identifies the events that may be selected for reporting. To activate an event, click in the box beside the desired entry. A check in the box indicates the item is selected.

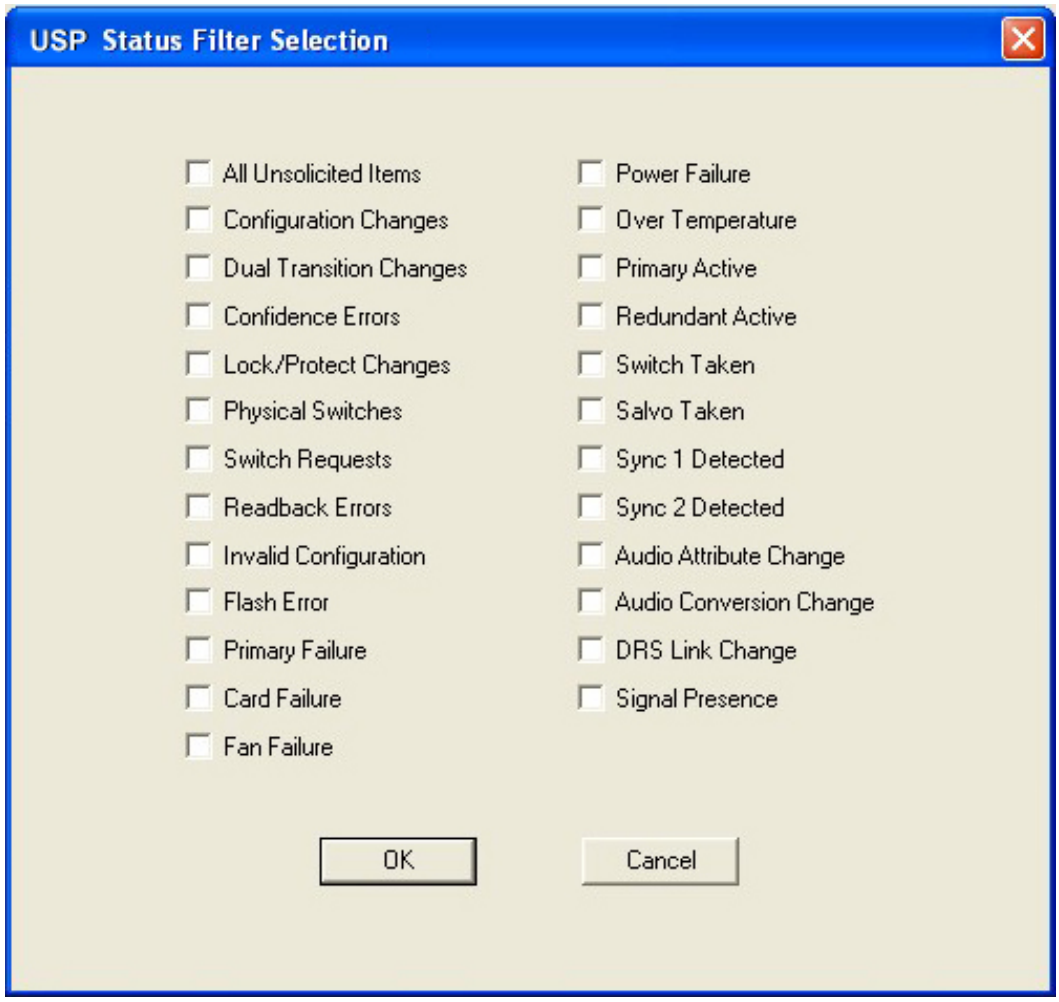


Figure 6-19 Status Filter Selection Screen

- **Network Info**

  Network Info entries are not used in the current configuration of the P2K and no data entry is required. This functional area is reserved for future use.

- **Network Flags**

  Data in the Network Flags area is not used in the current configuration of the P2K and no data entry is required. This functional area is reserved for future use.

6.13.2 LEVELS CONFIGURATION

A level is a group of related components that are switched together by the P2K Controller. Levels are the lowest element that you can manipulate in the control system. The maximum number of levels in a configuration is 16. Figure 6-20 illustrates a 2x2 RGB video level named VID, which is made up of three components named RED, GRN and BLU.

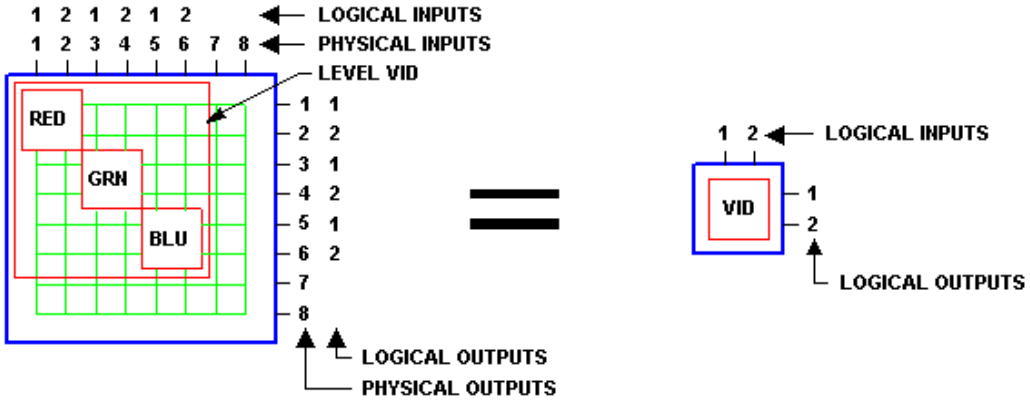


Figure 6-20: 2x2 RGB Video Level

When the **Levels** Command is selected, the Levels Configuration Screen, Figure 6-21, is displayed. From this screen you can assign and enter operational parameters for various system levels. Each area of the Levels Configuration screen is introduced in the following paragraphs and shown in Figure 6-22:

- **Nickname and Name**

  - **Nickname** – Nickname is a label (up to 8 characters) associated with the level and is the character string displayed on status display screens and system remote control panels (with display capability) for the defined switching level. Nickname text is also the character string displayed in the Levels sub-menu branch of the menu tree. In order to assign the level a nickname, click the cursor in the Nickname field and enter the nickname label text.

    Once nickname text is assigned to a level, the nickname character string is displayed as a sub-entry below the Levels Menu header. Any time you wish to return to the set-up screen for a particular level, simply click on the nickname sub-entry under Levels associated with the desired level.

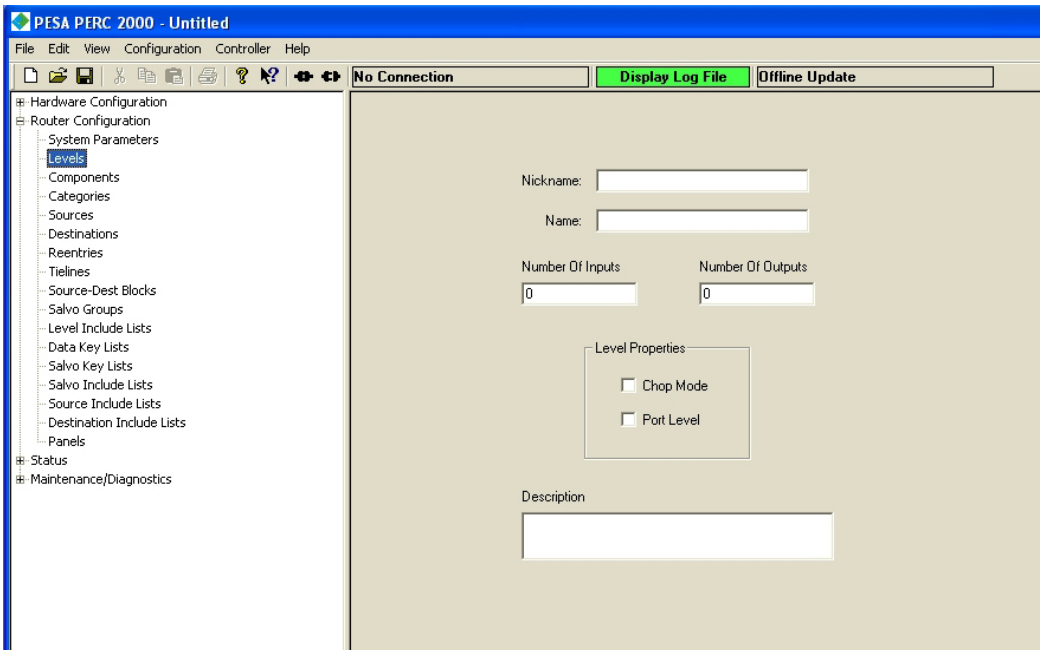


Figure 6-21: Levels Configuration Screen

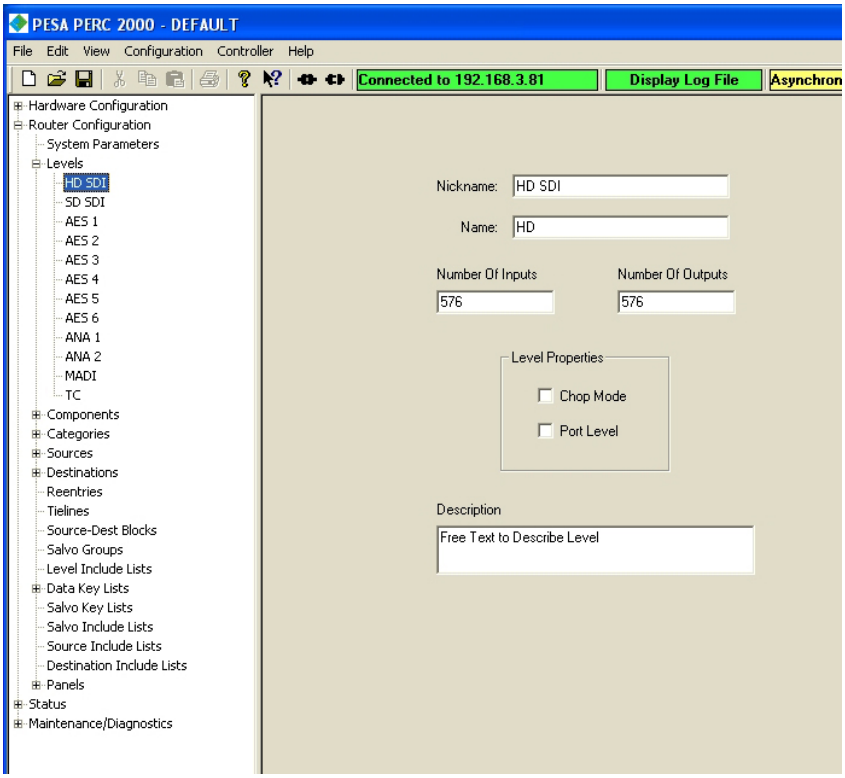


Figure 6-22 Levels Configuration Fields

- **Name -** The Name field allows a longer and more descriptive name for the level. Generally, this field is used to assign a name to the level that more accurately identifies its function.

  For example, assume you are defining the level illustrated by the 2X2 RGB Video Level in Figure 6-20. You might assign the level the NAME "RGB Video" and assign the NICKNAME "RGB" or "RGB VID." Generally, when assigning names and nicknames, the NAME field is a longer more precise description of the defined level and the NICKNAME field is a shortened acronym or mnemonic used to identify the level on display devices or screens.

- **Number of Inputs and Outputs**
  - **Number of Inputs** – Enter the number of input sources associated with the defined level.
  - **Number of Outputs** – Enter the number of output signals associated with the defined level.

- **Level Properties**
  - **Chop Mod**e - When this box is checked it indicates the level is "chop enabled" and may be included in a chop function.
  - **Port Level** – This function not used in current version of P2K Software.

- **Description**

  Description is a free text field where you can enter a full description of the switching level or add notes or information as desired. This field is solely for discretionary use and has no effect on the defined level characteristics.

- **Adding or Deleting Levels**
  - **Adding a Level** - P2K allows a maximum of 16 switching levels. To add a level, simply click on the Levels parent header to access a blank levels set-up screen. You may also right click the mouse with the cursor on the Levels parent header or any sub-header, select the "Add Level" option, Figure 6-23, from the click box and a blank levels set-up screen is displayed.
  - **Deleting a Level -** To delete a level, expand the Levels parent header to display the list of assigned levels. Click on the name of the level you wish to delete, right click the mouse and select the "Delete Level" option from the click box, Figure 6-23.

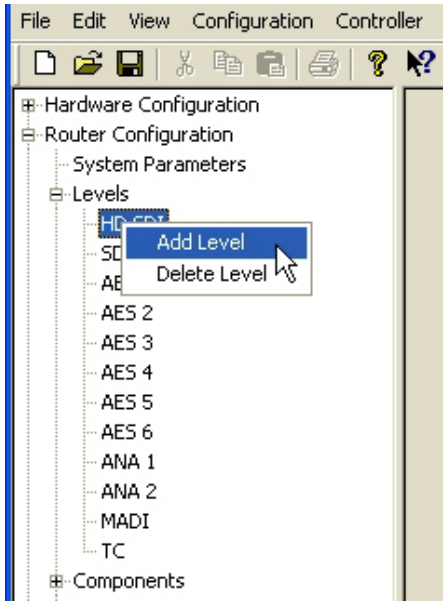


Figure 6-23 Right Mouse Click Options

6.13.3 COMPONENTS CONFIGURATION

A component is the most basic signal element that can be switched by a system controller. Components map level inputs/outputs of the actual physical matrix and are collected under a level name that can be controlled by users. For example, in RGB video signals of “Red”, “Green”, and “Blue” may be the components; in stereo audio, “Left” and “Right” audio signals may be the components. Figure 6-24 illustrates a 2x2 RGB video level named VID, which is made up of three components named RED, GRN and BLU. The maximum number of components allowed in a configuration is 64.

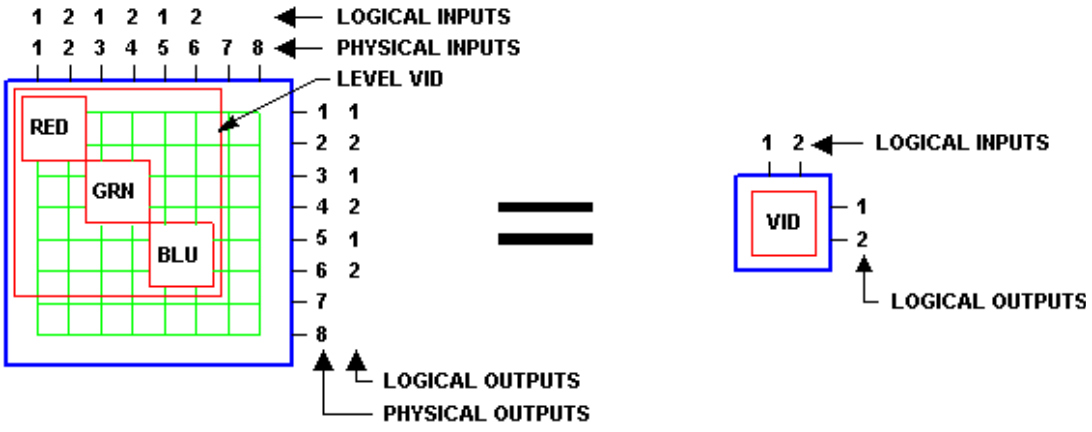


Figure 6-24: Components of 2x2 RGB Video Level

When the **Components** Command is selected, the Components Configuration Screen, Figure 6-25, is displayed. From this screen you can assign and enter operational parameters for various system components. Each area of the Components Configuration screen is introduced in the following paragraphs and shown in Figure 6-26:

- **Nickname and Name**
  - **Nickname** – Nickname is a label (up to 8 characters) associated with the component and is the character string displayed in the Components sub-menu branch of the menu tree. In order to assign the component a nickname, click the cursor in the Nickname field and enter the nickname label text.

    Once nickname text is assigned to a component, the nickname character string is displayed as a sub-entry below the Components Menu header. Any time you wish to return to the set-up screen for a particular component, simply click on the nickname sub-entry under Components associated with the desired component.
  - **Name** - The Name field is where a longer, more descriptive name is defined for the component. Generally, when assigning names and nicknames, the NAME field is a more precise description of the defined component and the NICKNAME field is a shortened acronym or mnemonic.

- **IP Address**

  Enter the IP address, if applicable, of the switcher frame in which the component sources reside.

- **Level Name**

  Level Name is a pull-down menu list containing the nickname of the levels defined for the system. Highlight and select the level name from the list to which the component being defined is a subset. You must have already created the level you want to use before you can select the name in this field.

- **Input and Output Offset**

  Offset defines the numerical difference between the physical input or output number and the level input or output number for a given source or destination.

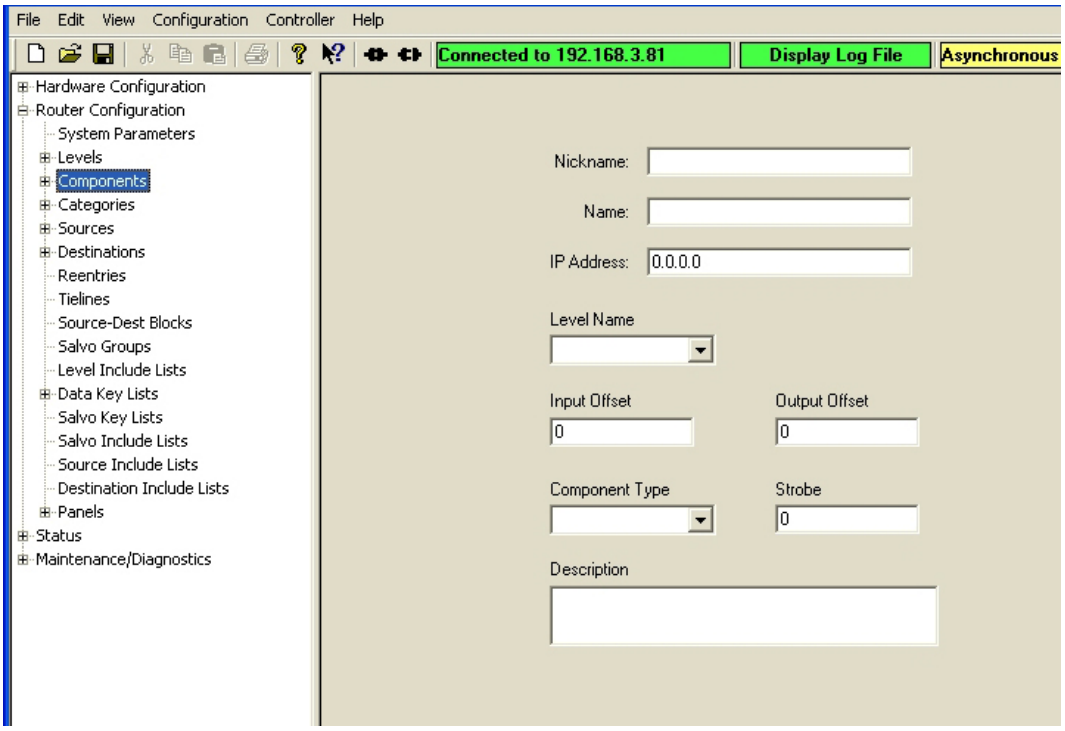


Figure 6-25 Components Configuration Screen

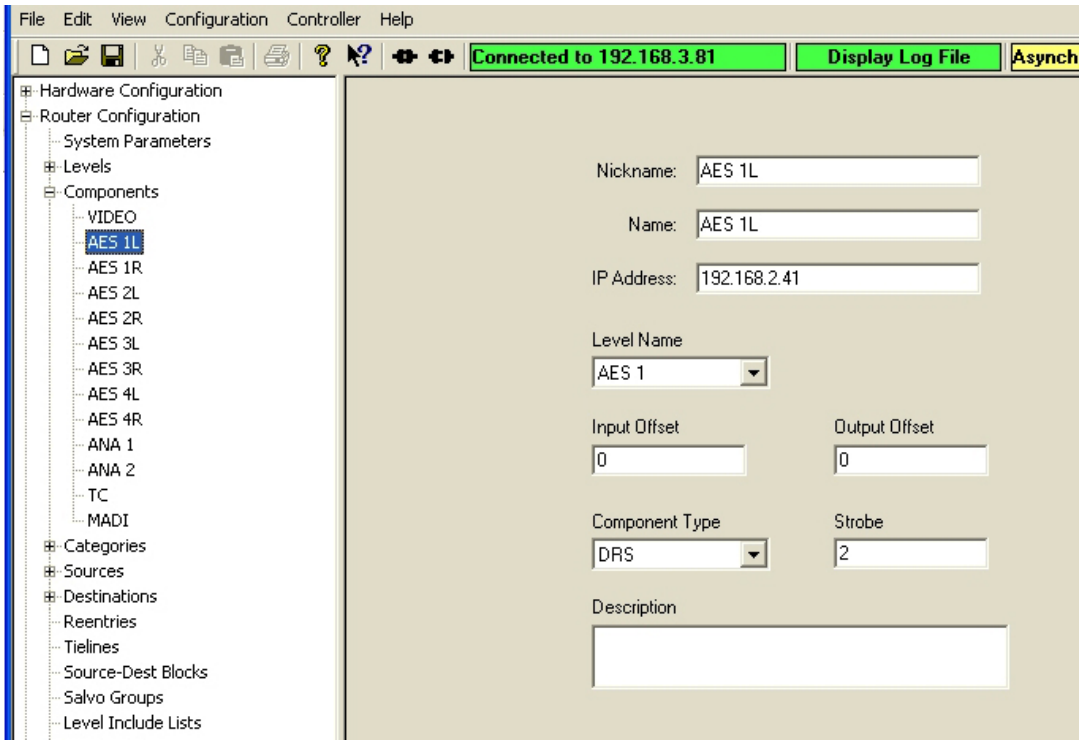


Figure 6-26 Components Configuration Fields

- **Component Type**

  Component Type is a pull-down menu list containing acronyms defining the types of hardware devices controlled by the P2K controller from the following options:

  - **PRC** – Describes any PESA switching product using the PESA Routing Control (PRC) bus for control interface.
  - **TGR** – Describes the legacy PESA Tiger Series of switching products.
  - **XTN** – Describes an External Control Bus to interface with non-PESA equipment.
  - **P2** – Reserved for future use.
  - **DRS** – Describes the Cheetah DRS Series of audio routing products.

  Highlight and select the proper hardware designator corresponding to the type of hardware routing the component.

- **Strobe**

  Strobe defines a numeric digit identifying the physical hardware routing the component.

- **Description**

  Description is a free text field where you can enter a full description of the switching component or add notes or information as desired. This field is solely for discretionary use and has no effect on the defined component characteristics.

- **Adding or Deleting Components**

  - **Adding a Component** - P2K allows a maximum of 64 components. To add a component, simply click on the Components parent header to access a blank Components Configuration Screen. You may also right click the mouse with the cursor over the Components parent header, or any sub-header, select the “Add Component” option from the click box, Figure 6-27, and a blank Components Configuration Screen is displayed.
  - **Deleting a Component** - To delete a component, expand the Components parent header to display the list of assigned components. Click on the name of the component you wish to delete, right click the mouse and select the “Delete Component” option from the click box, Figure 6-27.

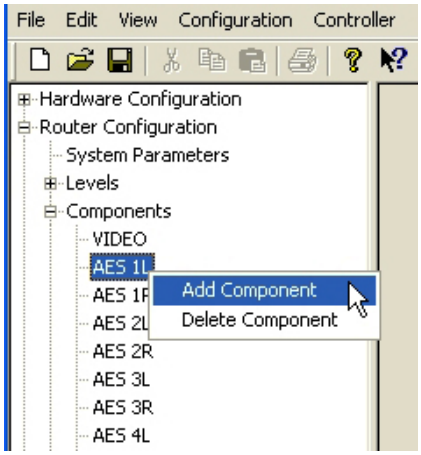


Figure 6-27 Right Mouse Click Options

6.13.4 CATEGORIES

Categories are alphanumeric strings (up to 8 characters) used as labels when indexing sources and destinations from a remote control panel. Any combination of letters and numbers may be used as a category label. Generally, labels used as categories are elements of a name which can be paired to specify a certain source or destination. For example the screen shot shown in Figure 6-28 lists the digits 0 thru 9 and the words INPUT and OUTPUT as categories. To call the source named Input 5 when indexing from a panel you would scroll through the categories to the word INPUT as the first character and then scroll to the digit 5 for the second character. Categories are entered from the **Categories** Configuration Screen. Up to 1024 categories are allowed in a configuration file.

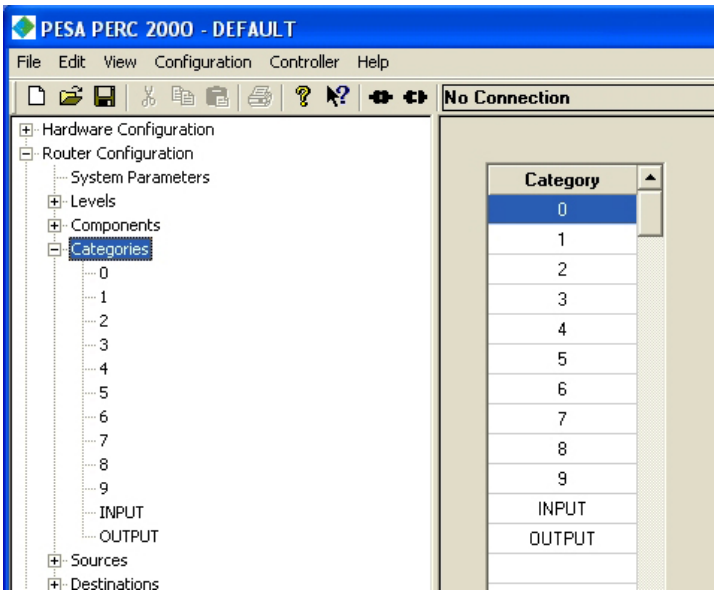


Figure 6-28 Categories Configuration Screen

- **Adding a Category**

  To add a category label, click on the Categories parent command item to bring up the categories set-up screen. Move the cursor to a blank cell in the categories list box, click in the cell and enter the character string for the category label you wish to enter. You may also right click the mouse with the cursor over the Categories command item, select the "Add Category" option from the click box to access the set-up screen, Figure 6-29.

  Once category text is entered in a cell, the character string is displayed as a sub-entry below the Categories Menu header. Any time you wish to quickly move to the cell for a particular category label, simply click on the text entry under the Categories command item. From the cell you may modify or delete the category entry.

- **Deleting a Category**

  To delete a category label, click on the Categories parent command item to bring up the categories set-up screen. Move the cursor to the cell in the categories list box containing the character string you wish to delete. You may also quickly move to the cell for a particular category label by clicking on the text entry under the Categories command item. With the cursor in the cell, right click the mouse and select the "Delete Category" option from the click box, Figure 6-29, to delete the entry.

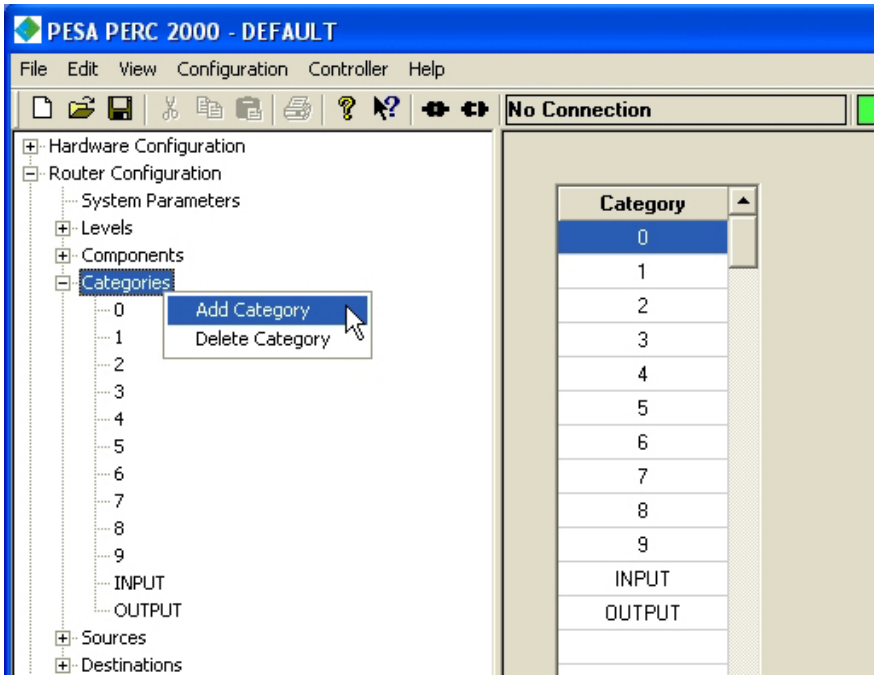
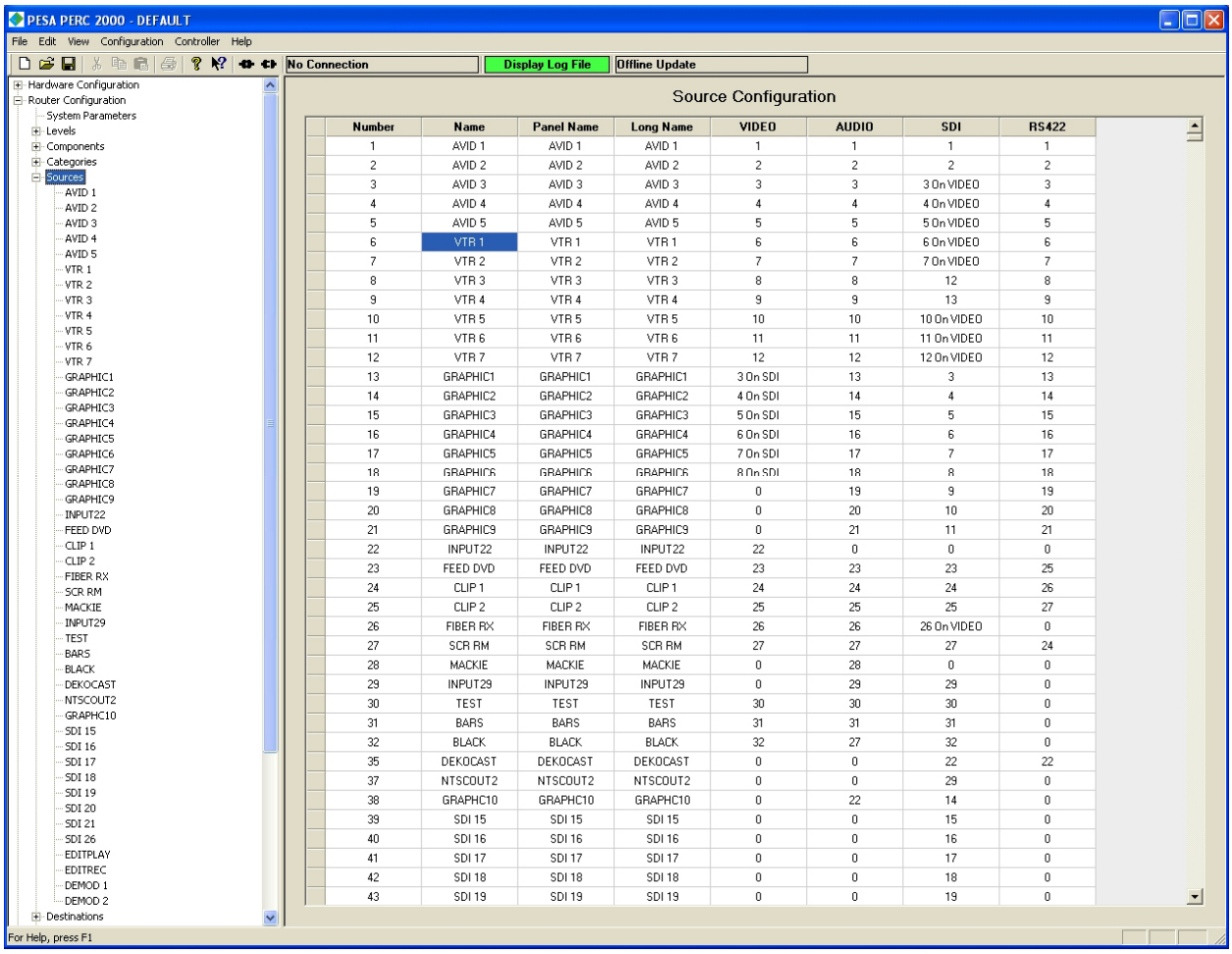


Figure 6-29 Right Mouse Click Options

6.13.5 SOURCES

Click the **Sources** header on the Configuration Command Tree to access the Source Configuration Screen, Figure 6-30. This screen allows you to define all of the sources in the router configuration. From this screen each physical input to the system is assigned a name, a panel designator and linked to a physical input of a router frame. In router terminology, this screen essentially maps each physical source (input) to the router to its logical input in level and panel designator nomenclature.

Note the Sources Screen is in the form of a database spreadsheet with data entries for each source made on individual rows from left to right. Each area of the Sources set-up screen is introduced in the following paragraphs:



Number	Name	Panel Name	Long Name	VIDEO	AUDIO	SDI	RS422
1	AVID 1	AVID 1	AVID 1	1	1	1	1
2	AVID 2	AVID 2	AVID 2	2	2	2	2
3	AVID 3	AVID 3	AVID 3	3	3	3 On VIDEO	3
4	AVID 4	AVID 4	AVID 4	4	4	4 On VIDEO	4
5	AVID 5	AVID 5	AVID 5	5	5	5 On VIDEO	5
6	VTR 1	VTR 1	VTR 1	6	6	6 On VIDEO	6
7	VTR 2	VTR 2	VTR 2	7	7	7 On VIDEO	7
8	VTR 3	VTR 3	VTR 3	8	8	12	8
9	VTR 4	VTR 4	VTR 4	9	9	13	9
10	VTR 5	VTR 5	VTR 5	10	10	10 On VIDEO	10
11	VTR 6	VTR 6	VTR 6	11	11	11 On VIDEO	11
12	VTR 7	VTR 7	VTR 7	12	12	12 On VIDEO	12
13	GRAPHIC1	GRAPHIC1	GRAPHIC1	3 On SDI	13	3	13
14	GRAPHIC2	GRAPHIC2	GRAPHIC2	4 On SDI	14	4	14
15	GRAPHIC3	GRAPHIC3	GRAPHIC3	5 On SDI	15	5	15
16	GRAPHIC4	GRAPHIC4	GRAPHIC4	6 On SDI	16	6	16
17	GRAPHIC5	GRAPHIC5	GRAPHIC5	7 On SDI	17	7	17
18	GRAPHIC6	GRAPHIC6	GRAPHIC6	8 On SDI	18	8	18
19	GRAPHIC7	GRAPHIC7	GRAPHIC7	0	19	9	19
20	GRAPHIC8	GRAPHIC8	GRAPHIC8	0	20	10	20
21	GRAPHIC9	GRAPHIC9	GRAPHIC9	0	21	11	21
22	INPUT22	INPUT22	INPUT22	22	0	0	0
23	FEED DVD	FEED DVD	FEED DVD	23	23	23	25
24	CLIP 1	CLIP 1	CLIP 1	24	24	24	26
25	CLIP 2	CLIP 2	CLIP 2	25	25	25	27
26	FIBER RX	FIBER RX	FIBER RX	26	26	26 On VIDEO	0
27	SCR RM	SCR RM	SCR RM	27	27	27	24
28	MACKIE	MACKIE	MACKIE	0	28	0	0
29	INPUT29	INPUT29	INPUT29	0	29	29	0
30	TEST	TEST	TEST	30	30	30	0
31	BARS	BARS	BARS	31	31	31	0
32	BLACK	BLACK	BLACK	32	27	32	0
35	DEKOCAST	DEKOCAST	DEKOCAST	0	0	22	22
37	NTSCOUT2	NTSCOUT2	NTSCOUT2	0	0	29	0
38	GRAPHC10	GRAPHC10	GRAPHC10	0	22	14	0
39	SDI 15	SDI 15	SDI 15	0	0	15	0
40	SDI 16	SDI 16	SDI 16	0	0	16	0
41	SDI 17	SDI 17	SDI 17	0	0	17	0
42	SDI 18	SDI 18	SDI 18	0	0	18	0
43	SDI 19	SDI 19	SDI 19	0	0	19	0

Figure 6-30 Sources Configuration Screen

- **Number**

  The left-most column is labeled **NUMBER** and is numerically sequential and automatically filled in as sources are added. You can not change the entry in the Number column.

- **Name, Panel Name and Long Name**

  The next three columns allow you to assign identifying names and/or acronyms to each source according to the following formats:

  - **Name –** Any combination of up to 8 alphanumeric characters may be used to identify the source.
  - **Panel Name -** Any combination of up to 8 alphanumeric characters may be used to identify the source. The entry made in this column is the text string that appears on system remote control panels with display capability.
  - **Long Name –** This column is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly identify an external device or system.

- **Switching Levels**

  To the right side of the three name columns are columns corresponding to each system switching level. The entry (in most cases a number) in the columns on each row assigns the actual physical input to the switching device associated with the source.

  For example, look at entry number 6 in Figure 6-30 labeled VTR 1. Assume this nomenclature is assigned to a VTR with analog video, stereo analog audio and time code outputs. Video is switched by the VIDEO level, the two audio outputs (left and right) are each components (AUDIO1 and AUDIO2, respectively) of the AUDIO level and the time code output is switched by the RS422 level. Assume further that each output signal type from the VTR (video, audio and time code) is physically switched through a separate switcher frame. For discussion purposes assume the video is switched through a Cheetah video matrix switcher, audio is routed through a Cheetah DRS frame and the time code signal is routed through a PESA Tiger switcher.

  Notice on Figure 6-30 that the numeric entry for VTR 1 in both the VIDEO and RS422 level columns is a 6 for each level. This entry tells the P2K controller that the video signal from the hardware device identified as VTR 1 is present at physical input number 6 of the matrix switcher identified by the logical switching level named VIDEO, and that the time code signal from VTR 1 is present at physical input number 6 of the Tiger switcher defined by the logical level named RS422.

  The numeric entry for VTR 1 in the column corresponding to the logical switching level named AUDIO is also a 6. Remember, however, that logical level AUDIO is composed of two components named AUDIO1 and AUDIO2 and that each audio signal is routed through separate routing circuitry. In this case, the numeric 6 entry indicates that the left channel output from VTR 1 is applied at physical input number 6 of the switching matrix identified as AUDIO 1 under the logical level named AUDIO and that the right channel output from VTR 1 is applied at physical input number 6 of the switching matrix identified as AUDIO 2 under the logical level named AUDIO. In matrix space, the controller treats logical level AUDIO as a single entity and switches both components simultaneously. These may be two separate routing frames or may be one frame with the matrix space configured as two or more separate routing units using input offset values to define the physical inputs to the switching matrix.

  Note that an entry appears under the logical level SDI column for VTR 1. This entry identifies and assigns a tie-line arrangement for the matrix identified by level VIDEO. Tie-lines are discussed in Paragraph 6.13.5.

Only one source per level is allowed. A level may be left undefined on a source. Inputs may be shared between different sources. The maximum number of sources is 2400.

- **Navigating the Sources Spreadsheet**

  Access the Sources Configuration Screen by clicking the Sources command entry under the Configuration Command tree. The entire Source Configuration spreadsheet is displayed for easy access. When the Sources tab is expanded, note that a listing of all assigned source identifiers appears below the parent command. Clicking any of the identifiers in the list causes the spreadsheet cursor to immediately move to and highlight the configuration entry row associated with the source.

  Right clicking either the Sources command tab or any source identifier entry below it, causes a click box as shown in Figure 6-31 to appear with the following options:

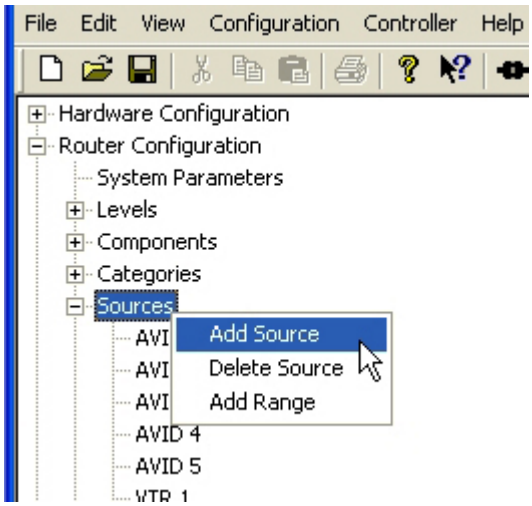


Figure 6-31 Right Click Mouse Options

- **Add Source** – Clicking the Add Source option inserts a blank line in the sources spreadsheet and moves the cursor to the new entry line. From this line a new source can be added to the configuration.
- **Delete Source** – If you wish to remove a source entry from the configuration spreadsheet, move the cursor to the source identifier beneath the Sources header in the Command Screen Window you wish to delete, highlight the source to be deleted and right click to open the option box. Select Delete Source and the source entry line is removed from the spreadsheet.
- **Add Range** – Adds a range of sources using a category index type of naming scheme, as shown by Figure 6-32. You define the base name, such as "CAM," the starting index - such as 3 and the number of sources to create – such as 5. This example would create sources "CAM 3:" to "CAM 7."

NOTE	**Starting index is defined on a level-by-level basis.**

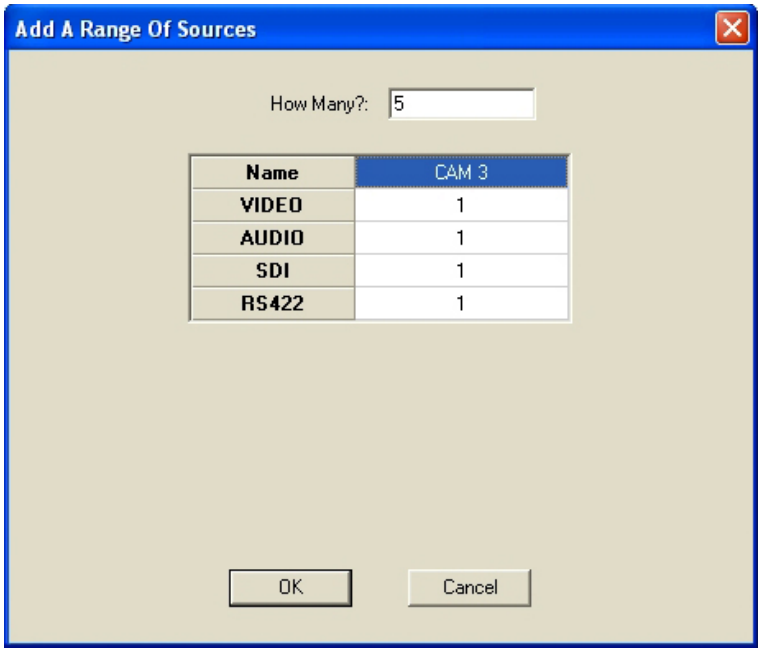


Figure 6-32 Source Range Entry Box

- **Spreadsheet Right Mouse Click Functions**

  When you right-click on any cell in the Source Configuration Spreadsheet a pop-up menu appears providing command options for the cell, as shown in Figure 6-33. Command items appearing in the pop-up menu vary depending on which commands are pertinent for data entered in the selected cell. Paragraph 6-8 discusses the function of common commands available from the pop-up menu. Remember that all commands listed and discussed below may or may not appear in the pop-up menu for a specific cell.

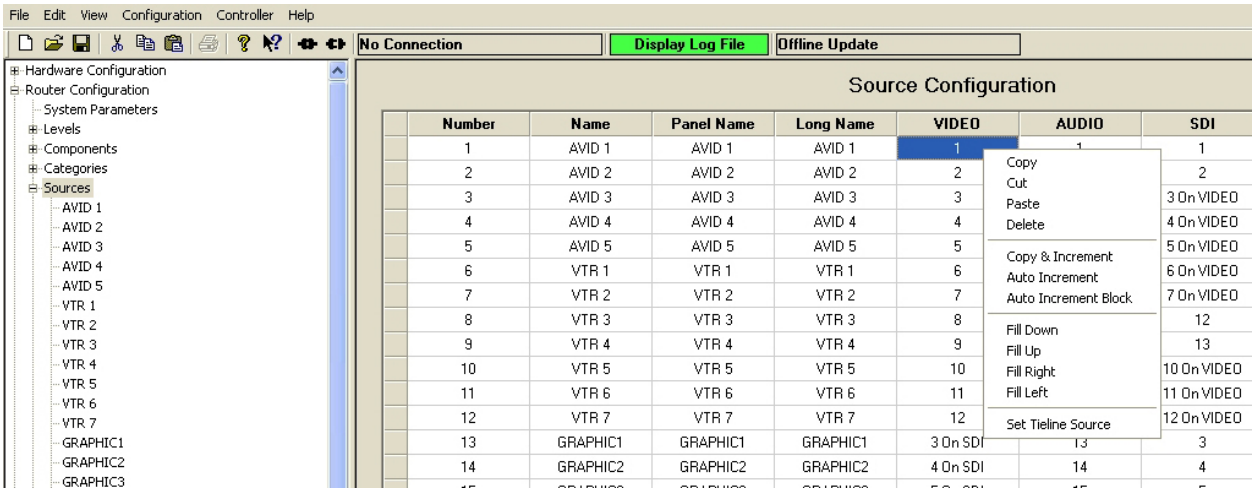


Figure 6-33 Sources Spreadsheet Right Mouse Click Options

- **Set Tieline Source**

  A Tie-line is a special purpose routing function that dedicates a physical source input and a physical destination output on different switching levels as a direct connected path through an external physical connection.

  Sources are linked to tie-lines using the **Set Tieline Source** command from the right-click command box. Click the cursor in the cell corresponding to the source and level you wish to assign to a tie-line. Right click and select the "Set Tieline Source" option from the menu. A graphic illustration, Figure 6-34, displays showing the level you are assigning on the right side. On the left side of the graphic you define the source and level that you wish to tie to the source on the level you are configuring using the pull-down menu boxes.

  In the example shown, by selecting "Set Tieline Source" in the spreadsheet cell for VTR 1 on the SDI level, the graphic below appears and shows the SDI level as the source and by selecting 6 as the Input # and VIDEO as the Level from the pull-downs we have assigned a connection to route the source at physical input 6 on the VIDEO level through a tie-line to a dedicated physical input on the SDI level, which the controller accesses when VTR 1 is selected as the source on the SDI level. On the source spreadsheet the text entry "6 On VIDEO" is automatically written in the cell for VTR 1 on the SDI level. This indicates that when VTR 1 is selected as a source on the SDI level, the source signal will be the signal on physical input 6 of the Video level routed through an external tie-line to the SDI level.

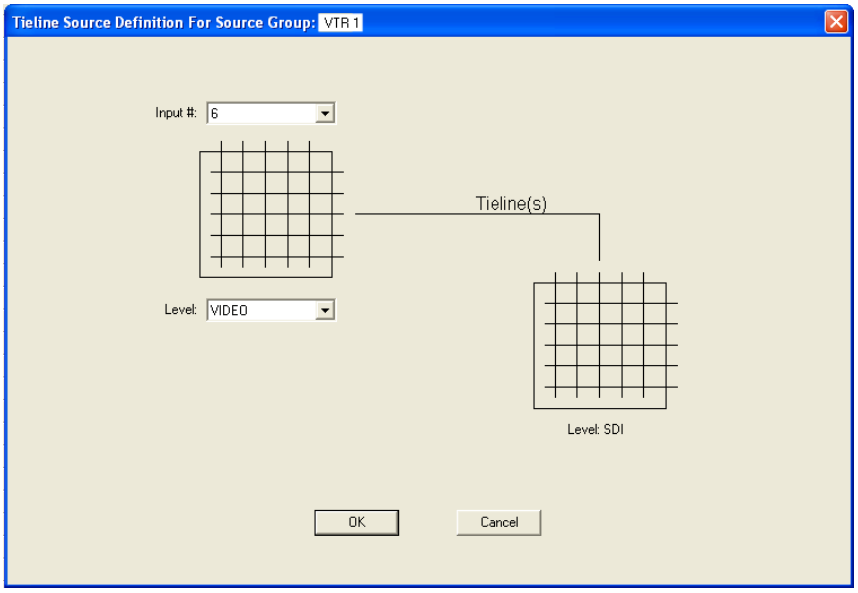


Figure 6-34 Tieline Configuration Screen

6.13.6 DESTINATIONS

Clicking the **Destinations** Command on the Configuration Command Tree accesses the Destination Configuration Screen, Figure 6-35. This screen allows you to define all of the destinations in the switcher configuration. From this screen each physical output from the system is assigned a name, a panel designator and linked to a physical output of a router frame. In router terminology, this screen essentially maps each physical destination (output) from the router to its logical output in level and panel designator nomenclature.

Note the Destinations Screen is in the form of a database spreadsheet with data entries for each destination made on individual rows from left to right. Each area of the Destinations set-up screen is introduced in the following paragraphs:

- **Number**

  The left-most column is labeled NUMBER and is numerically sequential and automatically filled in as sources are added. You can not change the entry in the Number column.

- **Name, Panel Name and Long Name**

  The next three columns allow you to assign identifying names and/or acronyms to each destination according to the following formats:

  - **Name –** Any combination of up to 8 alphanumeric characters may be used to identify the destination.
  - **Panel Name -** Any combination of up to 8 alphanumeric characters may be used to identify the destination. The entry made in this column is the text string that appears on system remote control panels with display capability.
  - **Long Name –** This column is essentially a free text space where you may enter a name up to 32 characters in length for the destination. This name is only displayed on this configuration screen and may be used to more clearly identify an external device or system.

- **Switching Levels**

  To the right side of the three name columns are columns corresponding to each assigned system level. The entry (in most cases a number) in the columns on each row assigns the actual physical output from the switching device associated with the switching level for each destination.

  For example, look at entry number 6 in Figure 6-35 labeled VTR 1. Assume this nomenclature is assigned to a VTR with analog video, stereo analog audio and time code inputs. Video is derived from the VIDEO level, the two audio outputs (left and right) are each components (AUDIO1 and AUDIO2, respectively) of the AUDIO level and the time code output is derived from the RS422 level. Assume further that each input signal type to the VTR (video, audio and time code) is physically switched through a separate switcher frame. For discussion purposes assume the video is switched through a Cheetah video matrix switcher, audio is routed through a Cheetah DRS frame and the time code signal is routed through a PESA Tiger switcher.

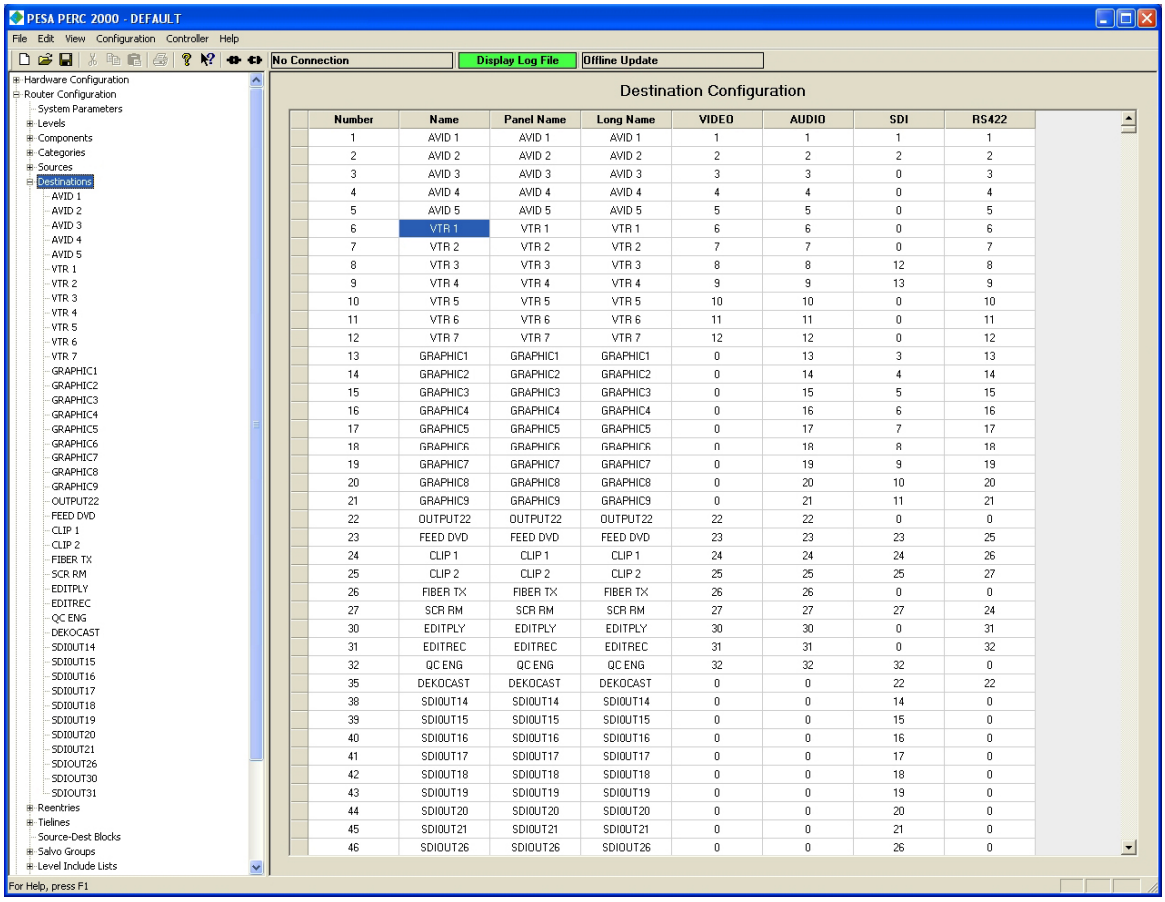


Figure 6-35 Destinations Configuration Screen

Notice on Figure 6-35 that the numeric entry for VTR 1 in both the VIDEO and RS422 level columns is a 6 for each level. This entry tells the P2K controller that the video signal to the hardware device identified as VTR 1 is present at physical output number 6 of the switching matrix identified by the logical switching level named VIDEO and that the time code signal for VTR 1 is present at physical output number 6 of the matrix defined by the logical level named RS422.

