Utah Scientific

UTAH-100/UDS

System Setup and Operation

UTAH 100/UDS Operations Guide

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Declaration of Conformity

Utah Scientific, Inc.

4750 Wiley Post Way, Suite 150
Salt Lake City, Utah 84116-2878 U.S.A.

We declare our sole responsibility that the UTAH-100/UDS Digital Routing Switcher is in conformance with the following standards:

Emission

- EN55022:1994+A1&A2

Immunity

- EN55024:1998
- EN61000-3-2
- EN61000-3-3

Safety

- IEC 60950-1:2001 /EN 60950-1:2001

Following the provisions of the Directive(s) of the Council of the European Union:

- EMC Directive 89/336/EED
- Low Voltage Electrical Directive 72/23/EEC

Utah Scientific, Inc. hereby declares that the product specified above conforms to the above Directive(s) and Standard(s).

Important Safeguards and Notices

This section provides important safety guidelines for the Operator and Service Personnel. Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, specifically those instructions related to risk of fire, electric shock, or injury to persons.

Safety Symbols

- Hazardous Voltage symbol

- Caution symbol. The product is marked with this symbol when it is necessary to refer to the manual to prevent damage to the product.

Warnings

Please observe the following important warnings:

- Any instructions in this guide that require opening the chassis, changing a power supply, or removing a board, should be performed by qualified personnel only. To reduce the risk of electric shock, do not perform any service unless you are qualified to do so.
- Heed all warnings on the unit and in the operating instructions.
- Do not use this product in or near water. Disconnect AC power before installing any options or servicing the unit unless instructed to do so by this manual.

- This product is grounded through the power cord ground conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product inputs or outputs.
- Route power cords and other cables so they won't be damaged.
- The AC receptacle (socket) should be located near the equipment and be easily accessible.
- Disconnect power before cleaning. Do not use any liquid or aerosol cleaner - use only a damp cloth.

- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed conductors and components while power is on. Do not insert anything into either of the systems two-power supply cavities with power connected.
- Do not wear hand jewelry or watches when troubleshooting high current circuits, such as power supplies. During installation, do not use the door handles or front panels to lift the equipment as they may open abruptly and injure you.
- To avoid fire hazard when replacing fuses, use only the specified correct type, voltage and current rating as referenced in the appropriate parts list for this product. Always refer fuse replacement to qualified service personnel.
- Have qualified personnel perform safety checks after any service.

Cautions

Please observe the following important cautions:

- When installing this equipment do not install power cords to building surfaces. To prevent damage when replacing fuses, locate and correct the problem that caused the fuse to blow, before reconnecting power.
- Use only specified replacement parts

Company Information

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- Repair or replacement of the software or hardware that does not meet the above warranties and is returned to Utah Scientific under the returned materials authorization (RMA) process with freight and forwarding charges paid.

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Section 1

System Setup

Introduction

The Universal Distribution System is a compact, power efficient series of SDI routing switchers. They combine a compact design with unique control facilities to allow cost effective routing solutions and flexible, configurable distribution amplifiers or, when combined with a Utah Scientific SC-4 or SC-400 control system, provide a cost sensitive alternative to the flagship Utah Scientific UTAH-400 SDI routers.

The UDS routing switchers are available in three frame sizes –

- 32x32 in 1 RU, consuming less than 30 watts of power.
- 64x64 in 2 RU, consuming less than 60 watts of power.
- 144x144 in 4 RU, consuming 100 watts of power.

Each frame is less than 4 inches deep.

Control System Options

The crosspoint switching and status monitoring of the UDS routing switcher is performed in one of two ways, a standard ‘Internal Control’ option, or an optional ‘MX-Bus Interface’ option.

The standard Internal Control consists of a plug in module that supports one serial port running Utah Scientific RCP-1 protocol, and up to 10 connections via 10/100 ethernet running Utah Scientific RCP-3 ethernet based protocol. Each control location, whether it be a PC running a web based control panel, Utah Scientific Softpanel 2 software, or a hardware based control panel consumes one of these 10 possible connections.