The numeric entry for VTR 1 in the column corresponding to the logical switching level named AUDIO is also a 6. Remember, however, that logical level AUDIO is composed of two components named AUDIO1 and AUDIO2 and that each audio signal is routed through separate routing circuitry. In this case, the numeric 6 entry indicates that the left channel input signal to VTR 1 is derived from physical output number 6 of the switching matrix identified as AUDIO 1 under the logical level named AUDIO and that the right channel input to VTR 1 is derived from physical output number 6 of the switching matrix identified as AUDIO 2 under the logical level named AUDIO. In matrix space, the controller treats logical level AUDIO as a single entity and switches both components simultaneously. These signals may be derived from two separate routing frames or may be from one frame with the matrix space configured as two or more separate routing units using output offset values to define the physical outputs from the switching matrix.

Note that an entry of 0 (zero) appears under the logical level SDI column for VTR 1. This entry indicates that there is no valid destination for VTR 1 from the SDI logical switching level.

- **Navigating the Destinations Spreadsheet**

  Access the Destinations configuration screen by clicking the Destinations command entry under the Configuration Command tree. When the Destinations tab is expanded, note that a listing of all assigned destination identifiers appears below the parent command. Clicking any of the identifiers in the list causes the spreadsheet cursor to immediately move to and highlight the configuration entry row associated with the destination.

  Right clicking either the Destinations command tab or any destination identifier entry below it, causes a click box as shown in Figure 6-36 to appear with the following options:

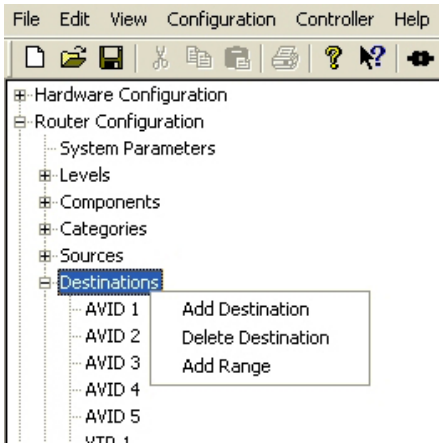


Figure 6-36 Right Click Mouse Functions

- **Add Destination** – Clicking the Add Destination option inserts a blank line in the spreadsheet and moves the cursor to the new entry line. From this line a new destination can be added to the configuration.
- **Delete Destination** – If you wish to remove a destination entry from the configuration spreadsheet, move the cursor to the destination identifier beneath the Destinations tab in the Command Screen Window you wish to delete, highlight the destination to be deleted, right click to open the option box, and select Delete Destination.
- **Add Range** – Adds a range of destinations using a category index type of naming scheme, as shown by Figure 6-37. You define the base name, such as “CAM,” the starting index - such as 3 and the number of sources to create – such as 5. This example would create sources “CAM 3:” to “CAM 7.”

NOTE	**Starting index is defined on a level-by-level basis.**

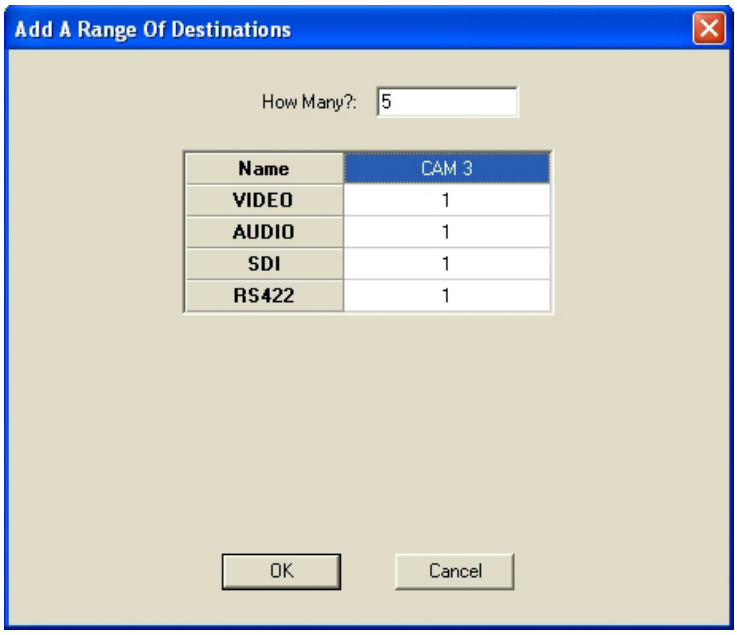


Figure 6-37 Destination Range Entry Box

- **Right Mouse Click Functions**

  When you right-click on any cell in the Destination Configuration spreadsheet, a pop-up menu appears providing command options for the cell, as shown in Figure 6-38. Command options appearing in the pop-up menu vary depending on which commands are pertinent for the data entered in the selected cell. Paragraph 6-8 discusses the function of common commands available from the pop-up menu. Remember that all commands listed and discussed below may or may not appear in the pop-up menu for a specific cell.

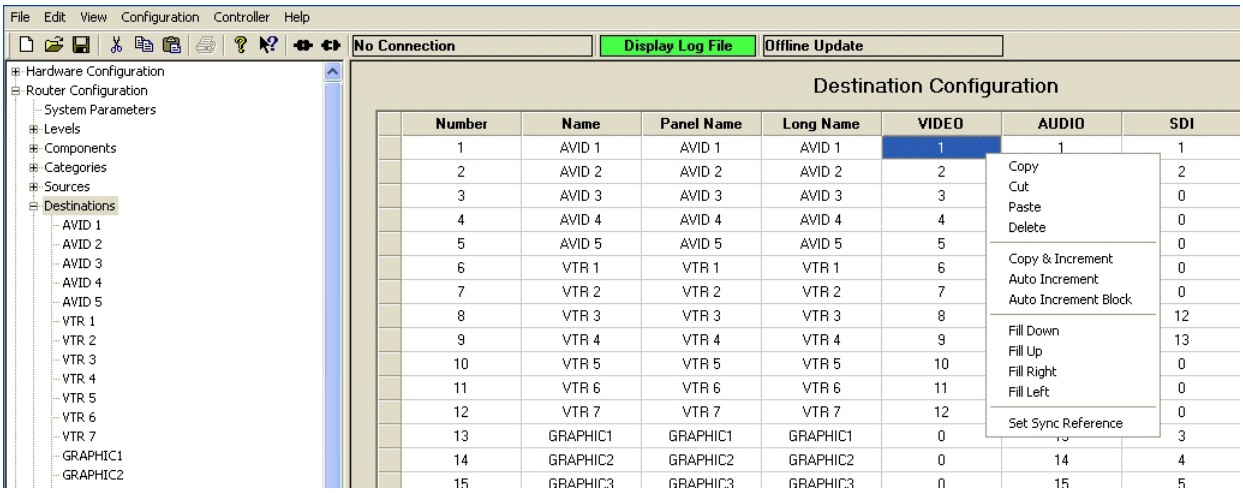


Figure 6-38 Destination Spreadsheet Right Mouse Click Functions

- **Set Sync Reference**

  Typical Cheetah installations allow input of up to two sources of external Sync Reference signals for synchronizing switching times and destination output signals. P2K allows you to assign either of the sync sources to any single destination or multiple destinations simultaneously.

  Destinations are mapped to sync signals using the **Set Sync Reference** command from the right-click command box. Click the cursor in the single cell corresponding to the destination and level, or to selected multiple destination cells you wish to map to a sync source. Right click and select the "Set Sync Reference" option from the menu. A window, Figure 6-39, displays identifying the level and current destination you are configuring at the top. In the middle of the window you assign a sync source to the destination using the pull-down menu boxes.

  Three radio buttons allow you to assign the sync source to only the Current Destination, All Destinations or Selected Destinations. Choose the Selected Destinations option when multiple cells have been highlighted.

  In the example shown, by selecting "Set Sync Reference" in the spreadsheet cell for VTR 1 on the Video level, the window below appears and shows VTR 1 on the VIDEO level as the current destination. By selecting SYNC1 from the pull-down we have assigned the physical output named VTR 1 on the VIDEO level to synchronize to the reference input named SYNC1 for the current destination only.

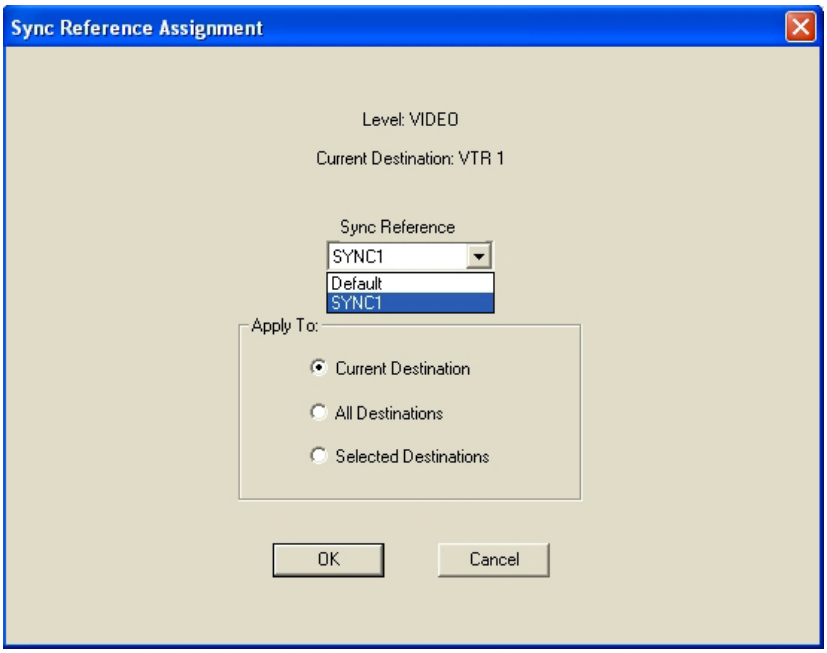


Figure 6-39 Sync Reference Assignment Window

6.13.7 REENTRIES CONFIGURATION SCREEN

A Reentry is a switching function that allows routing a single source to multiple destinations with a single switch. In implementation, think of a reentry as a virtual path that is both a source and destination. For example assume you have a source named SRC1 that you would like to simultaneously switch to destinations DST1, DST2, and DST3, Figure 6-40. Reentry REENT1 is created and switched to the three destinations. With a single logical switch, SRC1 can now be switched to REENT1 and the signal arrives at all three destinations simultaneously. While similar in operation to a salvo function, the major difference is that a salvo must be set-up as part of a configuration file. Once a reentry function is assigned it can be selected as needed just as any other source or destination from system remote control panels. The maximum number of reentries is 256.

Reentry functions are assigned using the Reentry Configuration Screen, Figure 6-41.

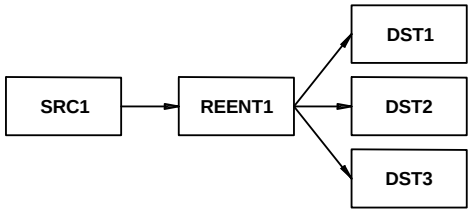


Figure 6-40 Reentry Example

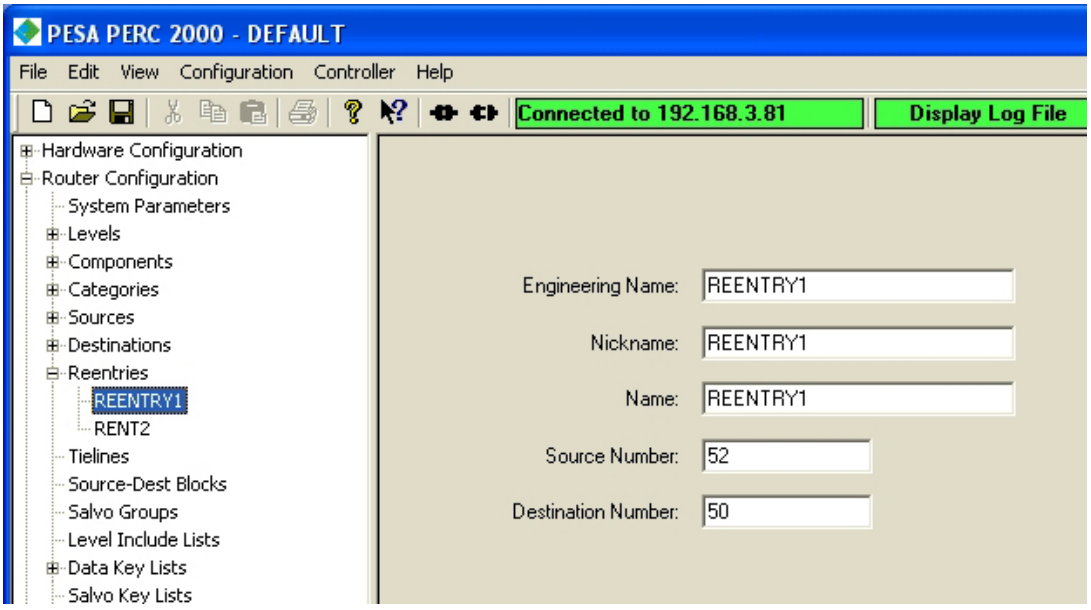


Figure 6-41 Reentry Configuration Screen

- **Engineering Name, Nickname and Name**

  These fields allow an identifying name to be assigned to the reentry path. In operation, this is the name used to signify both the source and destination when using a reentry path. Each of the name fields is discussed below:

  - **Engineering Name –** Any combination of up to 8 alphanumeric characters may be used to assign the Engineering Name to the reentry.
  - **Nickname -** Any combination of up to 8 alphanumeric characters may be used to assign the Nickname to the reentry.
  - **Name –** This field is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly comment the reentry function.

- **Defining a Reentry**

  Remember that a reentry is a virtual signal path, meaning there is no physical input or output, used as both a source and destination. In order to configure a reentry it is necessary to enter the Source Number and Destination Number as follows:

  - **Source Number** – Click the cursor in the Source Number cell and enter the Source Identification Number you wish to assign to the reentry function. This may be any number NOT used to identify an actual physical source. Typically, the way to choose a valid ID number is to look at the Sources Configuration Screen and note the last ID number used for a physical source. In the example shown Source Number 52 is used for the reentry path named **REENTRY1**. In this configuration file, 50 is the last source number assigned to a physical source. Therefore 52 is a valid and convenient number to assign to the reentry source.
  - **Destination Number** – Click the cursor in the Destination Number cell and enter the Destination Identification Number you wish to assign to the reentry function. This may be any number NOT used to identify an actual physical destination. Typically, the way to choose a valid ID number is to look at the Destinations Configuration Screen and note the last ID number used for a physical destination. In the example shown Destination Number 50 is used for the reentry path named **REENTRY1**. In this configuration file, 48 is the last number assigned to a physical destination. Therefore 50 is a valid and convenient number to assign to the reentry destination.

- **Adding or Deleting a Reentry**
  - **Add Reentry** – Clicking the Add Reentry option, Figure 6-42, opens a new reentry configuration screen. From this screen a new reentry path can be added to the file configuration.
  - **Delete Reentry** – If you wish to remove a reentry path from the configuration file, move the cursor to the reentry name beneath the Reentries tab in the Command Screen Window you wish to delete, Figure 6-42, highlight the reentry to be deleted and right click to open the option box. Select Delete Reentry and the reentry is removed from the configuration.

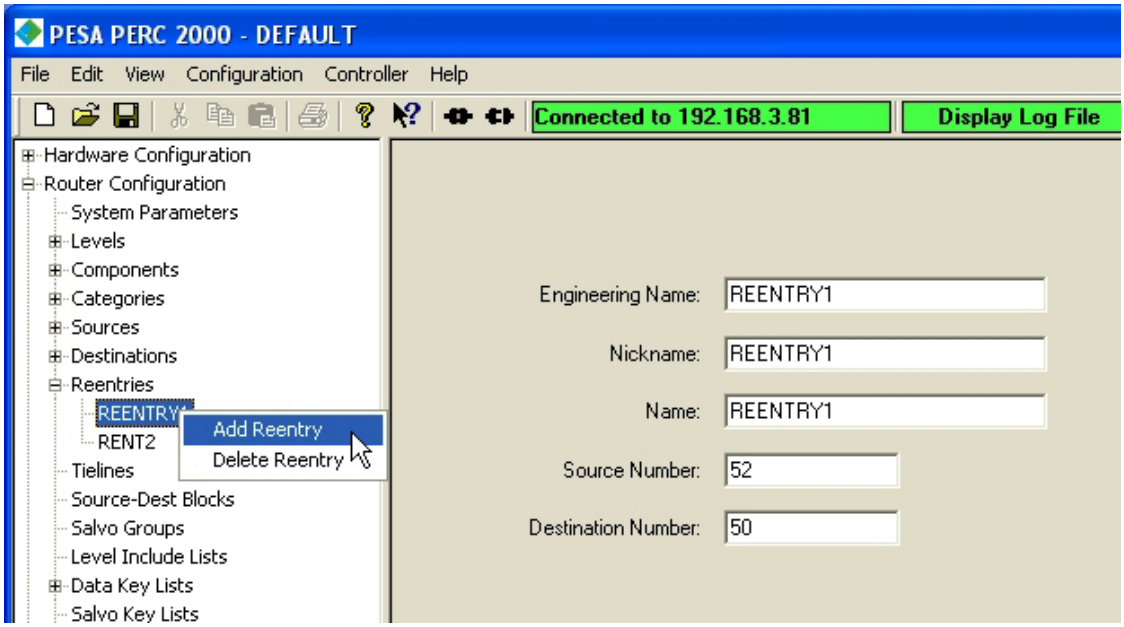


Figure 6-42 Adding or Deleting a Reentry

6.13.8 TIE-LINES CONFIGURATION SCREEN

A tie-line is a physical connection between two switching levels – one level being the signal output, or tie-line source; and the other being a signal input, or tie-line destination. An excellent application example of the use of a tie-line is illustrated within the set-up screens presented here. Before we discuss the entries necessary in the configuration set-up to establish a tie-line, let's take a closer look at the example embedded in these screens.

Suppose you have a switching application where an analog video source needs to be available as an analog output, and also converted by external equipment to a digital signal and be available from a digital video level in addition to the analog output. In order to implement such an arrangement we would like to have a dedicated output from the analog level named Video and a dedicated input to the digital level, in this example named SDI. Video conversion equipment is physically inserted between the dedicated physical output from Video and the dedicated physical input to SDI. Whenever we select one of the analog sources on Video as the desired output to one or more of the SDI destinations the controller transparently switches the analog source to our dedicated output from Video, through the conversion equipment and applies the converted digital signal to our dedicated input of SDI, where that input is switched by SDI to the selected destination output of SDI. This actual physical connection made between the two switching levels is the physical portion of a tie-line. In addition, we have to configure the controller to recognize the tie-line by programming the level name and physical connection of the signal output and input, and assign an identification name to the tie-line – this is done by the Tie-Line configuration screen, Figure 6-43.

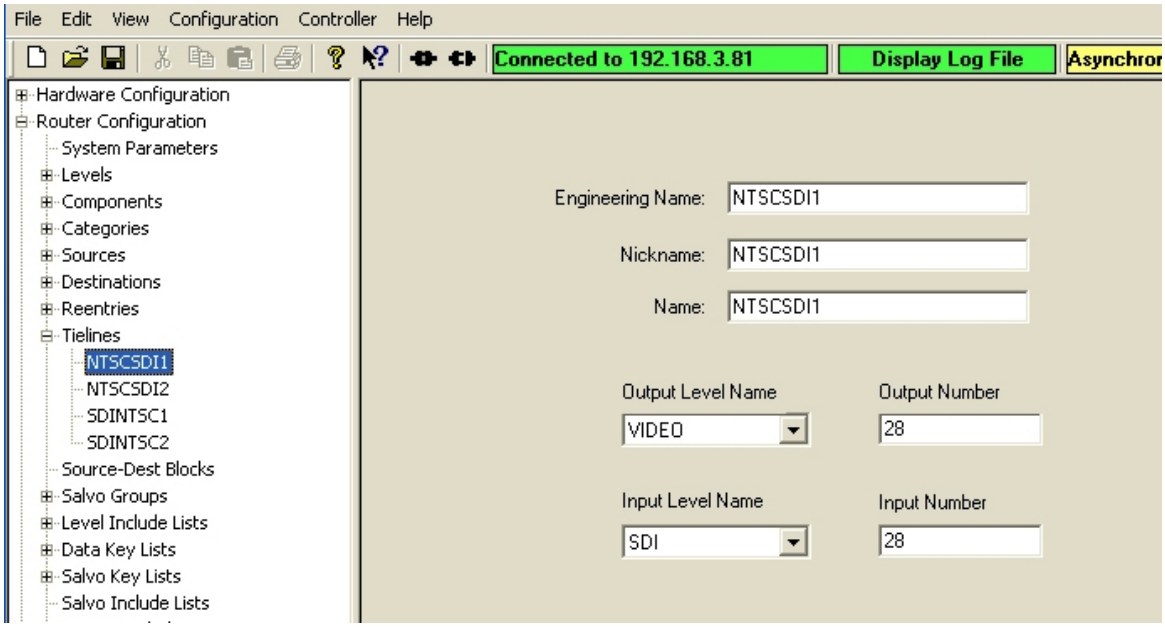


Figure 6-43 Tie-Line Configuration Screen

- **Engineering Name, Nickname and Name**

  In the case of the tie-line, PESA recommends that you choose a name that is descriptive of the function of the tie-line. The name you assign is not used on other status screens and is not used or seen by an operator. In this example, notice that there are four tie-lines used in this system. NTSCSDI1 is chosen to signify the first of two tie-line connections dedicated between an output (destination) of NTSC analog video from the level named Video and an input (source) of digital SDI compliant video to the level named SDI. In similar manner, the name SDINTSC2 signifies the second of two tie-line connections dedicated between an output (destination) from level SDI and an input (source) to level Video. Each of the name fields is discussed below:

  - **Engineering Name –** Any combination of up to 8 alphanumeric characters may be used to assign the Engineering Name to the tie-line.
  - **Nickname -** Any combination of up to 8 alphanumeric characters may be used to assign the Nickname to the tie-line.
  - **Name –** This field is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly comment the tie-line function.

- **Defining a Tie-Line**

  Remember that a tie-line is a hard-wired external connection between a dedicated physical output (destination) from one level and a dedicated physical input (source) on another level. It is important to clearly understand that a tie-line is a *physical* connection made external to the router using cable attached to physical BNC connectors on the rear panel of the router. In order to configure a tie-line it is necessary to program the destination and source as follows:

  - **Output Level Name** – This entry field contains a pull-down menu containing all the levels defined in the configuration. Move the cursor to and click on the switching level from which you wish to derive the signal routed to the tie-line.
  - **Output Number** – Enter the number of the physical output connection from the level entered above from which you wish to derive the signal routed to the tie-line.
  - **Input Level Name** – This entry field contains a pull-down menu containing all the levels defined in the configuration. Move the cursor to and click on the switching level you wish to receive the signal from the tie-line.
  - **Input Number** – Enter the number of the physical input connection of the level entered above you wish to receive the signal from the tie-line.

  In our example configuration screen, we have assigned the name NTSCSDI1 to a tie-line deriving its source signal from physical output 28 on switching level VIDEO and directing its destination signal to physical input 28 on switching level SDI.

6.13.9 SOURCE-DESTINATION (DEST) BLOCKS CONFIGURATION SCREEN

The Source-Dest Block Configuration Screen, Figure 6-44, allows you to selectively block any source from being switched to a designated destination. Clicking on the **Source-Dest Blocks** parent entry in the Command Screen Window brings up a clean copy of the working screen. Note that the screen has three areas:

- **Destination Name** – This field is where you enter the name of the destination to which you wish to apply source blocks. There are two way to enter a destination name. You can simply type the name of the destination or you can copy and paste the name from a cell of the destination screen.
- **Blocked Sources** – Sources you wish to block from access by the named destination are listed in this column.
- **Available Sources** – This column contains a listing of all the sources which may be switched to the named destination.

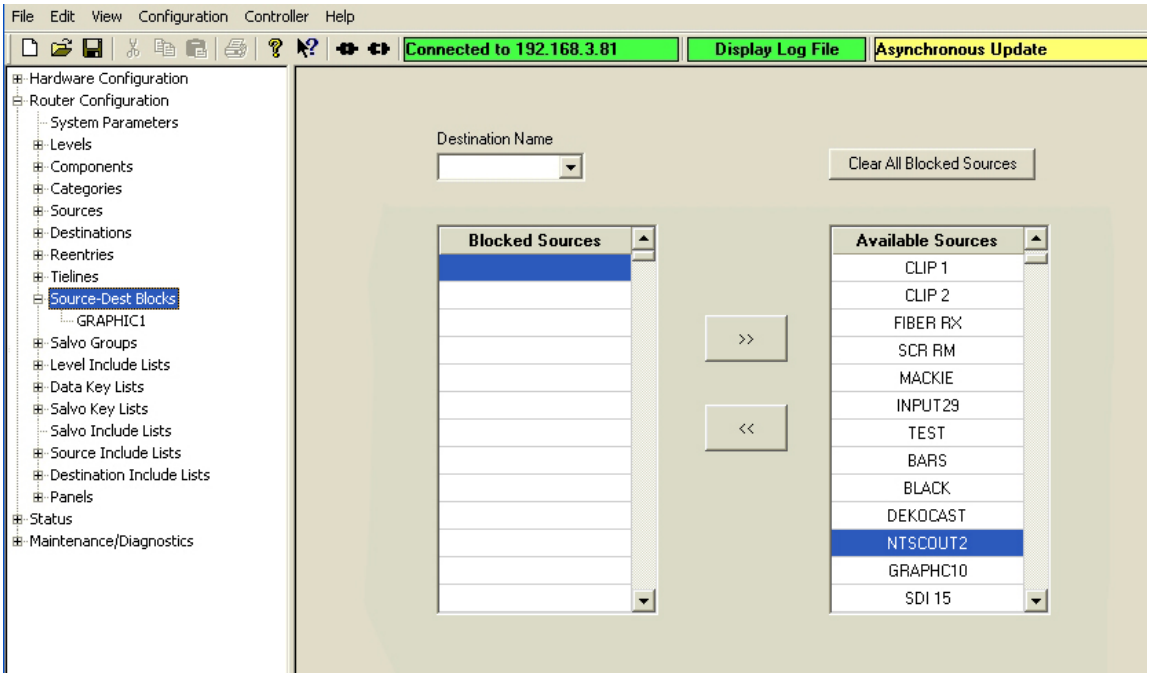


Figure 6-44 Source-Destination Block Display

Initially, all sources are listed in the Available Source list box. Listed sources are moved between the two list boxes using the two arrows between the boxes. In order to move a source from available to blocked, highlight the source you desire to block from access by the destination and click the arrow pointing from the available list to the blocked list. You may list any number of sources you wish to block. In order to unblock a source, highlight and move the source name from the blocked list to the available list using the arrow pointing to the available list.

Expanding the tree under the Source-Dest Block parent header in the command tree window opens a listing of destinations assigned to allow source blocking. If you wish to access the configuration screen for a specific destination, click on the destination name in the listing. If you wish to access a blank Source-Dest Block configuration screen, click on the Source-Dest Block parent header in the command tree window.

6.13.10 SALVO GROUPS CONFIGURATION SCREEN

A salvo is a group of predefined switches made simultaneously with a single "take" command. Salvos groups are defined on the Salvo Groups Configuration Screen, Figure 6-45.

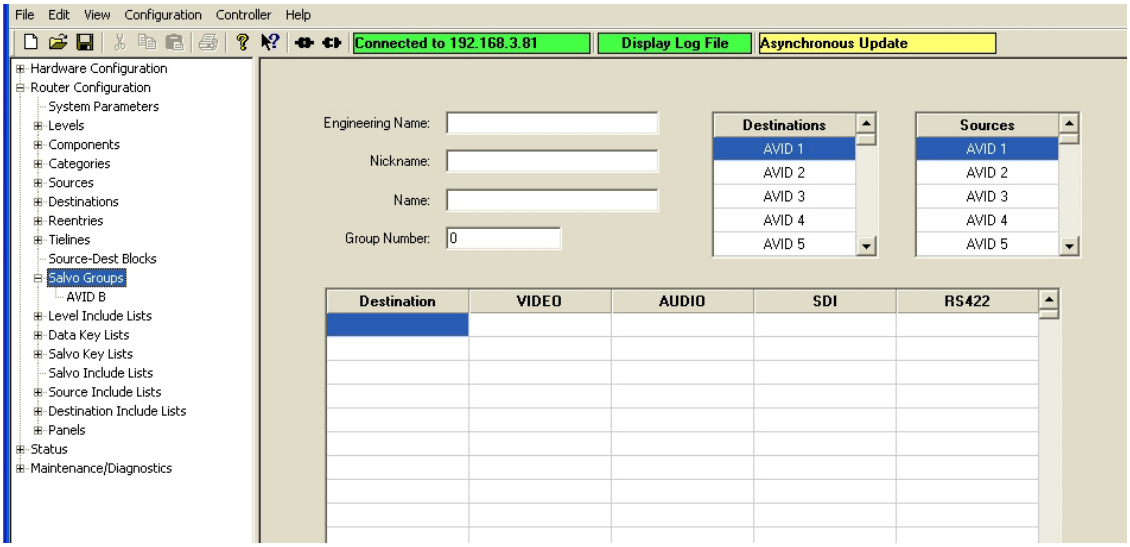


Figure 6-45 Salvo Groups Configuration Screen

Figure 6-46 illustrates a salvo group named AVID B which, when executed, switches the source named BARS to the indicated levels of the four listed destinations. Salvo groups may be assigned by group name to a single control panel key. When this key is pressed all switches defined in the salvo group are simultaneously switched. All switches in a salvo are taken within the same vertical interval.

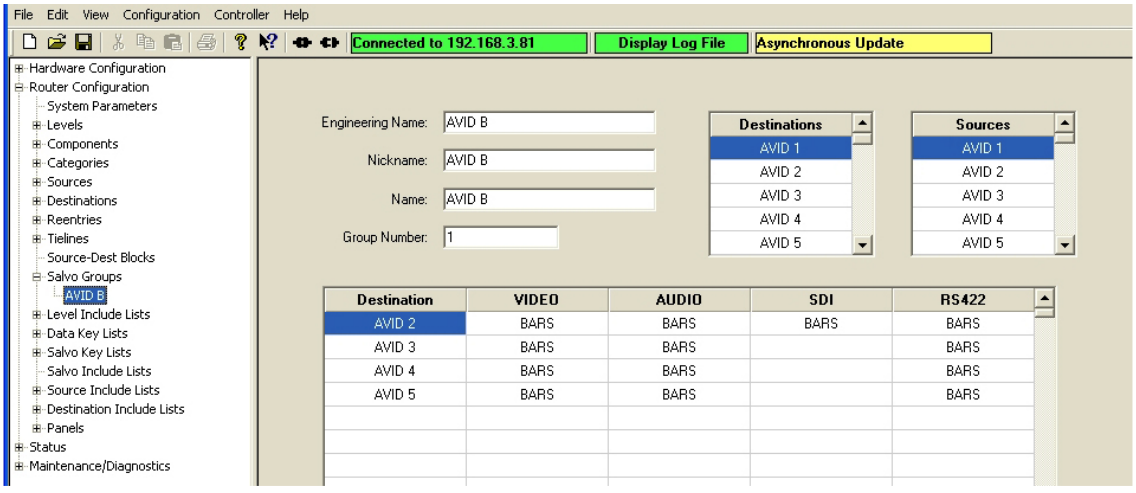


Figure 6-46 Salvo Group Configuration Fields

In order to define a salvo group, access a blank salvo group configuration screen as follows: right click on the parent Salvo Groups entry in the command tree window and select the Add Salvo Group command from the pop-up box, Figure 6-47.

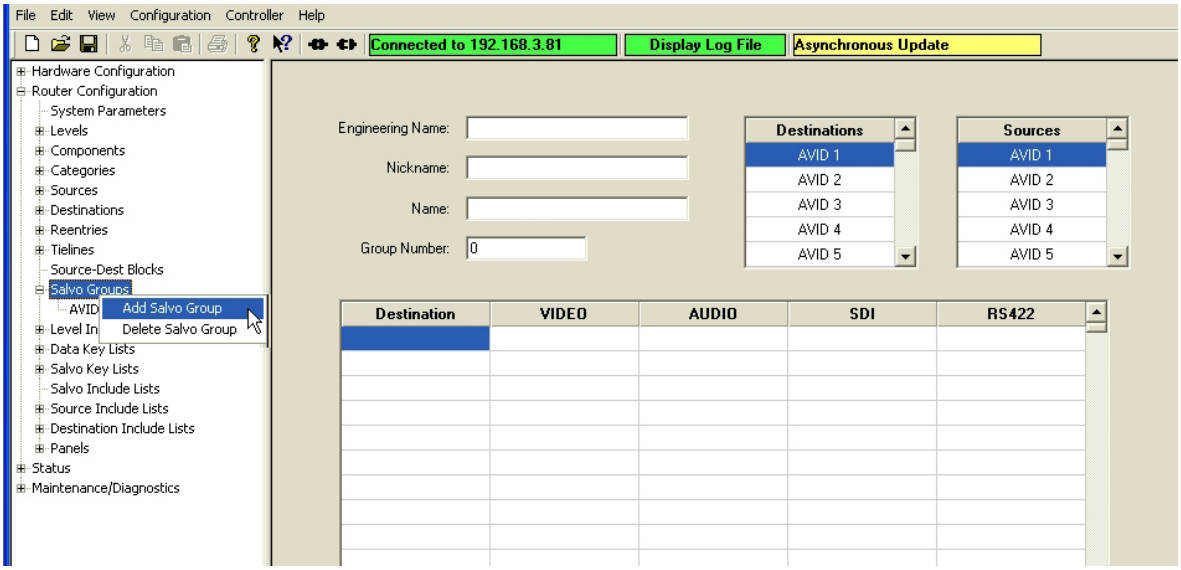


Figure 6-47 Right Mouse Click Functions

- **Engineering Name, Nickname, Name and Group Number**

  Salvo group names may be from one to eight characters in length and constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter. As in most other P2K configuration screens three fields are provided for naming the salvo group. In the case of the salvo configuration, PESA recommends that you choose a name that is descriptive of the function of the salvo. In this example, the name AVID B, for analog video – bars, is chosen to signify a salvo that switches a reference source called BARS to the listed analog destinations. Each of the name fields is discussed below:

  - **Engineering Name** – Up to 8 alphanumeric characters are allowed when assigning the Engineering Name to the salvo group.
  - **Nickname** – Up to 8 alphanumeric characters are allowed when assigning the Nickname to the salvo group.
  - **Name** – This field is essentially a free text space where you may enter a descriptive name, up to 32 characters in length, for the salvo group. This name is only displayed on this configuration screen and may be used to more clearly comment the salvo function.
  - **Group Number** – Group number is sequentially assigned by software and is not user definable.

- **Defining A Salvo Group**

  Click the cursor in the top cell of the Destination column. Locate the first destination you wish to assign to the salvo group from the Destinations list at the top of the screen and double-click the entry to copy the destination name into the cell. In like manner, move the cursor to the cells under the various switching level columns and using the entries in the Source list double-click the name of the source you wish to switch to the indicated level of the destination. If desired, you may enter additional destinations and assign sources to them.

6.13.11 LEVEL INCLUDE LISTS CONFIGURATION SCREEN

The Level Include Lists Configuration Screen, Figure 6-48, allows you to selectively build a named list of switching levels which, when assigned to a specific remote control panel, designates the levels that panel is authorized to control. Multiple panels may share a Level Include List. Clicking on the Level Include Lists parent entry in the Command Screen Window brings up a clean copy of the working screen. Note that the screen has three areas:

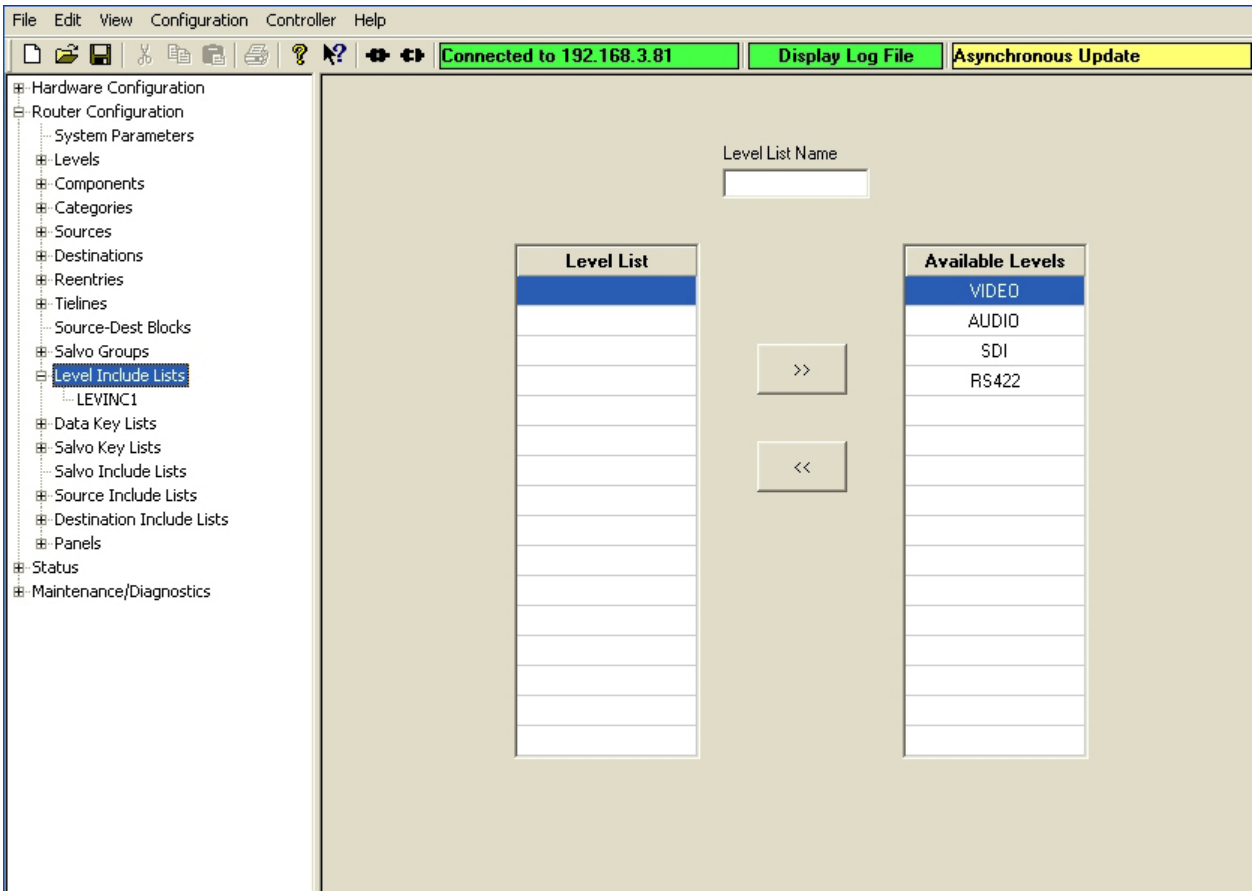


Figure 6-48 Level Include Lists Configuration Screen

- **Level List Name** – This field is where you assign a name to the Level Include List. Names can be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the level include list.
- **Level List** – Levels listed in this column are accessible by remote control panels functioning under the named level include list.
- **Available Levels** – This column contains a listing of all levels which may be included in the level include list.

  Initially, all levels are listed in the Available Levels list box. Listed levels are moved between the two list boxes using the two arrows between the boxes. In order to move a level from the available list to the level include list, highlight the level you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a level from the include list, highlight and move the level name from the include list to the available list using the arrow pointing to the available list.

  Expanding the tree under the Level Include Lists parent header in the command tree window opens a listing of named level include lists, Figure 6-49. If you wish to access the configuration screen for a specific level include list, click on the name in the column listing. If you wish to access a blank Level Include Lists configuration screen, click on the Level Include Lists parent header in the command tree window.

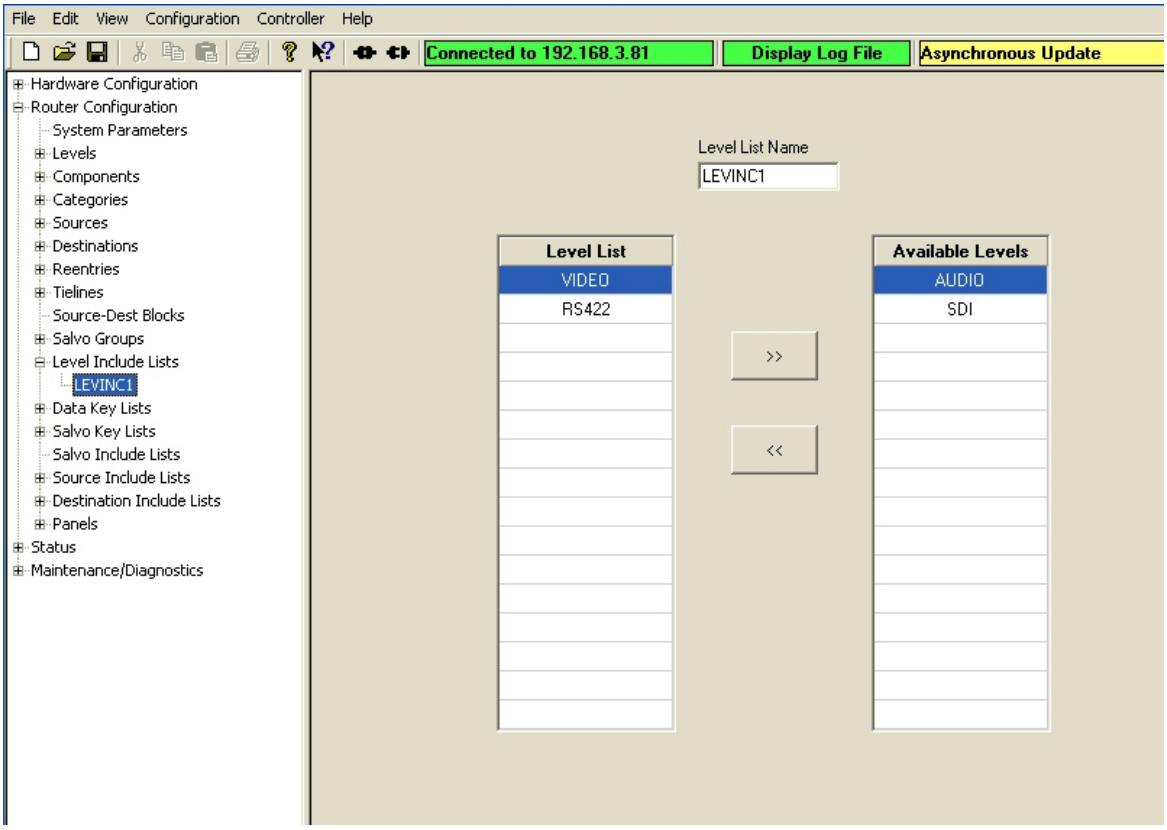


Figure 6-49 Level Include List Data Entry

6.13.12 DATA KEY LISTS CONFIGURATION SCREEN

The Data Key Lists Configuration Screen, Figure 6-50, allows you to generate one or more named lists which assign specific functions to each configurable key on a remote control panel. Multiple panels may share a data key list as long as they are the same type of panel. Different panel types may not use the same data key list. Clicking on the Data Key Lists parent entry in the Command Screen Window brings up a clean copy of the configuration screen. It is from this screen that you program keys on the various remote control panels in a system. Let's take a look at the elements found here.

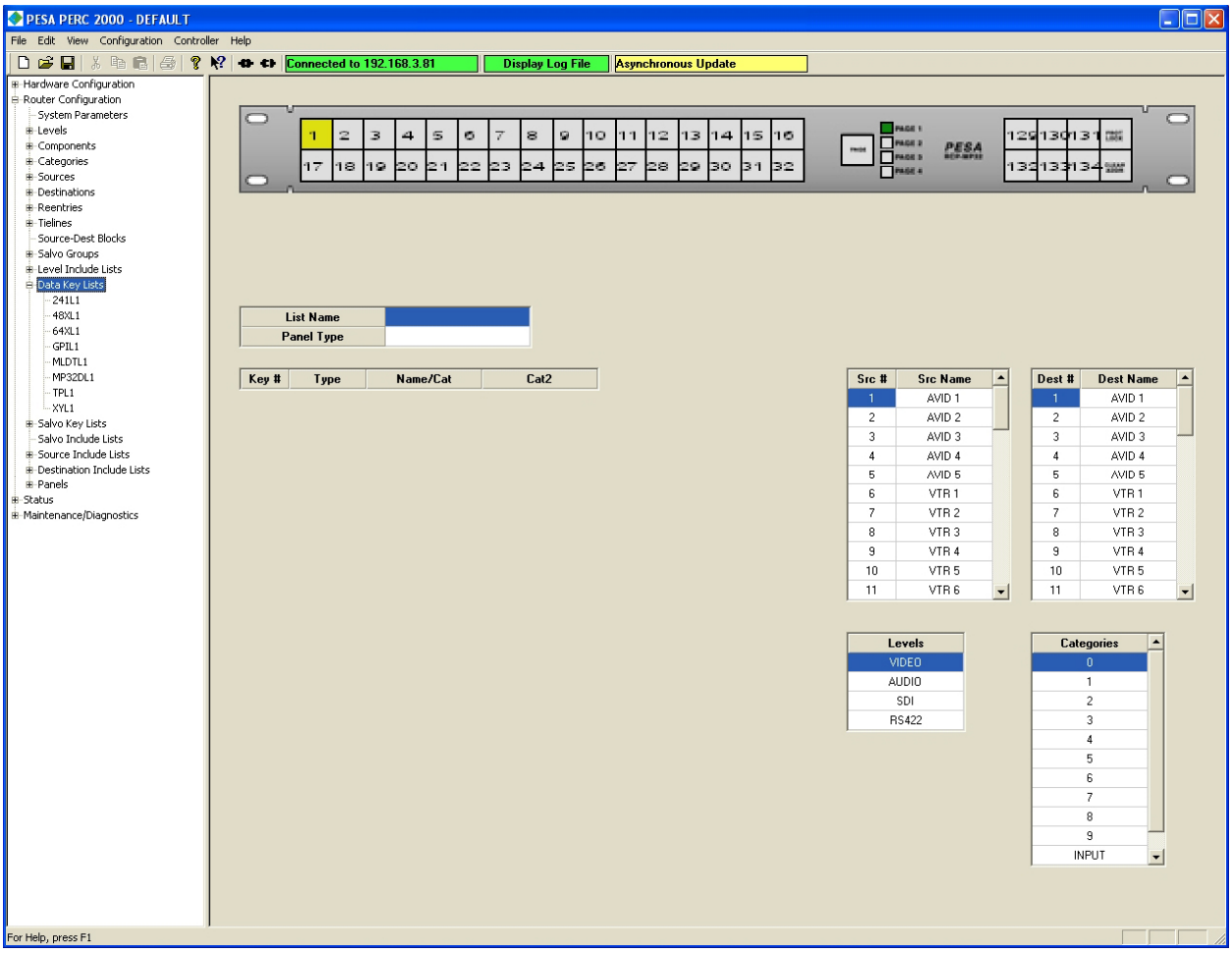


Figure 6-50 Data Key Lists Configuration Screen

To make the programming task more straightforward, a visual image of the type of remote control panel you are programming is displayed at the top of the configuration screen once the panel type is entered. There are a number of different remote control panels in the PESA product line – each is designed for a specific purpose – and each panel has a different key and display layout. Displaying a graphic image provides an easy guide for you to follow when configuring a specific type of panel. Before a panel type is assigned, the graphic display defaults to a random graphic.

- **Defining List Name and Panel Type**

  Note the fields labeled List Name and Panel Type, Figure 6-51. Enter a name for the data key list (up to 8 characters of letters and numbers). PESA recommends you assign a name that is somewhat descriptive of the function of the data key list or the type of panel it controls. Data Key List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.

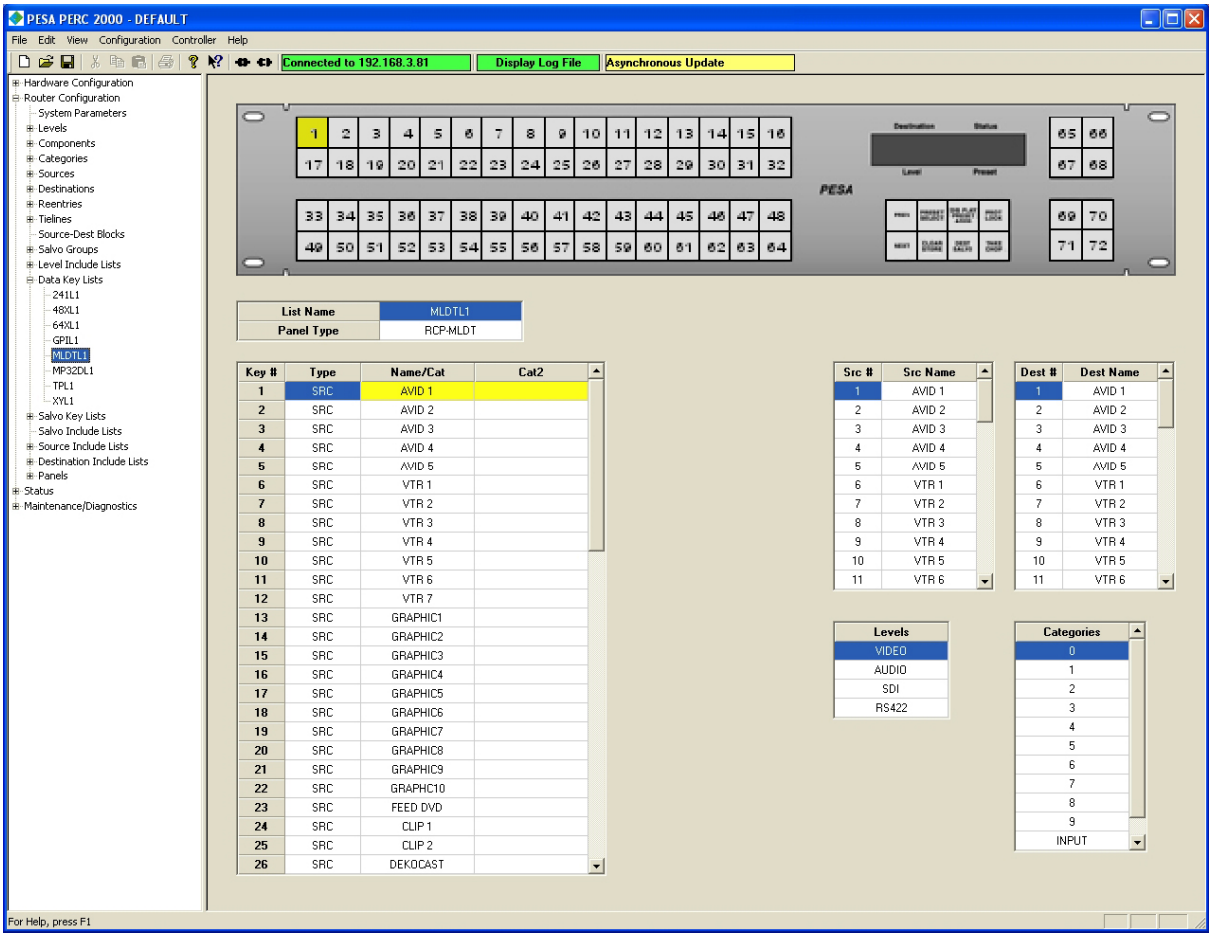


Figure 6-51 Data Key Lists Data Entry

Once a name has been assigned to the list, click the cursor in the Panel Type field. A pull-down box appears listing the PESA remote control panels by model number. Locate the model number of the panel you are programming and click on the entry. The model number is placed in the field and a graphic image of the panel appears at the top of the screen, Figure 6-51.

- **Assigning Data Functions to Configurable Panel Keys**

  Below the fields you just entered there is a list field with a column labeled Key # on the left-hand side. Numbers in the key # column correspond to the number assigned to each key of the panel as depicted by the on-screen graphic.

  On the right-hand side of the screen are four scroll lists for Sources, Destinations, Levels and Categories. You can assign any key on the panel any item in any of the four lists. Once a control panel key is assigned, when the operator presses that key its label or function is recalled.

  As shown by Figure 6-52 there are two rows of sixteen keys each (labeled 1 – 16 and 17 -32) on the left side of the panel and two groups of four numbered keys (labeled 33 – 36 and 37 – 40) on the right side. Assume you would like to program the top row to select sources, the bottom row to select destinations and the top cluster of four buttons to each select one of the four levels in the system.

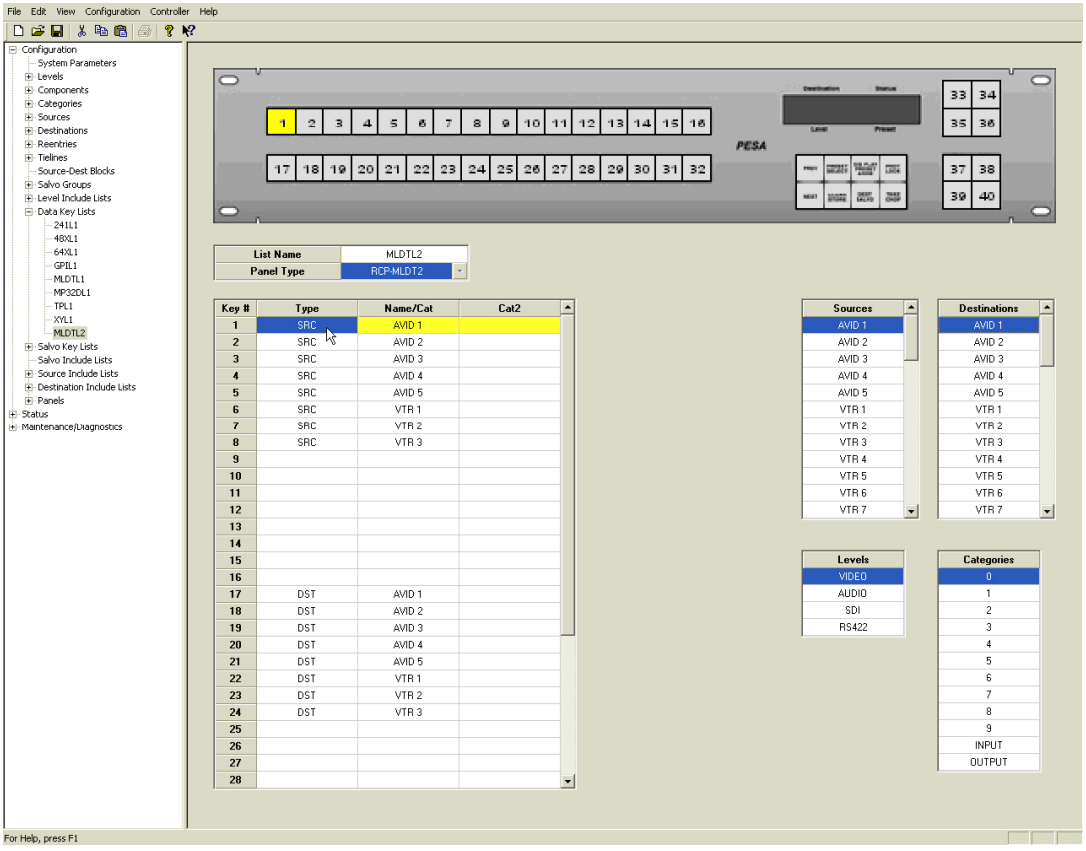


Figure 6-52 Data Function Assignment

Move the cursor to the column labeled Type on the row for Key #1. You can do this either by clicking in the cell or by mouse clicking on button number 1 on the graphic image.

Locate the Source you wish to assign to button number 1 in the sources listing and double click. Refer to Figure 6-52 and note the Type (SRC for source) and the Name (AVID 1) are automatically entered and the cursor advances to the row for Key # 2. Continue locating and clicking sources until all upper keys are assigned as desired.

Since our example is to program the bottom row as destinations, move the cursor to the cell under the Type heading for key number 17. Using the destination names listed in the Destinations scroll box, locate and double click on the destinations you wish to assign to the panel keys. In our example, we have assigned the first eight keys to the first eight destinations in the scroll box.

Let's further assume we would like to assign the top cluster of four buttons on the right side to each represent one of the four switching levels defined for this system. Just as in the above steps, move the cursor to the key you wish to assign to the VIDEO layer, for this text we are using key number 33. Locate the Levels scroll box and double click the level name VIDEO. Type is identified as LEV and VIDEO is placed in the Name cell. Whenever you wish to access the VIDEO level on a panel operating under this data key list, press key 33.

Categories and their use and purpose are discussed in other areas of this manual. If you wish to assign a key on the panel to represent a specific category label, move the cursor to the Name/Cat cell of the key row to assign and then locate and double click the desired category label from the Categories scroll box. The column labeled Cat2 is used only when assigning a category label to a specific key. An entry in this column assigns the category label accessed when the panel key is selected after first selecting a Category Key.

Expanding the tree under the Data Key Lists parent header in the command tree window opens a listing of named data key lists. If you wish to access the configuration screen for a specific data key list, click on the name in the column listing. If you wish to add a data key list right mouse click on the Data Key Lists parent header in the command tree window to access a blank configuration screen.

6.13.13 SALVO KEY LISTS CONFIGURATION SCREEN

The Salvo Key Lists Configuration Screen, Figure 6-53, allows you to generate one or more named lists which assign salvo groups to each configurable key on a remote control panel. Multiple panels may share a salvo key list as long as they are the same type of panel. Different panel types may not use the same salvo key list. Clicking on the Salvo Key Lists parent entry in the Command Screen Window brings up a clean copy of the configuration screen. It is from this screen that you program the keys on the various remote control panels in a system. Let's take a look at the elements found here.

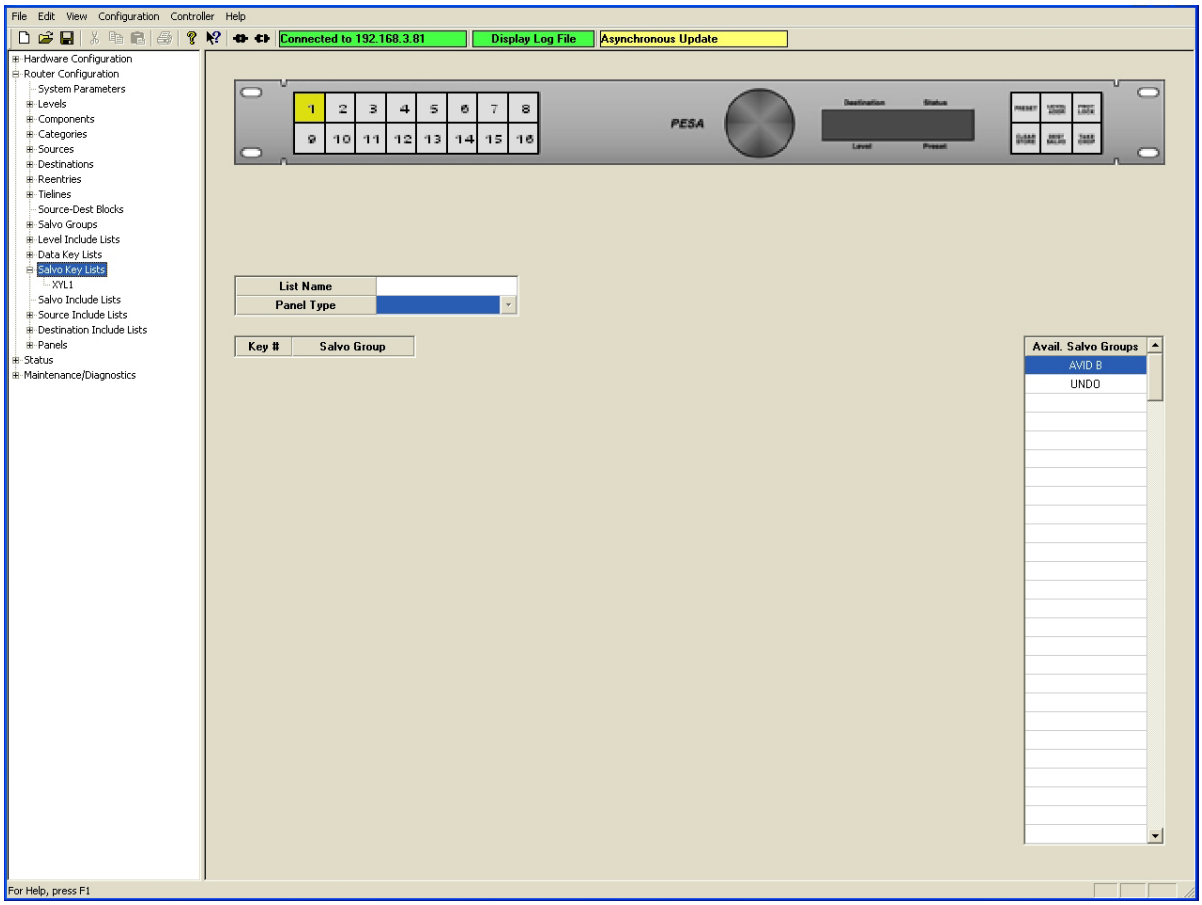


Figure 6-53 Salvo Key Lists Configuration Screen

To make the programming task more straightforward, a visual image of the type of remote control panel you are programming is displayed at the top of the configuration screen once the panel type is entered. There are a number of different remote control panels in the PESA product line – each is designed for a specific purpose – and each panel has a different key and display layout. Displaying a graphic image provides an easy guide for you to follow when configuring a specific type of panel. Before a panel type is assigned, the graphic display defaults to a random graphic.

- **Defining List Name and Panel Type**

  Note the fields labeled List Name and Panel Type, Figure 6-54. Enter a name for the salvo key list (up to 8 characters of letters and numbers). PESA recommends you assign a name that is somewhat descriptive of the function of the salvo key list or the type of panel it controls. Salvo Key List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.

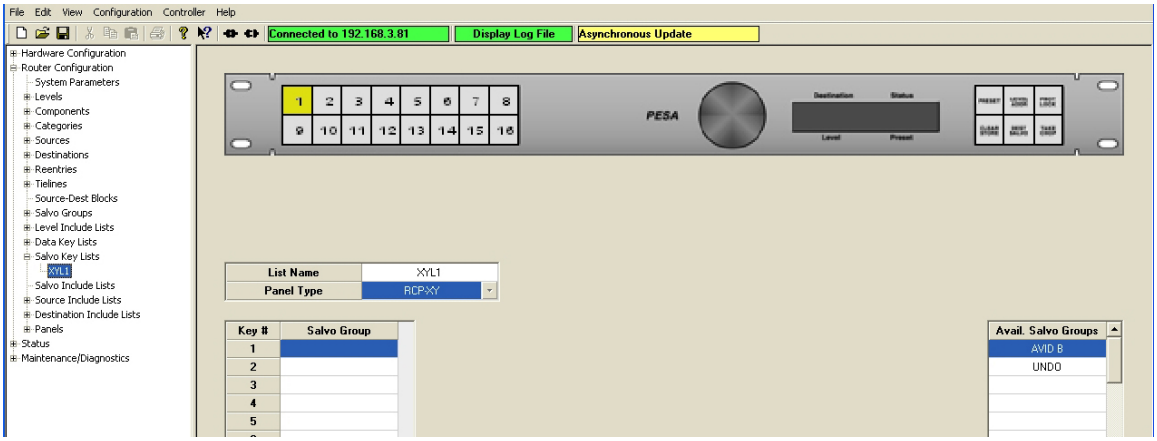


Figure 6-54 Salvo Key Lists Data Entry Fields

Once a name has been assigned to the list, click the cursor in the Panel Type field. A pull-down box appears listing the PESA remote control panels by model number. Locate the model number of the panel you are programming and click on the entry. The model number is placed in the field and a graphic image of the panel appears at the top of the screen, Figure 6-54.

- **Assigning Salvo Groups to Configurable Panel Keys**

  Below the fields you just entered there is a list field with a column labeled Key # on the left-hand side. Numbers in the key # column correspond to the number assigned to each key of the panel as depicted by the on-screen graphic.

  On the right-hand side of the screen there is a scroll list for Available Salvo Groups. You can assign any key on the panel any item in the list. Once a control panel key is assigned, whenever the remote control panel is operating in salvo mode a specific salvo group is recalled when the operator presses the key associated with that salvo group.

  For example, Figure 6-55 depicts the same panel we used to program the data key list in the previous paragraph. In addition to keys 1 thru 36 that we programmed previously, there is a second group of four numbered keys (labeled 37 – 40) on the right side. Assume you would like to program these buttons to associate button number 37 with salvo group AVID B and button 38 with the UNDO salvo function.

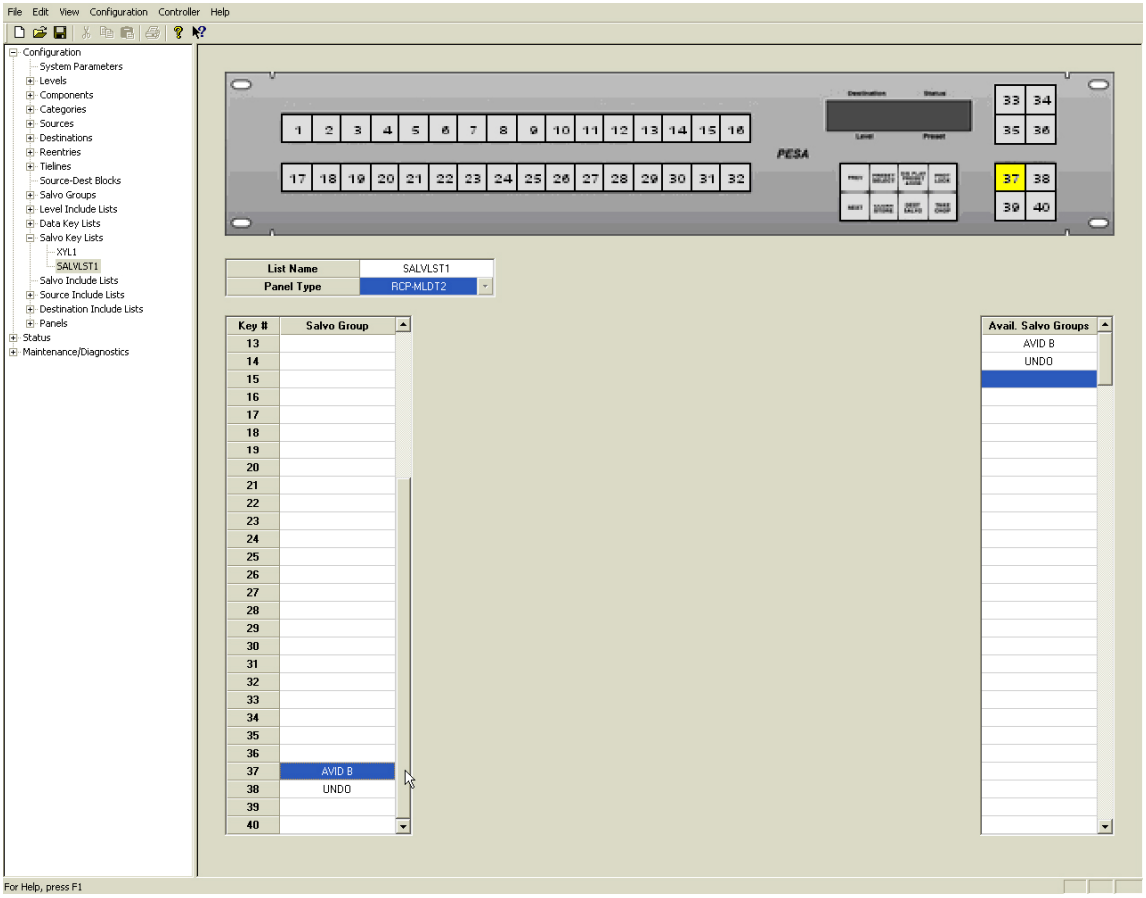


Figure 6-55 Salvo Key Lists Data Key Programming Example

Move the cursor to the column labeled Type on the row for Key #37. You can do this either by clicking in the cell or by mouse clicking button number 37 on the graphic image.

Locate the Salvo Group you wish to assign to button number 37 in the available salvo groups listing and double click. The cursor advances to the row for Key # 38. Continue locating and clicking salvo groups until the panel keys are assigned as desired. For our example we double click on the UNDO label in the group listing to associate that function with button 38.

In order to access a salvo group name the remote control panel must be operating in the salvo mode. This is done in different ways for different panels and you should consult the technical manual for the specific panel being used. In our example panel you would press and hold the key labeled DESTN/SALVO until the lamp in the key starts to flash. In this mode when you press a key assigned to a salvo group, that group name appears on the panel display ready to be activated.

Expanding the tree under the Salvo Key Lists parent header in the command tree window opens a listing of named salvo key lists. If you wish to access the configuration screen for a specific salvo key list, click on the name in the column listing. If you wish to add a salvo key list, right mouse click on the Salvo Key Lists parent header in the command tree window to access a blank configuration screen.

6.13.14 SALVO INCLUDE LISTS CONFIGURATION SCREEN

The Salvo Include Lists Configuration Screen, Figure 6-56, allows you to selectively build a named list of salvo groups which, when assigned to a specific remote control panel, designates the salvo groups that panel is authorized to control. Multiple panels may share a Salvo Include List. Clicking on the Salvo Include Lists parent entry in the Command Screen Window brings up a clean copy of the working screen. Note that the screen has three areas:

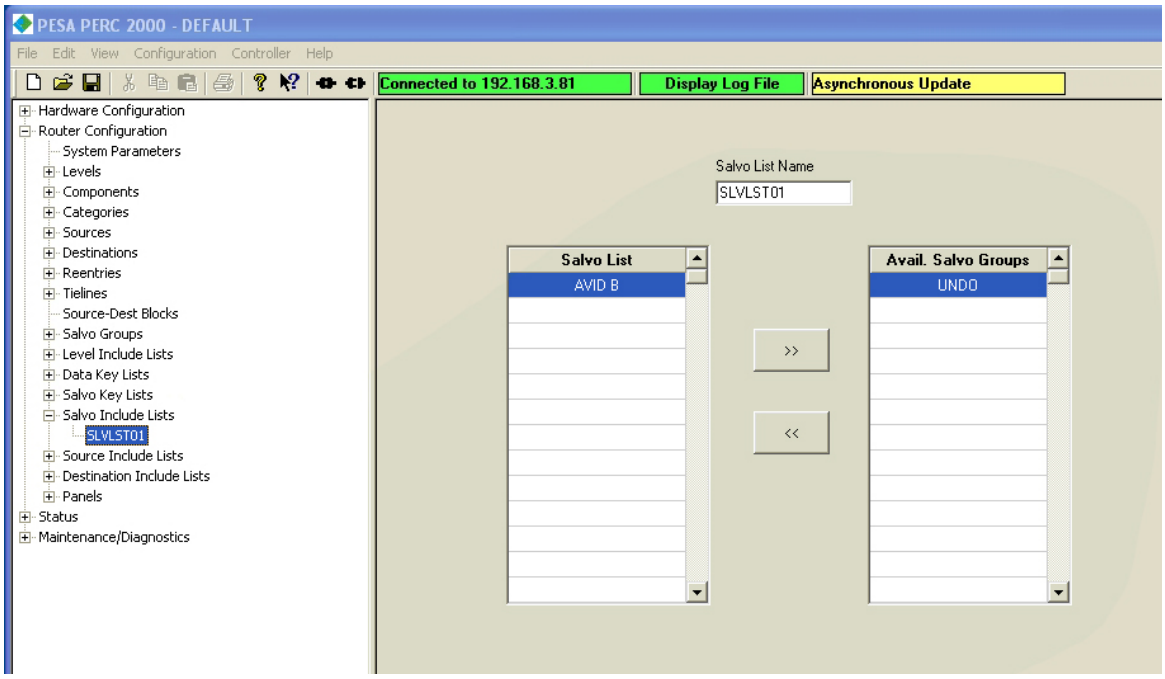


Figure 6-56 Salvo Include Lists Configuration Screen

- **Salvo List Name** – This field is where you assign a name to the Salvo Include List. Names can be any combination of letters and numbers up to eight characters. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the salvo include list. Salvo List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Salvo List** – Salvo groups listed in this column are accessible by remote control panels functioning under the named salvo include list.
- **Available Salvo Groups** – This column contains a listing of all salvo groups which may be included in the salvo include list.

  Initially, all salvo groups are listed in the Available Salvo Groups list box. Listed salvo groups are moved between the two list boxes using the two arrows between the boxes. In order to move a salvo group name from the available list to the salvo include list, highlight the salvo group you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a salvo group from the include list, highlight and move the salvo group name from the include list to the available list using the arrow pointing to the available list.

Expanding the tree under the Salvo Include Lists parent header in the command tree window opens a listing of named salvo include lists. If you wish to access the configuration screen for a specific salvo include list, click on the name in the column listing. If you wish to access a blank Salvo Include Lists configuration screen, click on the Salvo Include Lists parent header in the command tree window.

6.13.15 SOURCE INCLUDE LISTS CONFIGURATION SCREEN

The Source Include Lists Configuration Screen, Figure 6-57, allows you to selectively build a named list of sources which, when assigned to a specific remote control panel, designates the sources that panel is authorized to control. Multiple panels may share a Source Include List. Clicking on the Source Include Lists parent entry in the Command Screen Window brings up a clean copy of the working screen. Note that the screen has three areas:

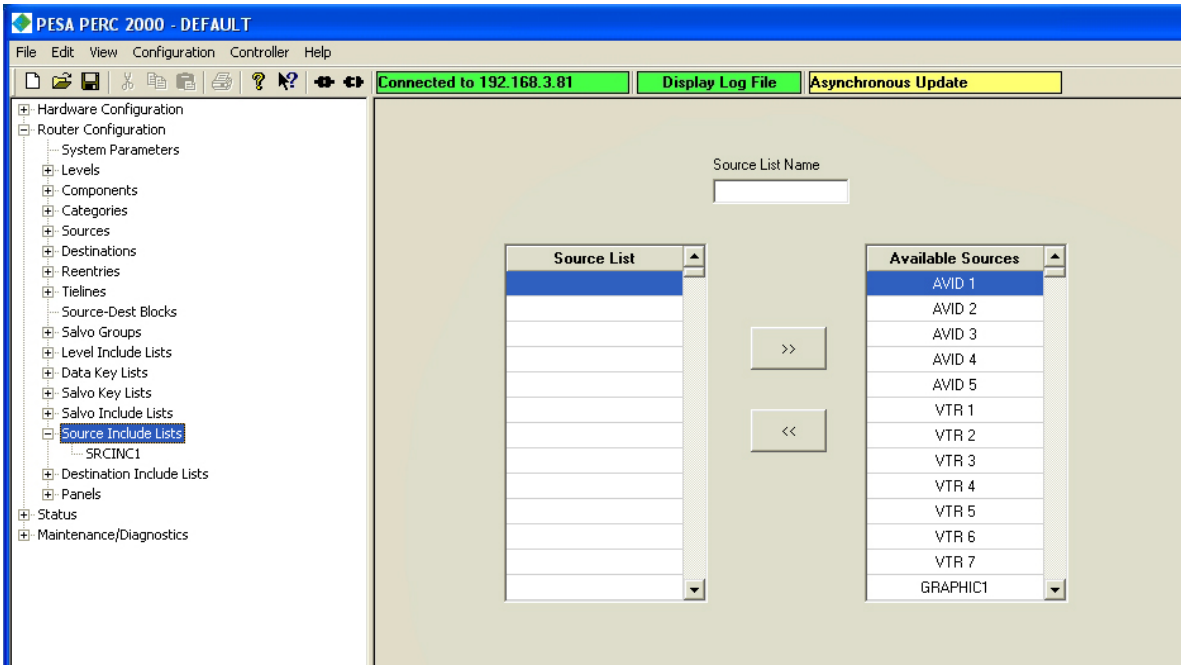


Figure 6-57 Source Include Lists Configuration Screen

- **Source List Name** – This field is where you assign a name to the Source Include List. Names can be any combination of letters and numbers up to eight characters. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the source include list. Source List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Source List** – Sources listed in this column are accessible by remote control panels functioning under the named source include list.
- **Available Sources** – This column contains a listing of all sources which may be included in the source include list.

Initially, all sources are listed in the Available Sources list box. Listed sources are moved between the two list boxes using the two arrows between the boxes, Figure 6-58. In order to move a source name from the available list to the source include list, highlight the source you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a source from the include list, highlight and move the source name from the include list to the available list using the arrow pointing to the available list.

Expanding the tree under the Source Include Lists parent header in the command tree window opens a listing of named source include lists. If you wish to access the configuration screen for a specific source include list, click on the name in the column listing. If you wish to access a blank Source Include Lists configuration screen, click on the Source Include Lists parent header in the command tree window.

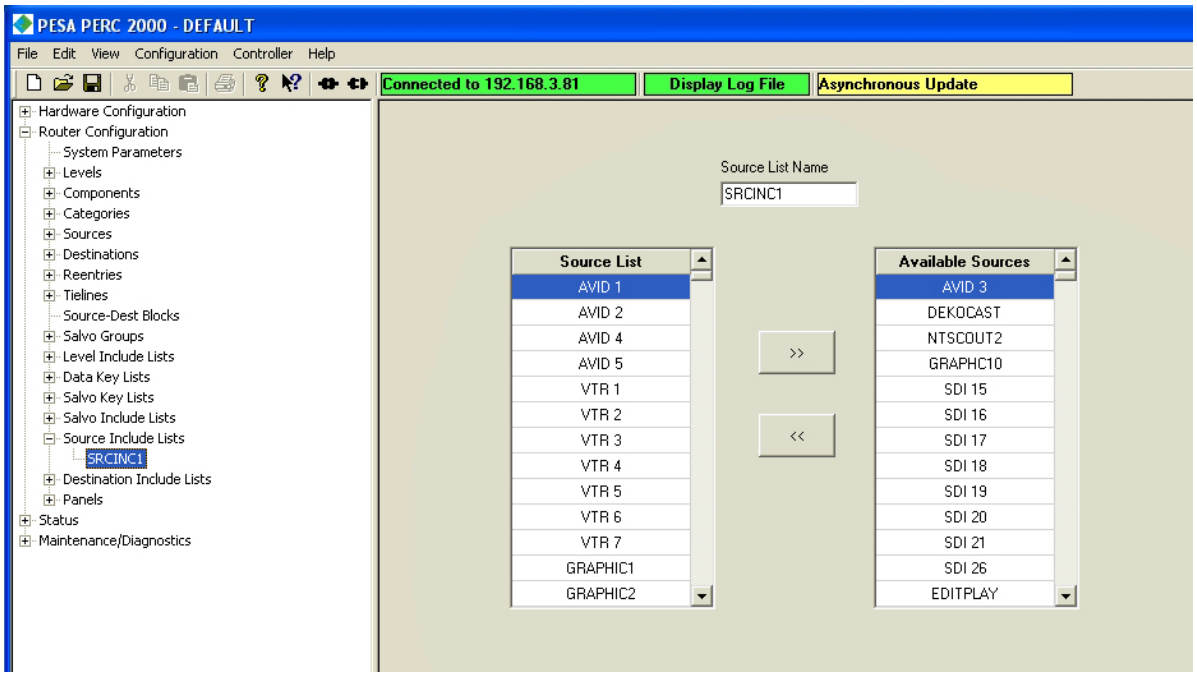


Figure 6-58 Source Include Lists Data Entry Fields

6.13.16 DESTINATION INCLUDE LISTS CONFIGURATION SCREEN

The Destination Include Lists Configuration Screen, Figure 6-59, allows you to selectively build a named list of destinations which, when assigned to a specific remote control panel, designates the destinations that panel is authorized to control. Multiple panels may share a Destination Include List. Clicking on the Destination Include Lists parent entry in the Command Screen Window brings up a clean copy of the working screen. Note that the screen has three areas:

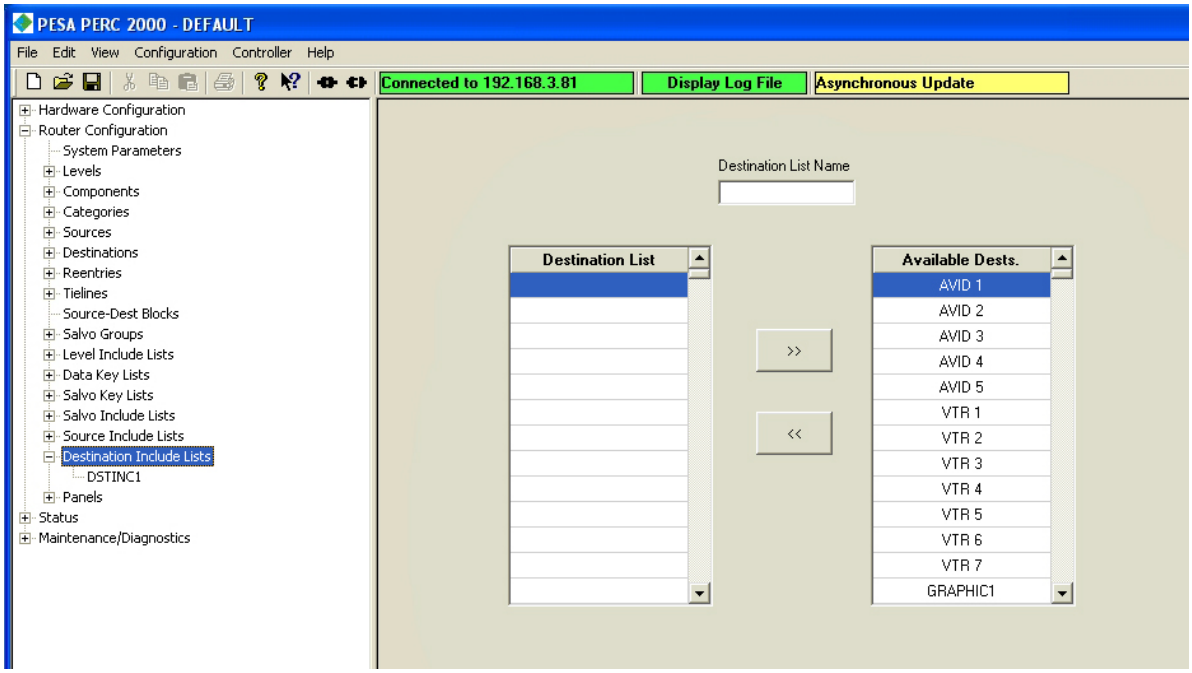


Figure 6-59 Destination Include Lists Configuration Screen

- **Destination List Name** – This field is where you assign a name to the Destination Include List. Names can be any combination of letters and numbers up to eight characters. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the destination include list. Destination List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Destination List** – Destinations listed in this column are accessible by remote control panels functioning under the named destination include list.
- **Available Sources** – This column contains a listing of all destinations which may be included in the destination include list.

  Initially, all destinations are listed in the Available Destinations list box. Listed destinations are moved between the two list boxes using the two arrows between the boxes, Figure 6-60. In order to move a destination name from the available list to the destination include list, highlight the destination you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a destination from the include list, highlight and move the destination name from the include list to the available list using the arrow pointing to the available list.

  Expanding the tree under the Destinations Include Lists parent header in the command tree window opens a listing of named destination include lists. If you wish to access the configuration screen for a specific destination include list, click on the name in the column listing. If you wish to access a blank Destination Include Lists configuration screen, click on the Destination Include Lists parent header in the command tree window.

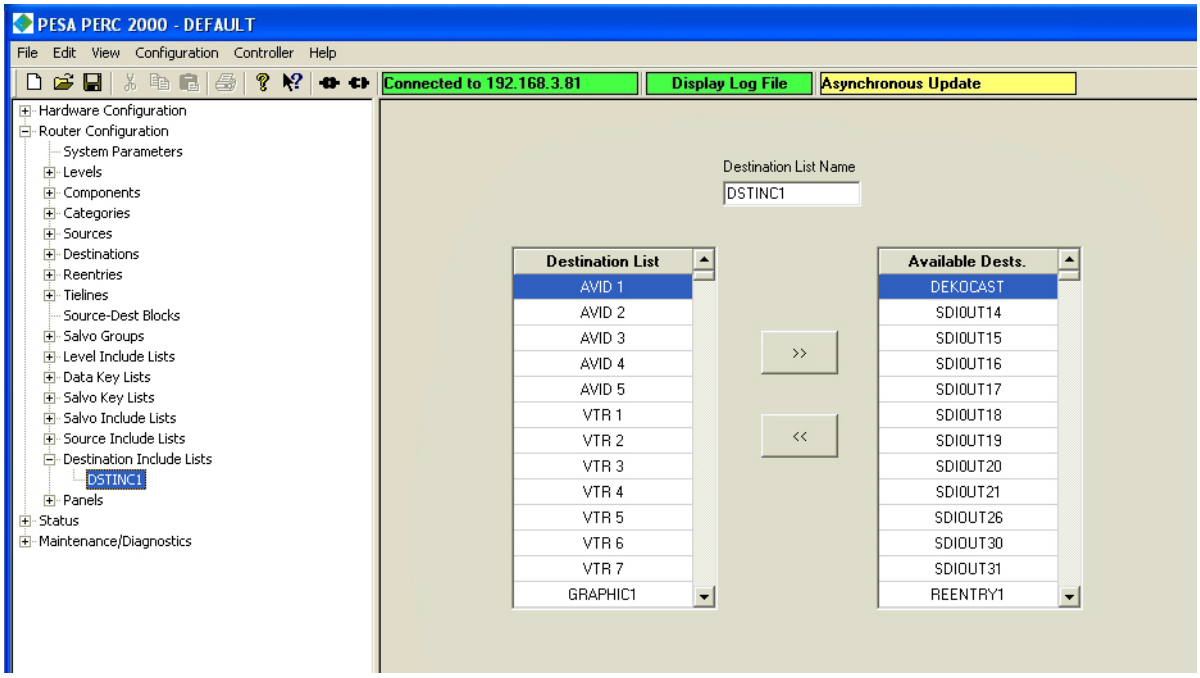


Figure 6-60 Destination Include Lists Data Entry Fields

6.13.17 PANELS CONFIGURATION SCREEN

The Panels Configuration Screen, Figure 6-61, allows you to add remote control panels to the system, program the functionality of each panel, and review the configuration of existing panels. There are several different types of panels in the PESA product family and each panel has a different control and display set. For this reason, text in this manual does not deal with operational procedures or displays of any specific panel type. Refer to the User Guide for the particular panel type for specific information.

Using the P2K system controller, remote control panels may be connected to the controller hardware using either the Remote Control Panel (RCP) bus – a PESA proprietary serial bus protocol – or, for panels so equipped, a standard Ethernet network communicating over a facility LAN. When using the RCP bus each remote control panel must be assigned a unique panel address. This is done by setting a DIP Switch on the rear of the remote control panel. When communicating with control panels over an Ethernet link, each panel must be assigned a unique IP address.

Clicking on the Panels parent entry in the Command Screen Window brings up the panels configuration screen.

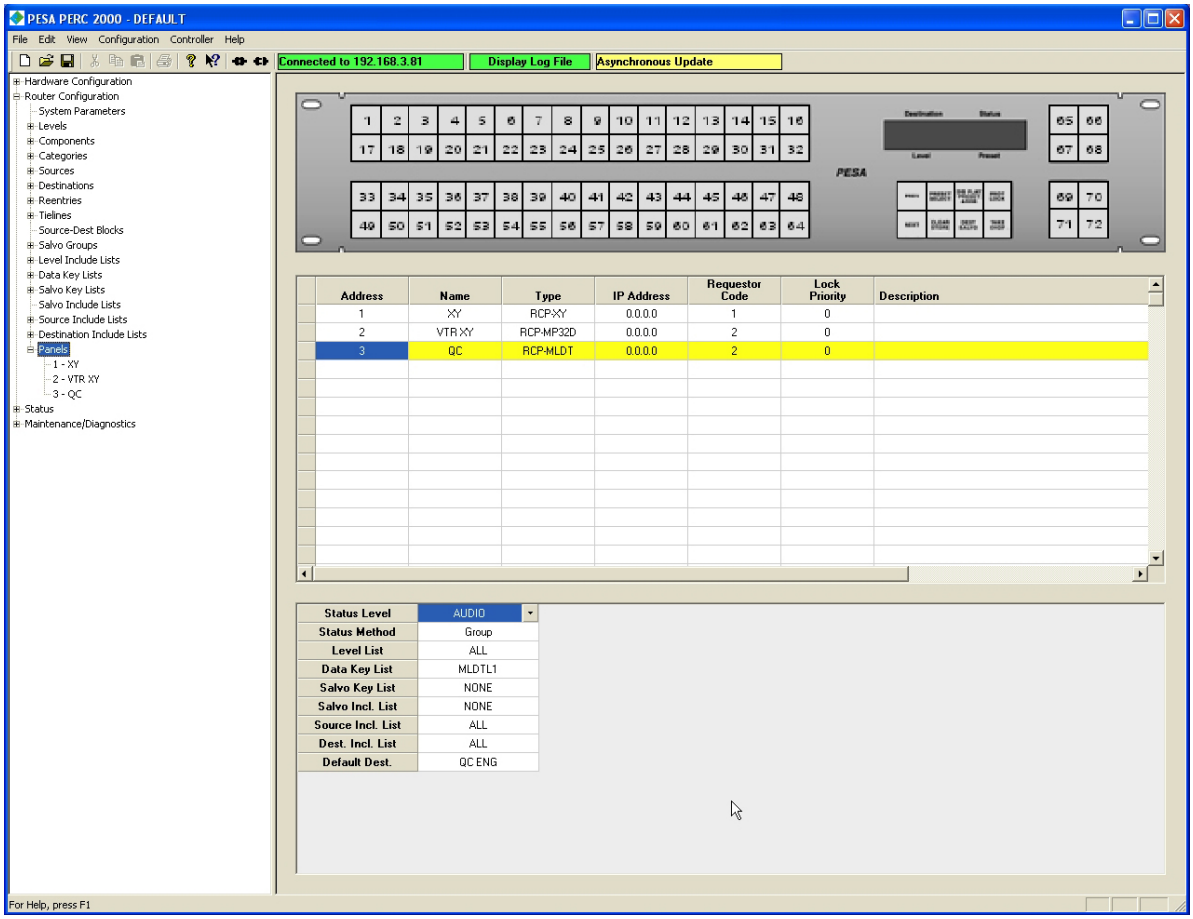


Figure 6-61 Panels Configuration Screen

In the middle of this screen there is a spreadsheet format table, Figure 6-61, with an entry for each remote control panel in the system. If you are starting a new configuration file, this screen will not have any entries until you add panel data. When viewing an existing configuration file, data for the currently configured panels is displayed.

Anytime a panel entry in the listing window is highlighted, a graphic image of the remote control panel is displayed at the top of the configuration screen. If you are adding a new panel to the listing, the graphic image of the panel is displayed once the panel type parameter is selected. Displaying a graphic image allows you to verify the panel type as well as provide a visual cue of the features and functions of the specific panel.

In order to add a remote control panel to the system, right click the Panels parent entry in the Command Screen Window and select the Add Panel option, Figure 6-62, from the pop-up box. A new row is highlighted for entering configuration data of the panel. Order of data entry is not particularly critical, but be aware that the graphic image does not update to the new panel until the panel type is entered in the Type column. Figure 6-63 offers a closer look at the configuration table. Table entries are discussed in the following paragraphs:

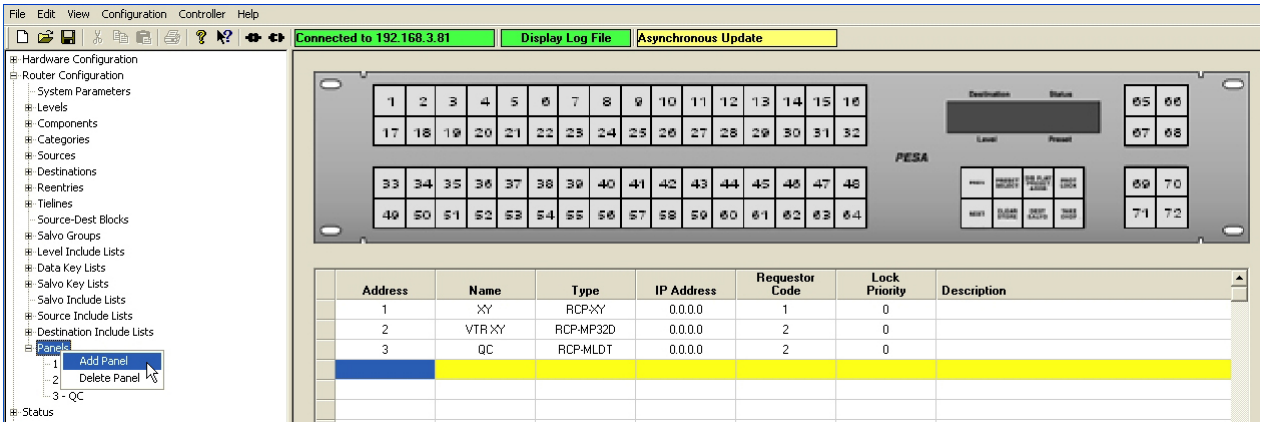


Figure 6-62 Adding A Panel Configuration

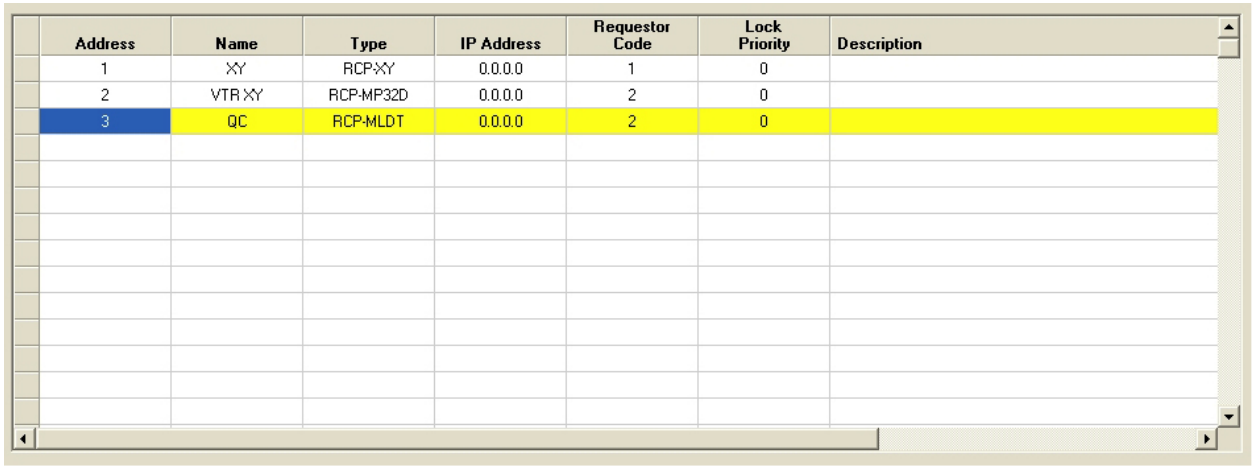


Figure 6-63 Panels Configuration Data Entry Fields

- **Enter Panel Configuration Data**
  - **Address** – Enter the address number assigned to the panel in the Address column. This is a unique number assigned to each remote control panel in the system as set by a DIP Switch on the rear of each remote control panel.
  - **Name** – This entry allows you to assign a name to each remote control panel. A panel name may be up to 8 characters in length and consist of a mix of alphanumeric characters. This is the text string displayed in other configuration and status screens to identify the panel.
  - **Type** – This column allows you to select the panel type using a pull-down menu of all PESA control panel model numbers. Click in the Type cell and open the pull-down menu. Select the model number of the panel you are installing and click the entry. The model number appears in the cell and a graphic image of the panel is displayed on the configuration screen.

- **IP Address** – If the panel you are installing communicates with the P2K Controller over an Ethernet connection, enter the IP Address of the panel in the IP Address column. Each panel must be assigned a unique IP address and also a unique panel identifier address. If the panel you are adding is not an Ethernet panel and uses the daisy-chain RCP control bus, the character string 0.0.0.0 should be entered in this column.

- **Destination Protect and Lock Functions**

  PERC2000 provides two similar methods, *Protect* and *Lock*, by which a user can prevent or control another user's ability to make switches on particular, defined destinations (output signals) by assigning codes and priorities to control panels and control ports in the system. Every remote control panel in the system is assigned a code number, called its Requestor Code; and is also assigned a numerical Lock Priority value as part of the Panels Configuration process.

  A Protect function may be applied to a destination through any remote control panel with lock/protect capability. Once protect is applied, the protected destination can not be switched to a different source by any panel in the system, unless the panel attempting to switch the protected output meets one of these three criteria:

  - Panel originating the protect function can switch the destination.
  - Any panel configured with the same requestor code and an equal lock priority.
  - Any panel with a higher lock priority.

  A Lock function is very similar to protect, and may be applied to a destination through a remote control panel with lock/protect capability. Once a lock is applied, the locked destination can not be switched to a different source by any panel in the system, until the lock is cleared by a panel with the authority to clear it, by meeting one of these criteria:

  - Panel originating the lock function can unlock the destination.
  - Any panel with a higher lock priority.

  The key difference between protect and lock is that when a destination is protected, any panel meeting the criteria to override the protect function operates totally impervious to the protect function and may make switches on the destination just as it would to any other unprotected destination. When a destination is locked, however, no panel may make a switch on the destination until the lock has been cleared from the destination.

- **Requestor Code and Lock Priority Values**

  When panels are configured through the P2K GUI, each panel in the system is assigned a unique address that identifies that panel, and only that panel, on the RCP bus. Each panel with lock/protect capability is also assigned a requestor code value between 1 and 65535, and a lock priority value between 0 and 1023.

  Typically, and by default, the requestor code is assigned the same value as the panel address. However, there may be certain circumstances of an installation that require an exception to this numbering scheme. If you wish to allow two separate panels identical control over a protected destination, you may assign the same requestor code and lock priority to each panel.

Lock priority is a numerical value that determines the rights of a panel to place or remove a lock or override a protect function on a destination. Panels with higher lock priority values have greater control over lock/protect functions. Any panel assigned a lock priority of zero (0) has the highest priority.

Let's look at an example. Suppose you assign a panel a requestor code of 201 and a lock priority of 2, and assume we issue a protect function to a destination through this panel. Since it is the originating panel, it may continue to switch the destination, but other panels in the system may not switch that destination unless the panel attempting to make the switch also has a requestor code of 201 and lock priority of 2, or unless it has a lock priority of 1 or 0, regardless of its requestor code.

Now suppose this same panel issues a lock function to a destination. The lock could only be cleared by the originating panel or by a panel with a higher lock priority. A panel with a lock priority of zero (0) can override and protect function or clear any lock function.

- **Description** – Description is a free text field where you can enter a description of the panel and its function or any other data you wish to enter concerning this panel.

  Once the panel information is entered, enter the specific operational parameters for the panel in the box located beneath the panel, Figure 6-64. Each cell in this table uses a pull-down menu to display the options available. In order to enter or change any selection in the configuration, click in the cell containing the parameter you want to change and click on the pull-down arrow. From the pull-down menu, click on the selection you want to enter for the panel configuration. Note that not all fields shown in Figure 6-64 are pertinent to all panel types. If a panel does not support certain functions, fields pertaining to that function are not displayed.

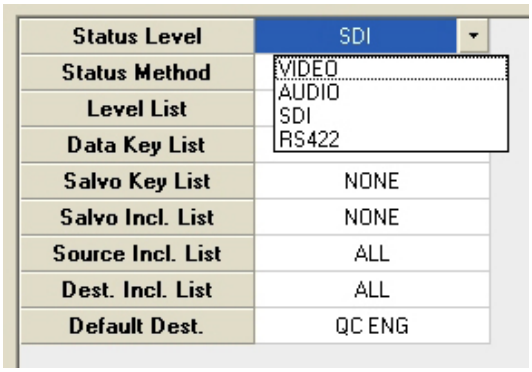


Figure 6-64 Panel Operational Parameters

- **Status Level** – Status Level is the default switching level displayed or controlled by the panel. To assign or edit the Status Level click in the cell and change the level selection from the pull-down menu.

- **Level List** – This entry determines the switching levels authorized for the panel by assigning a Level Include List to the panel. If the panel is authorized for all switching levels, select ALL from the pull-down menu.
- **Data Key List** – This entry determines the function of the configurable panel keys by assigning a Data Key List to the panel. The desired data key list is chosen from the pull-down menu associated with the cell. Only data key lists which are valid for the panel type are included in the pull-down menu.
- **Salvo Key List** – This entry maps salvo group functions to configurable panel keys by assigning a Salvo Key List to the panel. The desired salvo key list is chosen from the pull-down menu associated with the cell. Only salvo key lists that are valid for the panel type are included in the pull-down menu. If there is no valid salvo key list for the panel type, the Salvo Key List row will not appear in the table listing.
- **Salvo Include List** – This entry determines the salvo groups authorized for access by the panel by assigning a Salvo Include List to the panel. The desired salvo include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all salvo groups, select ALL from the pull-down menu.
- **Source Include List** - This entry determines the sources authorized for access by the panel by assigning a Source Include List to the panel. The desired source include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all sources, select ALL from the pull-down menu.
- **Destination Include List** - This entry determines the destinations authorized for access by the panel by assigning a Destination Include List to the panel. The desired destination include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all destinations, select ALL from the pull-down menu.
- **Default Destination** – This entry assigns the default destination to the panel. In operation, the default destination determines which destination is displayed and controlled on initial panel power-up.

Expanding the tree under the Panels parent header in the command tree window opens a listing of named remote control panels, Figure 6-65. If you wish to access the configuration screen for a specific panel, click on the name in the column listing. If you wish to add a panel configuration, right mouse click on the Panels parent header in the command tree window to access a blank configuration screen. To delete a panel configuration, click the panel name in the panel list, right click and select Delete Panel. You will NOT be asked to verify your choice to delete a panel – the action is immediate. Be absolutely sure you want to delete the panel configuration before you click on the delete command.

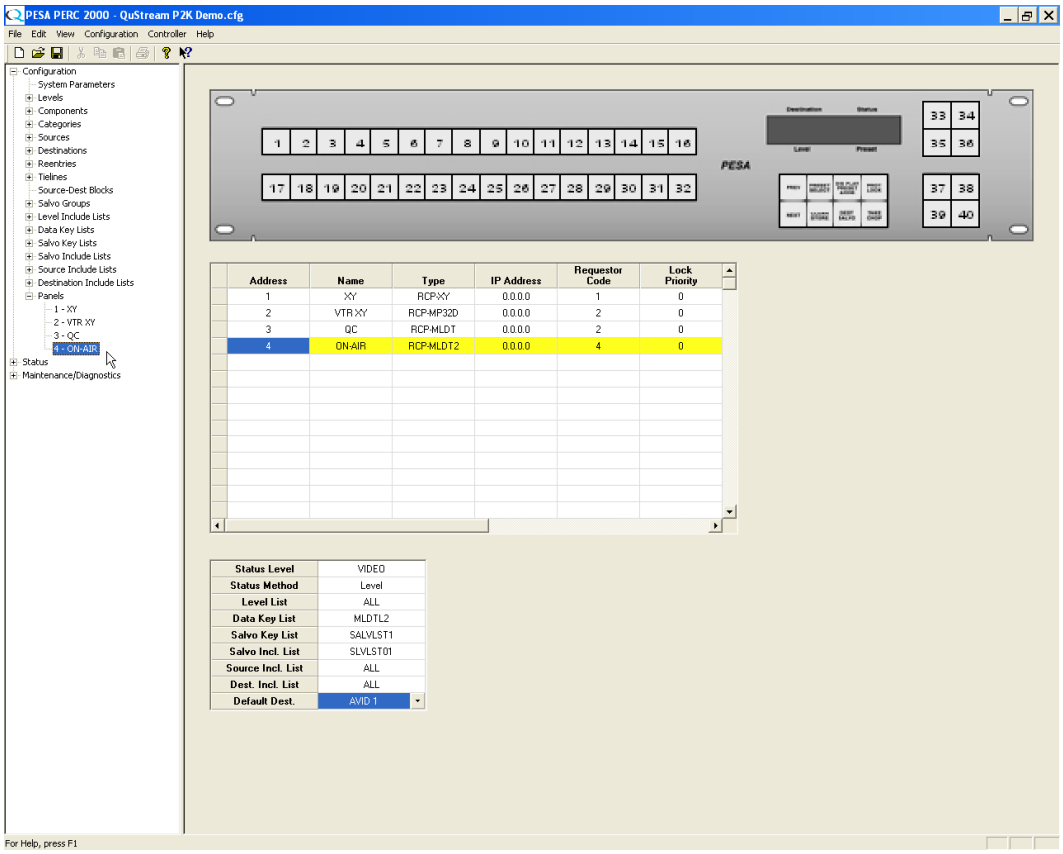


Figure 6-65 Assigned Panel Listing

6.14 INCREMENTAL ADD/EDIT (ON-LINE UPDATE)

Using commands available through the On-Line Update feature of PERC2000, you can make limited changes to the controller configuration on-the-fly, without having to upload, modify and re-load the configuration file. Changes you make to the configuration using this feature are written into on-board system controller memory, and become a permanent part of the configuration until modified or until the configuration file is re-loaded.

6.14.1 CONFIGURATION UPDATE MODES

There are three possible configuration update modes available through PERC2000. The currently active update mode is always indicated by the Update Status Display window located in the Tool Bar, as shown by Figure 6-66. Each mode is discussed in the following paragraphs:

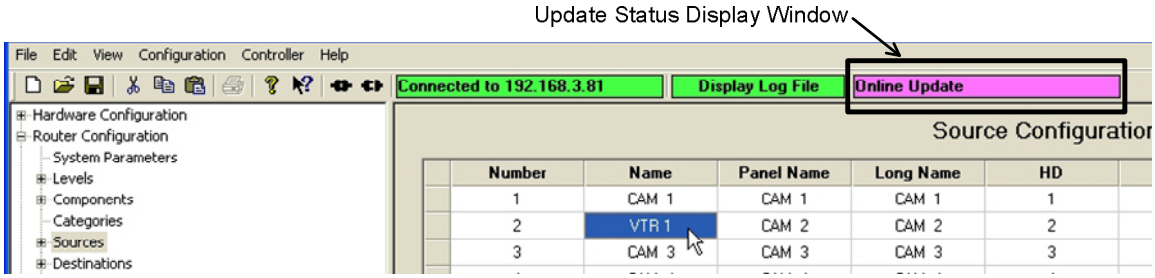


Figure 6-66 Update Status Window

- **Offline Update** – Whenever the P2K GUI is not connected to a system controller (controller offline), the application is, by default, operating in the Offline Update mode as indicated by the message *Offline Update* displayed in the Update Status Display window. Location of this display window is shown by Figure 6-66. In this mode, you may create a new or update an existing configuration and the file may be saved for future download; however, the host PC has no communication with the controller and cannot affect any changes to controller operation.
- **Asynchronous Update** – Anytime the GUI application and the system controller are connected and communicating the application functions in the asynchronous mode as indicated by a yellow background and the message *Asynchronous Update* displayed in the Update Status Display window. The term *asynchronous* is used for this mode to indicate that although the host PC and system controller are communicating, if you make any modifications to the configuration file loaded into the host PC, the file you are modifying and the configuration file currently loaded into the controller are no longer identical, and are therefore *asynchronous* with one another, until the modified configuration file is downloaded to the system controller.
- **Online Update** – Online Update mode allows you to use the incremental add/edit feature of P2K, and affect immediate modifications to the currently active controller configuration. When Online Update is active, the mode is indicated by a purple background and the message *Online Update* displayed in the Update Status Display window, as illustrated by Figure 6-66.

6.14.2 USING ONLINE UPDATE MODE

In order to use Online Update, the configuration file active in the GUI software must initially be the same file as currently loaded into the controller hardware. You may ensure they are the same by uploading the current file from the controller. Anytime the GUI application and the system controller are connected and communicating, and the currently active controller file is loaded into the P2K GUI, you may select the **Online Update** mode from the Controller tab in the menu bar, as shown by Figure 6-67. The message *Online Update* is displayed in the Update Status Display window. Open the View tab in the menu bar and ensure that the **Online Update Bar** selection is checked, as shown by Figure 6-68. When Online Update is active, the Online Update Bar window is displayed beneath the main display window, as shown by Figure 6-69.

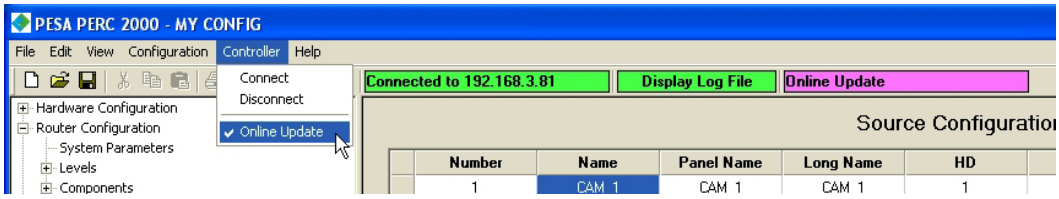


Figure 6-67 Update Mode Display

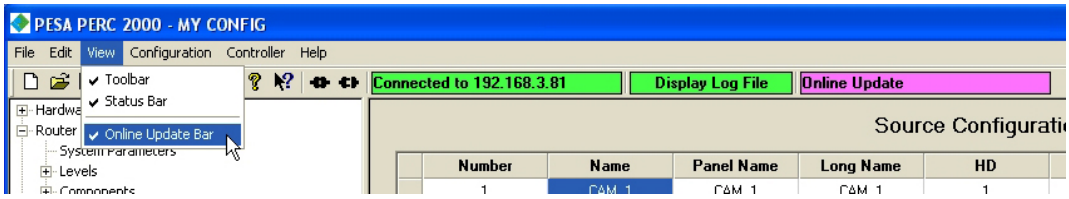


Figure 6-68 Online Update Bar Menu Entry

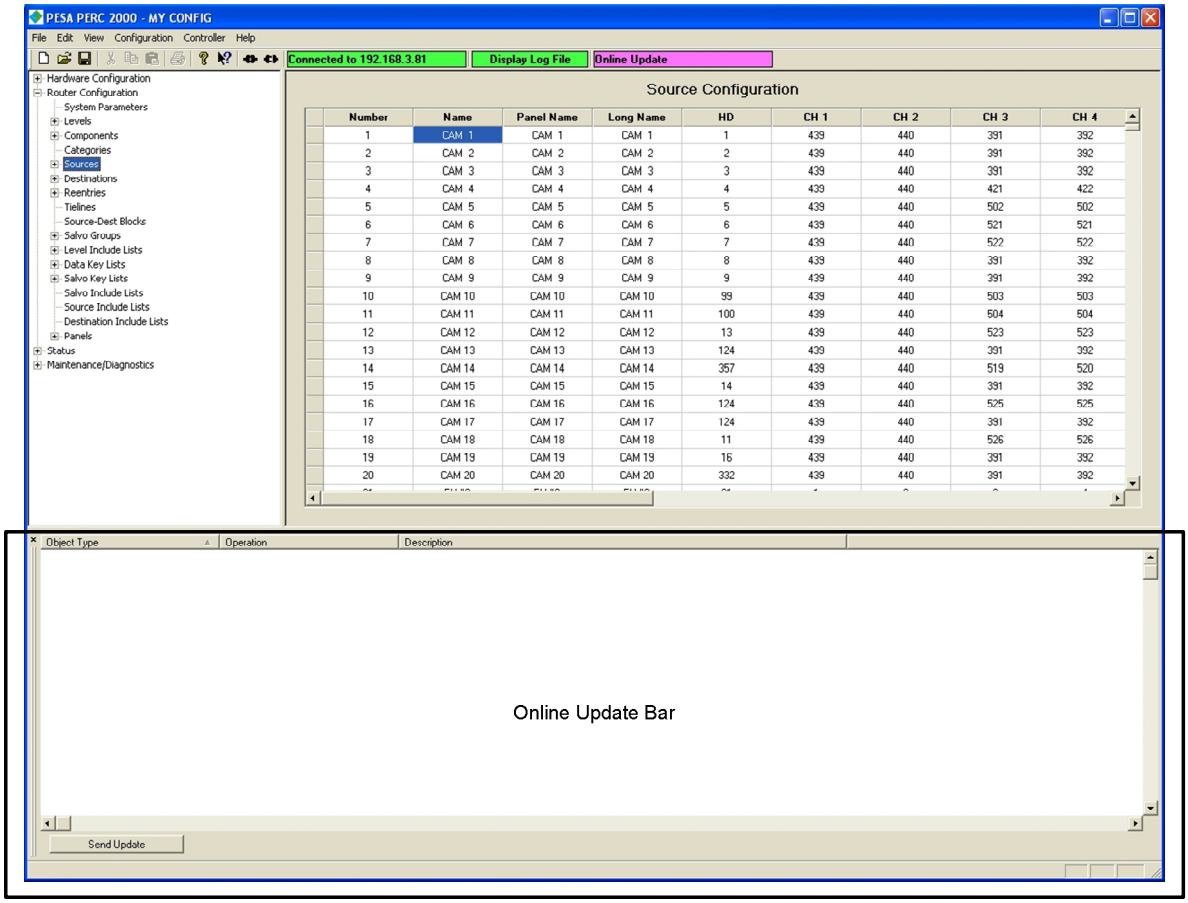


Figure 6-69 Online Update Display Window

Through the online update function, a limited set of configuration commands are available as shown by Table 6-1. As you make additions, modifications or deletions to available configuration parameters, each change you make is listed in the online update bar display area, as shown in Figure 6-70.

Table 6-1 Available Online Update Commands

Configuration Parameter	Add Data	Delete Data	Modify Data
Configuration Information	N/A	N/A	Yes
Levels	No	No	No
Components	No	No	No
Categories	Yes	No	No
Sources	Yes	No	Yes
Destinations	Yes	No	Yes
Reentries	No	No	No
Tielines	No	No	No
Source-Destination Blocks	Yes	Yes	N/A
Salvo Groups	No	No	No
Level Include Lists	Yes	No	Yes
Data Key Lists	Yes	No	Yes
Salvo Key Lists	Yes	No	Yes
Salvo Include Lists	Yes	No	Yes
Source Include Lists	Yes	No	Yes
Destination Include Lists	Yes	No	Yes
Panels	Yes	No	Yes

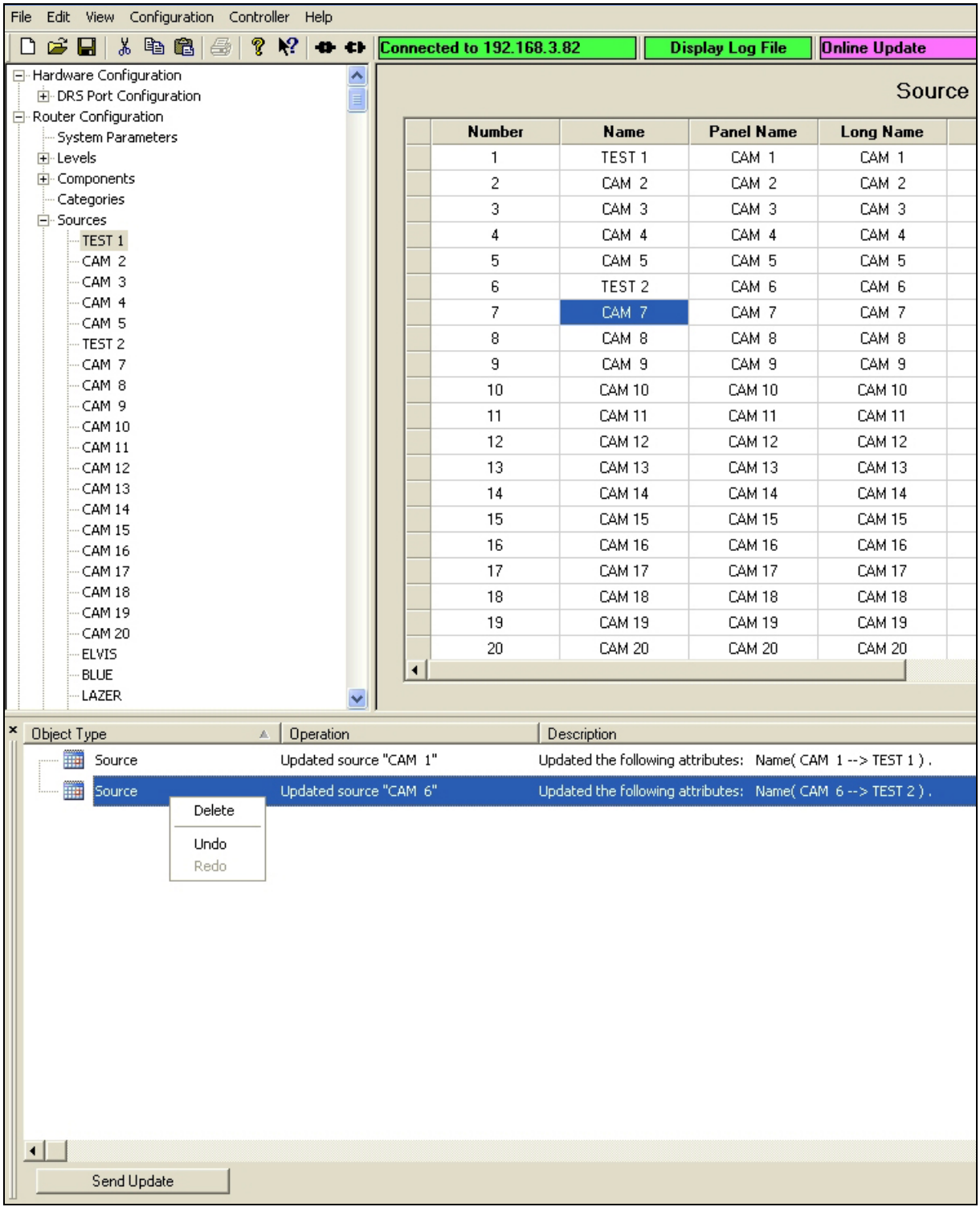


Figure 6-70 Online Update Data Entry

In the example shown, we have changed the entry in the Name column for source number 1 from CAM 1 to TEST 1, and the entry for source number 6 from CAM 6 to TEST 2. These changes appear in the online update display area, as well as the main display grid and source listing under the Sources parent header. Notice that each individual change item is listed on a separate line entry of the update display window. However, the changes you make do NOT become active in the controller until you click the **Send Update** button at the bottom of the update display area.

Highlighting any line in the update display listing selects that line and allows you to use the right-click menu to edit the line using the following options, as shown in Figure 6-70:

- **Delete** – Selecting Delete permanently removes item from the update listing. You will be prompted prior to deletion of the item.
- **Undo** – Selecting Undo immediately removes item from the listing, however, the Undo command is not immediately permanent, and the item can be retrieved using the Redo command.
- **Redo** – Selecting Redo restores items removed with the Undo command. To use the Redo function, move the cursor into the update display window and right-click. Click on the Redo function and the last item deleted is restored. You may continue to click the Redo selection to restore previously removed items in the order they were removed using the Undo command.

To exit Online Update mode or to abort configuration modifications you have entered, remove the check from the Online Update entry under the Controller tab of the Menu bar. If modifications will be discarded by the action, you will be prompted prior to online update mode being closed.

6.15 STATUS COMMANDS

Commands and screens contained in the Status tree header allow real-time status monitoring of the router system. Certain of these screens also allow you to perform on the fly switches directly from the status screen. Since all of the Status functions are polled in real-time, the software application must have an active (on-line) connection to the P2K Controller.

Anytime a user requests a command or screen under the Status header and an active connection to the controller is not established, a pop-up box displays prompting you to select the controller card desired for monitoring. Double click the entry in the box to activate the connection to the card. If desired, you may also connect to a controller card using commands contained under the Controller heading on the menu bar. Click on Controller and select the Connect option.

When all status monitoring functions are completed and you wish to disconnect the software application from the controller hardware, click on the Controller heading on the menu bar and select the Disconnect option from the command list.

Figure 6-71 lists the command headers contained under the Status parent header. Each command is discussed in the following paragraphs.

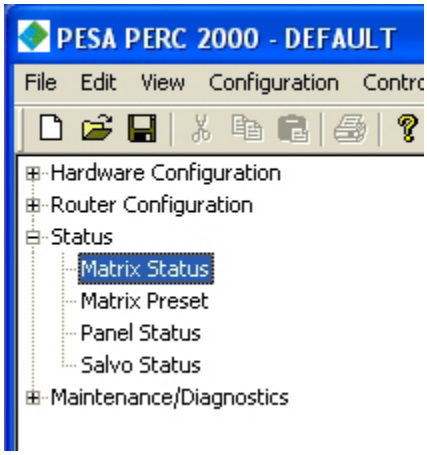


Figure 6-71 Status Commands Menu

6.15.1 MATRIX STATUS

The Matrix Status screen, Figure 6-72, is the top-level default screen of the Status menu. From this screen you can monitor the status of the entire switching matrix, presented in a spreadsheet format of rows and columns. For each listed destination the spreadsheet columns provide the following information:

- **Destinations** – This column is a listing, by name, of every destination in the system as assigned by the Destinations Configuration Screen.
- **Lock** – If a check mark appears in the box, the destination is locked. Destinations can be locked from system remote control panels or from this status screen.
- **Levels** – There is a column for each switching level as assigned by the Levels Configuration Screen.6756

For each destination, the lock status is displayed and the source switched to it is identified by switching level(s). For example, looking at Figure 6-72, the destination named PROD-1 is currently in an unlocked status and the source named ARXB-87 is switched to PROD-1 on the A VIDEO level. A blank indicates no active switch for the indicated level.

A scroll box on the right-hand side of the screen contains a list of all sources by name as assigned by the Sources Configuration Screen. Three click buttons labeled Take, Lock and Unlock are located beneath the scroll box. Using the source list and the click buttons you can make on the fly changes to the matrix configuration. Suppose that while monitoring the matrix status screen, you have a need to change the source of destination PROD-1 from ARXB-87 to ARXB-2 on the A VIDEO level:

- Click the cursor in the cell on row PROD-1 under the A VIDEO column to highlight the cell.
- Locate ARXB-2 in the Sources scroll list and click to highlight the cell and select the source.

A switch may be taken in one of two ways: you may double click on the source entry or click on the Take button. Once the switch is taken, the destination status cell for A VIDEO updates to reflect the new source selection.

Lock and Unlock buttons allow you to lock or unlock a destination. Move the cursor to the cell under the Lock column of the destination you wish to lock or unlock. If the destination is currently unlocked, it may be locked by clicking the *Lock* button; if the destination is currently locked, it may be unlocked by clicking the *Unlock* button.

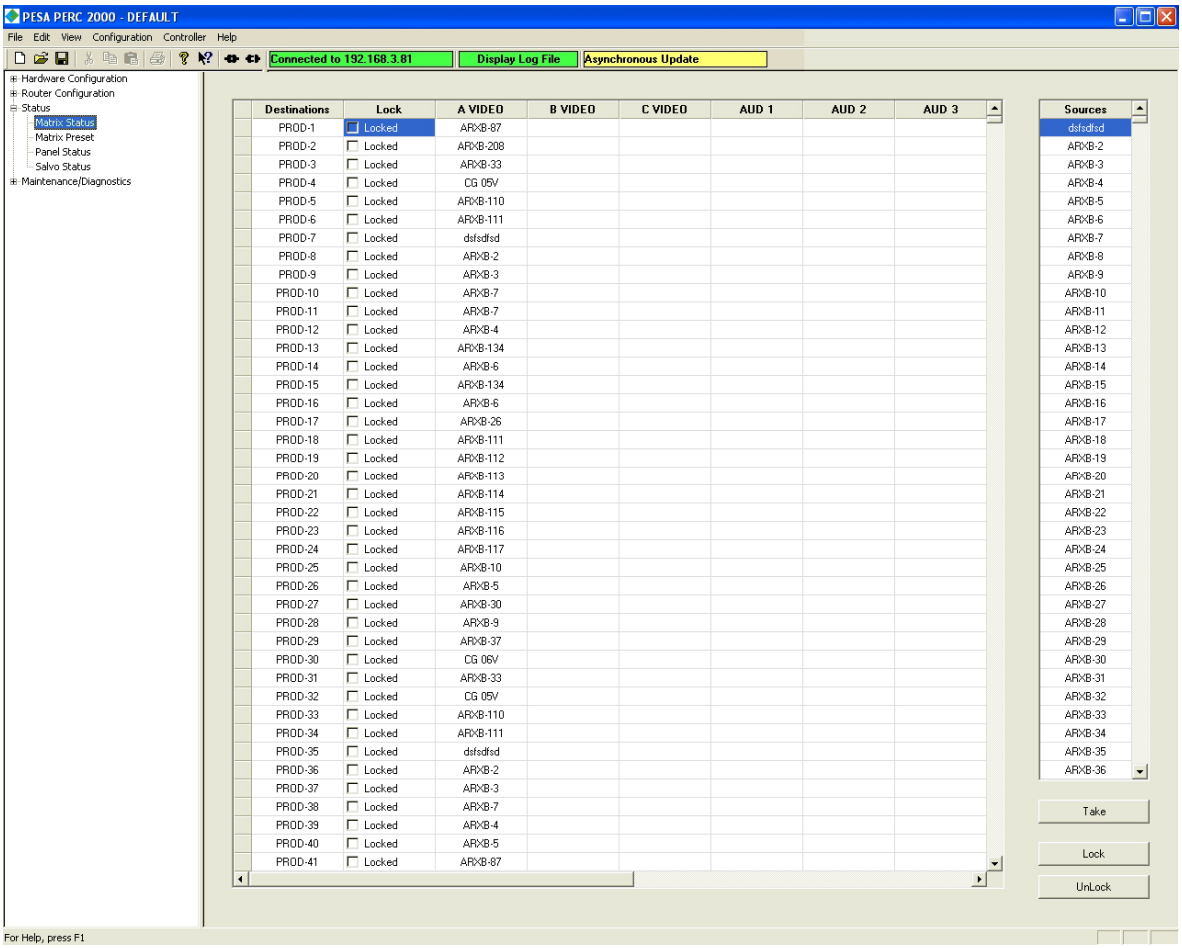


Figure 6-72 Matrix Status Display

6.15.2 MATRIX PRESET

The Matrix Preset screen, Figure 6-73, allows you to preset switches for any valid destination and source pairing in the system. Preset switches can be taken simultaneously or selectively directly from this menu screen.

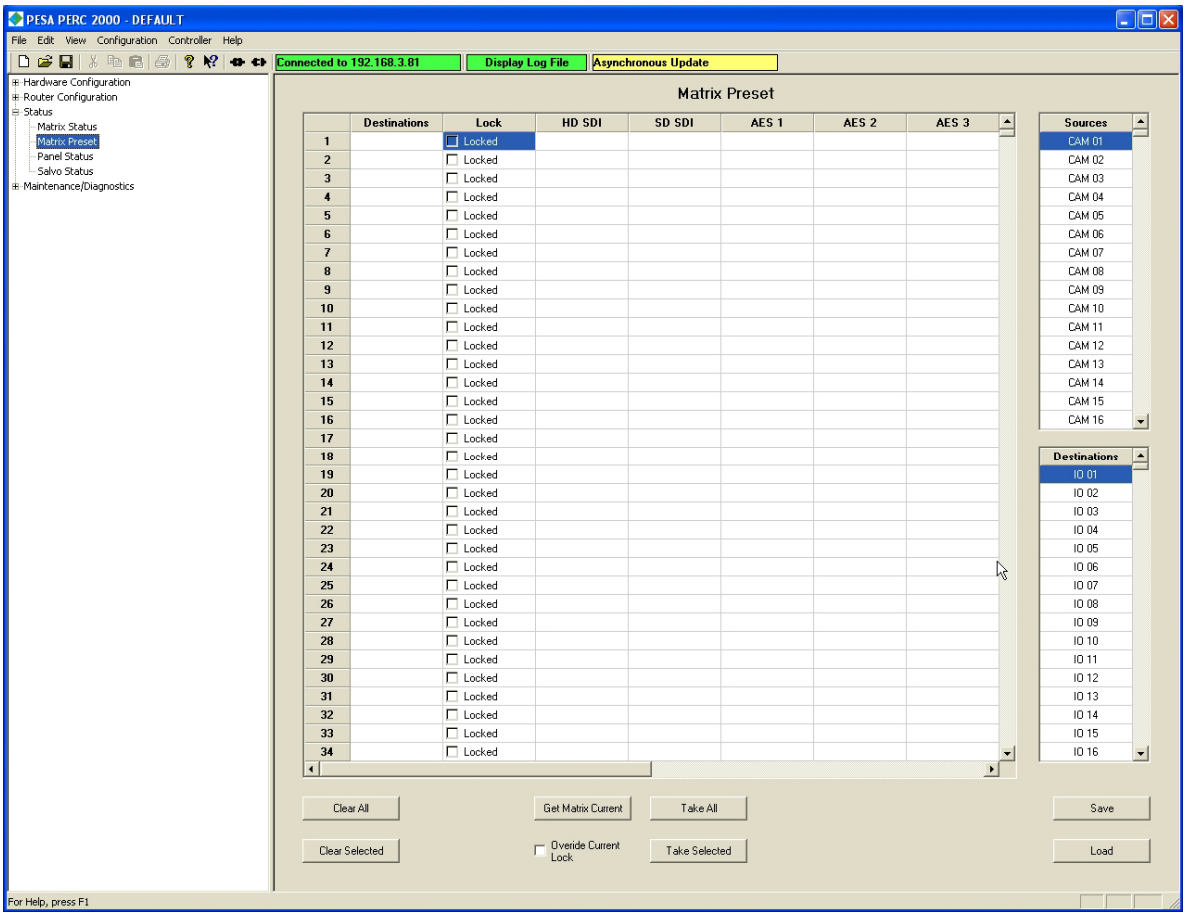


Figure 6-73 Matrix Preset Display

- **To Preset a Switch:**
  - Move the cursor to a clear cell under the Destinations column and click to highlight the cell. Locate the desired destination for the switch in the destinations scroll box and double click the entry. The selected destination name displays in the cell.
  - If you wish to lock the destination once the switch is made, click the box in the Lock column.
  - Move the cursor to the cell under the column of the level on which you wish the switch to occur and click to highlight the cell. Locate the desired Source for the switch in the Sources scroll box and double click the entry to paste the selection in the cell. Repeat this procedure for all switching levels on which you wish the switch to occur.
  - Repeat the previous steps to define other destinations, sources and levels on which you wish to take a switch.
  - Pressing the Take All button causes all the preset switches to occur simultaneously.
  - Switches can be selectively chosen by highlighting one or more destination cells and pressing the Take Selected button.

- **Clear All** - Clears all preset entries from the screen.
- **Clear Selected** - Clears only highlighted presets from the list.
- **Get Matrix Current** - Polls the controller card and displays the current status of the switch matrix.
- **Override Current Lock** – If you have preset a switch combination that will modify a currently locked switch, checking this box temporarily overrides the lock, allows the preset switch and re-locks the path.
- **Take All** – Clicking this button executes all switches entered on the matrix preset screen.
- **Take Selected** – Clicking this button executes only switches that are highlighted on the matrix preset screen.
- **Save** – Saves the current preset matrix screen for future use.
- **Load** – Loads a saved preset matrix file.

6.15.3 PANEL STATUS

The Panel Status screen, Figure 6-74, displays the current status of all remote control panels in the router system. Each entry in the spreadsheet is described below:

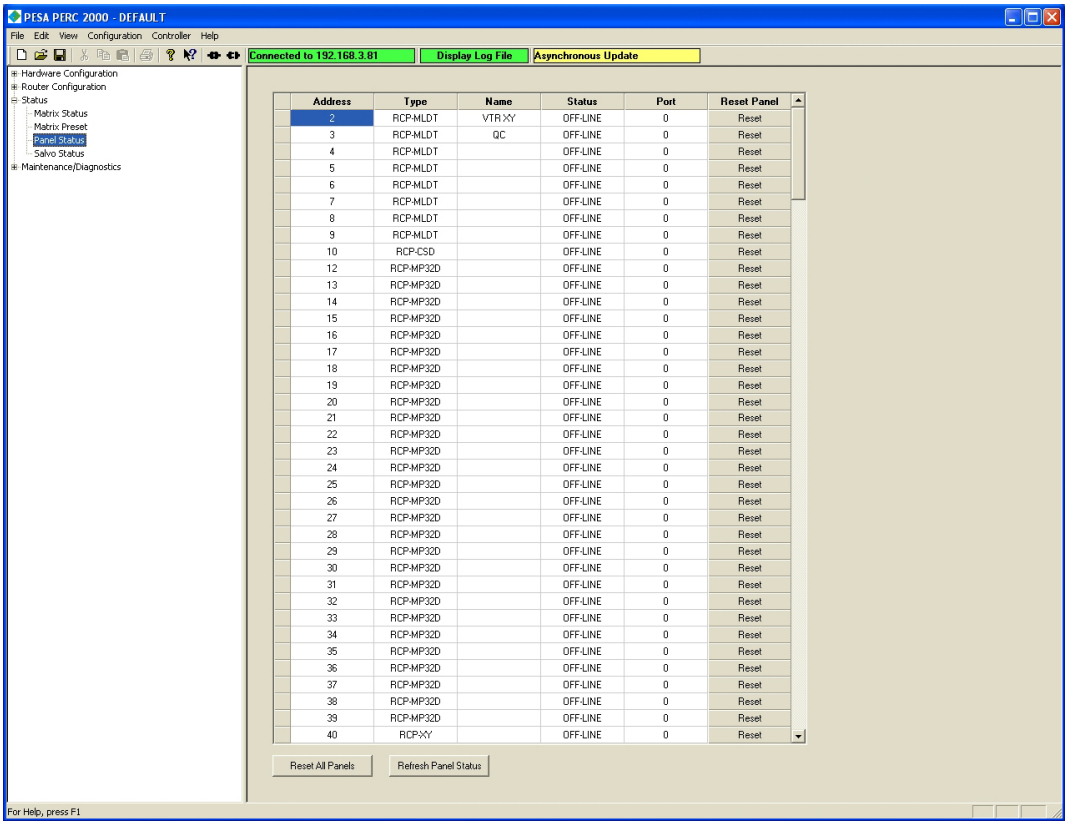


Figure 6-74 Panel Status Display

- **Address** – Displays the active address of the panel.
- **Type** – Indicates the panel type
- **Name** – Displays the name assigned to the panel through the Panels screens.
- **Status** – Indicates whether the panel is currently online and communicating with the system controller or offline.
- **Port** – Indicates to which of the RCP port links the panel is attached.
- **Reset Panel** – Clicking this button performs a hardware reset on the indicated panel.
- **Reset All Panels** – Clicking this button issues a hardware reset command to all panels in the router system.
- **Refresh Panel Status** – Clicking this button causes the GUI application to re-poll the status of all remote control panels.

6.15.4 SALVO STATUS

The Salvo Status screen, Figure 6-75, displays the current status of all salvo groups in the router system.

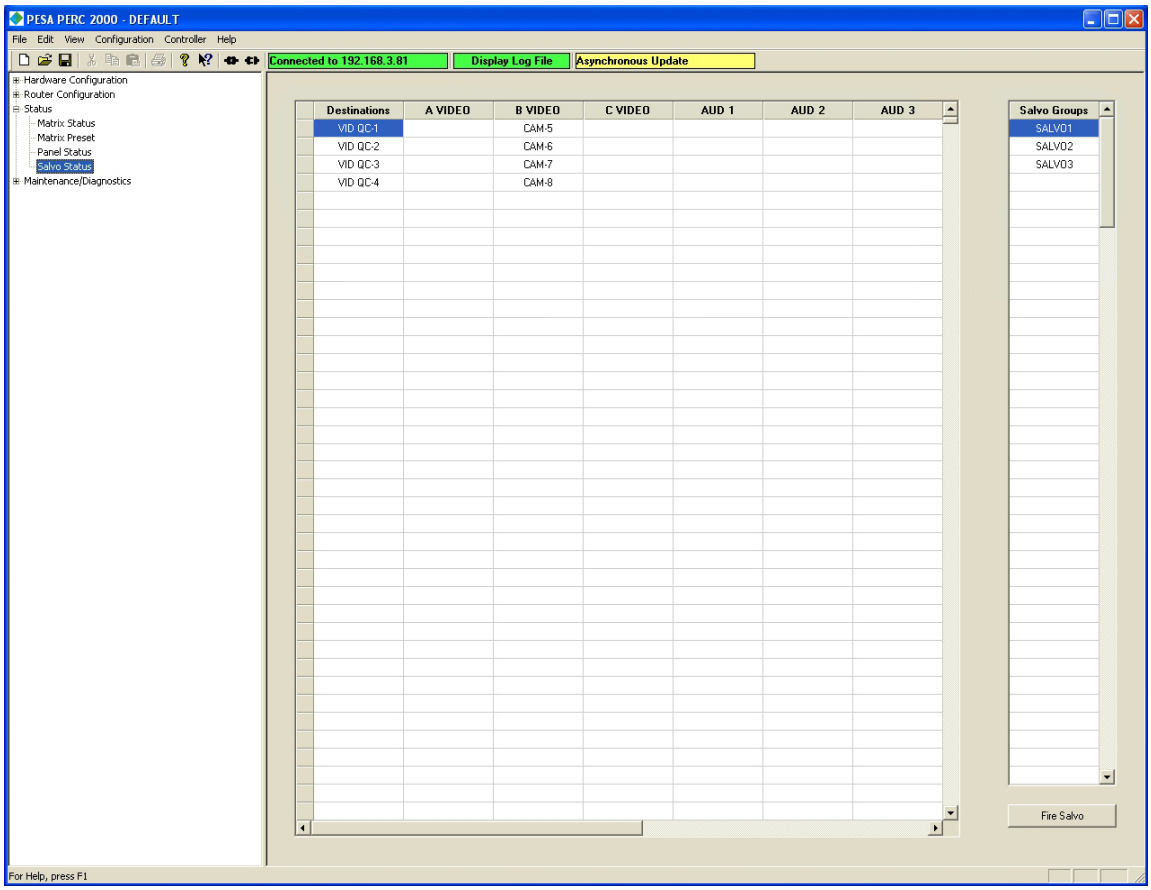


Figure 6-75 Salvo Status Display

Selecting an entry in the Salvo Groups listing displays the destinations and sources, by switching level, contained in the salvo group. You may immediately "take" the salvo group by clicking the **Fire Salvo** button.

6.16 MENU BAR

Menu bar tabs for the PERC2000 GUI are very similar to those of other Microsoft Windows® based applications. Application-specific tabs and functions are discussed in the following paragraphs:

6.16.1 FILE MENU

Figure 6-76 illustrates commands available from the P2K File menu.

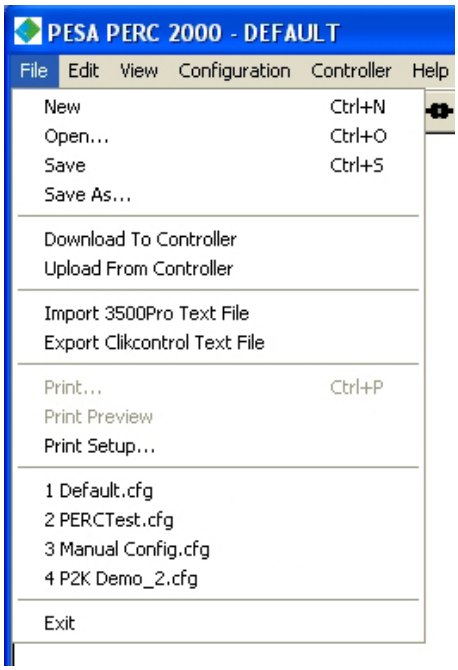


Figure 6-76 File Menu

- **New** – Opens a "clean slate" configuration. If a configuration is currently open when the new command is selected, you will be prompted to verify the request before the current configuration is closed.
- **Open** – Allows you to select and load a stored configuration file.
- **Save** – Saves the current configuration under the current filename.
- **Save As** - Saves the current configuration under a filename of your choosing.
- **Download To Controller** – Downloads the currently open configuration to the system controller. Currently active controller configuration will be deleted from controller memory and replaced with the downloaded file.

- **Upload From Controller** – Reads and opens the configuration file currently stored in system controller memory.
- **Import 3500Pro Text File** – Imports a legacy configuration text file generated by PESA's 3500PRO System Controller GUI.
- **Export ClikControl Text File** – Generates a file that may be loaded to PESA's ClikControl internet controller system.
- **Print Commands** – Standard Microsoft Windows® printer commands
- **Recently Opened Files** – Allows you quick access to recently opened configuration files by filename.
- **Exit** – Exits the P2K GUI application.

6.16.2 EDIT MENU

Figure 6-77 illustrates commands available from the P2K Edit menu.

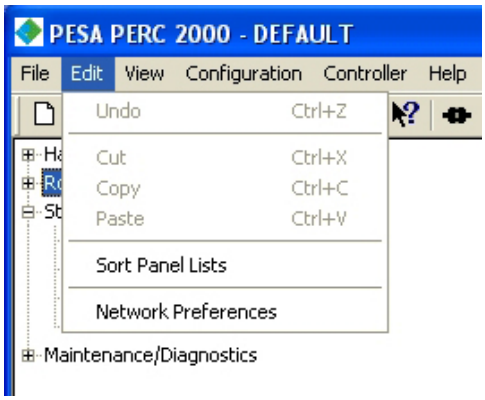


Figure 6-77 Edit Menu

- **Undo, Cut, Copy, Paste** – Standard Microsoft Windows® commands.
- **Sort Panel Lists** – A toggle function that determines the sorting and scrolling order of list items displayed on remote control panels equipped with displays. When this selection is unchecked (default), scrolling through panel lists on remote control panels displays the list items in the same sequence they are displayed on the definition and status screens of the GUI menus. Clicking on this entry selects an alphabetical sorting option where panel lists entries are displayed in alphabetical order by name as you scroll through the various lists. When alphabetical sorting is selected, a check mark appears next to this item in the Edit menu. Clicking the entry when a check is present toggles the sort function and returns the panel display to sequential display rather than alphabetic display. Either selection made for this menu entry is not panel-specific, and determines the sorting order for all display-capable remote control panels in the router system.

NOTE	**Clicking the *Sort Panel Lists* entry in the Edit menu causes the list sorting method to immediately change on all display-capable remote control panels. It is NOT necessary to download a revised configuration file to the system controller to toggle this display function.**

- **Network Preferences** – Allows you to configure network parameters for the GUI application. Refer to Paragraph 6-3 of this User Guide.

6.16.3 VIEW MENU

Figure 6-78 illustrates commands available from the P2K View menu.

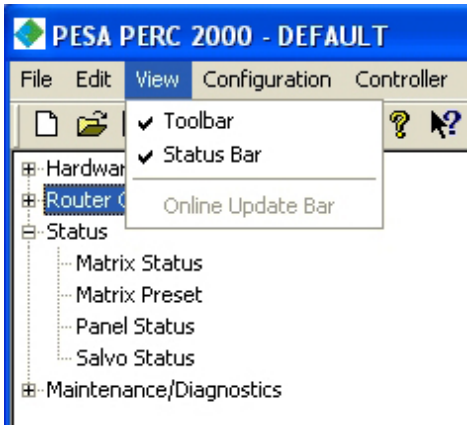


Figure 6-78 View Menu

- **Toolbar and Status Bar** – Shows or hides the Microsoft Windows® Toolbar or Status Bar.
- **Online Update Bar** – Shows or hides the Online Update Bar.

6.16.4 CONFIGURATION MENU

Functions listed under the Configuration tab are not active in current releases of the PERC2000 GUI application and are shown grayed-out. These are for future product implementation.

6.16.5 CONTROLLER MENU

Figure 6-79 illustrates commands available from the P2K View menu.

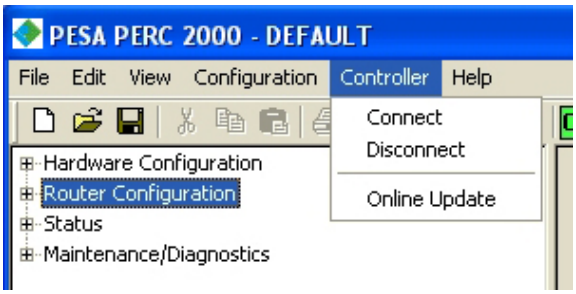


Figure 6-79 Controller Menu

- **Connect** – Opens a listing of available system controller cards.
- **Disconnect** – Closes the communication link between the host PC and the system controller card.
- **Online Update** – If the GUI is actively connected to the P2K system controller, checking this selection activates the online update function. Refer to Paragraph 8.10 of this User Guide.

6.16.6 HELP MENU

Figure 6-80 illustrates commands available from the P2K Help menu.

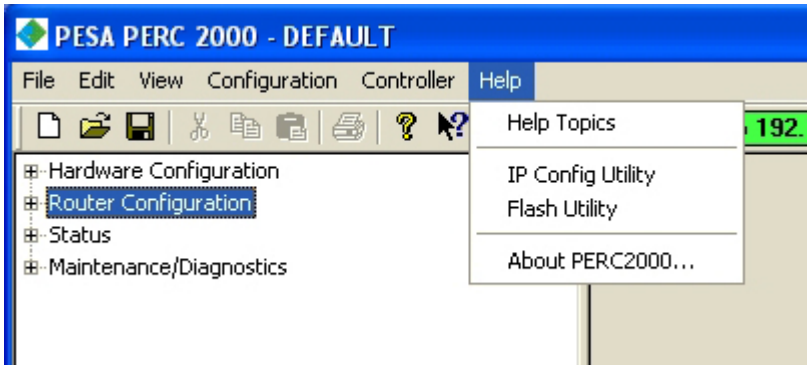


Figure 6-80 Help Menu

- **Help Topics** – Not active in current releases of the PERC2000 GUI application.
- **IP Configuration (Config) Utility** – Functions available through the IP Config Utility allow you to change the base IP address of a PERC2000 system controller. Refer to Paragraph 6-5 of this User Guide.
- **Flash Utility** – This function allows you to download flash memory updates to various PESA devices in the router system. Selecting the Flash Utility function opens the Flash Utility menu screen as shown by Figure 6-81.

Notice there are three areas of the menu screen:

- The upper area lists by IP address and Device Type, the system components on which you may perform firmware updates. Click to highlight the item you wish to update.
- The center area identifies the specific hardware items within the selected system device that contain firmware which can be updated through the GUI. Locate the specific hardware item in the listing and click to select that item for updating.
- The lower area lists the firmware modules contained in the selected device. Select the module you wish to update and click *Update Flash* under the **Module Update** column to continue with the update process. Once you have completed all desired flash updates to PESA hardware, click the *OK* button to close the box.

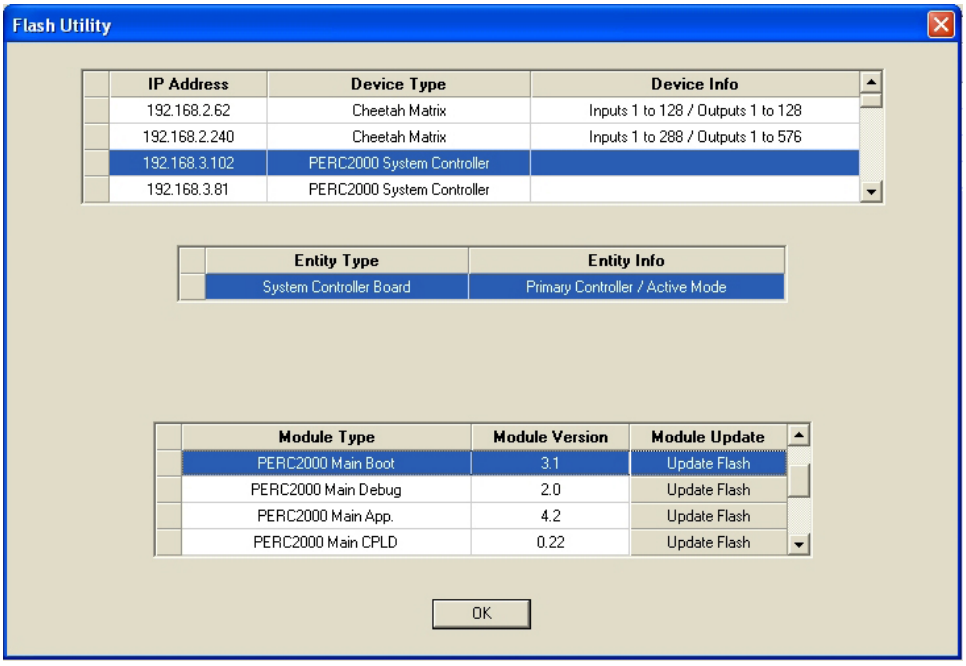


Figure 6-81 Flash Utility Menu Screen

- **About PERC2000** – This entry opens a display banner that identifies the current version of the PERC2000 control software loaded onto the host PC.

Chapter 7 – PERC2000 Operation Using Cattrax Control Software

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 or later, you must use Cattrax Version 3.0, or later, for proper interface operation. Beginning with these operating software versions, the switching level and component control screens and the source and destination numbering methodology used for system configuration have been changed.** **Beginning with Paragraph 7.15, system changes resulting from the software and firmware changes, as well as operator interface screens and operating procedures applicable to Version 5.0 and later system controllers are introduced. If you are configuring a Version 5.0 or later controller, PESA recommends that you familiarize yourself with these changes before continuing with the following discussions.** **Unless otherwise indicated in the following paragraphs, the screen and operating procedure presented is valid for system controllers with previous and current firmware versions.** **If you are using Cattrax Version 3.0 or later to configure a system controller loaded with firmware *prior* to Version 5.0, the operator interface screens and operating procedures presented in the following paragraphs are applicable.**

7.1 INTRODUCTION

Designing and configuring a routing switcher system requires a thorough working knowledge of the hardware components and the operational modes and functions available to the user. This discussion of the Cattrax control application assumes the user has the knowledge of switching functions and terminologies required to configure a system using the various commands and screens introduced in the following paragraphs.

Through Cattrax you can view real-time status of virtually every aspect of router operation, modify many system operating parameters, issue manual switches on individual or multiple destinations, create new, or modify existing, router configuration files for the system controller, plus many other control and system monitoring functions.

The configuration file loaded into the PERC2000 system controller is where the actual signal switching functions for the entire router system, such as signal input/output assignments, signal names and aliases, switching levels, components and other special router functions are defined for the system. Through Cattrax you can create application-specific files that define all operational aspects for the router. Once created, a configuration file can be stored, edited or downloaded to the system controller device to become the active operating router configuration.

Be aware that system changes you can make through the commands and screens discussed in the following paragraphs configure virtually all operational aspects of the router system. Mistakes or erroneous entries made in many of the following programming steps can cause serious problems ranging from incorrect sources being switched to total shutdown of the entire system. Be sure you know exactly what you want to do before you make changes to the system configuration.

7.2 CATTRAX CONTROL SOFTWARE

Cattrax is a multi-system application that communicates with, and controls, many different types of PESA equipment; it incorporates data files for specific equipment into the software structure that contain equipment-specific interface screens, configuration parameters and control functions. In order for Cattrax to "discover" and communicate with a PERC2000 system controller, or any other piece of PESA equipment, the proper data file must be present in the version of Cattrax used.

Cattrax automatically searches for PESA equipment on the network and when a piece of equipment is detected, the application establishes communication with the equipment and lists it as an active device in the Devices View window.

If Cattrax is not already installed on the host PC, refer to the Cattrax User Guide and follow the procedure to install and set-up the control software.

During installation of Cattrax, an icon is placed on the PC desktop. You may start the application by clicking on the desktop icon, or by navigating to the folder containing the Cattrax program files and clicking on the ***Cattrax.exe*** file. When Cattrax is first started an application interface similar to the one shown in Figure 7-1 is displayed on the host PC monitor and Cattrax begins searching the network for PESA equipment with which it can communicate. As the search process continues, a listing of PESA devices it locates is displayed in the Devices View window.

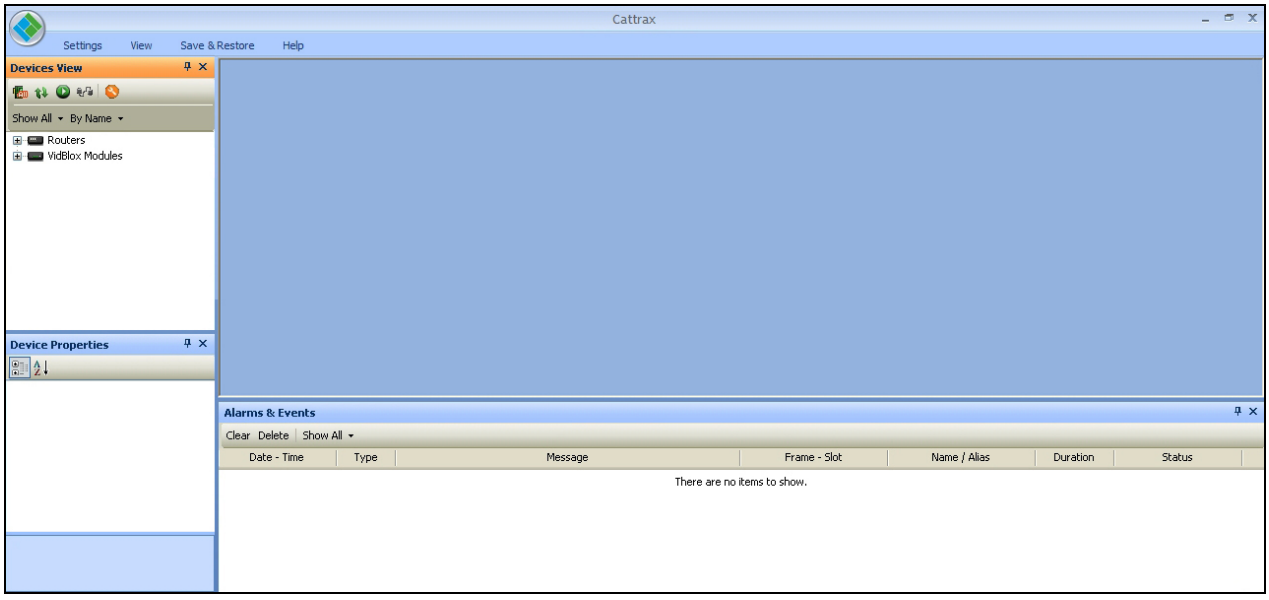


Figure 7-1 Cattrax Main Display Screen

7.3 NAVIGATING CATTRAX DISPLAY SCREEN

As shown in Figure 7-2, the Cattrax display screen is divided into five major functional areas: Menu Bar, Devices View Window, Device Properties Window, Menu Display Window and Alarm and Events Window.

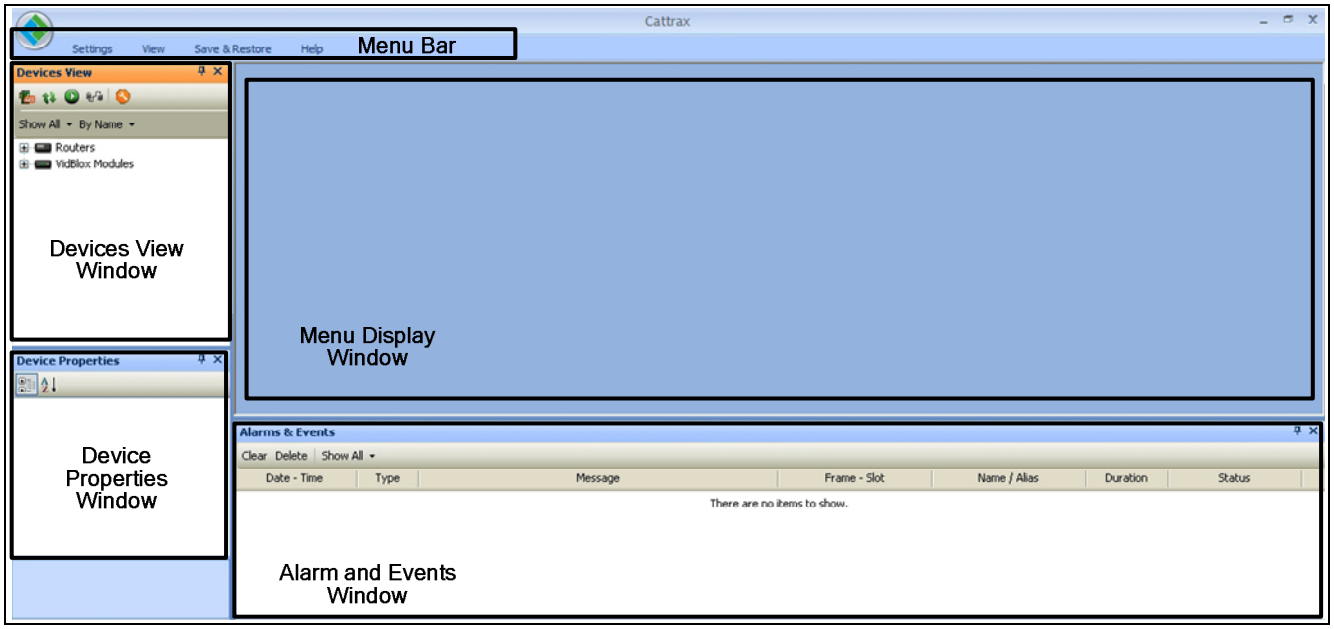


Figure 7-2 Cattrax Main Display Screen

7.3.1 MENU BAR

The Menu Bar functions in a similar manner to other Microsoft Windows® based programs; application specific commands are discussed in detail where appropriate in the operating guide paragraphs.

7.3.2 DEVICES VIEW WINDOW

Cattrax' Devices View window, Figure 7-3, identifies PESA devices on the network. Depending on the view mode selected, Cattrax can display devices that have previously been connected to the network, even if they are currently not active. Also depending on the view mode, devices may be displayed in groups by device type as shown. Notice that the heading *Routers* appears in the menu tree with a branch to a DRS Audio router. When a PESA device is connected to the network, and communication is established, the device ID is displayed as a branch of the menu tree in bold letters. If the *Show Active* mode is selected, only active devices are listed. When the *Show All* view mode is selected the name of devices that have been "discovered" previously but are not currently under active control appear in the menu tree in gray letters; and continue to appear in the menu trees until they are manually removed. You may obtain more information on viewing modes and other operational features and functions of Cattrax by referring to the User Guide for the software application.

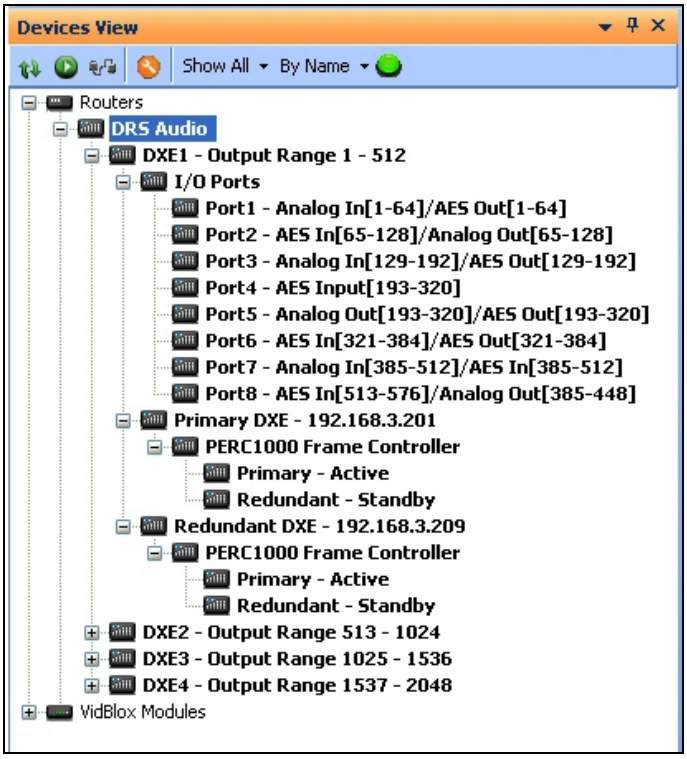


Figure 7-3 Example Devices View Window

7.3.3 DEVICE PROPERTIES PANEL

Operational characteristics for the device selected in the Devices View panel are displayed in this panel. Properties such as IP address of the device and other data related to selected device are displayed.

7.3.4 MAIN DISPLAY PANEL

Operational characteristics, configuration, or controls for the menu item selected in the Menu Tree listing are displayed in the Main Display panel. Control and display functions used in this panel follow standard Microsoft Windows® operating system protocol.

7.3.5 ALARMS AND EVENTS WINDOW

The Alarms and Events Window, Figure 7-4, displays flags when a defined alarm condition occurs or when a defined event occurs within the system. Notice from the example screen that when Cattrax establishes connection with a device, it is flagged as an event; as is disconnecting a device from the network. When a device is discovered and flagged as connected, its identity appears in the Devices View window in bold letters.

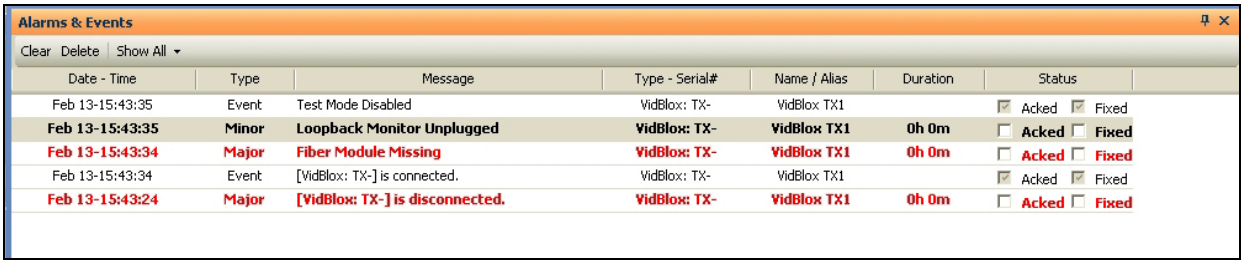
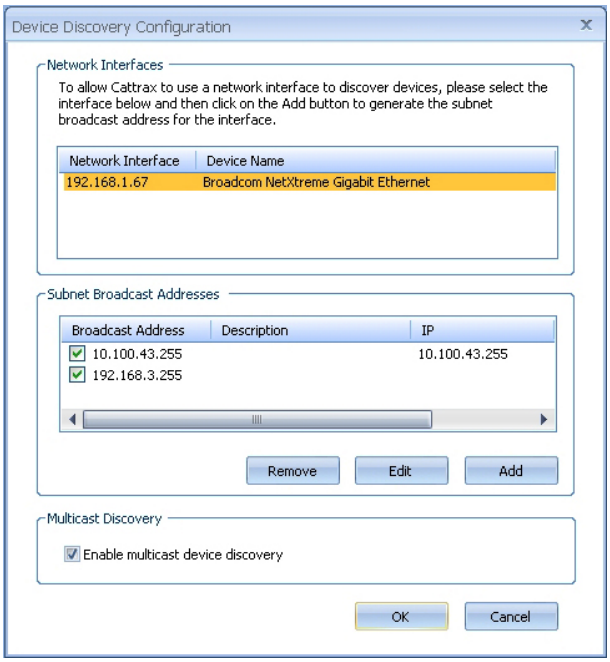


Figure 7-4 Example Alarms and Events Window

7.4 NETWORK CONFIGURATION WITH CATTRAX

In order for Cattrax to communicate with PESA equipment, the network interface device used by Cattrax must be actively connected to the subnet, or multiple subnets, containing equipment you wish to control. When communicating on a subnet containing PESA network controllable devices, Cattrax should immediately begin the search and discovery process for all devices configured for the same subnet. In some installations, PESA devices may reside on subnets different from one another within the network. Cattrax allows you to easily select both the network interface device it uses and the subnets on which it communicates through the ***Network Preferences*** tab under the ***Settings*** menu.

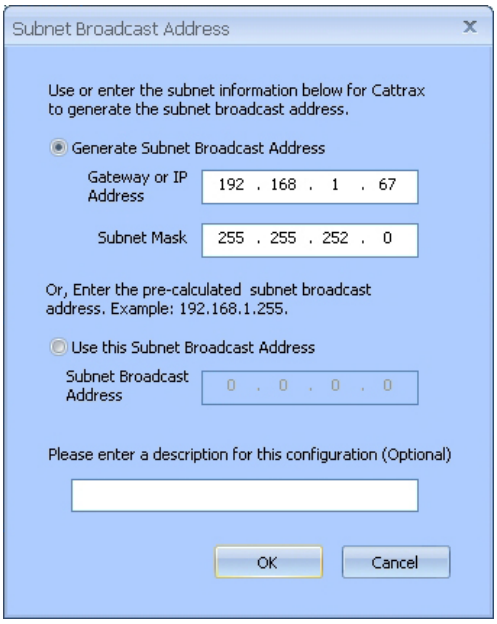
To view or modify current network communication parameters for Cattrax, click the Network Preferences tab under the Setting menu in the Cattrax menu bar to open the Host Network Configuration screen as shown in the illustration below.



The upper area displays by IP address and name the network interface devices available to Cattrax. In many installations there is only one entry in the window and by default this would be the device used by Cattrax. If there are multiple entries, as would be the case, for example, if the host PC contains both an Ethernet NIC and a wireless adapter, the device Cattrax is currently communicating through is shown highlighted. You may select the network interface device you wish Cattrax to use by double-clicking the entry in the listing. Be sure that the network interface device you select is communicating over the subnet(s) containing all PESA devices you wish to control.

Subnets currently available to Cattrax are listed in the middle area of the screen under the Broadcast Address column. A check in the box beside an entry indicates that Cattrax is actively communicating over that subnet and will automatically discover PESA devices on the subnet. If you wish to prevent Cattrax from communicating over a specific subnet, click the checkbox to remove the check. If you need to add additional subnets or modify address parameters of currently available subnets use the buttons to the right of the display window as follows:

- **Add** – allows you to add subnets to the list of those available. Clicking the Add button opens the screen shown here.



Enter the IP and Subnet Mask data for the subnet address you wish to add. You may use the text box at the bottom of the pop-up to enter a description of the subnet. Click **OK** to enter the parameters. The new entry is added to the listing and a check is placed in the checkbox to activate the new subnet.

- **Edit** – allows you to modify address parameters of any entry in the listing. Highlight the entry you wish to modify and click the Edit button. The Subnet menu is displayed with current parameters for the entry listed. Make any changes you wish and enter OK to commit the changes.

- **Remove** – allows you to remove any subnet from the listing. Highlight the entry you wish to delete and click the Remove button. The entry is immediately removed from the listing.

The lower area of the screen contains a checkbox that allows you to disable the Multicast device discovery function that allows Cattrax to automatically locate PESA devices in multiple subnets. Default selection for this function is ***Enabled*** as indicated by a check in the box. **This option should not be disabled under normal use**. Multicast discovery should be disabled only if Cattrax is not required to discover devices in the local subnet (the same subnet as the PC running Cattrax). If it is ever necessary to disable Multicast capability, click the checkbox to remove the checkmark. If Multicast is disabled, the local subnet entry in the subnet configuration window (middle area of screen) should be deselected as well.

When you have the network parameters properly configured, click the **OK** button to select the new configuration and exit the dialog box, or click **Cancel** to exit the box without making changes.

7.5 PERC2000 DEVICES VIEW ENTRIES

When a PERC2000 system controller is discovered on the network, its assigned name is added under the Routers parent header in the Devices View window, and a listing of control and status menus available for the component is displayed in the Menu Tree window, as shown by Figure 7-5 using the name DemoRoom-P2K as an example menu entry.

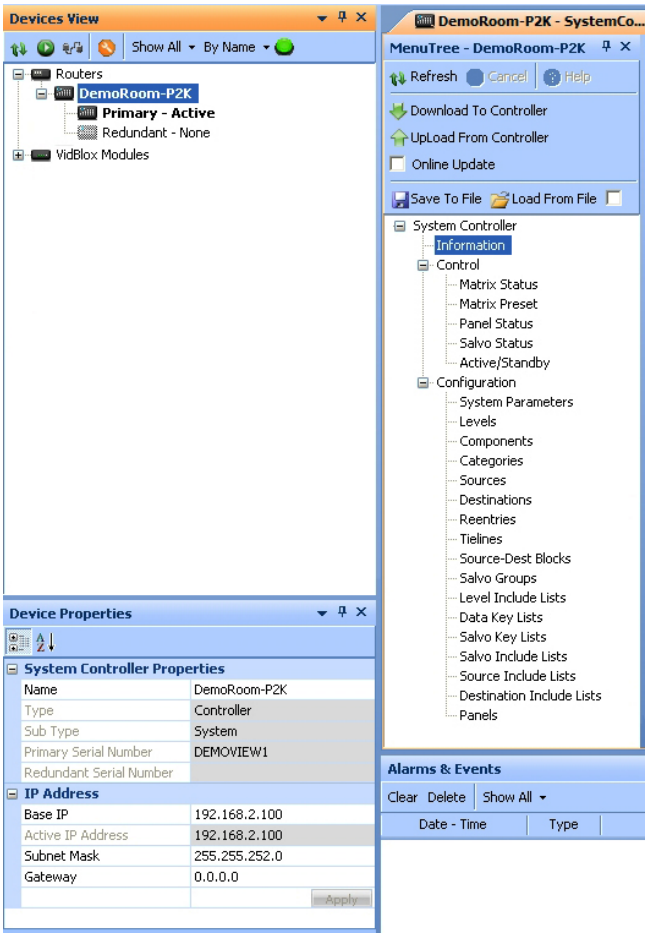


Figure 7-5 Example Devices View Display

7.6 PERC2000 DEVICE PROPERTIES DISPLAY

With the top-level P2K entry selected in the Devices View window, the Device Properties window, Figure 7-6, displays the name, component data and currently active network communication parameters for the controller.

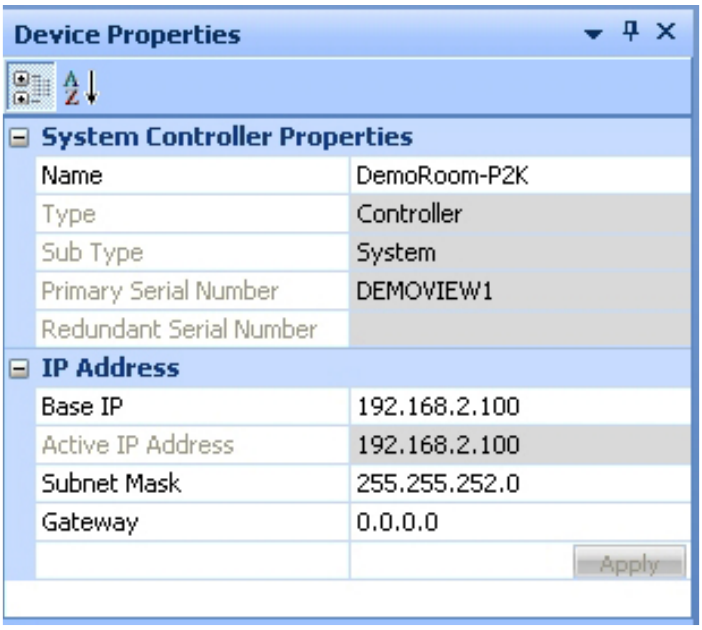


Figure 7-6 Example System Controller Device Properties Display

The top entry in the upper area of the window labeled System Controller Properties, displays the user-selected name assigned to identify the P2K system controller in the Devices View listing. You may change the name at any time by clicking in the cell displaying the name. You may edit the current name or delete the current entry and type a new name. Click the Apply button at the bottom of the display to enter the name change data.

The remainder of the upper area of the window is shown with muted fields and displays component information of the system controller. Entries in the muted fields cannot be modified.

7.7 CHANGING NETWORK PARAMETERS AND BASE IP ADDRESS OF P2K SYSTEM CONTROLLER

The lower area of the Device Properties Display, labeled IP Address, displays current network parameters and the base IP address of each P2K system controller in the system. The system controller does not support DHCP protocol, and configured parameters are static until changed. From this display area you may enter new network parameters, including a new ***Base IP Address*** for the system controller device(s) by entering the new parameters in the active display fields.

Parameter values displayed initially are those currently loaded into system controller flash memory. Unless specified otherwise at time of shipment, **factory default values** for these settings are:

- IP Address: 192.168.1.220
- Subnet Mask: 255.255.255.0
- Gateway: 0.0.0.0

To change the base IP address, click in the IP Address block, remove the currently listed IP address and enter the "new" address values you have selected as the base IP address for the system controller(s). Remember that the numbers 0 (zero) and 255 are not valid for the fourth octet of the IP address. If, based on your network requirements, you also need to assign a "new" subnet mask or default gateway setting, enter the desired values in the Subnet Mask and Gateway boxes.

Click **Apply** to write the new network parameter data to the system controller(s). Once the new address is assigned, allow a few seconds for the system controller to reboot and verify that the displayed base IP address listed reflects the desired change.

When you expand the PERC2000 entry of the Devices View tree, a listing appears that identifies the active or standby status of the Primary and Redundant controller devices, as shown by Figure 7-5. If a redundant controller is present, the current active or standby status of each device is indicated. If no controller device is installed in the redundant slot, the entry is muted and the status is shown as none. When you select either of the device entries, operational parameters particular to the highlighted device are shown in the Device Properties display area, as shown by Figure 7-7.

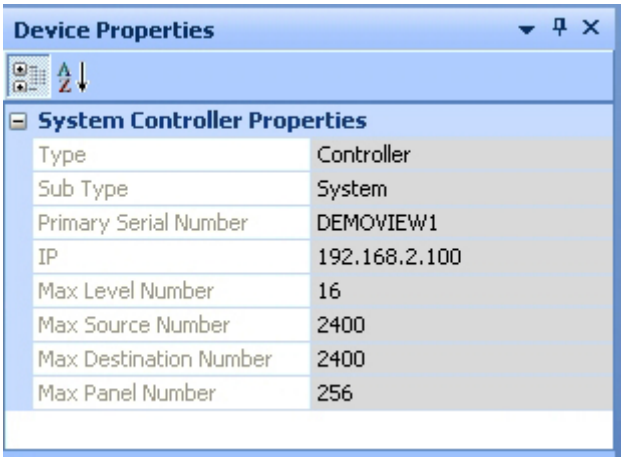


Figure 7-7 System Controller Device Properties

7.8 SYSTEM CONTROLLER MENUS

Commands and screens contained under the **System Controller** header in the Menu Tree Window, Figure 7-8, allow you to status and monitor functions of the PERC2000 system controller module; as well as create, modify or save router configuration files for the controller.

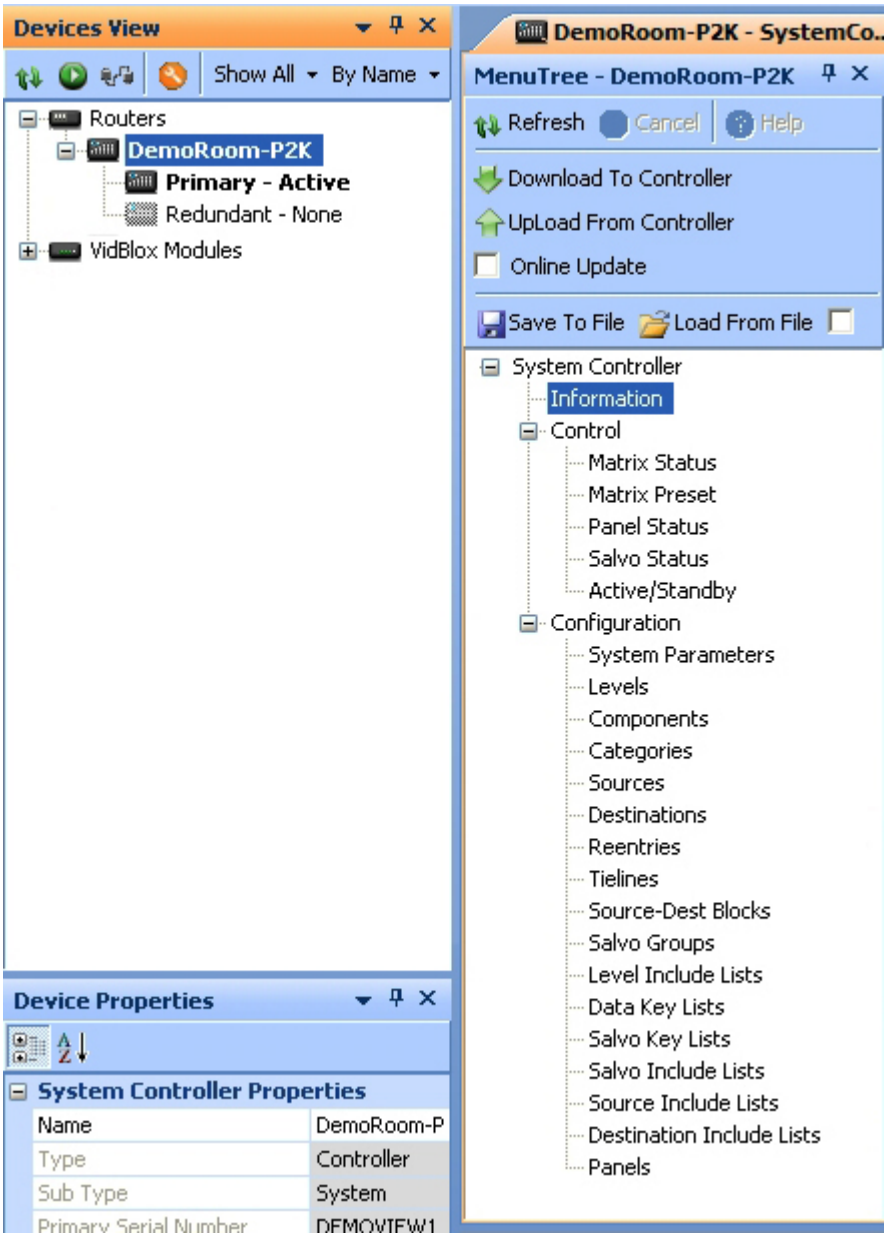


Figure 7-8 System Controller Menu Tree Commands

7.8.1 SYSTEM CONTROLLER FILE COMMANDS

Anytime the PERC2000 menu entry is selected from the Devices View window, a shaded box containing commands that are specific to the router configuration file is displayed as the top item of the Menu Tree, as shown by Figure 7-9.

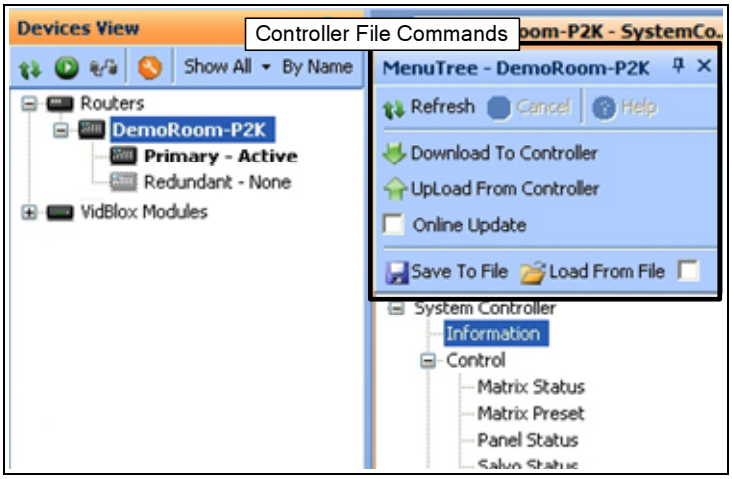


Figure 7-9 Controller File Commands

- **Refresh** – Refreshes currently displayed menu.
- **Cancel** – Cancels a requested action.
- **Help** – Access help files.
- **Download To Controller** – Downloads the configuration currently open in Cattrax to the system controller(s). Currently active controller configuration will be deleted from controller memory and replaced with the downloaded file.
- **Upload From Controller** – Reads and opens the configuration file currently stored in system controller memory.
- **Online Update** – If Cattrax is actively connected to the system controller, checking this selection activates the online update function. Refer to Paragraph 7.13 of this User Guide.
- **Save To File** - Saves the configuration file currently open in Cattrax under a filename of your choosing.
- **Load From File** – Allows you to load a saved configuration file from media such as a hard drive or thumb drive for review or modification. Anytime a saved file is loaded as the configuration file currently open in Cattrax, a check mark appears in the small box beside the Load from File command entry as a visual indication that the file currently displayed by Cattrax is not the currently active configuration file resident in system controller memory.

7.8.2 SYSTEM CONTROLLER INFORMATION SCREEN

When the Information entry is selected from the menu tree, the screen shown by Figure 7-10 displays the following status information for controllers present in the router system.

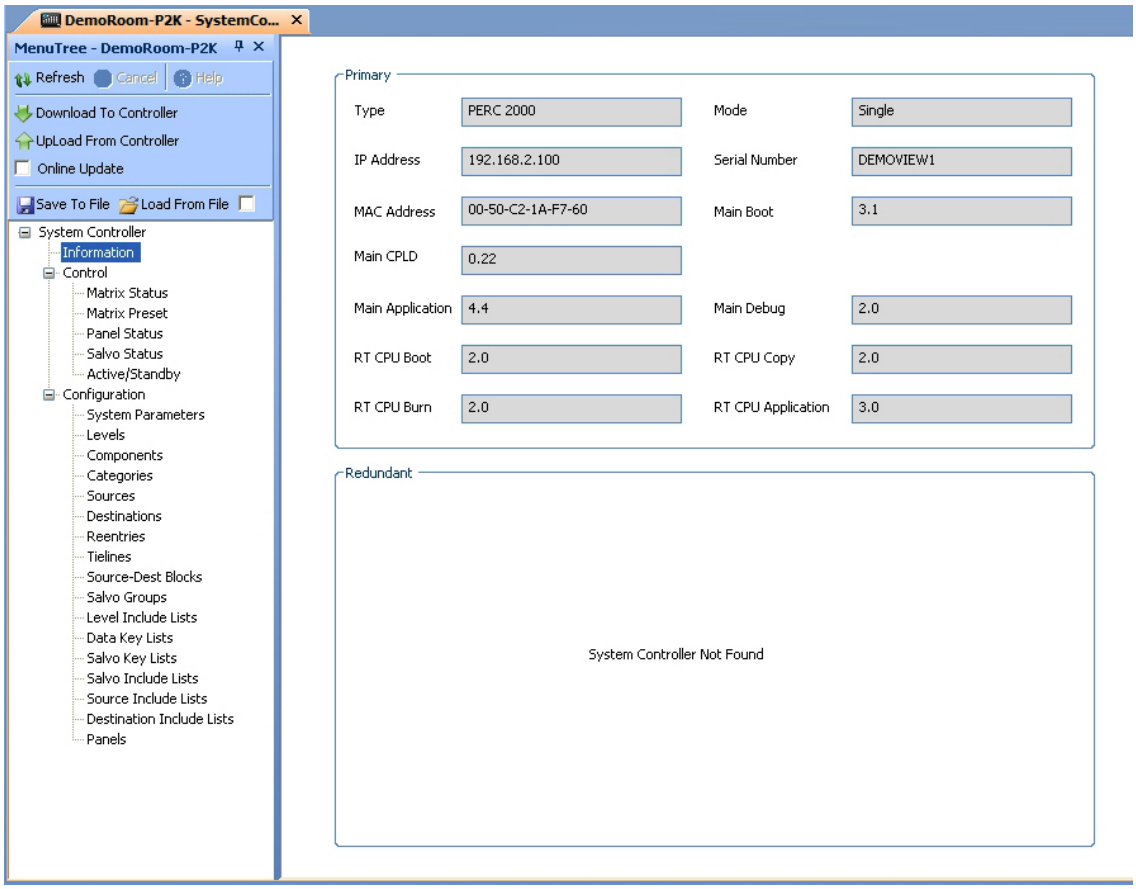


Figure 7-10 Example Information Display Screen

- **Type** – Identifies the controller as a PERC2000 controller device.
- **Mode** – If a redundant controller is installed, this entry identifies whether the indicated controller device is currently functioning as the active or standby device for the frame. *Single* indicates that there is only one controller in the router system.
- **IP Address** – Displays the IP address assigned to the indicated controller device. The Primary controller assumes its assigned base IP address and the Redundant controller, if present, assumes the IP address of base IP + 1.
- **Serial Number** – Displays the serial number of the controller device installed in the indicated position.
- **MAC Address** – Identifies assigned MAC address for module.
- **Firmware Module Revision Cells** – Indicate revision level of program firmware modules loaded into system controller hardware.

7.9 PERC2000 CONTROL MENU

Commands and screens contained under the **Control** parent header in the Menu Tree allow you to monitor status and issue direct control commands to certain functions of the system controller. When any menu entry under the Control header is selected, Cattrax reads current status of the system controller and displays pertinent data in each menu screen.

7.9.1 MATRIX STATUS

The Matrix Status screen, Figure 7-11, allows you to monitor current status of the entire switching matrix, presented in a spreadsheet format of rows and columns. For each listed destination the spreadsheet columns provide the following information:

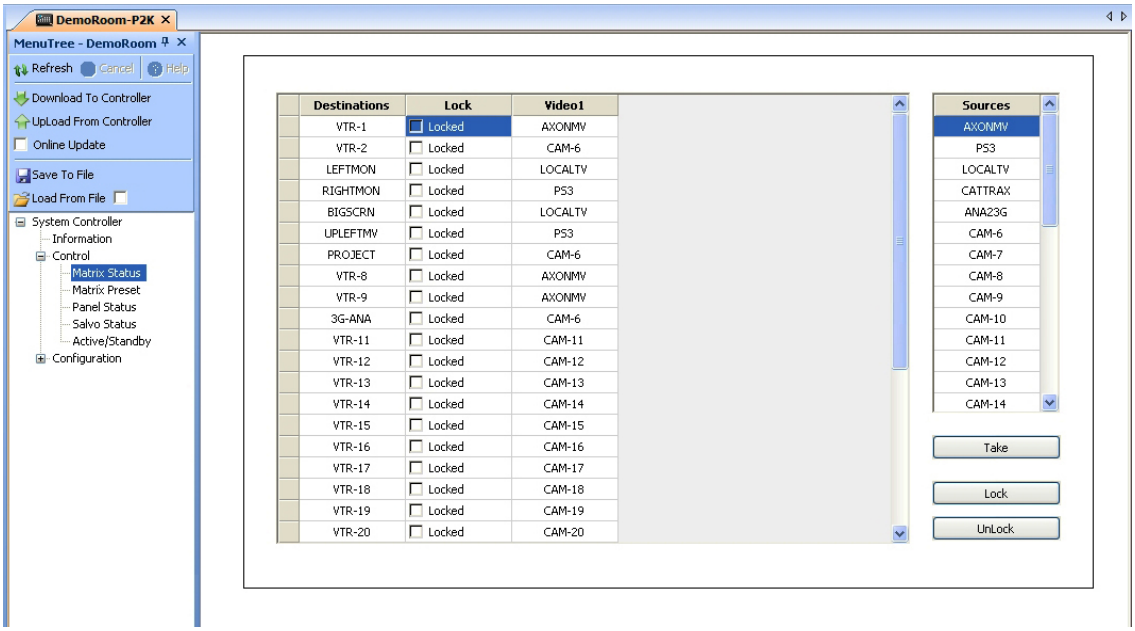


Figure 7-11 Matrix Status Display

- **Destinations** – This column is a listing, by name, of every destination in the system as assigned by the Destinations Configuration Screen.
- **Lock** – If a check mark appears in the box, the destination is locked. Destinations can be locked from system remote control panels or from this status screen.
- **Switching Levels** – There is a column for each switching level as assigned by the Levels Configuration Screen.

  For each destination, the lock status is displayed and the source switched to it is identified by switching level(s). For example, looking at Figure 7-11, the destination named VTR-2 is currently in a locked status and the source named CAM-6 is switched to VTR-2 on the VIDEO1 level. If any cell in a switching level column is blank, there is no active switch for the indicated level.

A scroll box on the right-hand side of the screen contains a list of all **Sources** by name as assigned by the Sources Configuration Screen. Three buttons labeled **Take, Lock** and **Unlock** are located beneath the scroll box. Using the source list and buttons you can make on the fly changes to the matrix configuration. Suppose that while monitoring the matrix status screen, you have a need to change the source of destination VTR-1 from AXONMV to CAM-6 on the VIDEO1 level:

- Click the cursor in the cell on row VTR-1 under the VIDEO1 column to highlight the cell.
- Locate CAM-6 in the Sources scroll list and click to highlight the cell and select the source.

A switch may be taken in one of two ways: you may double click on the source entry or click the Take button. Once the switch is taken, the destination status cell for VTR-1 updates to reflect the new source selection.

Lock and Unlock buttons allow you to lock or unlock a destination. Move the cursor to the cell under the Lock column of the destination you wish to lock or unlock. If the destination is currently unlocked, it may be locked by clicking the *Lock* button; if the destination is currently locked, it may be unlocked by clicking the *Unlock* button.

7.9.2 MATRIX PRESET

The Matrix Preset screen, Figure 7-12, allows you to preset switches for any valid destination and source pairing in the system. Preset switches can be taken simultaneously, or selectively, directly from this menu screen.

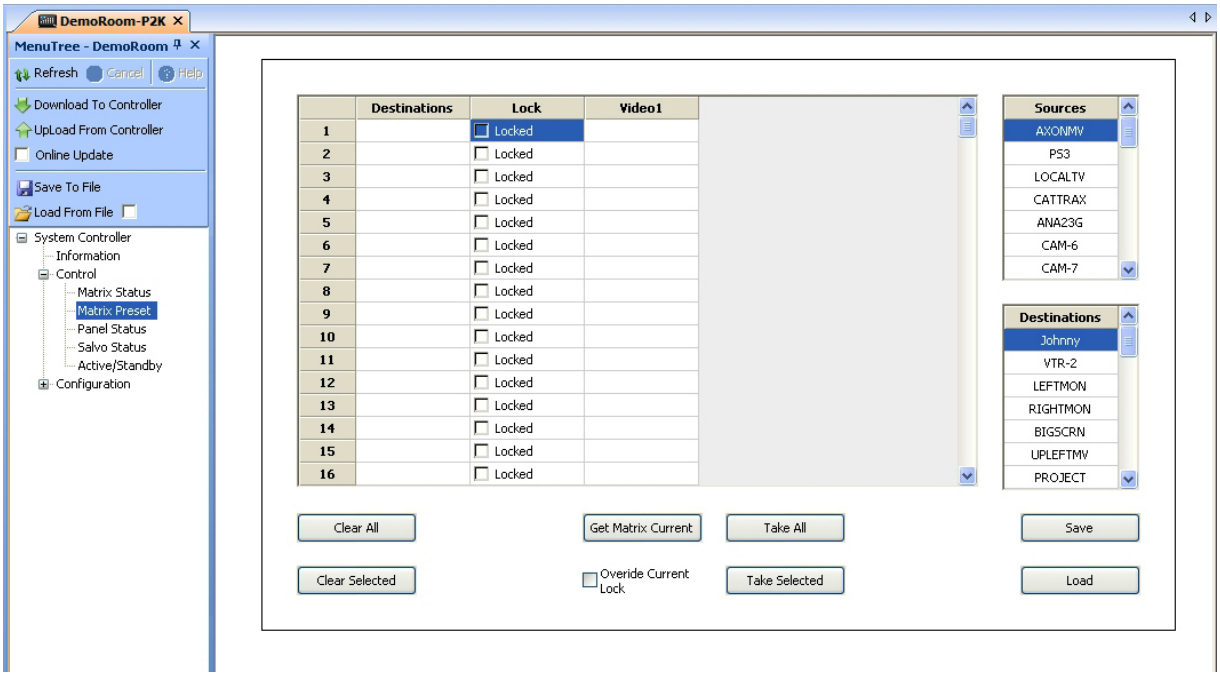


Figure 7-12 Matrix Preset Display

- **To Preset a Switch:**
  - Move the cursor to a clear cell under the **Destinations** column and click to highlight the cell. Locate the desired destination for the switch in the destinations scroll box and double click the entry. Selected destination name displays in the cell.
  - If you wish to lock the destination once the switch is made, click the box in the Lock column.
  - Move the cursor to the cell under the column of the switching level on which you wish the switch to occur and click to highlight the cell. Locate the desired Source for the switch in the **Sources** scroll box and double click the entry to paste the selection in the cell. Repeat this procedure for all switching levels on which you wish the switch to occur.
  - Repeat the previous steps to define other destinations, sources and levels on which you wish to take a switch.
  - Pressing the **Take All** button causes all the preset switches to occur simultaneously.
  - Switches can be selectively chosen by highlighting one or more destination cells and pressing the **Take Selected** button.
- **Clear All** - Clears all preset entries from the screen.
- **Clear Selected** - Clears only highlighted presets from the list.
- **Get Matrix Current** - Polls the system controller device and displays current status of the switch matrix.
- **Override Current Lock** – If you have preset a switch combination that will modify a currently locked switch, checking this box temporarily overrides the lock, allows the preset switch and re-locks the path.
- **Take All** – Clicking this button executes all switches entered on the matrix preset screen.
- **Take Selected** – Clicking this button executes only switches that are highlighted on the matrix preset screen.
- **Save** – Saves the current preset matrix screen for future use.
- **Load** – Loads a saved preset matrix file.

7.9.3 PANEL STATUS

The Panel Status screen, Figure 7-13, displays the current status of remote control panels in the router system that are under control of PERC2000. Each entry in the spreadsheet is described below:

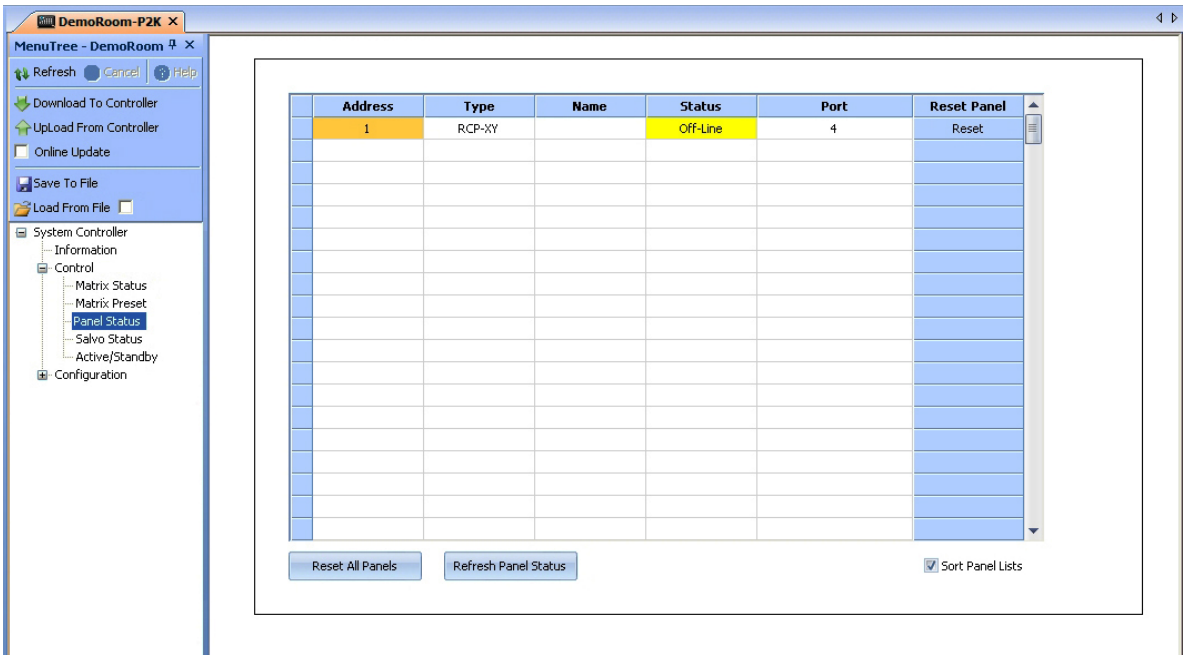


Figure 7-13 Panel Status Display

- **Address** – Displays the active hardware address setting of the panel.
- **Type** – Indicates the panel type
- **Name** – Displays the name assigned to the panel through the Panels screens.
- **Status** – Indicates whether the panel is currently online and communicating with the system controller or offline.
- **Port** – Indicates to which port link the panel is attached.
- **Reset Panel** – Clicking this button performs a hardware reset on the indicated panel.
- **Reset All Panels** – Clicking this button issues a hardware reset command to all panels in the router system.
- **Refresh Panel Status** – Clicking this button causes Cattrax to re-poll the status of all remote control panels.
- **Sort Panel Lists** - A toggle function that determines the sorting and scrolling order of list items displayed on remote control panels equipped with displays. When this selection is unchecked (default), scrolling through panel lists on remote control panels displays the list items in the same sequence they are displayed on the definition and status screens. Clicking on this entry selects an alphabetical sorting option where panel lists entries are displayed in alphabetical order by name as you scroll through the various lists. When alphabetical sorting is selected, a check mark appears in the check box. Clicking the entry when a check is present toggles the sort function and returns the panel display to sequential display rather than alphabetic display. Either selection made for this menu entry is not panel-specific, and determines the sorting order for all display-capable remote control panels in the router system.

NOTE	**Clicking the *Sort Panel Lists* entry in the Edit menu causes the list sorting method to immediately change on all display-capable remote control panels. It is NOT necessary to download a revised configuration file to the system controller to toggle this display function.**

7.9.4 SALVO STATUS

The Salvo Status screen, Figure 7-14, displays the current status of all salvo groups in the router system.

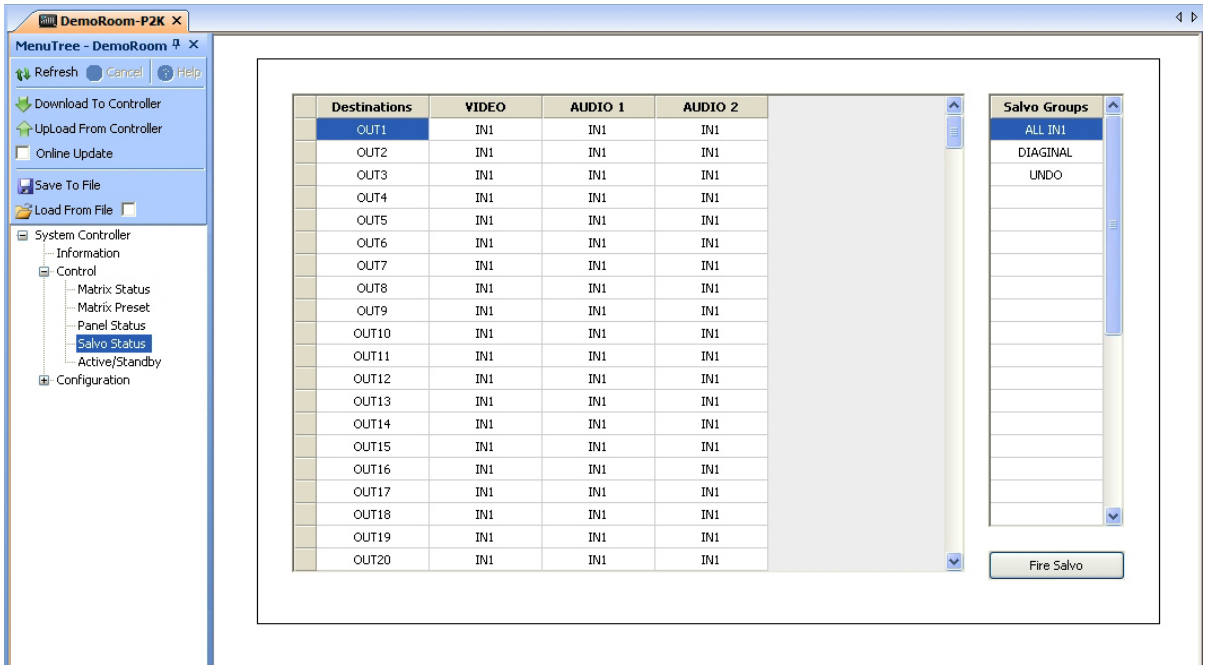


Figure 7-14 Salvo Status Display

Selecting an entry in the Salvo Groups listing displays the destinations and sources, by switching level, contained in the salvo group. You may immediately "take" the salvo group by clicking the **Fire Salvo** button.

7.9.5 ACTIVE/STANDBY

For both the Primary and Redundant PERC2000 system controller, the Active/Standby status screen, Figure 7-15, displays the IP address and current operating mode. If the router is not equipped with a redundant controller module, the IP address of the primary module is displayed and the mode box indicates that the module is the *single* controller for the router. If the router contains a redundant controller, the *active* or *standby* status of each module is displayed along with a pair of radio buttons that allow you to swap the active controller. You may use either Set Mode button set to initiate the status toggle. A pop-up prompts you to verify the action before the status toggle is implemented.

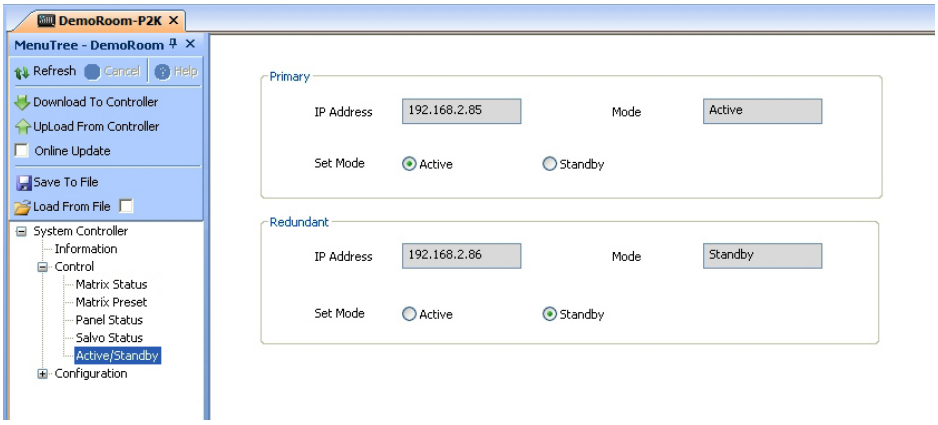


Figure 7-15 Active/Standby Menu Screen

7.10 SYSTEM CONTROLLER CONFIGURATION

Commands and screens contained under the System Controller → Configuration parent header in the Menu Tree Window allow you to view configuration status and edit or create a router configuration file that can be saved or downloaded to the P2K Controller Card. Figure 7-16 lists the command headers contained under the Configuration parent. Each command is discussed in the following paragraphs.

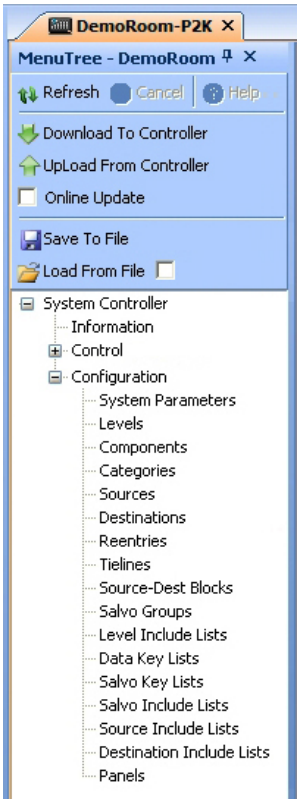


Figure 7-16 Controller Configuration Commands

When any system controller configuration command or menu is first accessed, there is no configuration file data loaded into the Cattrax control software. You have two options from which to select the type of configuration operation you wish to perform, either option allows you to view or modify an existing configuration file.

- Load an existing configuration file from a previously saved and stored file.
- Upload the currently active configuration file stored in system controller flash memory. This action requires that the host PC and the PERC2000 system controller be connected via an Ethernet interface.

In order to view or modify the currently active configuration file loaded into the system controller, you must upload the configuration file from the active system controller by one of two methods:

- Select the *Upload from Controller* command from the System Controller File commands menu.
- Select any command from the Configuration menu trees and you will be prompted with a decision box giving you the option to upload the current configuration file from the system controller flash memory.

Until you have performed one of these two actions, there is no "working" file data loaded into Cattrax, and every time you select any configuration menu item, with no configuration file loaded, you will be prompted with a decision box to upload the current configuration file from the controller.

As most configuration data is entered or modified through Cattrax menu commands, it is stored on the host PC – and only on the host PC. Changes entered do not get saved to a file, written to the system controller, or become active, until the operator issues a command through Cattrax to either save or download the configuration data. Once a configuration file is created or modified, use the *Download to Controller* command in the File Commands menu to immediately download the file to the system controller hardware and activate the configuration changes.

In order to download a configuration, upload the current configuration file from the controller or to perform any status monitoring or maintenance/diagnostics procedures the host PC and system controller must both be active on the network.

Each unique configuration file satisfies a specific system application. However, the following are some basic steps that are common to creating each router configuration file.

- Assign System Operating Parameters.
- Set up Levels and Components for the application.
- Define and assign Sources and Destinations for each level that correspond to external equipment connected to the router.
- Define special application functions such as Source-to-Destination Blocks and Salvo Groups.
- Configure remote control panels and define specific application functions to configurable control panel keys.

7.11 SYSTEM CONTROLLER CONFIGURATION SCREENS – RIGHT MOUSE CLICK FUNCTIONS

As with most other applications based on the Microsoft Windows® operating system, Cattrax contains several application-specific functions for various configuration command or data entry operations that are accessed by clicking the right mouse button and selecting the desired operation. Functions and commands presented on the right click menu vary greatly between screens and data entry cells or fields. The example shown by Figure 7-17 illustrates a typical menu for data entry editing and short-cut functions. Not all commands shown below appear on every right-click menu.

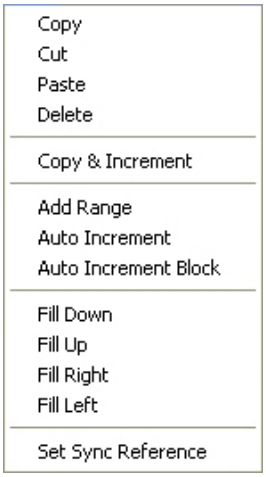


Figure 7-17 Typical Right-Click Mouse Commands

7.11.1 COPY, CUT, PASTE, DELETE

Copy, Cut, Paste and Delete Commands in Cattrax function exactly as the standard Microsoft Windows® functions.

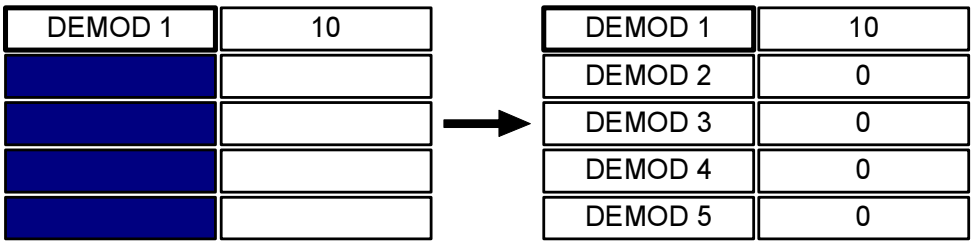
7.11.2 QUICK DATA ENTRY TOOLS

For many data entry operations, such as source and destination spreadsheets, that require you to enter repetitive information, such as Inputs, Outputs, etc., there are additional commands available from the right mouse click menu. Commands vary depending on the system screen and grid column you are working with:

- **Copy & Increment**

  Copy & Increment allows you to quickly fill fields of a configuration grid by duplicating the text and incrementing the numerical value of a starting entry into fields selected by a user-defined data block. Copy & increment always fills in all valid fields of the data grid lines within the selected block, but it behaves differently depending on where from the grid you select the starting values fields.

If you choose a starting field from any of the name columns of the grid, and do not include any of the numerical entry fields in the switching level columns when defining the size of the fill block, as shown by the diagram below, the text entry of the name will be duplicated in each field of the defined block, and the numerical value associated with the name fields only will be incremented by one in each successive field of the fill block. All of the numerical values in the switching level columns will be filled with zeros, as shown.

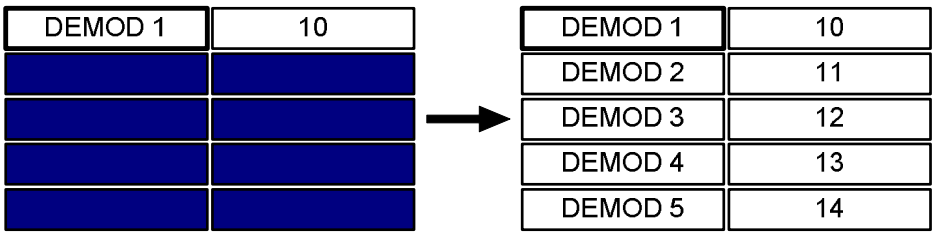


COPY AND INCREMENT EXAMPLE 1

If you choose a starting field from the name columns of the grid, and you do include numerical entry fields under the switching level columns when defining the fill block, as shown below, the text entry of the name will be duplicated in each field of the defined block, and the numerical value associated with the name will be incremented by one in each successive field of the fill block. All of the numerical values in the switching level columns included in the data block will be incremented by one in each successive field, as shown. Numerical fields NOT included in the defined data block will be filled with zeros.

There are a couple of rules you need to be aware of when using the copy and increment function:

- The fill block you define with the mouse must include at least one of the name columns, and the name entry in the starting field must end in a numerical value, such as DEMOD1, DEMOD2, etc.
- Numerical values under any of the switching level columns will be incremented by one up to the maximum number of physical inputs or outputs defined for the level. If the fill block contains additional lines after any level column reaches the maximum number, any successive fields in that column will be filled with a zero.

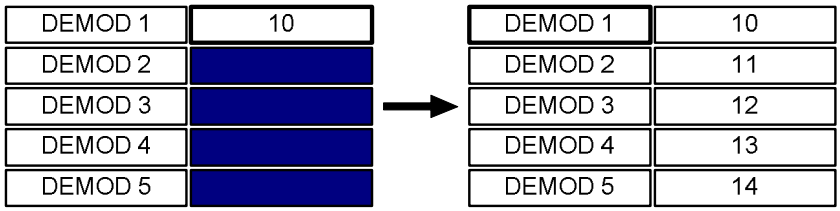


COPY AND INCREMENT EXAMPLE 2

- **Auto Increment**

  The Auto Increment function increments the numerical value of a starting entry into the fields of a user-defined fill block located below and in the same column as the starting entry. You must choose a starting field from a numerical entry field in any of the switching level columns when defining the fill block, as shown by the diagram below. Numerical values in the selected column will be incremented by one in each successive field, as shown. Auto Increment only adds numerical values if every line of the fill block already has a name, such as assigned to a source or destination, associated with the level.

  Numerical values under the selected switching level column will be incremented by one up to the maximum number of physical inputs or outputs defined for the level. If the fill block contains additional lines after any switching level column reaches the maximum number, any successive fields in that column will be filled with a zero.

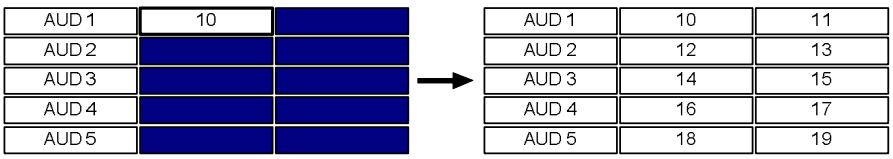


AUTO INCREMENT FUNCTION

- **Auto Increment Block**

  Auto Increment Block is very similar to the Auto Increment function, the difference being that it allows the fill block to consist of multiple switching level columns, as shown by the diagram. Auto increment block always uses the field in the upper left corner of the fill block as the starting value entry, and fills successive fields with numerical values, incremented by a value of one, from left to right and top to bottom. Auto Increment Block only adds numerical values if every line of the fill block already has a name, such as assigned to a source or destination, associated with the level.

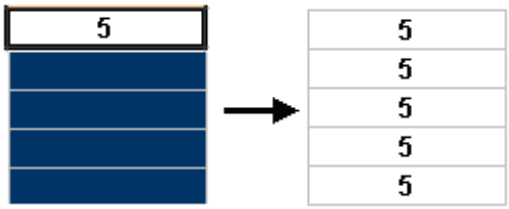
  Numerical values filled in the switching level columns will be incremented by one up to the maximum number of physical inputs or outputs defined for the level in the starting entry field. If the fill block contains additional fields after any field in the block reaches the maximum number, any successive fields in the remainder of the fill block will be filled with zeros.



AUTO INCREMENT BLOCK FUNCTION

- **Fill-Down**

  Fill-Down fills in the fields below a selected field with the selected number. First, select the field with the number you want to duplicate and then, select the fields below it. Right-click and select Fill-Down to fill in the fields with the selected number, as shown.



FILL-DOWN COMMAND

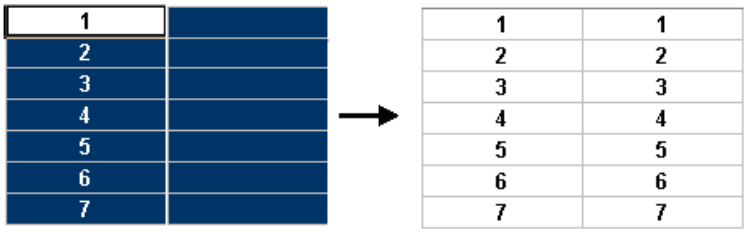
- **Fill-Up**

  Fill-Up fills in fields above a selected field with the same information. First, select the field with the number you want to duplicate and then, select the fields above it. Right-click and select Fill-Up to fill in the fields with the selected information, as shown by the diagram.

FILL-UP COMMAND

- **Fill-Right**

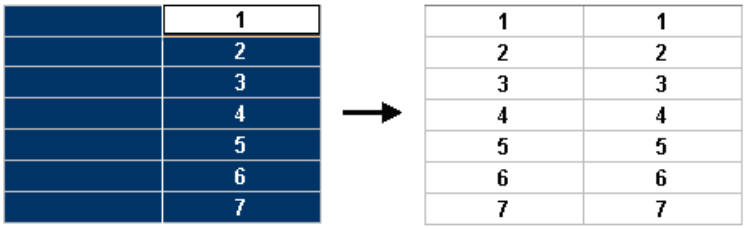
  Fill-Right fills in the fields to the right of a selected field with the selected number(s). First, select the fields with the numbers you want to duplicate and then, select the fields to the right. Right-click and select Fill-Right to fill in the fields with the selected numbers. You can select either one field or several fields with this function, as shown.



FILL-RIGHT COMMAND

- **Fill-Left**

  Fill-Left fills in the fields to the left of a selected field with the selected number(s). First, select the fields with the numbers you want to duplicate and then, select the fields to the left. Right-click and select Fill-Left to fill in the fields with the selected numbers. You can select either one field or several fields with this function, as shown by the diagram



FILL-LEFT COMMAND

7.12 CONFIGURATION COMMANDS

Each command contained under the Configuration parent header in the Menu Tree window is discussed in the following paragraphs.

7.12.1 SYSTEM PARAMETERS

The system parameters screen is the top level configuration screen and identifies the currently loaded configuration data by name and initial operating parameters as shown by Figure 7-18.

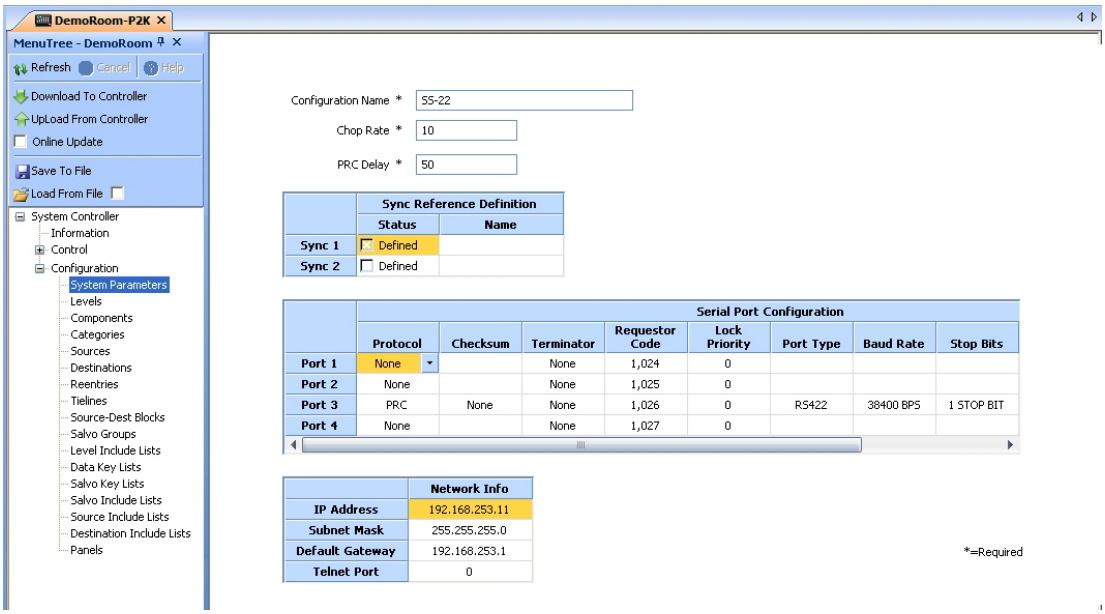


Figure 7-18 System Parameters Screen

- **Configuration Name -** This field allows you to name the configuration file. Type the desired name in the Configuration Name box. Configuration names may have up to 32 alphanumeric characters.
- **Chop Rate -** Chop Rate indicates the frame rate of switches used by the Chop mode of operation. To change the chop rate, enter the desired value in the Chop Rate box. Any desired Chop Rate between 1 and 255 frames is supported by PERC2000. Default value of this parameter is 10 frames.
- **PRC Delay -** This option specifies the time delay between data messages sent over the proprietary PESA Router Control (PRC) bus. PRC delay values can range from 50 to 100 ms; the default value is 50 ms.
- **Sync Reference Definition –** PERC2000 assigns up to two sources of external Sync Reference signals for synchronizing switching times and destination output signals. Cells in this field allow you to define sync sources.
  - **Status –** When a sync source is attached to the indicated input and the source is defined in the configuration, click in the Defined box. An X in the box indicates that the synce source is defined.
  - **Name –** Enter an alphanumeric string in each cell to assign a name to the sync source.
- **Serial Port Configuration**

  The Serial Port Configuration portion of the System Parameters Window allows you to configure the serial ports on the P2K system controller. The entry in the left-most column of the configuration table identifies the port (1 thru 4) defined by the entries in the associated row.

  The following data fields are used for port configuration:

  - **Protocol -** This entry identifies the protocol, defining the format used when sending data through the serial ports on the P2K system controller. Enter the desired data protocol from the pull-down menu associated with the table cell. There are currently four protocols available for use:
    - CPU Link Protocol 1 with Extensions (P1E) (81-9062-0407-0)
    - Unsolicited Status Protocol (USP) (81-9062-0409-0)
    - PESA Routing Control (PRC) (81-9062-0316-0)
    - AutoPatch (81-9059-0695-0)

  Number in parenthesis identifies the PESA document that describes the data protocol or interface.

NOTE	**Selection box associated with Port 3 contains only the PRC serial data protocol. Current revision of Cattrax Software has Port 3 fixed as a PRC Port.**

NOTE	**Two additional protocol options are listed in the selection box pull-down list for ports 1, 2 and 4, labeled P2-Serial and SMS7000. These protocols are not used in the current revision of Cattrax, and are reserved for future P2K implementations.**

- **Checksum -** A checksum determines how the validity of transmitted data is confirmed. There are three available checksum types:
  - **NONE -** No validity checking.
  - **PESA -** Data validity is checked using PESA's standard method. (See Protocol documentation.)
  - **HEX -** Data validity is checked using a standard HEX-ASCII checksum.
- **Terminator -** Terminator identifies the character(s) used to denote the end of a data packet or command string. Three terminators are available:
  - **CR -** A carriage return.
  - **LF -** A line feed.
  - **CRLF -** A carriage return followed by a line feed.
- **Requestor Code -** A Requester Code is used in conjunction with Lock Priority to determine if a lock or protect function can be removed. When a lock or protect has been assigned by a port (or panel), it can only be removed by another port (or panel) with a higher lock priority or with the same lock priority and same requester code.

  Requester codes not explicitly defined automatically default to 1024, 1025, and 1026 for Ports 1, 2, and 4 respectively.

  Permitted range of requester codes is 1 - 65535.
- **Lock Priority -** Lock Priority is used in conjunction with Requester Code to determine if a lock or protect function can be removed. When a lock or protect has been assigned by a port or panel, it can only be removed by another port or panel with a higher lock priority, or with the same lock priority and same requester code. The lower the lock priority number, the higher the priority.

  Port lock priorities not explicitly defined automatically default to "0" which gives absolute authority to clear any lock or protect on the system. Permitted range of lock priorities is 0-255 ("0" is Highest Priority).
- **Port Type -** This pull down menu allows you to assign either the RS-422 or RS-232 operational protocol to the bus being configured.
- **Baud Rate -** Baud rate is the data transfer rate through the serial port measured in Baud (bits per second). A baud rate of either 9600 or 38400 may be assigned to any of the serial buses.

- **Stop Bits -** In asynchronous communications, a stop bit indicates that a byte of data has just been transmitted. Every byte of data is preceded by a start bit and followed by a stop bit.

  Either 1 or 2 stop bits may be selected for each of the serial ports.

- **Flow Control -** Flow Control is a serial data stream parameter that specifies a control method for data transmission. Flow control options available through a pull-down menu in PERC2000 include RTS/CTS, XON/XOFF or NONE.

NOTE	**Selection boxes associated with Port 3 all are fixed to configure a PRC Port.**

- **USP Status Filter -** The USP Status Filter determines which events are reported when a port is defined as a USP Port. Figure 7-19 illustrates the Status Filter Selection Screen and identifies the events that may be selected for reporting. To activate an event, click in the box beside the desired entry. A check in the box indicates the item is selected.

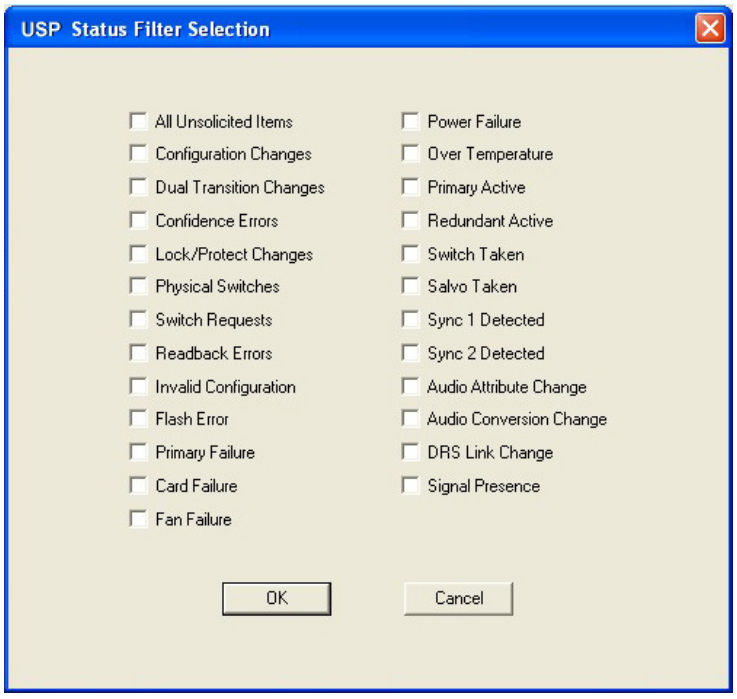


Figure 7-19 Status Filter Selection Screen

- **Network Info**

  Network Info entries are not used in the current configuration of the P2K and no data entry is required. This functional area is reserved for future use.

7.12.2 LEVELS CONFIGURATION

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 and Cattrax Version 3.0, or later, portions of the Switching Level screen and configuration procedure presented here are not applicable to your P2K controller configuration, refer to Paragraph 7.15.**

When the **Levels** menu entry is selected, the Levels Configuration Screen, Figure 7-20, is displayed. From this screen you can assign and enter operational parameters for up to 16 system switching levels. System controllers operating with firmware Version 5.0, and later, allow up to 17 switching levels.

The box labeled *Levels* on the left side of the display window contains a listing of all the assigned switching levels in the router, by nickname; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing switching levels.

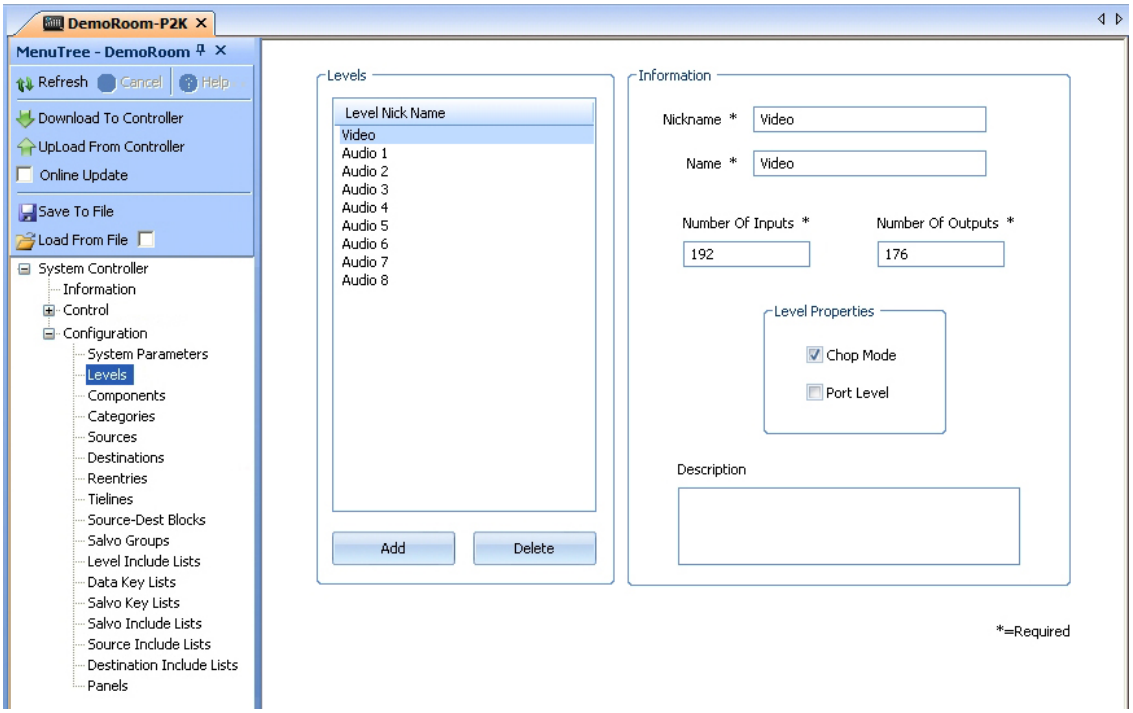


Figure 7-20 Levels Configuration Screen

- **Adding a Level** – PERC2000 allows a maximum of 16 switching levels. Up to 17 switching levels with firmware V5.0 and later. To add a level, click the **Add** button at the bottom of the Levels box to access a blank set-up screen in the Information box.
- **Deleting a Level** - To delete a level, locate the nickname of the level you wish to delete in the Levels box and click on the name to select it. Click "**Delete**" at the bottom of the box.

- **Nickname** – Nickname is a label (up to 8 characters) associated with the level and is the character string displayed on status display screens for the defined switching level. In order to assign the level a nickname, click the cursor in the Nickname field and enter the nickname label text.

  Once nickname text is assigned to a level, the nickname character string is displayed as a sub-entry in the Levels box. Any time you wish to return to the set-up screen for a particular level, simply click on the nickname sub-entry under the Level Nick Name header.

- **Name** - The Name field allows a longer and more descriptive name for the level. Generally, this field is used to assign a name to the level that more accurately identifies its function.

  Generally, when assigning names and nicknames, the NAME field is a longer more precise description of the defined level and the NICKNAME field is a shortened acronym or mnemonic used to identify the level on display devices or screens.

- **Number of Inputs** – Enter the number of input sources associated with the defined level.
- **Number of Outputs** – Enter the number of output signals associated with the defined level.
- **Chop Mod**e - When this box is checked it indicates the level is "chop enabled" and may be included in a chop function.
- **Port Level** – This function not used in current version of P2K Software.
- **Description -** Description is a free text field where you can enter a full description of the switching level or add notes or information as desired. This field is solely for discretionary use and has no effect on the defined level characteristics.

7.12.3 COMPONENTS CONFIGURATION

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 and Cattrax Version 3.0, or later, portions of the Components Configuration screen and configuration procedure presented here are not applicable to your P2K controller configuration, refer to Paragraph 7.15.**

When the **Components** menu entry is selected, the Components Configuration Screen, Figure 7-21, is displayed. From this screen you can assign and enter operational parameters for various system components. The box labeled *Components* on the left side of the display window contains a listing of all assigned components, by nickname; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing components.

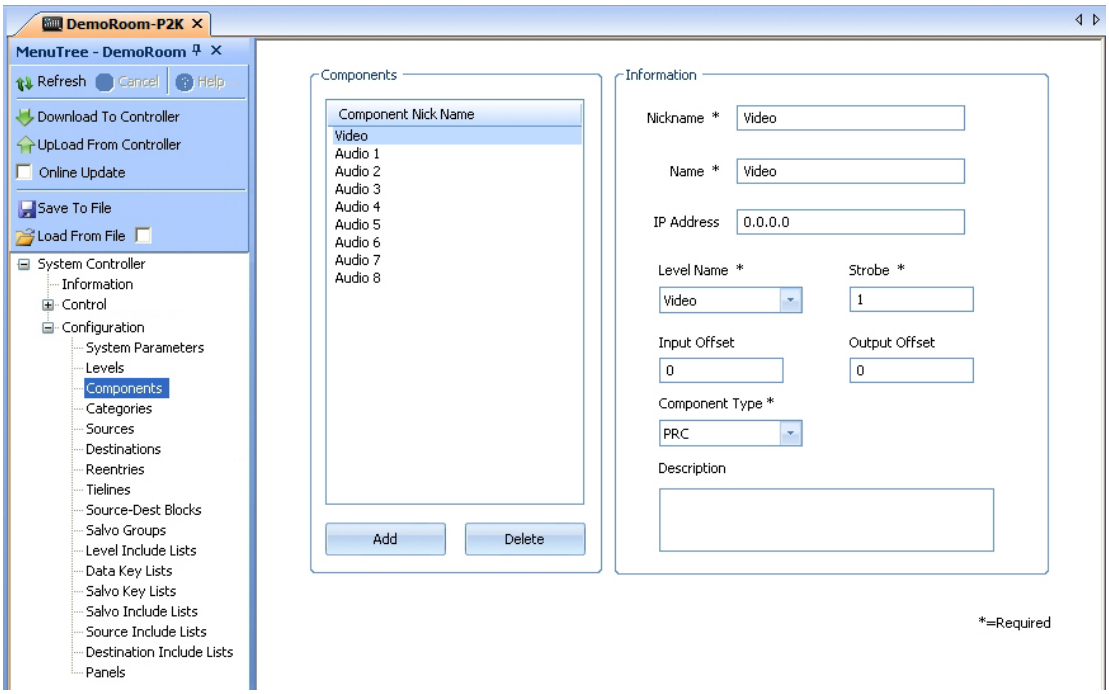


Figure 7-21 Components Configuration Screen

- **Adding a Component** – PERC2000 allows a maximum of 64 components. To add a component, click the Add button at the bottom of the Components box to access a blank set-up screen in the Information box.
- **Deleting a Component -** To delete a component, locate the nickname of the component you wish to delete in the Components box and click on the name to select it. Click "Delete" at the bottom of the box.
- **Nickname** – Nickname is a label (up to 8 characters) associated with the component and is the character string displayed in the Component Nick Name listing area. In order to assign the component a nickname, click the cursor in the Nickname field and enter the nickname label text.

  Once nickname text is assigned to a component, the nickname character string is displayed as a sub-entry in the Components box. Any time you wish to return to the set-up screen for a particular component, click on the nickname sub-entry under the Components Nick Name header.
- **Name** - The Name field is where a longer, more descriptive name is defined for the component. Generally, when assigning names and nicknames, the NAME field is a more precise description of the defined component and the NICKNAME field is a shortened acronym or mnemonic.
- **IP Address -** Enter the IP address of the router frame in which the component sources reside.
- **Level Name -** Level Name is a pull-down menu list containing the nickname of the levels defined for the system. Highlight and select the level name from the list to which the component being defined is a subset. You must have already created the level you want to use before you can select the name in this field.

- **Input and Output Offset -** Offset defines the numerical difference between the physical input or output number and the level input or output number for a given source or destination.
- **Component Type -** Component Type is a pull-down menu list containing the types of hardware devices controlled by the P2K controller from the following options:
  - PRC – Describes any PESA switching product using the PESA Routing Control (PRC) bus for control interface.
  - TGR – Describes the legacy PESA Tiger Series of switching products.
  - XTN – Describes an External Control Bus to interface with non-PESA equipment.
  - P2 – Reserved for future use.
  - DRS – Describes the Cheetah DRS Series of audio routing products.
  - PMFC - Describes the Cheetah video router Matrix Frame Controller when communicating with the P2K over an Ethernet network.

  Highlight and select the proper hardware designator corresponding to the type of hardware routing the component.
- **Strobe**

  Strobe defines a numeric digit identifying the physical hardware routing the component.
- **Description -** Description is a free text field where you can enter a full description of the switching component or add notes or information as desired. This field is solely for discretionary use and has no effect on the defined component characteristics.

7.12.4 CATEGORIES

When the **Categories** menu entry is selected, the Categories Entry Screen, Figure 7-22, is displayed. From this screen you can enter category labels. The box labeled *Category* contains a listing of all assigned categories, by label.

Categories are alphanumeric strings (up to 8 characters) used as labels when indexing sources and destinations from a remote control panel. Any combination of letters and numbers may be used as a category label. Generally, labels used as categories are elements of a name which can be paired to specify a certain source or destination. For example the screen shot shown in Figure 7-22 lists the digits 0 thru 9 and the words INPUT and OUTPUT as categories. To call the source named Input 5 when indexing from a panel you would scroll through the categories to the word INPUT as the first character and then scroll to the digit 5 for the second character. Categories are entered from the **Categories** Configuration Screen. Up to 1024 categories are allowed in a configuration file.

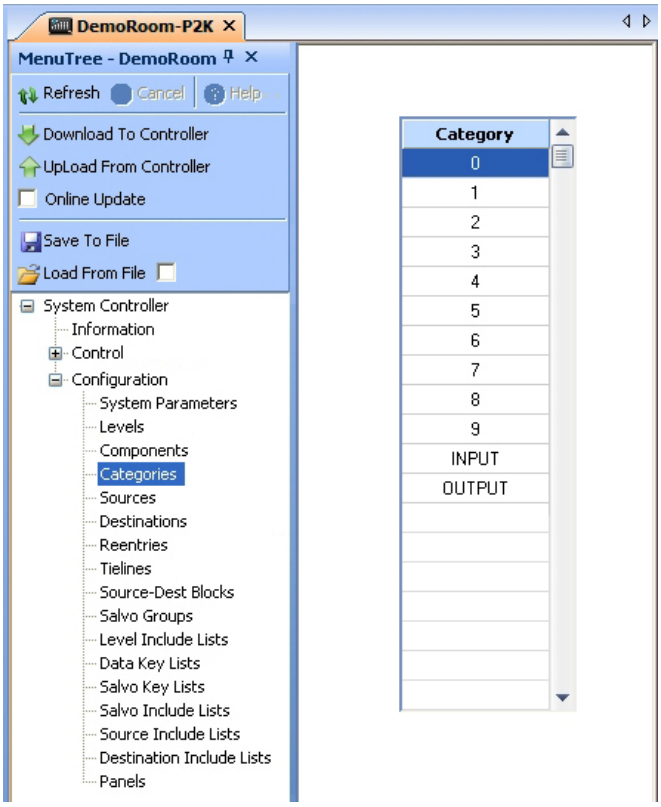


Figure 7-22 Categories Configuration Screen

- **Adding a Category**

  To add a category label, click a blank cell in the category list box, click in the cell and enter the character string for the category label you wish to enter.

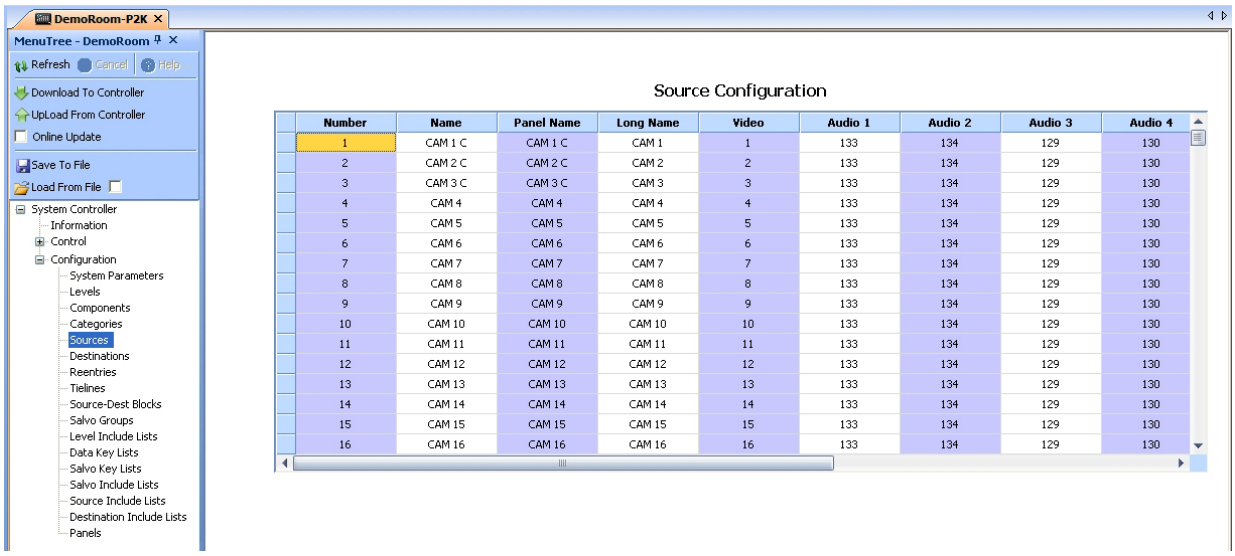
- **Deleting or Editing a Category**

  To delete or edit a category label, move the cursor to the cell in the category list box containing the character string you wish to modify and double click. You may delete the entry with the delete key, or you may right click to access the available editing options. \

7.12.5 SOURCES

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 and Cattrax Version 3.0, or later, portions of the Source Configuration screen and configuration procedure presented here are not applicable to your P2K controller configuration, refer to Paragraph 7.15.**

Click the **Sources** entry under the Configuration Menu Tree to access the Source Configuration Screen, Figure 7-23. This screen allows you to define source groups in the router configuration. Note the Sources Screen is in the form of a database spreadsheet with data entries for each source group made on individual rows from left to right. Each source group is assigned a name, and the physical inputs to the router system you wish to associate with the source group are assigned by switching level. In router terminology, this screen essentially maps each physical source (input) to the router to its logical input by switching level and source group nomenclature. Individual physical inputs to the router system may be assigned to multiple source groups. System controllers prior to firmware Version 5.0 allow a maximum of 2400 source names. Version 5.0, and later, allows up to 4800 source names.



Number	Name	Panel Name	Long Name	Video	Audio 1	Audio 2	Audio 3	Audio 4
1	CAM 1 C	CAM 1 C	CAM 1	1	133	134	129	130
2	CAM 2 C	CAM 2 C	CAM 2	2	133	134	129	130
3	CAM 3 C	CAM 3 C	CAM 3	3	133	134	129	130
4	CAM 4	CAM 4	CAM 4	4	133	134	129	130
5	CAM 5	CAM 5	CAM 5	5	133	134	129	130
6	CAM 6	CAM 6	CAM 6	6	133	134	129	130
7	CAM 7	CAM 7	CAM 7	7	133	134	129	130
8	CAM 8	CAM 8	CAM 8	8	133	134	129	130
9	CAM 9	CAM 9	CAM 9	9	133	134	129	130
10	CAM 10	CAM 10	CAM 10	10	133	134	129	130
11	CAM 11	CAM 11	CAM 11	11	133	134	129	130
12	CAM 12	CAM 12	CAM 12	12	133	134	129	130
13	CAM 13	CAM 13	CAM 13	13	133	134	129	130
14	CAM 14	CAM 14	CAM 14	14	133	134	129	130
15	CAM 15	CAM 15	CAM 15	15	133	134	129	130
16	CAM 16	CAM 16	CAM 16	16	133	134	129	130

Figure 7-23 Sources Configuration Screen

- **Number -** The left-most column is labeled **NUMBER,** is numerically sequential and automatically filled in as source groups are added. You can not change the entry in the Number column.
- **Name, Panel Name and Long Name -** The next three columns allow you to assign identifying names and/or acronyms to each source group according to the following formats:

- **Name –** Any combination of up to 8 alphanumeric characters may be used to identify the source group.
- **Panel Name -** Any combination of up to 8 alphanumeric characters may be used to identify the group. The entry made in this column is the text string displayed in the switching level columns on the Matrix Status display screen.
- **Long Name –** This column is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly identify an external device or system.

- **Switching Levels -** To the right side of the three name columns there are columns corresponding to each system switching level. The numerical entry in the columns on each row assigns the physical input to the router associated with the source group for that switching level.

  For example, look at entry number 2 in Figure 5-25 labeled CAM2C. Notice that the numeric entry for CAM2C in the VIDEO column is a 2. This entry tells the system controller that the video signal associated with the source group identified as CAM2C is present at physical input number 2 of the video router.

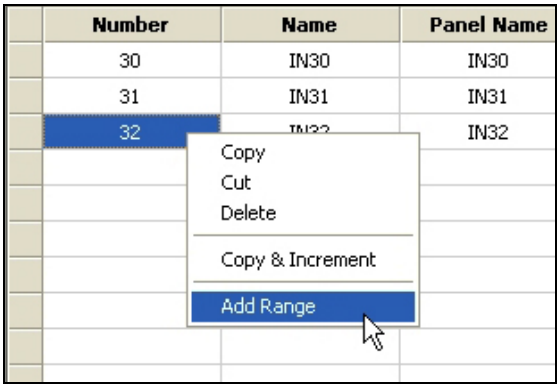
  Numeric entries for source group CAM2C in the columns corresponding to switching level AUDIO 1 and AUDIO 2 are 133 and 134, respectively. In this case, the numeric entries indicate that the audio signal associated with switching level AUDIO 1 is the signal present at physical input number 133 of the audio router frame, and the signal associated with AUDIO 2 is physically present at input 134 of the audio router.

  When you select source group CAM2C as the source for a router destination, the physical inputs for all switching levels associated with the source group are switched simultaneously to the physical outputs for all switching levels associated with the destination group.

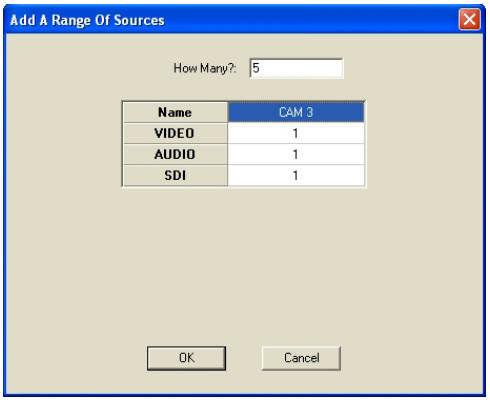
  Only one source entry per switching level is allowed. A level may be left undefined on a source group entry. Inputs may be shared between different source groups.

- **Navigating the Sources Spreadsheet -** From the Sources Configuration screen, you may view all assigned source groups, add a single source group or a range of groups to the configuration, delete a source or modify parameters of an existing source group.
  - **Add Source** – If you wish to add a single source group entry, use the scroll bar and move the display to the empty row beneath the last source entry in the spreadsheet. Click the cursor in the Name cell on the empty row and begin typing the name of the source group you wish to add. Press enter, and the next sequential index number is automatically assigned to the source entry and the name you entered is copied in all three of the name entry cells. If you wish to change any of the name entries, such as panel name or long name, click the cursor in the cell you wish to modify and enter the changes, followed by enter. Once the new source is entered, you may click the cursor in a switching level cell and enter the physical router input you wish to assign to the source for that level. You may continue adding single sources in this manner up to the maximum number of allowable sources for the controller.
  - **Delete Source** – If you wish to remove a source group entry from the configuration spreadsheet, move the cursor to the number column of the source row you wish to delete and right click. Select delete from the right click menu. You will be prompted to verify the action before the source is removed.

- **Spreadsheet Right Mouse Click Functions** - Right-click any cell in the Source Configuration Spreadsheet to display a pop-up menu that provides command options for the cell, as shown below. Command items appearing in the pop-up menu vary depending on which commands are pertinent for data entered in the selected cell. Paragraph 7-11 discusses the function of common commands available from the pop-up menu. Remember that all commands listed and discussed below may or may not appear in the pop-up menu for a specific cell.



- **Add Range** – Adds a range of sources using a category index type of naming scheme, as shown by the diagram below. You define the base name, such as "CAM," the starting index - such as 3 and the number of sources to create – such as 5. This example would create sources "CAM 3:" to "CAM 7."



- **Set Tieline Source**

  A Tie-line is a special purpose routing function that dedicates a physical source input and a physical destination output on different switching levels as a direct connected path through an external physical connection.

Sources are linked to tie-lines using the **Set Tieline Source** command from the right-click command box. Click the cursor in the cell corresponding to the source and level you wish to assign to a tie-line. Right click and select the "Set Tieline Source" option from the menu. A graphic illustration, Figure 7-24, displays showing the level you are assigning on the right side. On the left side of the graphic you define the source and level that you wish to tie to the source on the level you are configuring using the pull-down menu boxes.

In the example shown, by selecting "Set Tieline Source" in the spreadsheet cell for VTR 1 on the SDI level, the graphic below appears and shows the SDI level as the source and by selecting 6 as the Input # and VIDEO as the Level from the pull-downs we have assigned a connection to route the source at physical input 6 on the VIDEO level through a tie-line to a dedicated physical input on the SDI level, which the controller accesses when VTR 1 is selected as the source on the SDI level. On the source spreadsheet the text entry "6 On VIDEO" is automatically written in the cell for VTR 1 on the SDI level. This indicates that when VTR 1 is selected as a source on the SDI level, the source signal will be the signal on physical input 6 of the Video level routed through an external tie-line to the SDI level.

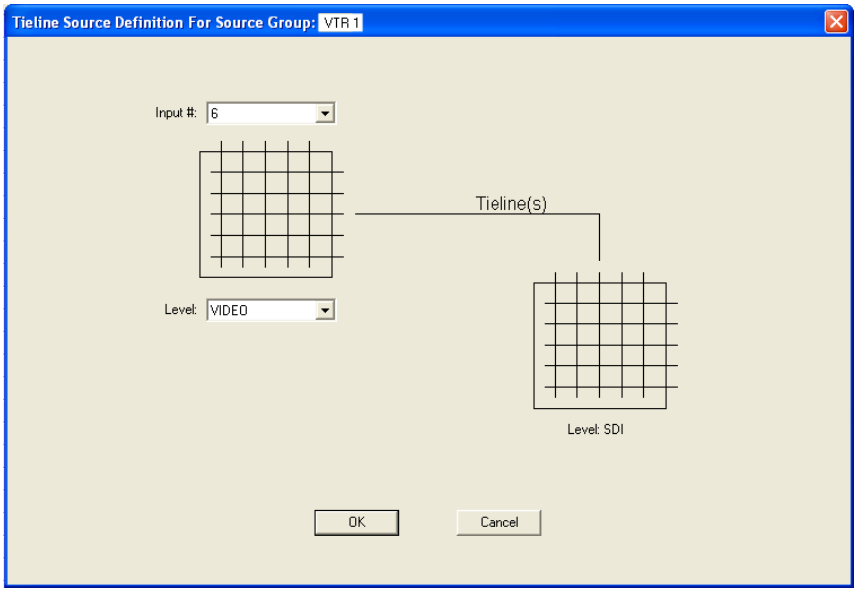
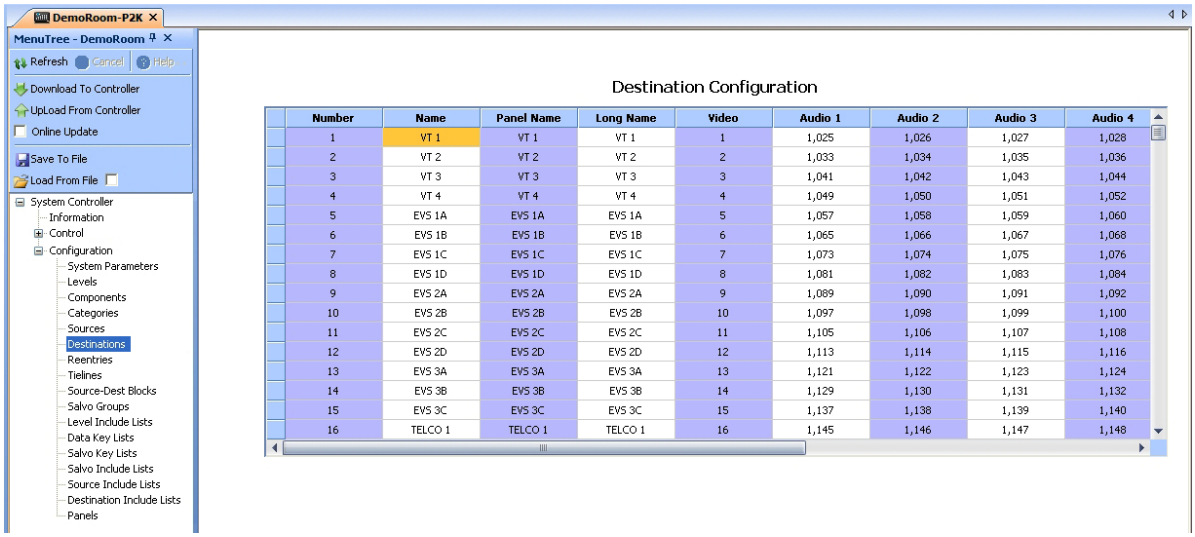


Figure 7-24 Tieline Configuration Screen

7.12.6 DESTINATIONS

NOTE	**If you are configuring a PERC2000 controller with firmware Version 5.0 and Cattrax Version 3.0, or later, portions of the Destination Configuration screen and configuration procedure presented here are not applicable to your P2K controller configuration, refer to Paragraph 7.15.**

Click the **Destinations** entry under the Configuration Menu Tree to access the Destination Configuration Screen, Figure 7-25. This screen allows you to define destination groups in the router configuration. Note the Destinations Screen is in the form of a database spreadsheet with data entries for each destination group made on individual rows from left to right. Each destination group is assigned a name, and the physical outputs from the router you wish to associate with the destination group are assigned by switching level. In router terminology, this screen essentially maps each physical destination (output) from the router to its logical output by switching level and destination group nomenclature. System controllers prior to firmware Version 5.0 allow a maximum of 2400 destination names. Version 5.0, and later, allows up to 4800 destination names.



Number	Name	Panel Name	Long Name	Video	Audio 1	Audio 2	Audio 3	Audio 4
1	VT 1	VT 1	VT 1	1	1,025	1,026	1,027	1,028
2	VT 2	VT 2	VT 2	2	1,033	1,034	1,035	1,036
3	VT 3	VT 3	VT 3	3	1,041	1,042	1,043	1,044
4	VT 4	VT 4	VT 4	4	1,049	1,050	1,051	1,052
5	EVS 1A	EVS 1A	EVS 1A	5	1,057	1,058	1,059	1,060
6	EVS 1B	EVS 1B	EVS 1B	6	1,065	1,066	1,067	1,068
7	EVS 1C	EVS 1C	EVS 1C	7	1,073	1,074	1,075	1,076
8	EVS 1D	EVS 1D	EVS 1D	8	1,081	1,082	1,083	1,084
9	EVS 2A	EVS 2A	EVS 2A	9	1,089	1,090	1,091	1,092
10	EVS 2B	EVS 2B	EVS 2B	10	1,097	1,098	1,099	1,100
11	EVS 2C	EVS 2C	EVS 2C	11	1,105	1,106	1,107	1,108
12	EVS 2D	EVS 2D	EVS 2D	12	1,113	1,114	1,115	1,116
13	EVS 3A	EVS 3A	EVS 3A	13	1,121	1,122	1,123	1,124
14	EVS 3B	EVS 3B	EVS 3B	14	1,129	1,130	1,131	1,132
15	EVS 3C	EVS 3C	EVS 3C	15	1,137	1,138	1,139	1,140
16	TELCO 1	TELCO 1	TELCO 1	16	1,145	1,146	1,147	1,148

Figure 7-25 Destinations Configuration Screen

- **Number** - The left-most column is labeled NUMBER, is numerically sequential and automatically filled in as destinations are added. You can not change the entry in the Number column.
- **Name, Panel Name and Long Name** - The next three columns allow you to assign identifying names and/or acronyms to each destination according to the following formats:
  - **Name** – Any combination of alphanumeric characters may be used to identify the destination.

- **Panel Name** - Any combination of up to 8 alphanumeric characters may be used to identify the destination. The entry made in this column is the text string displayed in the switching level columns on the Matrix Status display screen.
- **Long Name** – This column is essentially a free text space where you may enter a name up to 32 characters in length for the destination. This name is only displayed on this configuration screen and may be used to more clearly identify an external device or system.

- **Switching Levels** - To the right side of the three name columns there are columns corresponding to each system switching level. The numeric entry in the columns on each row assigns the physical output from the router associated with the destination group for that switching level.

  For example, look at entry number 2 in Figure 7-25 labeled VT 2. Notice that the numeric entry for VT 2 in the VIDEO column is a 2. This entry tells the system controller that the video signal associated with the destination group identified as VT 2 is present at physical output number 2 of the video router.

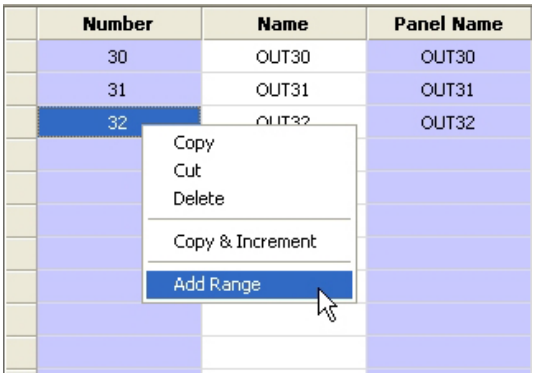
  Numeric entries for destination group VT 2 in the columns corresponding to switching level AUDIO 1 and AUDIO 2 are 1033 and 1034, respectively. In this case, the numeric entries indicate that the output signal associated with switching level AUDIO 1 for destination VT 2 is the signal present at physical output number 1033 of the audio router frame, and the signal associated with AUDIO 2 is physically present at output 1034 of the audio router.

  When you select destination group VT 2 as the output for a selected source group, the physical inputs for all switching levels associated with the source group are switched simultaneously to the physical outputs for all switching levels associated with the destination group.

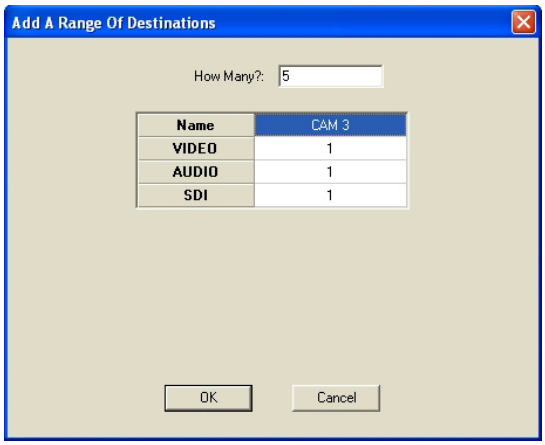
  Only one destination entry per switching level is allowed. An entry of 0 (zero) in any of the switching level cells indicates that there is no physical output defined for that switching level for the indicated destination group.

- **Navigating the Destinations Spreadsheet -** From the configuration screen, you may view all assigned destination groups, add a single destination group or a range of destinations to the configuration, delete a destination or modify parameters of an existing destination group.
  - **Add Destination** – If you wish to add a single destination entry, use the scroll bar and move the display to the empty row beneath the last destination entry in the spreadsheet. Click the cursor in the Name cell on the empty row and begin typing the name of the destination group you wish to add. Press enter, and the next sequential number is automatically assigned to the destination entry and the name you entered is copied in all three of the name entry cells. If you wish to change any of the name entries, such as panel name or long name, click the cursor in the cell you wish to modify and enter the changes, followed by enter. Once the new destination name is entered, you may click the cursor in a switching level cell and enter the physical router output you wish to assign as the destination for that level. You may continue adding single destinations in this manner up to the maximum number allowable for the controller.
  - **Delete Destination –** If you wish to remove a destination group entry from the configuration spreadsheet, move the cursor to the number column of the destination row you wish to delete and right click. Select delete from the right click menu. You will be prompted to verify the action before the destination is removed.

- **Spreadsheet Right Mouse Click Functions** - When you right-click on any cell in the Destination Configuration Spreadsheet, a pop-up menu appears providing command options for the cell, as shown below. Command items appearing in the pop-up menu vary depending on which commands are pertinent for data entered in the selected cell. Paragraph 7-11 discusses the function of common commands available from the pop-up menu. Remember that all commands listed and discussed below may or may not appear in the pop-up menu for a specific cell.

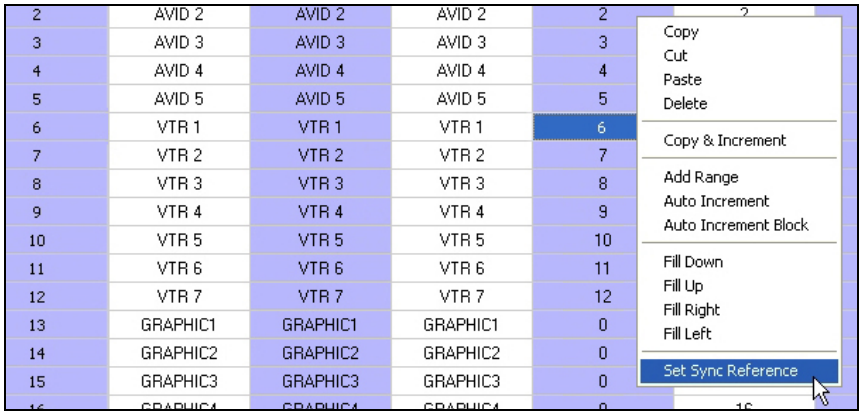


- **Add Range** – Adds a range of destinations using a category index type of naming scheme, as shown by the diagram below. You define the base name, such as "CAM," the starting index - such as 3 and the number of sources to create – such as 5. This example would create sources "CAM 3:" to "CAM 7."



- **Set Sync Reference –** Most PESA routers accept up to two sources of external Sync Reference signals for synchronizing switching times and destination output signals. PERC2000 allows you to assign either of the sync signals to any single destination or multiple destinations simultaneously.

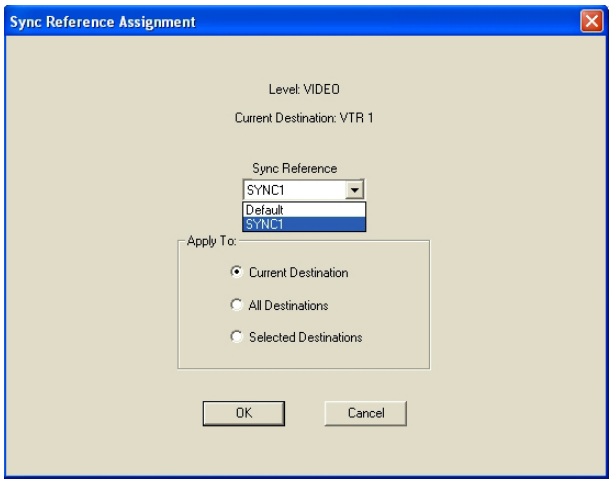
Destinations are mapped to sync signals using the **Set Sync Reference** command from the right-click command box, as shown below.



Click the cursor in a single cell corresponding to the destination and level, or to selected multiple destination cells you wish to map to a sync reference. Right click and select the "Set Sync Reference" option from the menu. A window, as shown in the diagram below, identifies the level and current destination you are configuring at the top. In the middle of the window you assign a sync source to the destination using the pull-down menu boxes.

Three radio buttons allow you to assign the sync source to only the Current Destination, All Destinations or Selected Destinations. Choose the Selected Destinations option when multiple cells have been highlighted.

In the example shown, by selecting "Set Sync Reference" in the spreadsheet cell for VTR 1 on the Video level, the window below appears and shows VTR 1 on the VIDEO level as the current destination. By selecting SYNC1 from the pull-down we have assigned the physical output named VTR 1 on the VIDEO level to synchronize to the reference input named SYNC1 for the current destination only.



7.12.7 REENTRIES CONFIGURATION SCREEN

A Reentry is a switching function that allows routing a single source to multiple destinations with a single switch. In implementation, think of a reentry as a virtual path that is both a source and destination. For example assume you have a source named SRC1 that you would like to simultaneously switch to destinations DST1, DST2, and DST3, Figure 7-26. Reentry REENT1 is created and switched to the three destinations. With a single logical switch, SRC1 can now be switched to REENT1 and the signal arrives simultaneously at all three destinations. While similar in operation to a salvo function, the major difference is that a salvo must be set-up as part of a configuration file. Once a reentry function is assigned it can be selected as needed just as any other source or destination from system remote control panels. The maximum number of reentries is 256.

Reentry functions are assigned using the Reentry Configuration Screen, Figure 7-27.

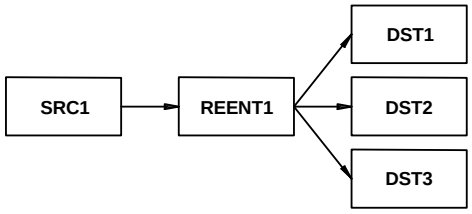


Figure 7-26 Reentry Example

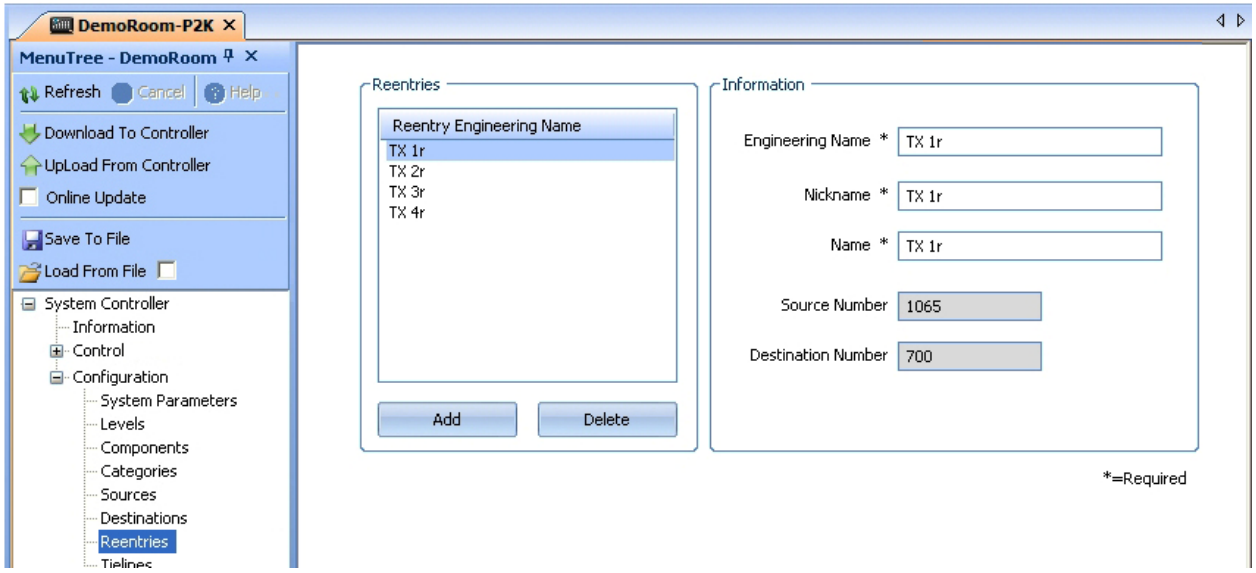


Figure 7-27 Reentry Configuration Screen

- **Engineering Name, Nickname and Name**

  These fields allow an identifying name to be assigned to the reentry path. In operation, this is the name used to signify both the source and destination when using a reentry path. Each of the name fields is discussed below:

  - **Engineering Name –** Any combination of up to 8 alphanumeric characters may be used to assign the Engineering Name to the reentry.
  - **Nickname -** Any combination of up to 8 alphanumeric characters may be used to assign the Nickname to the reentry.
  - **Name –** This field is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly comment the reentry function.

- **Defining a Reentry**

  Remember that a reentry is a virtual signal path, meaning there is no physical input or output, used as both a source and destination. In order to configure a reentry it is necessary to enter the Source Number and Destination Number as follows:

  - **Source Number** – Click the cursor in the Source Number cell and enter the Source Identification Number you wish to assign to the reentry function. This may be any number NOT used to identify an actual physical source. Typically, the way to choose a valid ID number is to look at the Sources Configuration Screen and note the last ID number used for a physical source. In the example shown Source Number 52 is used for the reentry path named **REENTRY1**. In this configuration file, 50 is the last source number assigned to a physical source. Therefore 52 is a valid and convenient number to assign to the reentry source.
  - **Destination Number** – Click the cursor in the Destination Number cell and enter the Destination Identification Number you wish to assign to the reentry function. This may be any number NOT used to identify an actual physical destination. Typically, the way to choose a valid ID number is to look at the Destinations Configuration Screen and note the last ID number used for a physical destination. In the example shown Destination Number 50 is used for the reentry path named **REENTRY1**. In this configuration file, 48 is the last number assigned to a physical destination. Therefore 50 is a valid and convenient number to assign to the reentry destination.

- **Adding or Deleting a Reentry**

  - **Add Reentry** – Clicking the Add Reentry option, Figure 7-28, opens a new reentry configuration screen. From this screen a new reentry path can be added to the file configuration.
  - **Delete Reentry** – If you wish to remove a reentry path from the configuration file, move the cursor to the reentry name beneath the Reentries tab in the Command Screen Window you wish to delete, Figure 7-28, highlight the reentry to be deleted and right click to open the option box. Select Delete Reentry and the reentry is removed from the configuration.

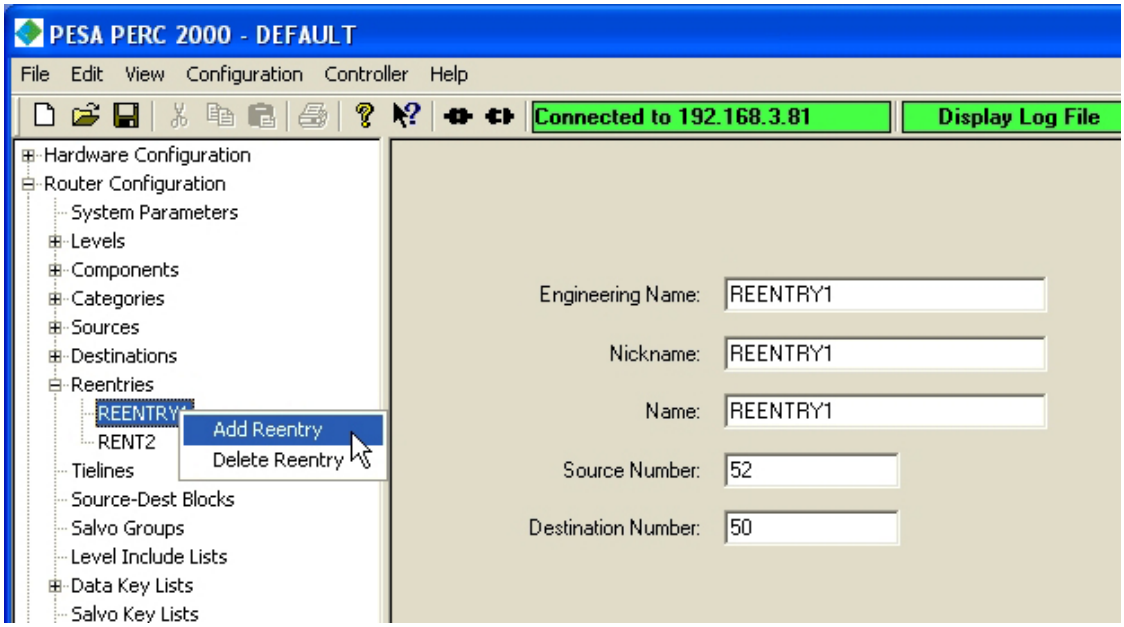


Figure 7-28 Adding or Deleting a Reentry

7.12.8 TIE-LINES CONFIGURATION SCREEN

A tie-line is a physical connection between two switching levels – one level being the signal output, or tie-line source; and the other being a signal input, or tie-line destination. An excellent application example of the use of a tie-line is illustrated within the set-up screens presented here. Before we discuss the entries necessary in the configuration set-up to establish a tie-line, let's take a closer look at the example embedded in these screens.

Suppose you have a switching application where an analog video source needs to be available as an analog output, and also converted by external equipment to a digital signal and be available from a digital video level in addition to the analog output. In order to implement such an arrangement we would like to have a dedicated output from the analog level named Video and a dedicated input to the digital level, in this example named SDI. Video conversion equipment is physically inserted between the dedicated physical output from Video and the dedicated physical input to SDI. Whenever we select one of the analog sources on Video as the desired output to one or more of the SDI destinations the controller transparently switches the analog source to our dedicated output from Video, through the conversion equipment and applies the converted digital signal to our dedicated input of SDI, where that input is switched by SDI to the selected destination output of SDI. This actual physical connection made between the two switching levels is the physical portion of a tie-line. In addition, we have to configure the controller to recognize the tie-line by programming the level name and physical connection of the signal output and input, and assign an identification name to the tie-line – this is done by the Tie-Line configuration screen, Figure 7-29.

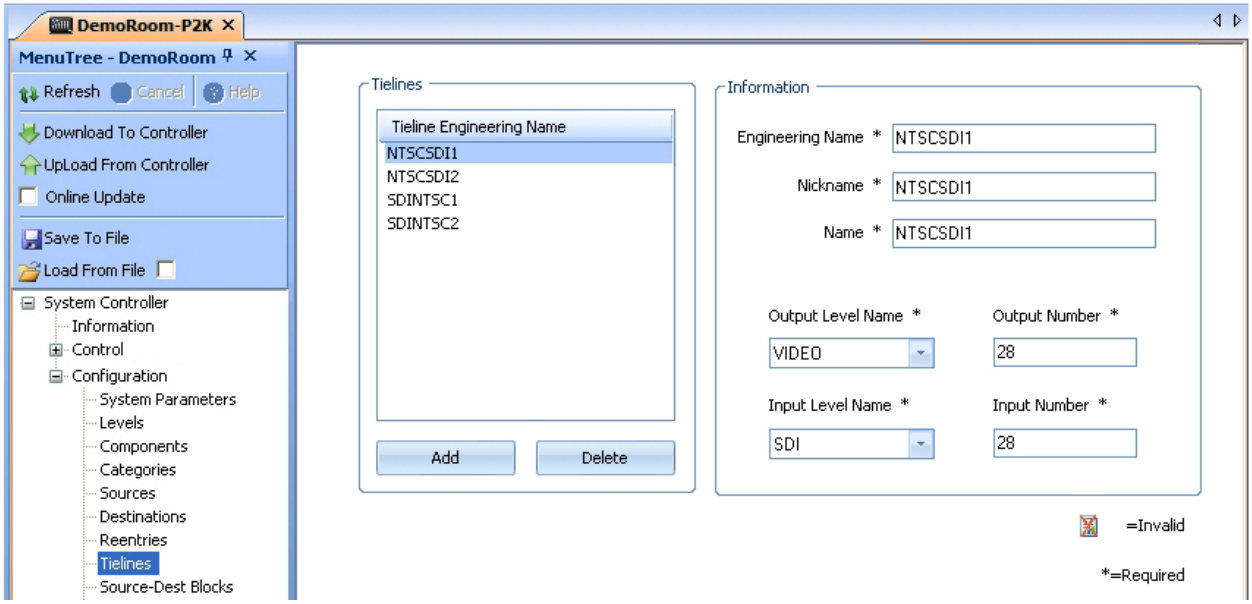


Figure 7-29 Tie-Line Configuration Screen

- **Engineering Name, Nickname and Name**

  In the case of the tie-line, PESA recommends that you choose a name that is descriptive of the function of the tie-line. The name you assign is not used on other status screens and is not used or seen by an operator. In this example, notice that there are four tie-lines used in this system. NTSCSDI1 is chosen to signify the first of two tie-line connections dedicated between an output (destination) of NTSC analog video from the level named Video and an input (source) of digital SDI compliant video to the level named SDI. In similar manner, the name SDINTSC2 signifies the second of two tie-line connections dedicated between an output (destination) from level SDI and an input (source) to level Video. Each of the name fields is discussed below:

  - **Engineering Name –** Any combination of up to 8 alphanumeric characters may be used to assign the Engineering Name to the tie-line.
  - **Nickname -** Any combination of up to 8 alphanumeric characters may be used to assign the Nickname to the tie-line.
  - **Name –** This field is essentially a free text space where you may enter a name up to 32 characters in length for the source. This name is only displayed on this configuration screen and may be used to more clearly comment the tie-line function.

- **Defining a Tie-Line**

  Remember that a tie-line is a hard-wired external connection between a dedicated physical output (destination) from one level and a dedicated physical input (source) on another level. It is important to clearly understand that a tie-line is a *physical* connection made external to the router using cable attached to physical connectors on the rear panel of the router. In order to configure a tie-line it is necessary to program the destination and source as follows:

- **Output Level Name** – This entry field contains a pull-down menu containing all the levels defined in the configuration. Highlight the switching level from which you wish to derive the signal routed to the tie-line.
- **Output Number** – Enter the number of the physical output connection from the level entered above from which you wish to derive the signal routed to the tie-line.
- **Input Level Name** – This entry field contains a pull-down menu containing all the levels defined in the configuration. Highlight the switching level you wish to receive the signal from the tie-line.
- **Input Number** – Enter the number of the physical input connection of the level entered above you wish to receive the signal from the tie-line.

In our example configuration screen, we have assigned the name NTSCSDI1 to a tie-line deriving its source signal from physical output 28 on switching level VIDEO and directing its destination signal to physical input 28 on switching level SDI.

7.12.9 SOURCE-DESTINATION (DEST) BLOCKS CONFIGURATION SCREEN

When the Source-Dest Blocks menu entry is selected, the configuration screen, as shown by Figure 7-30, is displayed. From this screen you can selectively block any source group from being switched to a designated destination group. The box labeled Blocks on the left side of the display window contains a listing of destinations with at least one source block assignment; and the box labeled Information on the right side contains the data entry cells used to create new or modify existing source block assignments. Note the Information block has three areas:

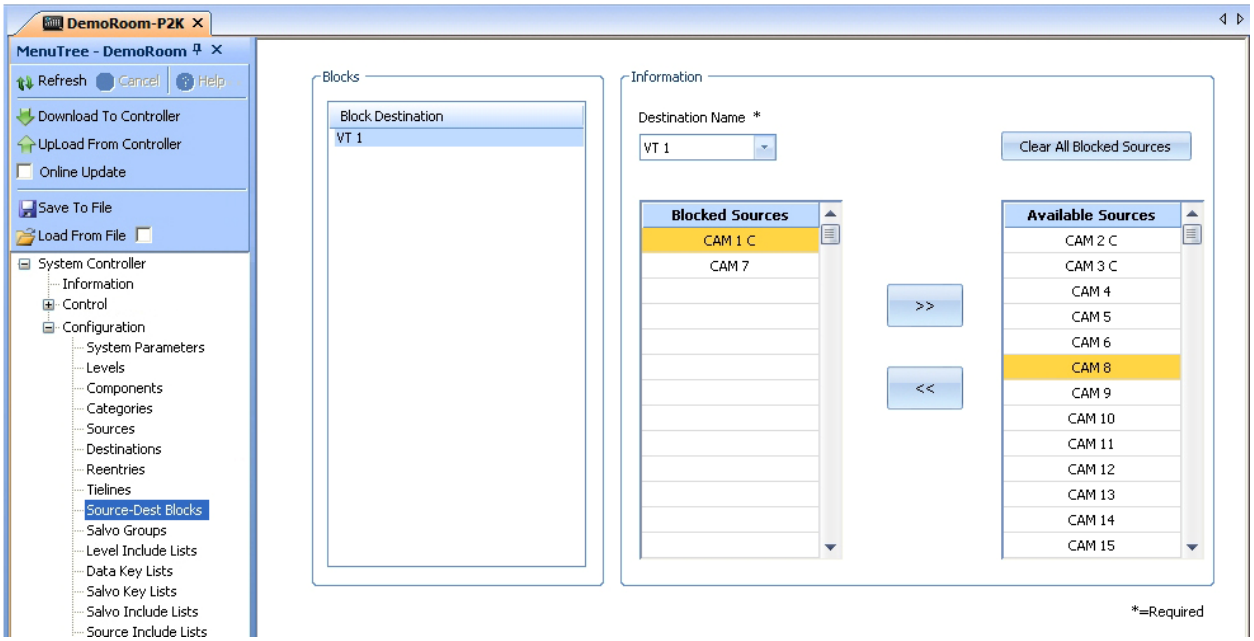
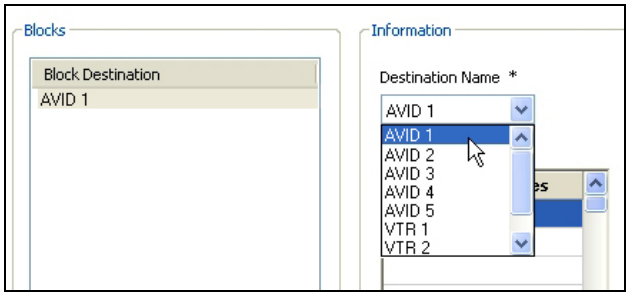


Figure 7-30 Source-Destination Block Display

- **Destination Name** – This is a pull-down listing of all destinations in the configuration, identified by name, as shown in the illustration below. To select a destination to which you wish to apply a source block, open the listing with the arrow icon, and select the destination name from the list.



- **Blocked Sources** – Sources you wish to block from access by the named destination are listed in this column.
- **Available Sources** – This column contains a listing of all the sources which may be switched to the named destination.

  In order to assign a source block to a specific destination, locate the desired destination in the Destination Name pull down list and highlight the name.

  Initially, all sources are listed in the Available Sources list box. Listed sources are moved between the two list boxes using the two arrows between the boxes. In order to move a source from available to blocked, highlight the source you want to block from access by the destination and click the arrow pointing from the available list to the blocked list. You may list any number of sources you wish to block. In order to unblock a source, highlight and move the source name from the blocked list to the available list using the arrow pointing to the available list.

  The Block Destination field contains a listing of all destinations, by name, with at least one blocked source. If you wish to access source block configuration for a specific destination, click on the destination name in the listing. From the configuration screen you may move sources from blocked to available using the arrow keys, or you may clear all source blocks for the destination by clicking the Clear All Blocked Sources key. If all source blocks are removed, the destination name is removed from the Block Destination listing.

7.12.10 SALVO GROUPS CONFIGURATION SCREEN

When the **Salvo Groups** menu entry is selected, the Salvo Configuration Screen, Figure 7-31, is displayed. From this screen you can create and define salvo groups for the router configuration. The box labeled *Salvos* on the left side of the display window contains a listing of all the defined salvo groups in the router configuration, by name; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing salvo groups.

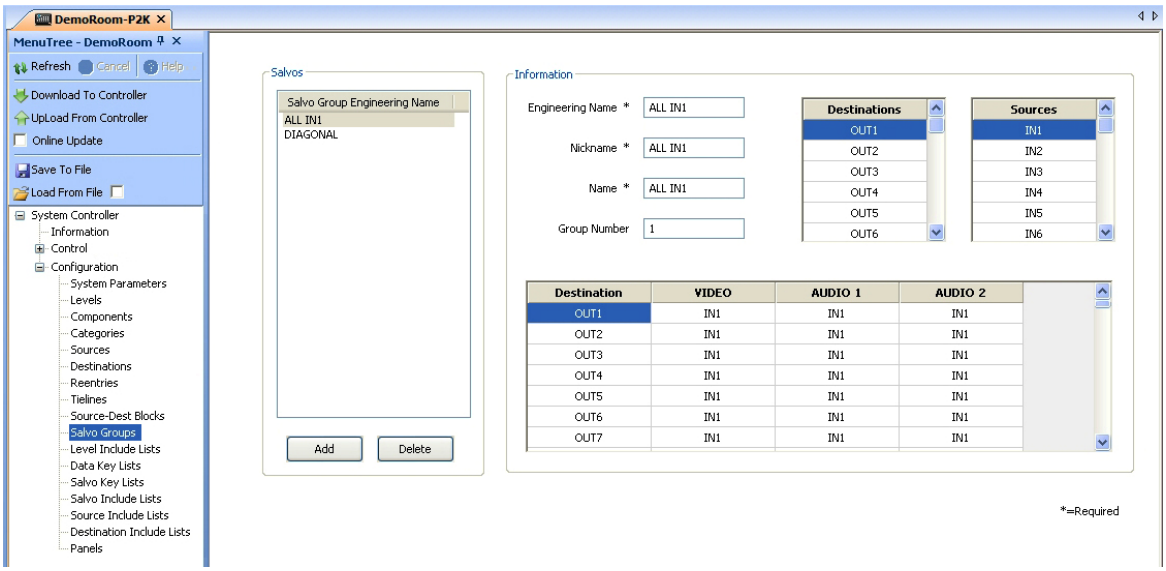


Figure 7-31 Salvo Groups Configuration Screen

Figure 7-31 illustrates a salvo group named ALL IN1 which, when "fired," switches the source group named IN1 to all defined destination groups. Salvo groups are "fired" from the Salvo Status menu screen (refer to Paragraph 7.9.4) and when executed, all switches defined in the salvo group are simultaneously switched. All switches in a salvo are taken within the same vertical interval.

- **Adding a Salvo Group** – PERC2000 allows a maximum of 64 salvo groups. To add a salvo group, click the Add button at the bottom of the Salvos box. A place-holder name is added to the Salvo Engineering Group Name list box and a set-up screen with the name entry fields pre-filled is displayed in the Information box. You may change the name field entries to the descriptive name you would like to use for the salvo group.
- **Deleting a Salvo Group -** To delete a salvo group, highlight the name of the group you wish to delete in the Salvo Group Engineering Name list box. Click "Delete" at the bottom of the box.
- **Engineering Name, Nickname, Name and Group Number -** Salvo group names may be from one to eight characters in length and constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter. Three fields are provided for naming the salvo group. In the case of the salvo configuration, PESA recommends that you choose a name that is descriptive of the function of the salvo. In this example, the name ALL IN1, signifies a salvo that switches the input signals defined by source group IN1, to the physical outputs associated with every defined destination group. Each of the name fields is discussed below:
  - **Engineering Name** – Up to 8 alphanumeric characters are allowed when assigning the Engineering Name to the salvo group.
  - **Nickname** – Up to 8 alphanumeric characters are allowed when assigning the Nickname to the salvo group.
  - **Name** – This field is essentially a free text space where you may enter a descriptive name, up to 32 characters in length, for the salvo group. This name is only displayed on this configuration screen and may be used to more clearly comment the salvo function.

- **Group Number** – Group number is sequentially assigned by software and is not user definable.
- **Defining A Salvo Group -** Click the cursor in the top cell of the Destination column. Locate the first destination you wish to assign to the salvo group from the Destinations list at the top of the screen and double-click the entry to copy the destination name into the cell. In like manner, move the cursor to the cells under the various switching level columns and using the entries in the Source list double-click the name of the source you wish to switch to the indicated level of the destination. If desired, you may enter additional destinations and assign sources to them.

7.12.11 LEVEL INCLUDE LISTS CONFIGURATION SCREEN

The Level Include Lists Configuration Screen, Figure 7-32, allows you to selectively build a named list of switching levels which, when assigned to a specific remote control panel, designates the levels that panel is authorized to control. Multiple panels may share a Level Include List. Click the Level Include Lists parent entry in the Configuration menu tree to display the configuration screen. .

The box labeled *Level Include Lists* on the left side of the display window contains, by nickname, the level include lists that have been created for the router; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing level include lists.

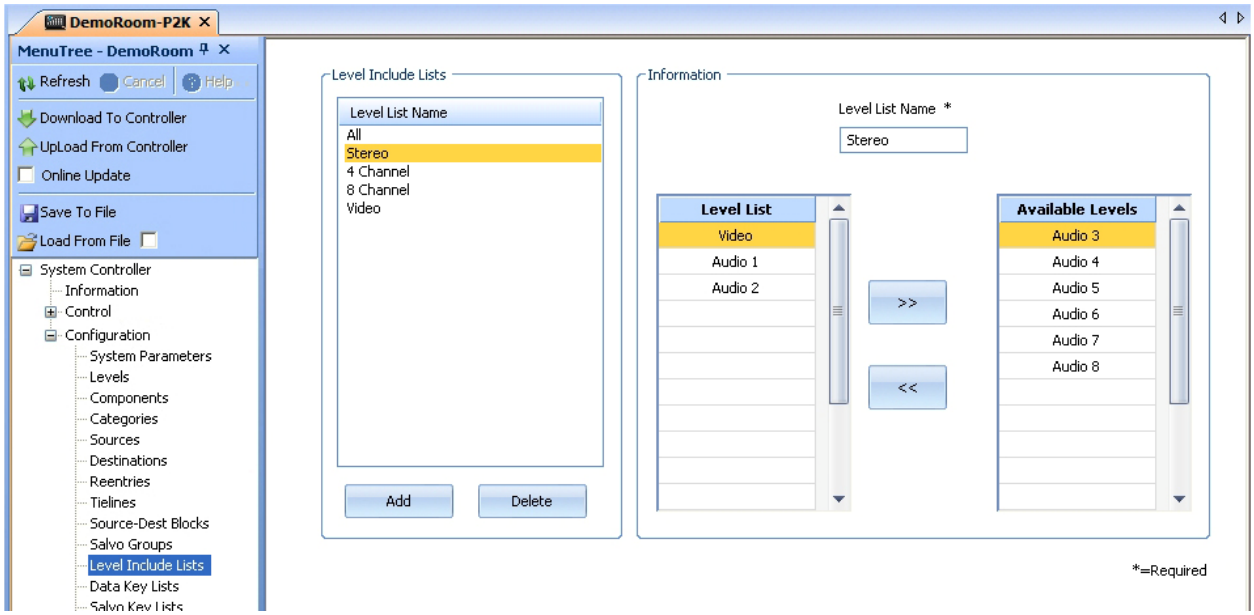


Figure 7-32 Level Include Lists Configuration Screen

- **Adding a Level Include List** –To add a level include list, click the Add button at the bottom of the Level Include Lists box. A place-holder name is added to the Level List Name list box and a set-up screen with the Level List Name entry field pre-filled is displayed in the Information box. You may change the name field entry to the descriptive name you would like to use for the level include list.

- **Deleting a Salvo Group -** To delete a level include list, highlight the name of the list you wish to delete in the Level Include Lists box. Click "Delete" at the bottom of the box.
- **Level List Name** – This field is where you assign a name to the Level Include List. Names can be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the level include list.
- **Level List** – Levels listed in this column are accessible by remote control panels functioning under the named level include list.
- **Available Levels** – This column contains a listing of all levels which may be included in the level include list.

  Initially, all levels are listed in the Available Levels list box. Listed levels are moved between the two list boxes using the two arrows between the boxes, as shown by Figure 7-33. In order to move a level from the available list to the level include list, highlight the level you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a level from the include list, highlight and move the level name from the include list to the available list using the arrow pointing to the available list.

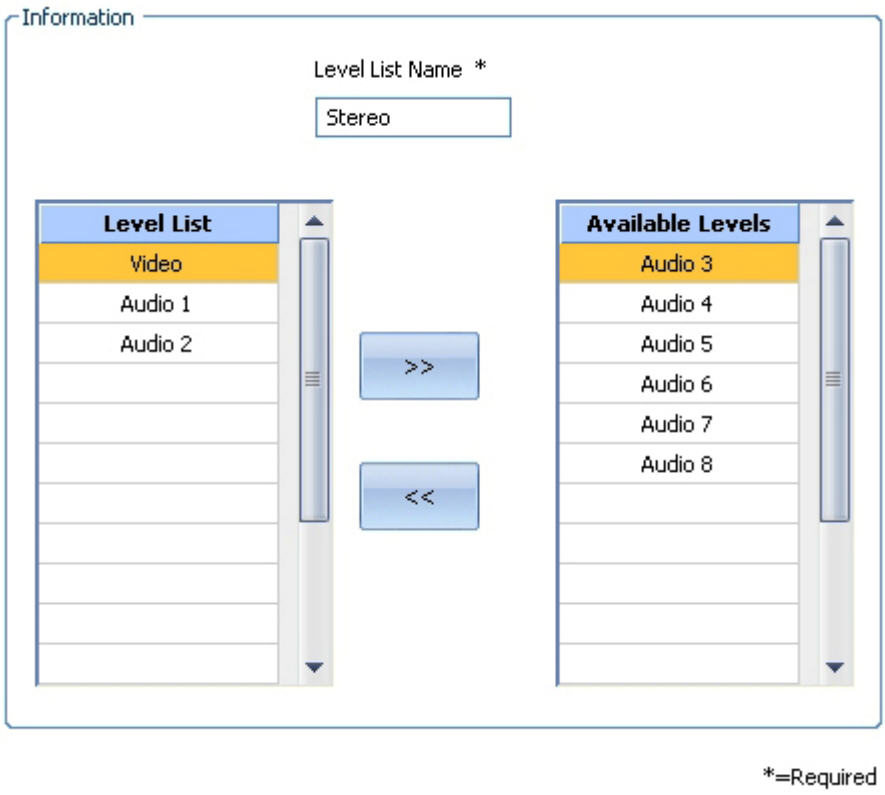


Figure 7-33 Level Include List Data Entry

7.12.12 DATA KEY LISTS CONFIGURATION SCREEN

The Data Key Lists Configuration Screen, Figure 7-34, allows you to generate one or more named lists which assign specific functions to each configurable key on a system remote control panel. Multiple panels may share a data key list as long as they are the same panel type. Click the Data Key Lists parent entry in the Configuration menu tree to display the configuration screen.

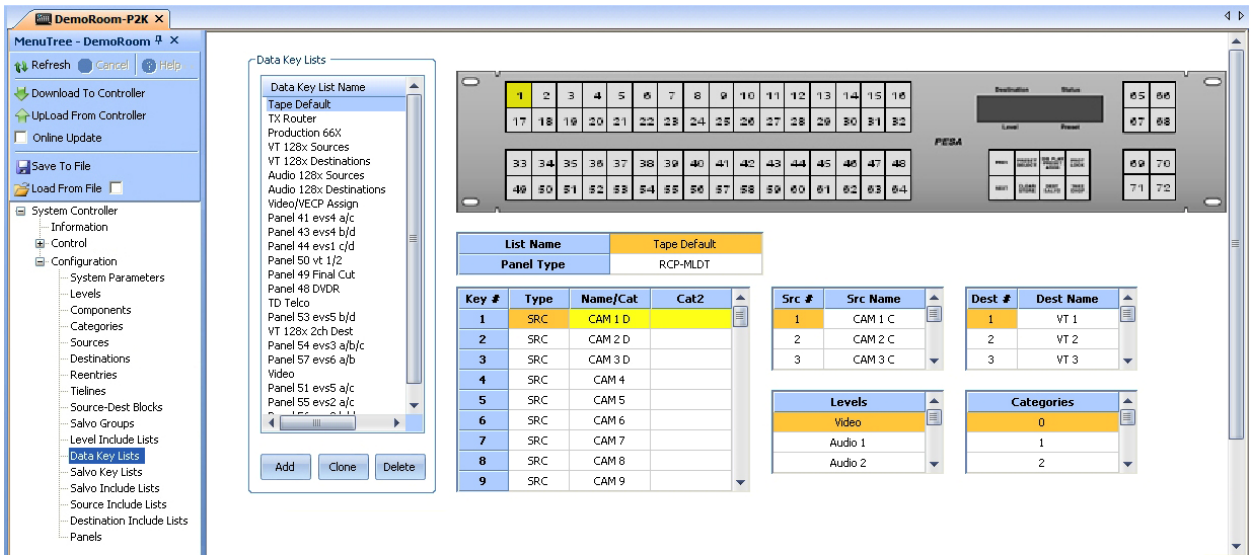
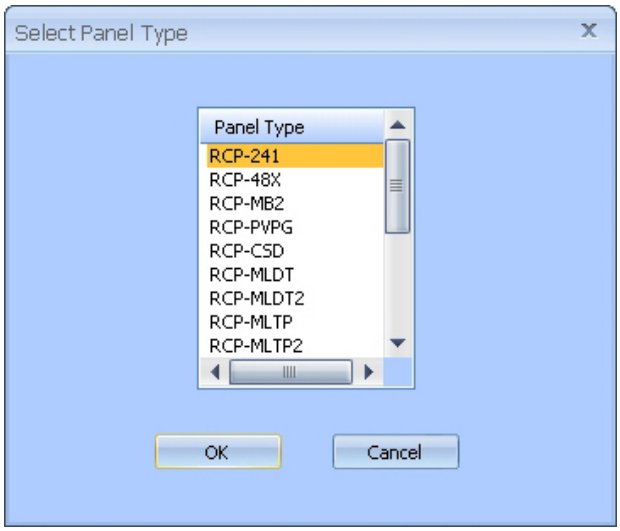


Figure 7-34 Data Key Lists Configuration Screen

- **Adding a Data Key List** –To add a data key list, click the Add button at the bottom of the Data Key Lists box. A place-holder name is added to the list name box and a pop-up box appears with a listing of the panel types you may set up through the system controller, as shown by the illustration below. Select the panel type you are configuring.

  To make the programming task more straightforward, a visual image of the panel type you have selected is displayed at the top of the configuration screen. There are a number of different remote control panels in the PESA product line – each is designed for a specific purpose – and each panel has a different key and display layout. Displaying a graphic image provides an easy guide for you to follow when configuring a specific type of panel. A place-holder list name is automatically inserted into the List Name field below the graphic; however, you may change it to the name you would like to use for the data key list.



- **Deleting a Data Key List** - To delete a data key list, locate the name of the list you wish to delete in the Data Key List Name box and click to select it. Click "Delete" at the bottom of the box.
- **Defining List Name and Panel Type -** Note the fields labeled List Name and Panel Type, Figure 7-35. Enter a name for the data key list. PESA recommends you assign a name that is somewhat descriptive of the function of the data key list or the type of panel it controls. In this example we have used the List Name Tape Default to indicate the function of the panels using this data key list. Data Key List names may be structured using uppercase letters, numbers, and spaces; however, the first character must be a letter.

  Panel Type displays the model number of the panel associated with the data key list name.

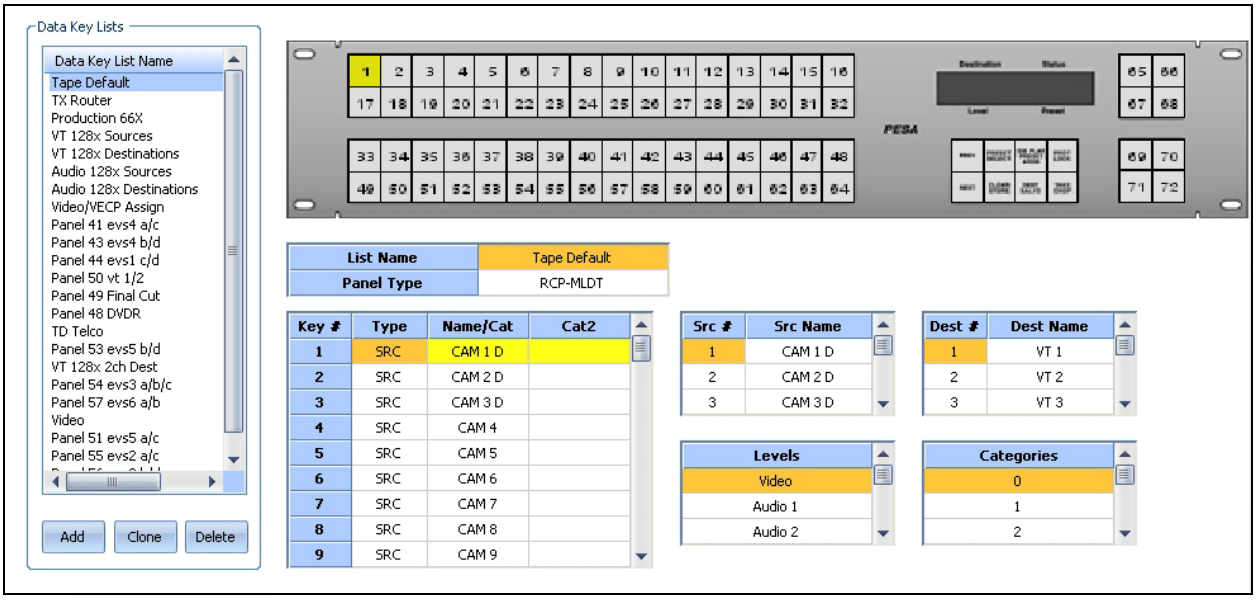


Figure 7-35 Data Key Function Assignment

- **Assigning Data Functions to Configurable Panel Keys -** Below the fields you just entered there is a list field with a column labeled Key # on the left-hand side. Numbers in the key # column correspond to the number assigned to each key of the panel as depicted by the on-screen graphic.

  On the right-hand side of the screen there are four scroll lists for Sources, Destinations, Levels and Categories. You can assign any key on the panel any item in any of the four lists. Once a control panel key is assigned, when the operator presses that key its label or function is recalled.

  As shown by Figure 7-35 there are two groups of 32 keys each (labeled 1 – 32 and 33 -64) on the left side of the panel and two groups of four numbered keys (labeled 65 – 68 and 69 – 72) on the right side. Assume you would like to program the top group on the left to select sources, the bottom group to select destinations and the top cluster of four buttons to each select one of four levels in the system.

  Move the cursor to the column labeled Type on the row for Key #1. You can do this either by clicking in the cell or by mouse clicking on button number 1 on the graphic image.

  Locate the Source you wish to assign to button number 1 in the sources listing and double click. Refer to Figure 7-35 and note the Type (SRC for source) and the Name (CAM 1 D) are automatically entered, and the cursor advances to the row for Key # 2. Continue locating and clicking sources until the upper keys are assigned as desired.

  Since our example is to program the bottom row as destinations, move the cursor to the cell under the Type heading for key number 33. Using the destination names listed in the Destinations scroll box, locate and double click on the destinations you wish to assign to the panel keys.

  Let's further assume we would like to assign the top cluster of four buttons on the right side to each represent one of the available switching levels defined for this system. Just as in the above steps, move the cursor to the key you wish to assign to the VIDEO layer, for this text we are using key number 65. Locate the Levels scroll box and double click the level name VIDEO. *Type* is identified as LEV and VIDEO is placed in the *Name* cell. Whenever you wish to access the VIDEO level on a panel operating under this data key list, press key 65.

  Categories and their use and purpose are discussed in other areas of this manual. If you wish to assign a key on the panel to represent a specific category label, move the cursor to the Name/Cat cell of the key row to assign and then locate and double click the desired category label from the Categories scroll box. The column labeled Cat2 is used only when assigning a category label to a specific key. The entry in this column assigns the category label accessed when the panel key is selected after first selecting a Category Key.

  Data Key Lists created for the configuration are listed in the Data Key List Name box. If you wish to access the configuration screen for a specific data key list, click on the name in the listing.

7.12.13 SALVO KEY LISTS CONFIGURATION SCREEN

The Salvo Key Lists Configuration Screen, Figure 7-36, allows you to generate one or more named lists which assign a salvo group to configurable keys on a system remote control panel. Multiple panels may share a salvo key list as long as they are the same panel type. Click the Salvo Key Lists parent entry in the Configuration menu tree to display the configuration screen.

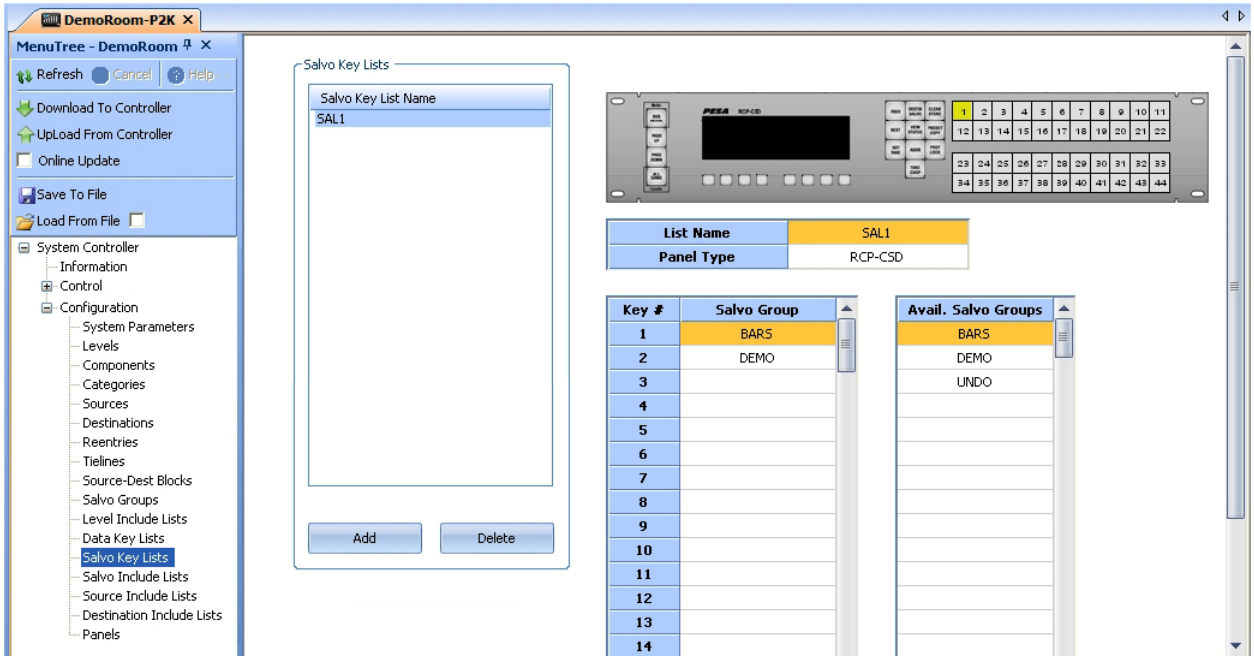


Figure 7-36 Salvo Key Lists Configuration Screen

- **Adding a Salvo Key List** –To add a salvo key list, click the Add button at the bottom of the Salvo Key Lists box. A place-holder name is added to the list name box and a pop-up box appears with a listing of the panel types you may set up through the system controller. Select the panel type you are configuring.

  To make the programming task more straightforward, a visual image of the panel type you have selected is displayed at the top of the configuration screen. A place-holder list name is automatically inserted into the List Name field below the graphic; however, you may change it to the name you would like to use for the data key list.

- **Deleting a Salvo Key List** - To delete a salvo key list, locate the name of the list you wish to delete in the Salvo Key List Name box and click to select it. Click “Delete” at the bottom of the box.

- **Defining List Name and Panel Type** - Note the fields labeled List Name and Panel Type, Figure 7-37. Enter a name for the salvo key list. PESA recommends you assign a name that is somewhat descriptive of the function of the salvo groups available to the panel. In this example we have used the List Name SAL 1 to identify the list. Salvo Key List names may be structured using uppercase letters, numbers, and spaces; however, the first character must be a letter.

  Panel Type displays the model number of the panel associated with the salvo key list name.

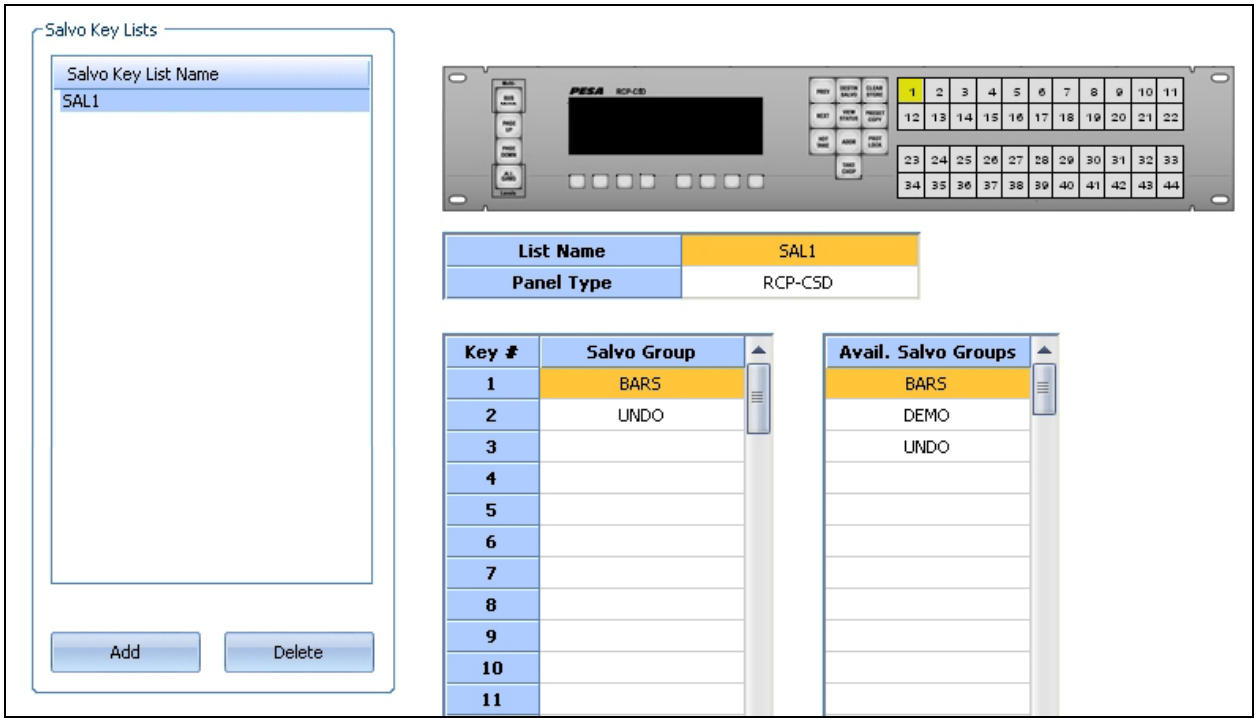


Figure 7-37 Salvo Key Lists Data Entry Fields

- **Assigning Data Functions to Configurable Panel Keys -** Below the fields you just entered there is a list field with a column labeled Key # on the left-hand side. Numbers in the key # column correspond to the number assigned to each key of the panel as depicted by the on-screen graphic.

  On the right-hand side of the screen there is a scroll list for Available Salvo Groups. You can assign any key on the panel any item in the list. Once a control panel key is assigned, whenever the remote control panel is operating in salvo mode a specific salvo group is recalled when the operator presses the key associated with that salvo group.

  For example, refer to Figure 7-37 and assume you would like to program button 1 to select the salvo group named BARS and button 2 with the UNDO salvo function. Move the cursor to the column labeled Type on the row for Key #1. You can do this either by clicking in the cell or by mouse clicking on button number 1 on the graphic image.

  Locate the Salvo Group you wish to assign to button number 1 in the available salvo groups listing and double click, and the cursor advances to the row for Key # 2. Continue locating and clicking salvo groups until the panel keys are assigned as desired. For our example we double click on the UNDO label in the group listing to associate that function with button 2.

  Since our example is to program the bottom row as destinations, move the cursor to the cell under the Type heading for key number 33. Using the destination names listed in the Destinations scroll box, locate and double click on the destinations you wish to assign to the panel keys.

In order to access a salvo group name the remote control panel must be operating in the salvo mode. This is done in different ways for different panels and you should consult the User Guide for the specific panel being used. With our example panel you would press and hold the key labeled DESTN/SALVO until the lamp in the key starts to flash. In this mode when you press a key assigned a salvo group that group name appears on the panel display ready to be activated.

Salvo Key Lists created for the configuration are listed in the Salvo Key List Name box. If you wish to access the configuration screen for a specific salvo key list, click on the name in the listing.

7.12.14 SALVO INCLUDE LISTS CONFIGURATION SCREEN

The Salvo Include Lists Configuration Screen, Figure 7-38, allows you to selectively build a named list of salvo groups which, when assigned to a specific remote control panel, designates the salvo groups that panel is authorized to control. Multiple panels may share a Salvo Include List. Click the Salvo Include Lists parent entry in the Configuration menu tree to display the configuration screen. .

The box labeled *Salvo Include Lists* on the left side of the display window contains, by nickname, the salvo include lists that have been created for the router; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing salvo include lists.

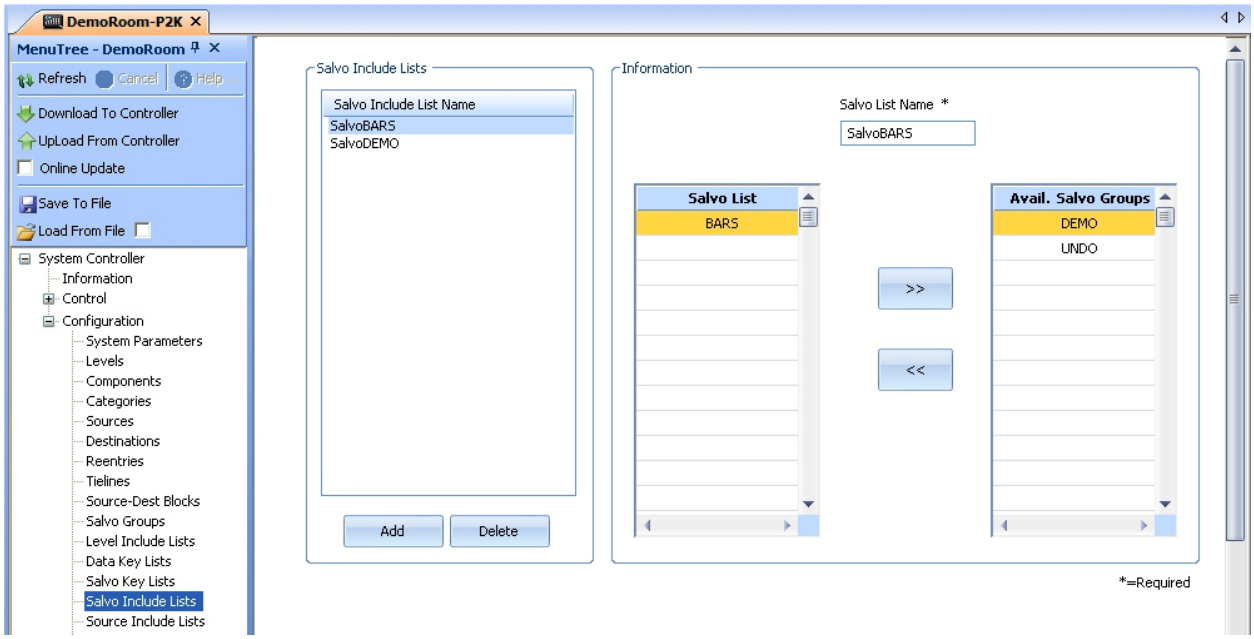


Figure 7-38 Salvo Include Lists Configuration Screen

- **Adding a Salvo Include List** –To add a salvo include list, click the Add button at the bottom of the Salvo Include Lists box. A place-holder name is added to the Salvo List Name list box and a set-up screen with the Salvo List Name entry field pre-filled is displayed in the Information box. You may change the name field entry to the descriptive name you would like to use for the salvo include list.
- **Deleting a Salvo Group -** To delete a salvo include list, highlight the name of the list you wish to delete in the Salvo Include Lists box. Click "Delete" at the bottom of the box.
- **Salvo List Name** – This field is where you assign a name to the Salvo Include List. PESA recommends that you choose a name which is somewhat descriptive of the function of the salvo include list. Salvo List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Salvo List** – Salvo groups listed in this column are accessible by remote control panels functioning under the named salvo include list.
- **Available Salvo Groups** – This column contains a listing of all salvo groups which may be included in the salvo include list.

  Initially, all salvo groups are listed in the Available Salvo Groups list box. Listed salvo groups are moved between the two list boxes using the two arrows between the boxes. In order to move a salvo group name from the available list to the salvo include list, highlight the salvo group you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a salvo group from the include list, highlight and move the salvo group name from the include list to the available list using the arrow pointing to the available list.

7.12.15 SOURCE INCLUDE LISTS CONFIGURATION SCREEN

The Source Include Lists Configuration Screen, Figure 7-39, allows you to selectively build a named list of sources which, when assigned to a specific remote control panel, designates the sources that panel is authorized to control. Multiple panels may share a Source Include List. Click the Source Include Lists parent entry in the Configuration menu tree to display the configuration screen. .

The box labeled *Source Include Lists* on the left side of the display window contains, by nickname, the source include lists that have been created for the router; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing source include lists.

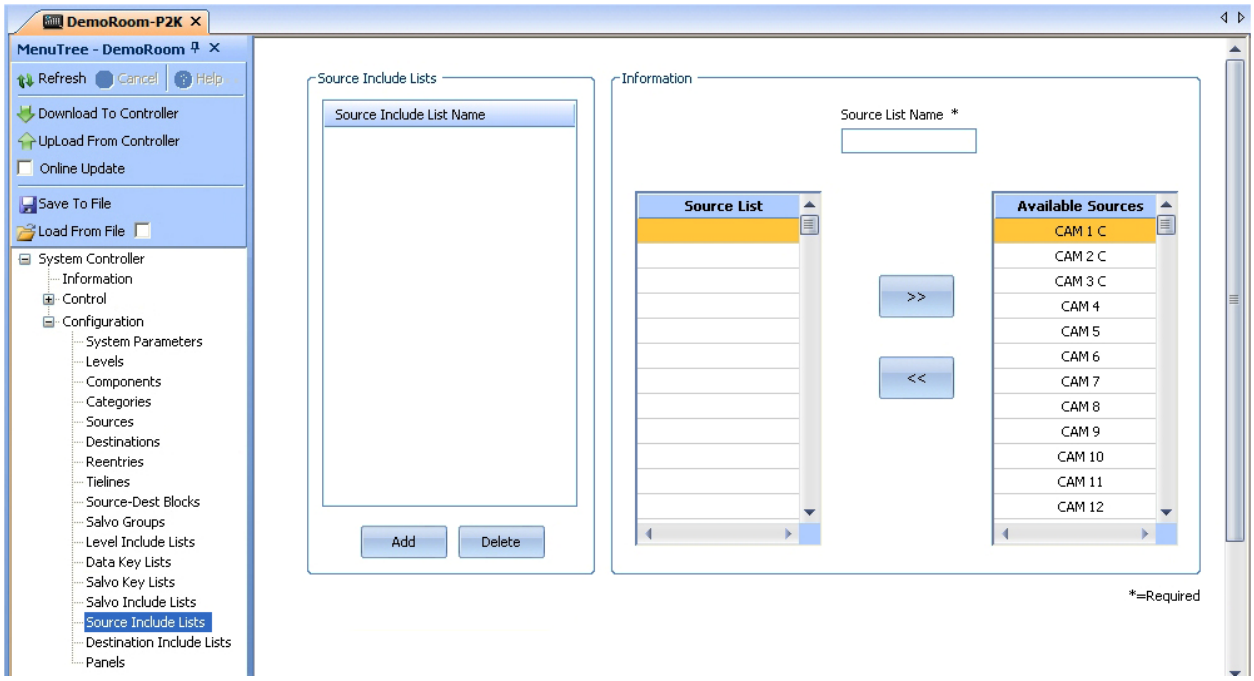


Figure 7-39 Source Include Lists Configuration Screen

- **Adding a Source Include List** –To add a source include list, click the Add button at the bottom of the Source Include Lists box. A place-holder name is added to the Source Include List Name list box and a set-up screen with the Source List Name entry field pre-filled is displayed in the Information box. You may change the name field entry to the descriptive name you would like to use for the source include list.
- **Deleting a Source Include List -** To delete a source include list, highlight the name of the list you wish to delete in the Source Include Lists box. Click "Delete" at the bottom of the box.
- **Source List Name** – This field is where you assign a name to the Source Include List. Names can be any combination of letters and numbers up to eight characters. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the source include list. Source List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Source List** – Sources listed in this column are accessible by remote control panels functioning under the named source include list.
- **Available Sources** – This column contains a listing of all sources which may be included in the source include list.

  Initially, all sources are listed in the Available Sources list box. Listed sources are moved between the two list boxes using the two arrows between the boxes, Figure 7-40. In order to move a source name from the available list to the source include list, highlight the source you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a source from the include list, highlight and move the source name from the include list to the available list using the arrow pointing to the available list.

Source Include Lists created for the configuration are listed in the Source Include List Name box. If you wish to access the configuration screen for a specific source include list, click on the name in the listing.

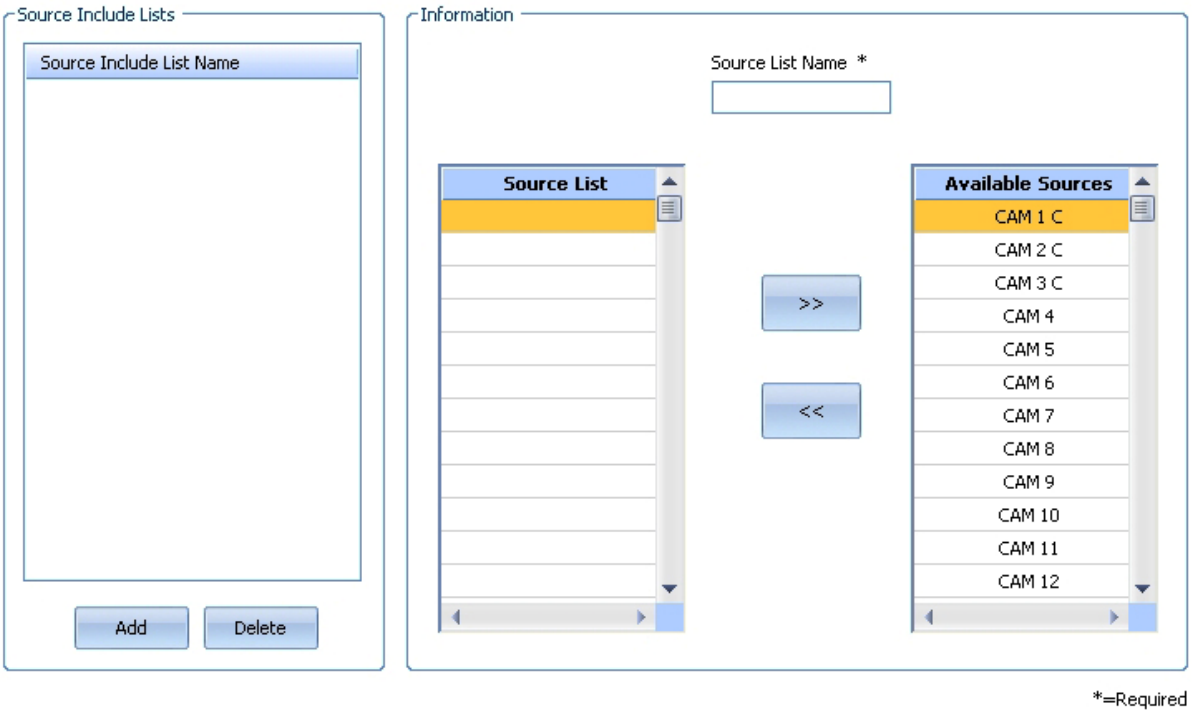


Figure 7-40 Source Include Lists Data Entry Fields

7.12.16 DESTINATION INCLUDE LISTS CONFIGURATION SCREEN

The Destination Include Lists Configuration Screen, Figure 7-41, allows you to selectively build a named list of destinations which, when assigned to a specific remote control panel, designates the sources that panel is authorized to control. Multiple panels may share a Destination Include List. Click the Destination Include Lists parent entry in the Configuration menu tree to display the configuration screen. .

The box labeled *Destination Include Lists* on the left side of the display window contains, by nickname, the destination include lists that have been created for the router; and the box labeled *Information* on the right side contains the data entry cells used to create new or modify existing source include lists.

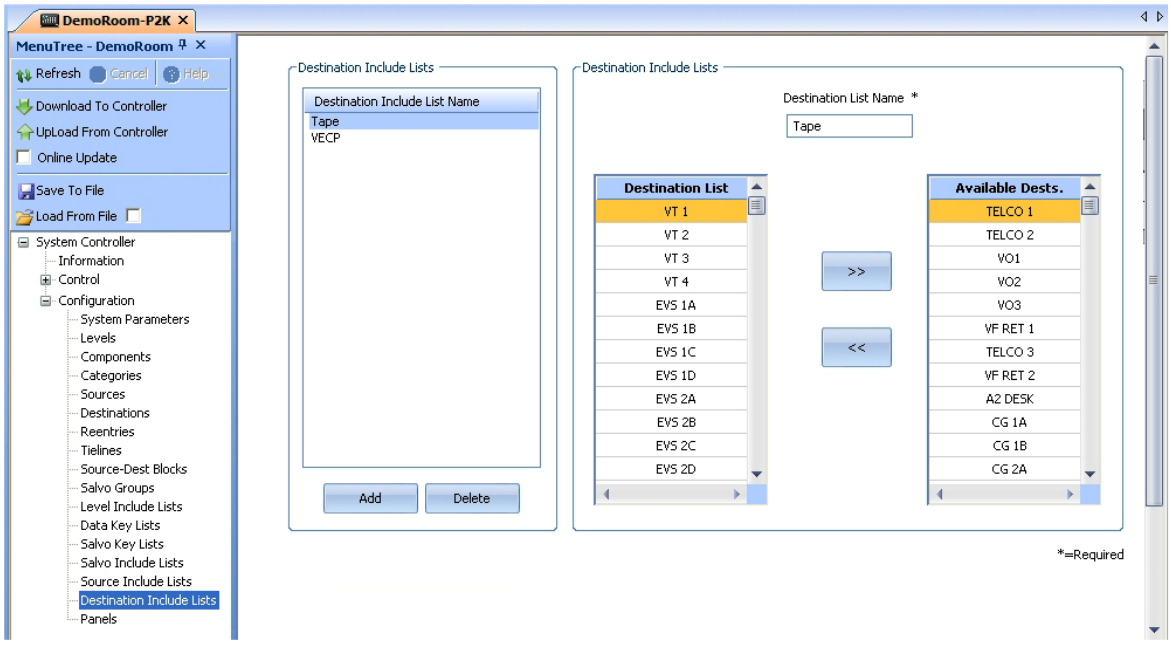


Figure 7-41 Destination Include Lists Configuration Screen

- **Adding a Destination Include List** – To add a destination include list, click the Add button at the bottom of the Destination Include Lists box. A place-holder name is added to the Destination Include List Name list box and a set-up screen with the Destination List Name entry field pre-filled is displayed in the Information box. You may change the name field entry to the descriptive name you would like to use for the destination include list.
- **Deleting a Destination Include List -** To delete a destination include list, highlight the name of the list you wish to delete in the Destination Include Lists box. Click "Delete" at the bottom of the box.
- **Destination List Name** – This field is where you assign a name to the Destination Include List. Names can be any combination of letters and numbers up to eight characters. PESA highly recommends that you choose a name which is somewhat descriptive of the function of the destination include list. Destination List names may be from one to eight characters in length and are constructed using uppercase letters, numbers, and spaces; however, the first character must be a letter.
- **Destination List** – Destinations listed in this column are accessible by remote control panels functioning under the named destination include list.
- **Available Sources** – This column contains a listing of all destinations which may be included in the destination include list.

  Initially, all destinations are listed in the Available Destinations list box. Listed destinations are moved between the two list boxes using the two arrows between the boxes, Figure 7-42. In order to move a destination name from the available list to the destination include list, highlight the destination you want to include in the list and click the arrow pointing from the available list to the include list. In order to disallow a destination from the include list, highlight and move the destination name from the include list to the available list using the arrow pointing to the available list.

Destination Include Lists created for the configuration are listed in the Destination Include List Name box. If you wish to access the configuration screen for a specific destination include list, click on the name in the listing.

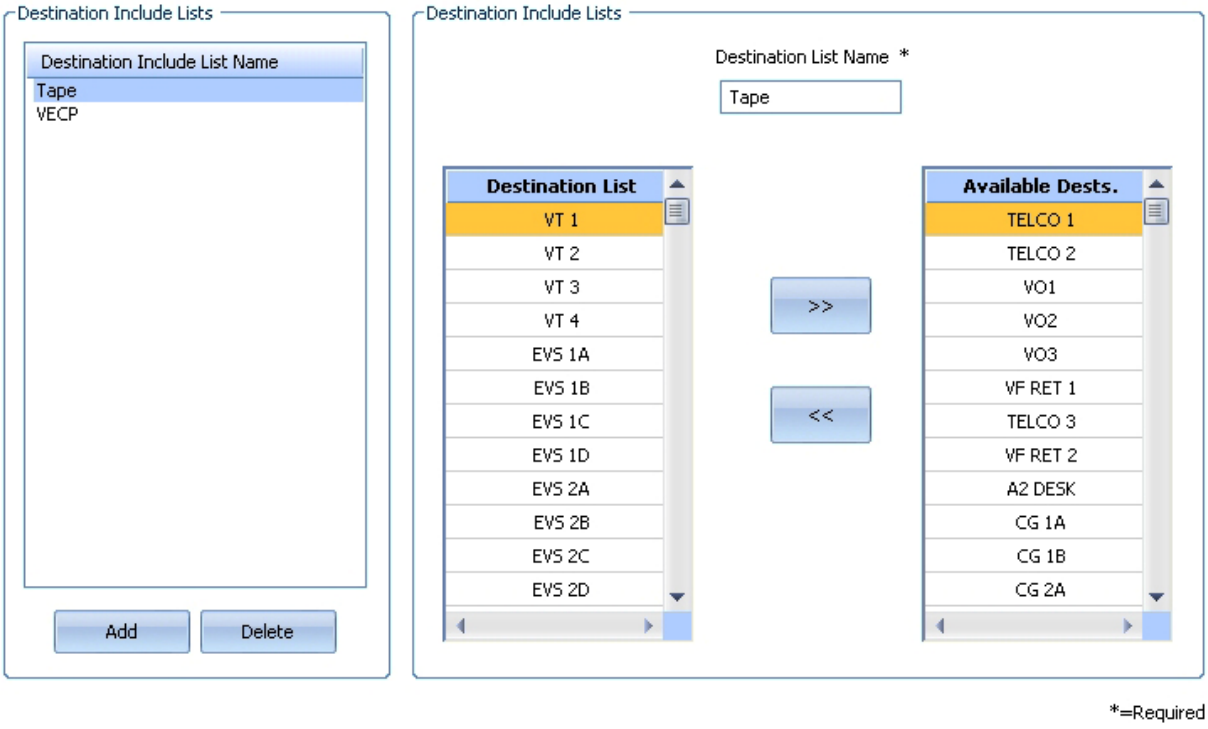


Figure 7-42 Destination Include Lists Data Entry Fields

7.12.17 PANELS CONFIGURATION SCREEN

There are several different types of remote control panels in the PESA product family and each panel has a different control and display set. For this reason, text in this manual does not deal with operational procedures or displays of any specific panel type. Refer to the User Guide for the particular panel type for specific information.

Using the P2K system controller, remote control panels may be connected to the controller hardware using either the Remote Control Panel (RCP) bus – a PESA proprietary serial bus protocol – or, for panels so equipped, a standard Ethernet network communicating over a facility LAN. When using the RCP bus each remote control panel must be assigned a unique panel address. This is done by setting a DIP Switch on the rear of the remote control panel. When communicating with control panels over an Ethernet link, each panel must be assigned a unique IP address.

The Panels Configuration Screen, Figure 7-43, allows you to add remote control panels to the system, program the functionality of each panel, and review the configuration of existing panels. Click the Panels parent entry in the Configuration menu tree to display the configuration screen.

The box labeled *Panels* on the left side of the display window contains, by panel address and name, the remote control panels that have been configured for the router system; the remainder of the screen contains the data entry cells used to create new or modify existing panel configurations.

Anytime a panel entry in the Panel Name window is highlighted, a graphic image of the remote control panel is displayed at the top of the configuration screen. If you are adding a new panel to the listing, the graphic image of the panel is displayed once the panel type parameter is selected. Displaying a graphic image allows you to verify the panel type as well as provide a visual cue of the features and functions of the specific panel.

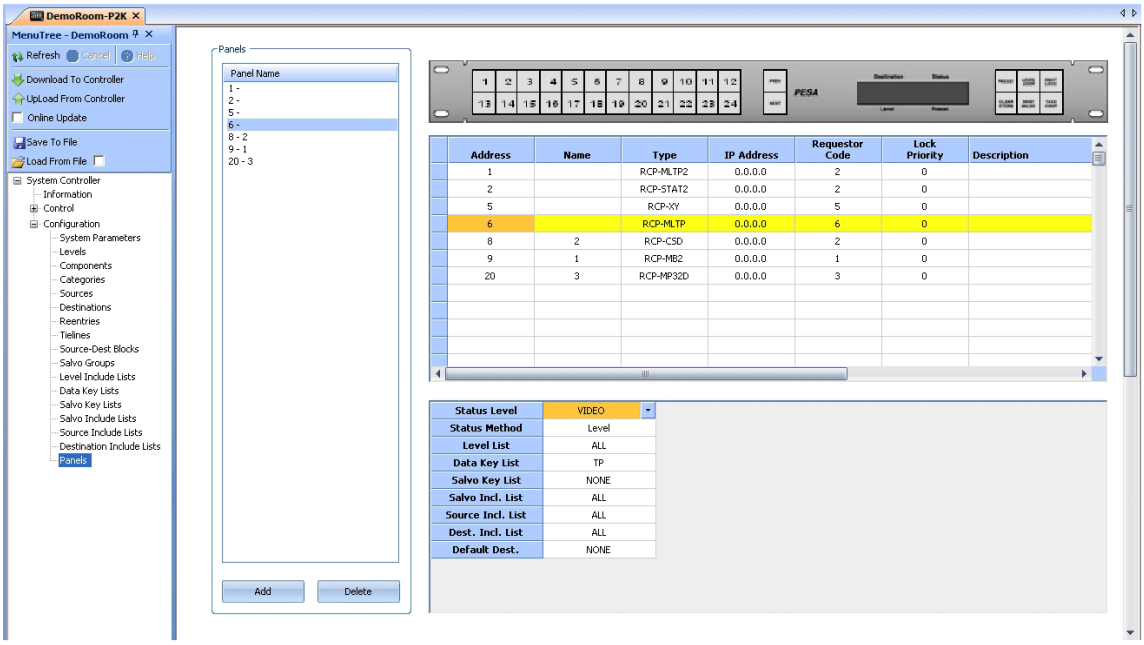


Figure 7-43 Panels Configuration Screen

- **Adding a Control Panel** – In order to add a remote control panel to the system, click the Add button at the bottom of the Panel Name list box. Choosing the Add function creates a data entry row in the panel configuration box for you to enter set-up data for the new panel. Order of data entry is not particularly critical, but be aware that the graphic image does not update to the new panel until the panel type is entered in the Type column. Figure 7-44 offers a closer look at the configuration table. Table entries are discussed in the following paragraphs:
- **Defining a Control Panel -** In the middle of this screen there is a spreadsheet format table, Figure 7-44, with an entry for each remote control panel in the system. Anytime a panel entry in the listing window is highlighted, a graphic image of that panel type is displayed at the top of the configuration screen. If you are adding a new panel to the listing, the graphic image of the panel is displayed once the panel type parameter is selected. Displaying a graphic image allows you to verify the panel type as well as provide a visual cue of the features and functions of the specific panel.

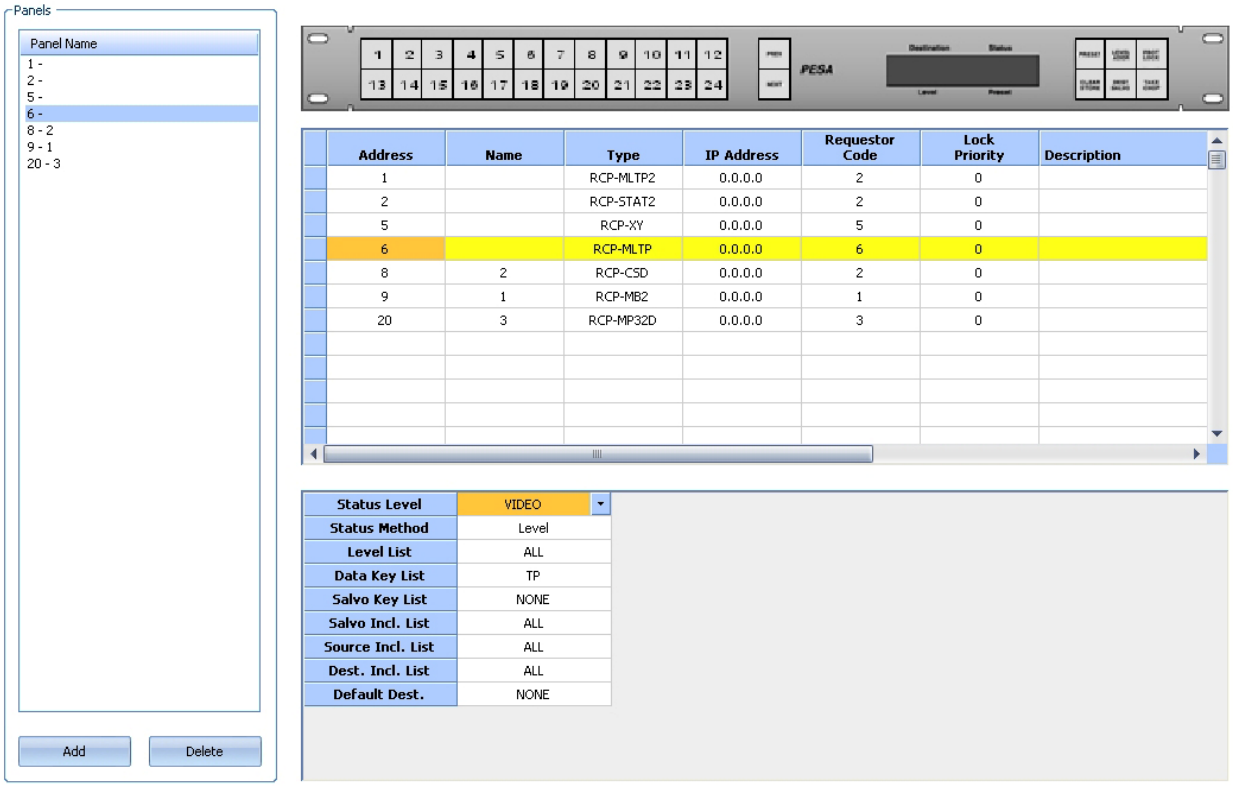


Figure 7-44 Adding a Panel Configuration

- **Enter Panel Configuration Data**
  - **Address** – Enter the hardware address number assigned to the remote control panel in the Address column. This is a unique number assigned to each panel in the system as set by DIP switches on the rear of each control panel.
  - **Name** – This entry allows you to assign a name to each panel. A panel name may be up to 8 characters in length and consist of a mix of alphanumeric characters. This is the text string displayed in other configuration and status screens to identify the panel.
  - **Type** – This column allows you to select the panel type using a pull-down menu of all PESA control panel model numbers. Click in the Type cell and open the pull-down menu. Select the model number of the panel you are installing and click the entry. The model number appears in the cell and a graphic image of the panel is displayed on the configuration screen.
  - **IP Address** – If the panel you are installing communicates with the P2K Controller over an Ethernet connection, enter the IP Address of the panel in the IP Address column. Each panel must be assigned a unique IP address and also a unique panel identifier address. If the panel you are adding is not an Ethernet panel and uses the daisy-chain RCP control bus, the character string 0.0.0.0 should be entered in this column.

- **Destination Protect and Lock Functions -** PERC2000 provides two similar methods, *Protect* and *Lock*, by which a user can prevent or control another user's ability to make switches on particular, defined destinations (output signals) by assigning codes and priorities to control panels and control ports in the system. Every remote control panel in the system is assigned a code number, called its Requestor Code; and is also assigned a numerical Lock Priority value as part of the Panels Configuration process.

  A Protect function may be applied to a destination through any remote control panel with lock/protect capability. Once protect is applied, the protected destination can not be switched to a different source by any panel in the system, unless the panel attempting to switch the protected output meets one of these three criteria:

  - Panel originating the protect function can switch the destination.
  - Any panel configured with the same requestor code and an equal lock priority.
  - Any panel with a higher lock priority.

  A Lock function is very similar to protect, and may be applied to a destination through a remote control panel with lock/protect capability. Once a lock is applied, the locked destination can not be switched to a different source by any panel in the system, until the lock is cleared by a panel with the authority to clear it, by meeting one of these criteria:

  - Panel originating the lock function can unlock the destination.
  - Any panel with a higher lock priority.

  The key difference between protect and lock is that when a destination is protected, any panel meeting the criteria to override the protect function operates totally impervious to the protect function and may make switches on the destination just as it would to any other unprotected destination. When a destination is locked, however, no panel may make a switch on the destination until the lock has been cleared from the destination.

- **Requestor Code and Lock Priority Values**

  When panels are configured through Cattrax, each panel in the system is assigned a unique address that identifies that panel, and only that panel, on the RCP bus. Each panel with lock/protect capability is also assigned a requestor code value between 1 and 65535, and a lock priority value between 0 and 1023.

  Typically, and by default, the requestor code is assigned the same value as the panel address. However, there may be certain circumstances of an installation that require an exception to this numbering scheme. If you wish to allow two separate panels identical control over a protected destination, you may assign the same requestor code and lock priority to each panel.

  Lock priority is a numerical value that determines the rights of a panel to place or remove a lock or override a protect function on a destination. Panels with higher lock priority values have greater control over lock/protect functions. Any panel assigned a lock priority of zero (0) has the highest priority.

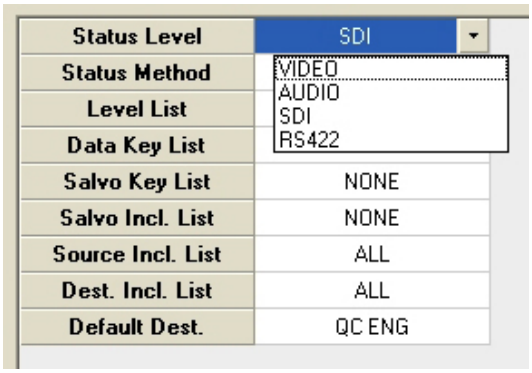
Let's look at an example. Suppose you assign a panel a requestor code of 201 and a lock priority of 2, and assume we issue a protect function to a destination through this panel. Since it is the originating panel, it may continue to switch the destination, but other panels in the system may not switch that destination unless the panel attempting to make the switch also has a requestor code of 201 and lock priority of 2, or unless it has a lock priority of 1 or 0, regardless of its requestor code.

Now suppose this same panel issues a lock function to a destination. The lock could only be cleared by the originating panel or by a panel with a higher lock priority. A panel with a lock priority of zero (0) can override any protect function or clear any lock function.

- **Description** – Description is a free text field where you can enter a description of the panel and its function or any other data you wish to enter concerning this panel.

- **Enter Panel Parameters**

  Once the panel information is entered, enter the specific operational parameters for the panel in the box located beneath the panel, as shown in the illustration below. Each cell in this table uses a pull-down menu to display the options available. In order to enter or change any selection in the configuration, click in the cell containing the parameter you want to change and click on the pull-down arrow. From the pull-down menu, click on the selection you want to enter for the panel configuration. Note that not all fields shown are pertinent to all panel types. If a panel does not support certain functions, fields pertaining to that function are not displayed. This table may contain the following entries:



  - **Status Level** – Status Level is the default switching level displayed or controlled by the panel. To assign or edit the Status Level click in the cell and change the level selection from the pull-down menu.
  - **Status Method** – The pull-down menu in this cell should always be set to *Level* in PERC2000 system applications.
  - **Level List** – This entry determines the switching levels authorized for the panel by assigning a Level Include List to the panel. If the panel is authorized for all switching levels, select ALL from the pull-down menu.

- **Data Key List** – This entry determines the function of the configurable panel keys by assigning a Data Key List to the panel. The desired data key list is chosen from the pull-down menu associated with the cell. Only data key lists which are valid for the panel type are included in the pull-down menu.
- **Salvo Key List** – This entry maps salvo group functions to configurable panel keys by assigning a Salvo Key List to the panel. The desired salvo key list is chosen from the pull-down menu associated with the cell. Only salvo key lists that are valid for the panel type are included in the pull-down menu. If there is no valid salvo key list for the panel type, the Salvo Key List row does not appear in the table listing.
- **Salvo Include List** – This entry determines the salvo groups authorized for access by the panel by assigning a Salvo Include List to the panel. The desired salvo include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all salvo groups, select ALL from the pull-down menu.
- **Source Include List** - This entry determines the sources authorized for access by the panel by assigning a Source Include List to the panel. The desired source include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all sources, select ALL from the pull-down menu.
- **Destination Include List** - This entry determines the destinations authorized for access by the panel by assigning a Destination Include List to the panel. The desired destination include list is chosen from the pull-down menu associated with the cell. If the panel is authorized access to all destinations, select ALL from the pull-down menu.
- **Default Destination** – This entry assigns the default destination to the panel. In operation, the default destination determines which destination is displayed and controlled on initial panel power-up.

- **Deleting a Control Panel** - To delete a control panel, locate the name of the panel you wish to delete in the Panel Name box and click to select it. Click “Delete” at the bottom of the box. You will NOT be asked to verify your choice to delete a panel – the action is immediate. Be absolutely sure you want to delete the panel configuration before you click on the delete command.

7.13 INCREMENTAL ADD/EDIT (ON-LINE UPDATE)

Using commands available through the On-Line Update feature of PERC2000, you can make limited changes to the controller configuration on-the-fly, without having to upload, modify and re-load the configuration file. Changes you make to the configuration using this feature are written into on-board system controller memory, and become a permanent part of the configuration until modified or until the configuration file is re-loaded.

- ### USING ONLINE UPDATE MODE

In order to use Online Update, the configuration file active in Cattrax must initially be the same file as currently loaded into the controller hardware. You may ensure they are the same by uploading the current file from the controller before selecting online update mode. Anytime the host PC and the P2K controller are connected and communicating, and the currently active controller file is loaded into Cattrax, you may select the **Online Update** mode by clicking the box in the Controller File Commands menu, as shown by Figure 7-45. When Online Update is active, the Online Update Bar window is displayed beneath the main display window, as shown by Figure 7-46.

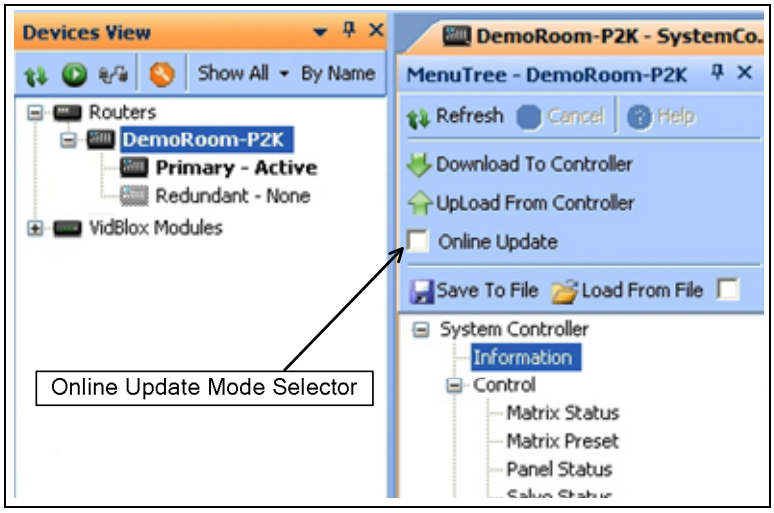


Figure 7-45 Update Mode Display

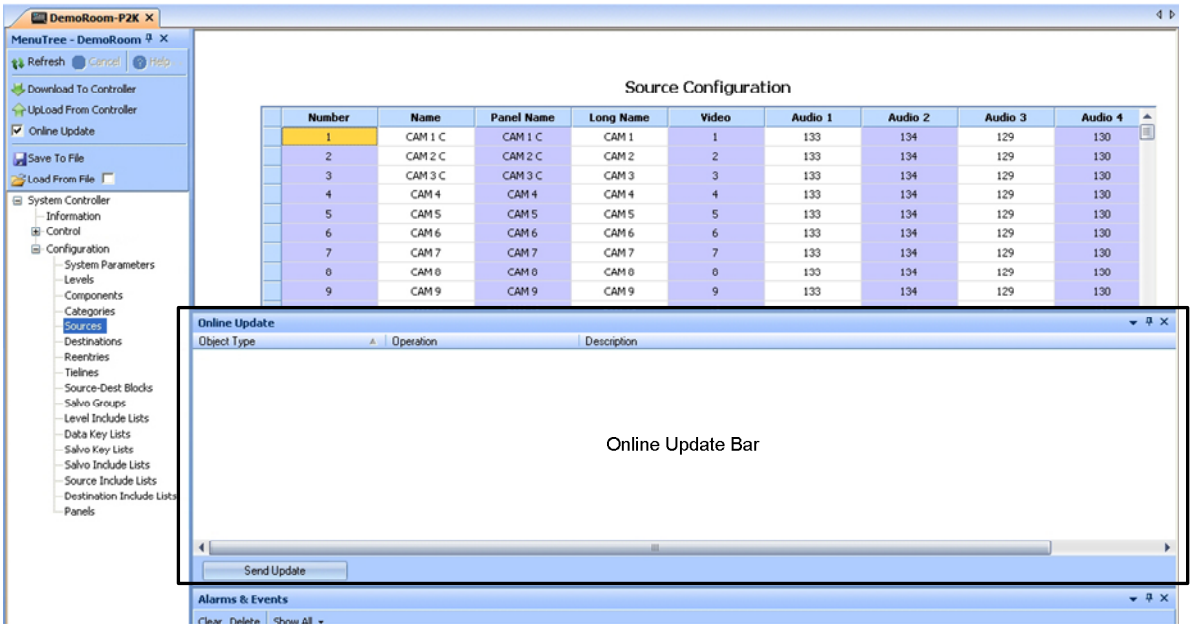


Figure 7-46 Online Update Bar Menu Entry

Through the online update function, a limited set of configuration commands are available as shown by Table 7-1. As you make additions, modifications or deletions to available configuration parameters, each change you make is listed in the online update bar display area, as shown in Figure 7-47.

Table 7-1 Available Online Update Commands

Configuration Parameter	Add Data	Delete Data	Modify Data
Configuration Information	N/A	N/A	Yes
Levels	No	No	No
Components	No	No	No
Categories	Yes	No	No
Sources	Yes	No	Yes
Destinations	Yes	No	Yes
Reentries	No	No	No
Tielines	No	No	No
Source-Destination Blocks	Yes	Yes	N/A
Salvo Groups	No	No	No
Level Include Lists	Yes	No	Yes
Data Key Lists	Yes	No	Yes
Salvo Key Lists	Yes	No	Yes
Salvo Include Lists	Yes	No	Yes
Source Include Lists	Yes	No	Yes
Destination Include Lists	Yes	No	Yes
Panels	Yes	No	Yes

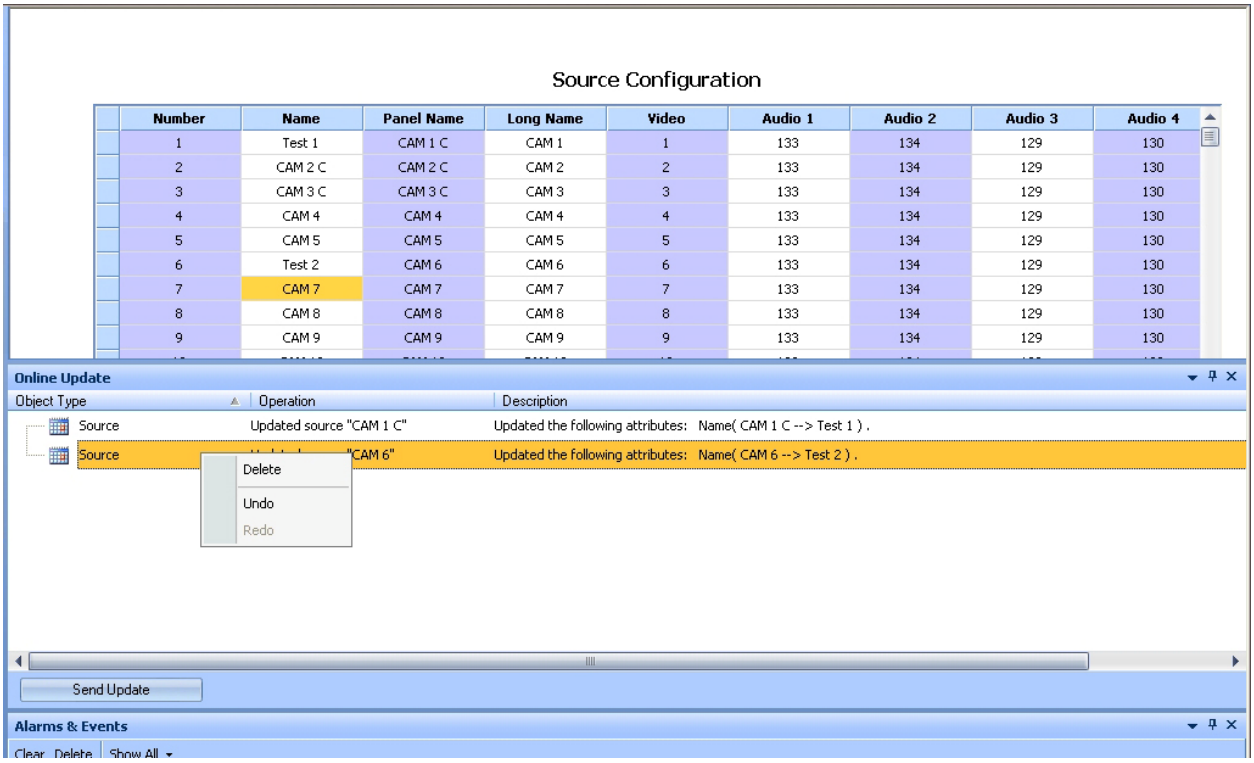


Figure 7-47 Online Update Data Entry

In the example shown, we have changed the entry in the Name column for source number 1 from CAM 1 C to TEST 1, and the entry for source number 6 from CAM 6 to TEST 2. These changes appear in the online update display area, as well as the main display grid and source listing under the Sources parent header. Notice that each individual change item is listed on a separate line entry of the update display window. However, the changes you make do NOT become active in the controller until you click the **Send Update** button at the bottom of the update display area.

Highlighting any line in the update display listing selects that line and allows you to use the right-click menu to edit the line using the following options, as shown in Figure 7-47:

- **Delete** – Selecting Delete permanently removes the item from the update listing. You will be prompted prior to deletion of the item.
- **Undo** – Selecting Undo immediately removes the item from the listing, however, the Undo command is not immediately permanent, and the item can be retrieved using the Redo command.
- **Redo** – Selecting Redo restores items removed with the Undo command. To use the Redo function, move the cursor into the update display window and right-click. Click on the Redo function and the last item deleted is restored. You may continue to click the Redo selection to restore previously removed items in the order they were removed using the Undo command.

To exit Online Update mode or to abort configuration modifications you have entered, remove the check from the Online Update entry under the Controller tab of the Menu bar, as shown in Figure 7-46. If modifications will be discarded by the action, you will be prompted prior to online update mode being closed.

7.14 OFFLINE CONFIGURATION

Cattrax' Offline Configuration mode allows you to create or modify a controller configuration file whether or not an active system controller is selected in the Devices View listing. To use offline configuration it is not necessary that a system controller be found on the Ethernet communication network; however, the upload from or download to controller functions will not be available. Offline configuration is often used when creating an entirely new configuration file for the router.

Access Offline Configuration mode by clicking either icon as shown by Figure 7-48:

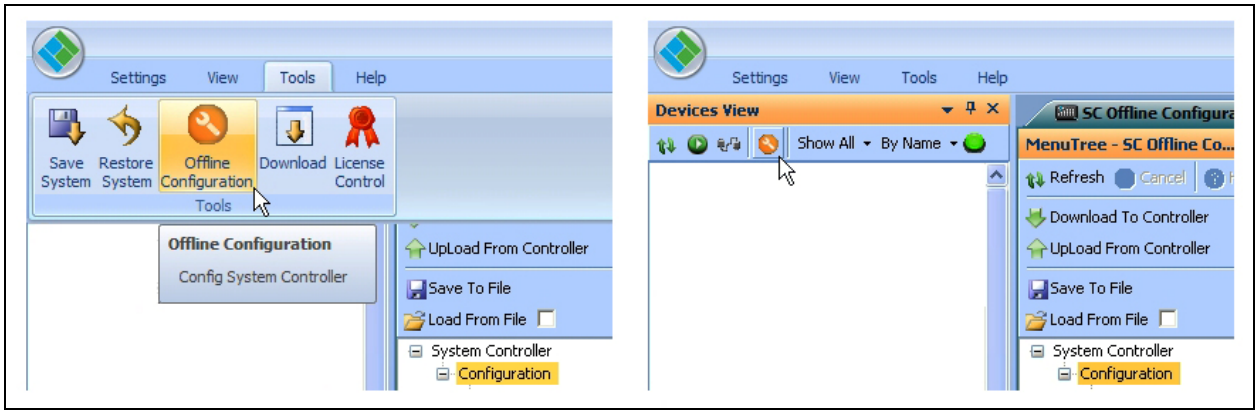


Figure 7-48 Offline Configuration Icon Locations

You will be prompted to select the type of controller device you wish to configure using the pull-down box as shown on the left in Figure 7-49. Once the selection is made, the initial screen is opened, as shown on the right side of the figure.

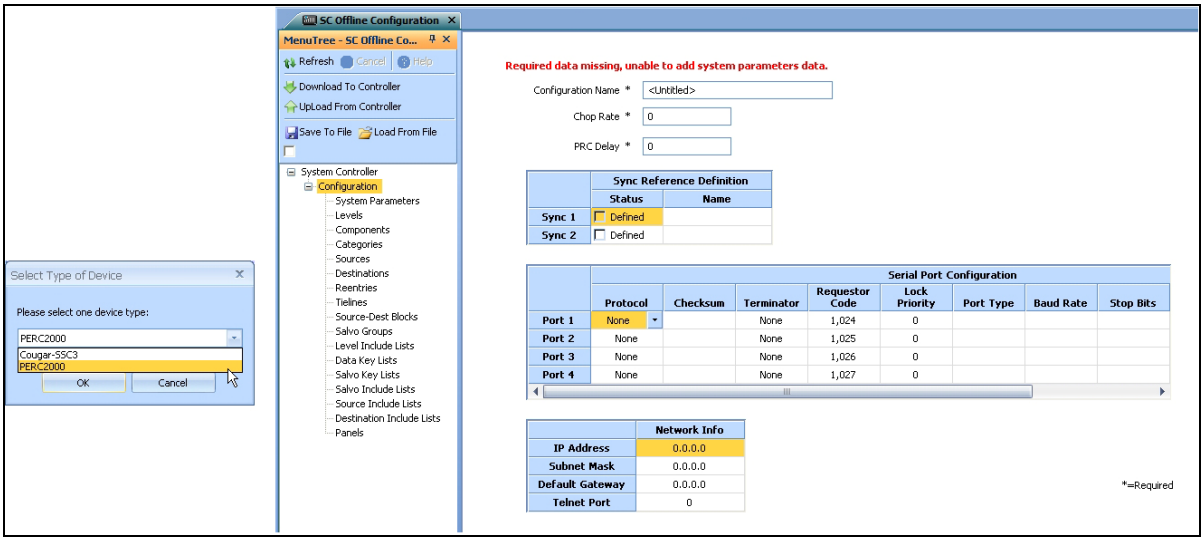


Figure 7-49 Initial Offline Configuration Screen

When this screen is first accessed, there is no configuration file data loaded into Cattrax program memory, and you have three options from which to select the type of configuration operation you wish to perform:

1. Treat the screens as a "clean slate" and generate a new configuration file by entering hardware and router configuration data for download to the controller, or save the "new" file to a storage media such as a hard drive of the host PC or other memory device.
2. Load an existing configuration file from a previously saved and stored file using the *Load From File* command.
3. Upload the currently active configuration file stored in system controller flash memory, if there is an active system controller on the Ethernet, using the *Upload From Controller* command. When you select the upload command a pull-down box appears prompting you to select the system controller you wish to upload from.

Options 2 and 3 allow you to view or modify an existing configuration file.

All menu and command screens discussed in Paragraph 7-12 are available with offline configuration.

As configuration data is entered or modified through Cattrax menu commands, it is stored on the host PC – and only on the host PC. Changes entered do not get saved to a file, written to the system controller, or become active, until the operator issues a command through Cattrax to either save or download the configuration data. Once a configuration file is created or modified, use the *Download To Controller* command in the File Commands menu to immediately download the file to the system controller hardware and activate the configuration changes.

7.15 PERC2000 System Controller Operating With Firmware V 5.0 or Later

PESA has implemented an operating software release for the PERC2000 system controller that re-structures the switching level and component creation process, adds user-definable numbering to source and destination entries and provides support for PESA's Enterprise DRS high-capacity audio routing system. These changes are implemented on PERC2000 system controller hardware loaded with operating software ***OS Main App 5.0,*** and later. Control and menu functions compatible with the operating software changes are available through Cattrax ***Release 3.0***, and later.

In order to use the changes introduced in the following paragraphs, you must have a system controller loaded with OS Main App 5.0, or later; and have Cattrax 3.0, or later loaded and running on the host computer. The following paragraphs introduce the Cattrax control screen and configuration file format changes.

7.15.1 Functional Changes

Recall that PESA routers incorporate a switching architecture composed of switching ***levels***, with each level composed of at least one ***component***. When you configure a component, you actually define a physical switch matrix that routes a specific group of signals. Previous versions of configuration software required that one or more components be associated to each level, thereby defining the signals, or groups of signals, switched by the level. Previous control applications allowed you to associate multiple components to a level, but an individual component could only be associated to one level. This meant if you wanted to access signals routed in the same physical matrix space on more than one switching level, you had to create a separate component, with a unique component name, to associate with each level. From a configuration process this meant that each component, at the time it was created, had to be assigned to a unique switching level, therefore you had to define and create the level before you could define and create the component.

PESA felt it would be more intuitive to define and create a single component for each physical matrix space, and then associate that same component by name to any switching levels needed. This eliminates multiple components pointing to the same matrix space. In order to do this, the Levels configuration screen is modified to include two columns with selection arrows between them. One column lists all available components by name, and the other lists the components associated with the indicated switching level.

Beginning with Release 3.0 of Cattrax, PESA has also added a user-assignable number field to the levels configuration screen, just beneath the nickname and name fields; and a column labeled number to the source and destination configuration screens. The number you enter in the field or column determines the display order if you sort the list entries by number, and also determines the entry display order when scrolling through lists on remote control panels. This change provides a simple method by which you can control display grouping by signal name or type, or add source or destination entries to existing display groupings and maintain continuity to the grouping by signal type or name sequence.

7.15.2 COMPATIBILITY

When Cattrax release 3.0, or later, discovers a PERC2000 system controller on the network, it performs an automatic handshake function with the controller to determine if it is loaded with OS Main App 5.0, or later. If it is, Cattrax automatically uses the control and menu screens that are compatible with the "new" configuration file format. If Cattrax determines that the system controller contains operating software prior to V 5.0, it uses the control and menu screens compatible with the previous configuration file format.

This operation is seamless to the user, *with one exception:* If Cattrax determines that you have a PERC2000 operating with firmware Version 5.0, or later, that uses the "new" configuration file format, and you attempt to download to the controller a previously saved configuration file that was created with a release of control software (P2K GUI or Cattrax prior to 3.0) that supported the "old" configuration format, Cattrax performs an automatic conversion of the configuration file to the "new" format that is compatible with the current software loaded in your PERC2000 controller. Once the conversion is completed, you will be prompted to either save the converted file with a different name or download the converted file to the system controller if you wish to use the configuration right away. The conversion process is totally non-destructive to the "old" configuration file.

A converted file functions exactly as before conversion. However, if you are familiar with configuration files created with previous versions of PESA control systems, the following paragraphs will familiarize you with the new configuration format and changes to your file introduced by the conversion process.

7.15.3 LEVELS CONFIGURATION SCREEN

Figures 7-50 and 7-51, below, illustrate the "old" and "new" Levels configuration screens, respectively. In PESA's switching architecture, a ***Level,*** or Switching Level, maps a grouping of signals to the ***component*** or multiple components that define the physical switch matrix which routes the actual input and output signals. System controllers prior to firmware Version 5.0 allowed up to a maximum of 16 switching levels. Version 5.0, and later, allows up to 17 switching levels.

Previous versions of P2K configuration software did not allow you, when creating a switching level for the system configuration, to select the component or components you wished to associate with the level. Rather, a component was associated to a level through the component configuration screen at the time the component was created. Notice in Figure 7-51 the addition of the Available Components and Selected Components list columns to the levels configuration screen.

With the "new" configuration format, you may move one or more components in the *Available* column to the *Selected* column using the directional arrows between the columns.

When you configure a switching level with the "new" configuration format, simply add and name the level, define the I/O size of the level and level properties, then select the component or components that map the desired physical hardware and I/O signals to the switching level. Remember that each switching level must have at least one mapped component, therefore, from a configuration process this means that the component must be created before you can define the switching level.

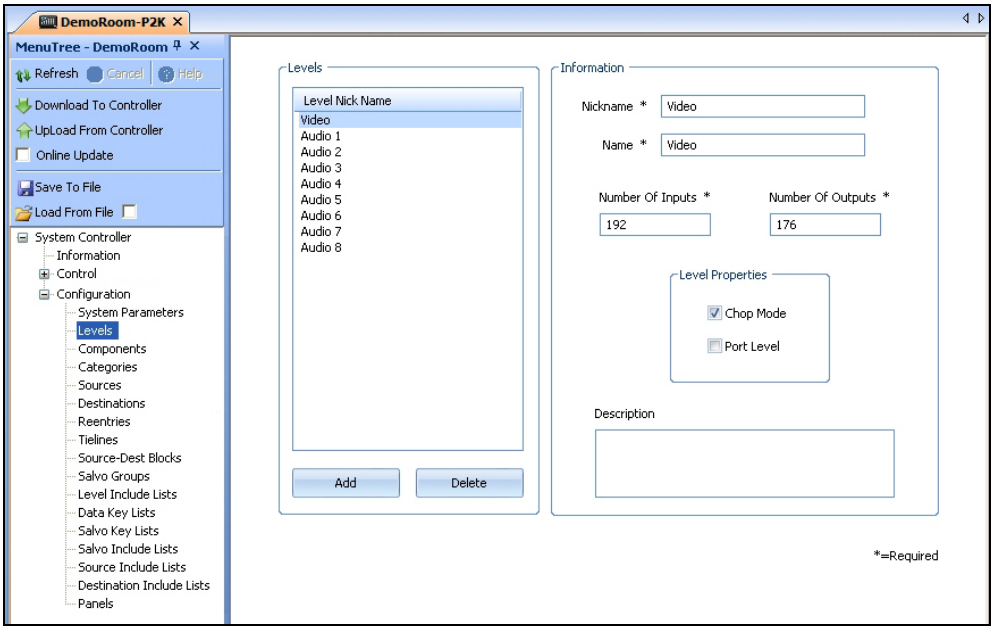


Figure 7-50 "Old" Levels Configuration Screen

Figure 7-51 also illustrates the addition of a user-assignable number field to the levels configuration screen, just beneath the nickname and name fields. The number entered in the field determines the display order if switching levels are sorted by number, and also determines the entry display order when scrolling through levels on remote control panels.

Each switching level may be assigned a sort number through the configuration screen with the caveat that each entry must be numeric, greater that zero, must be unique among other level entries and must be consecutive.

With the exception of the component columns and sorting number field, the controls function exactly as discussed in Paragraph 7.12.2.

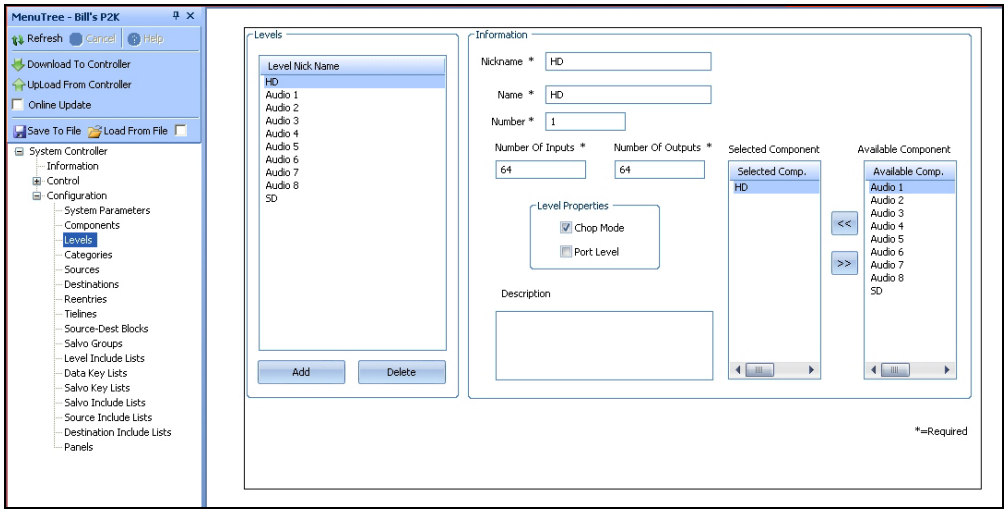


Figure 7-51 "New" Levels Configuration Screen

7.15.4 COMPONENTS CONFIGURATION SCREEN

Figures 7-52 and 7-53, below, illustrate the "old" and "new" component control screens, respectively. In PESA's switching architecture, a ***component*** defines a physical switch matrix, or matrix segment, that routes a specific group of signals.

Previous versions of P2K configuration software required that at least one component be associated to each switching level, as shown by the Level Name box in Figure 7-52; and each component could only be associated to one switching level. From a configuration process this meant that each component, at the time it was created, had to be assigned to a unique switching level, therefore you had to define and create the level before you could define and create the component.

Notice in Figure 7-53 the Level Name box has been removed on the "new" component configuration screen. The "new" format allows you to create and name a component for each physical switch matrix, or matrix segment, without having a previously created switching level with which to associate the component. The new configuration format also removes the limitation that each individual component can ONLY be associated to one switching level and allows you to associate each component to any switching levels you wish – through controls on the Levels configuration screen.

With the exception of eliminating the Level Name field, the component configuration controls function exactly as discussed in Paragraph 7.12.3.

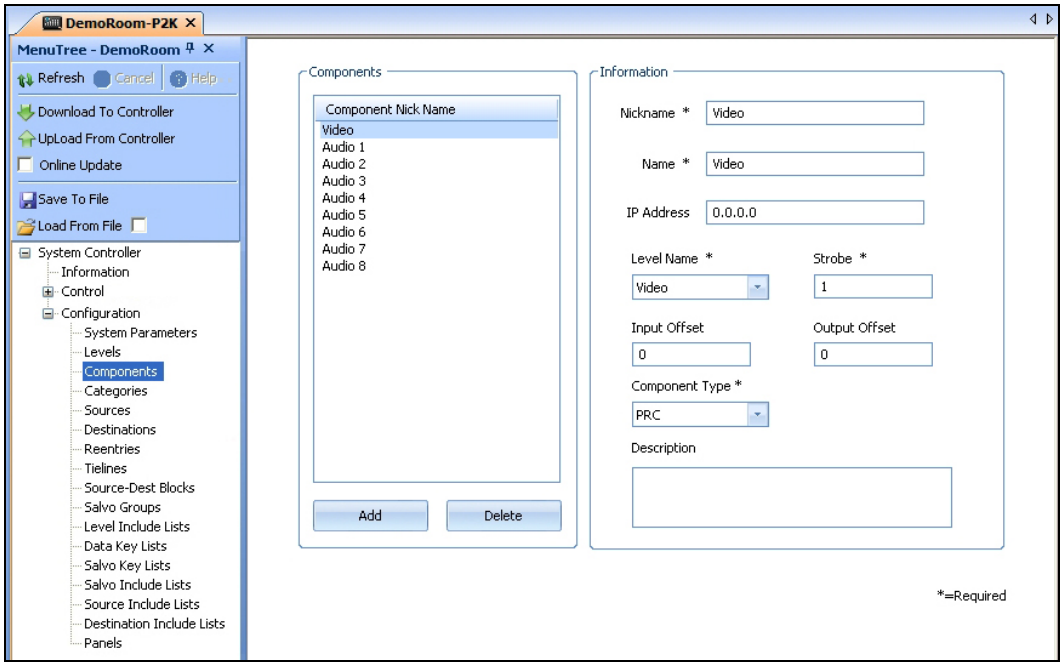


Figure 7-52 "Old" Component Configuration Screen

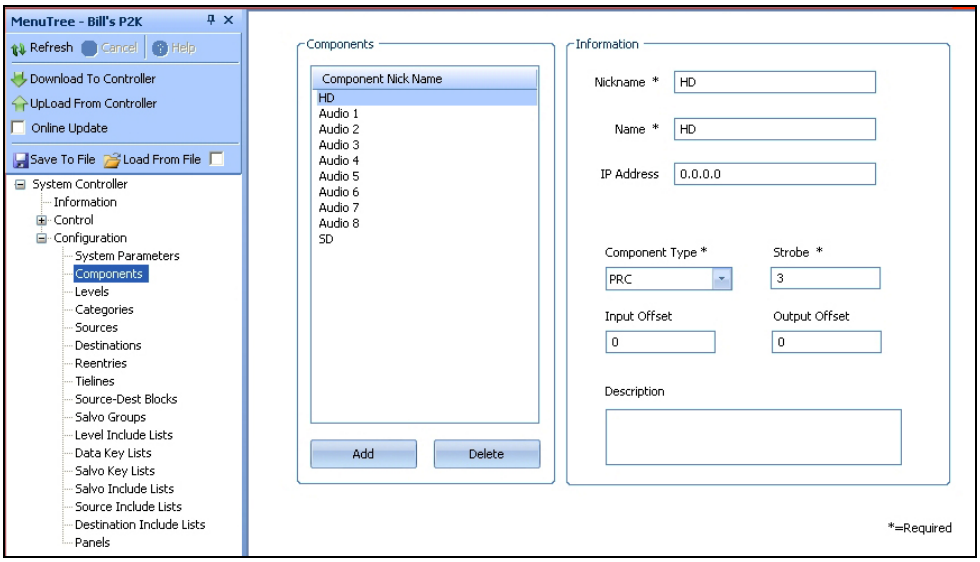


Figure 7-53 "New" Component Configuration Screen

7.15.5 USER-DEFINED SOURCE AND DESTINATION NUMBERING

With Release 3.0 of Cattrax, PESA has also changed the function of the column labeled Number on both source and destination spreadsheet screens that allows the user to assign a number to each entry in the spreadsheet. An example screen is shown by Figure 7-54. The number you enter in this column determines the display order if you sort the list entries by number, and also determines the entry display order when scrolling through lists on remote control panels.

This feature provides a simple method by which you can control display grouping by signal name or type, or add source or destination entries to existing display groupings and maintain continuity to the grouping by signal type or name sequence.

Source and destination configuration screens allow you to assign a number to a row entry with the caveats that each entry must be numeric, greater than zero and it must be unique among others of its type. Gaps in numbering sequence are allowed.

With the exception of the Number column, the process of creating or deleting a source or destination entry is exactly as previous versions of Cattrax.

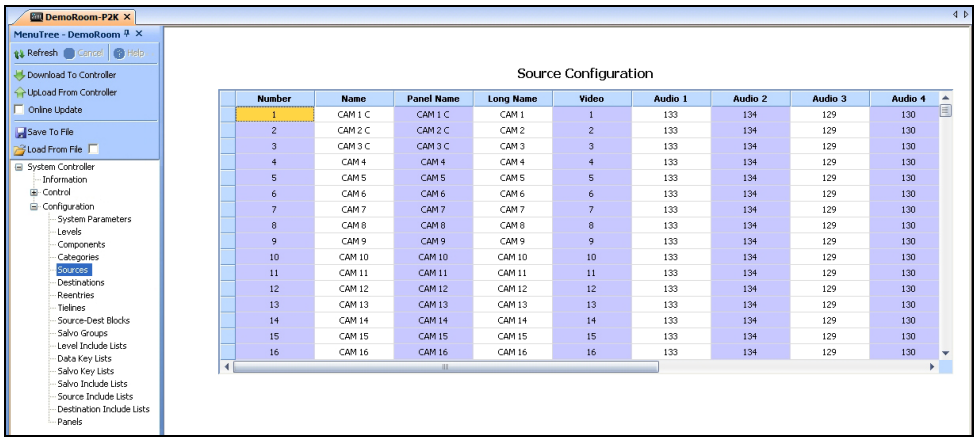


Figure 7-54 Sources Configuration Screen with Definable Number Column


PESA