The Internal Control option’s configuration and status monitoring is performed by a PC using a web browser. This connection makes extensive use of Java as a communications mechanism. A software based control panel is also available from this web connection. More detail on this functionality is in Section 2 of this guide.

When the optional MX-Bus Interface option is employed, the routing switcher is simply a slave to a larger Utah Scientific SC4 or SC400 control system. This is useful if a user requires more control locations or hardware panel options than are supplied with a base UDS system. Information regarding SC4 and SC400 control systems can be found in their respective manuals.

Router Hardware Description

The UDS system is based upon a three board architecture similar to other Utah Scientific routing switchers. These three boards are made up of an Input board, a crosspoint board, and output board. Input and Output boards insert into Crosspoint board assemblies that are permanently mounted inside their respective enclosures.

Input or Output boards can be removed or added in the field to expand systems, change IO types or replace defective modules.

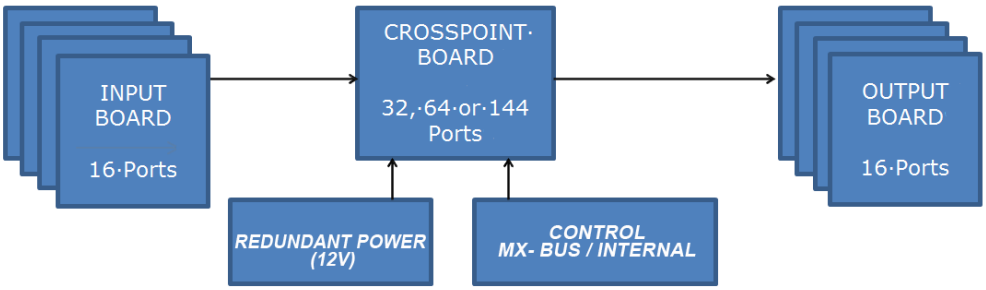


Figure 1-1.

The UDS system is designed to carry SDI signals. The system natively supports and reclocks SMPTE259C, SMPTE292, SMPTE424 and DVB-ASI signals, with a maximum data rate of 2.97 Gb/Sec. The reclocking mechanism within the UDS automatically bypasses when a signal that is not one of these standards is presented to it, allowing non-reclocked routing of any signal from 18 Mb/Sec to 3 Gb/Sec.

The UDS system supports two different types of IO cards, a coaxial version and a fiber optic system based around SFP pluggable fiber modules. In addition to standard SDI over fiber applications, the UDS is fully compatible with the Utah Scientific FLEX I/O architecture, which allows the user to populate SFP slots with CVBS to SDI converters, SDI to CVBS converters, HDMI to SDI converters, and many other module types.

The coaxial version of IO cards uses the HD-BNC connector offered by Amphenol and Samtec. It provides superior performance and density while allowing connection of industry standard Belden 1694 cable or other cable types with standard tools. Visit http://hdbnc.amphenolrf.com/ for more information.

The standard 32, 64 and 144 frames also allow for audio options. If AES routing is needed, an AES coaxial input card (121422-1) can be fitted in the frame and those AES signals routed out of a standard SDI output card. If analog audio routing is desired, the ADC Input (121420-1) and DAC Output (121421-1) cards can be fitted in the frame. They provide conversion of analog signals to a digital format that is passed thru the crosspoint, and then converted back to analog at the DAC output card.

UDS Routing Switchers are powered by 12V DC connections. Systems are delivered with 1 power supply as a standard. Part numbers for the optional redundant supply are – 94001-0012 for a 144 router, 140033-07 for a 64 router, and 140033-08 for a 32 router.

Installation: 144x, 64x, and 32x Systems

The UTAH-100/UDS family of Distribution Amplifiers provide an economical but highly reliable means of creating digital audio and video signals. All three frame configurations contain dual power supplies for maximum reliability.

144x144 UDS System

Figure 1-2. UTAH-100/UDS 144 - Front

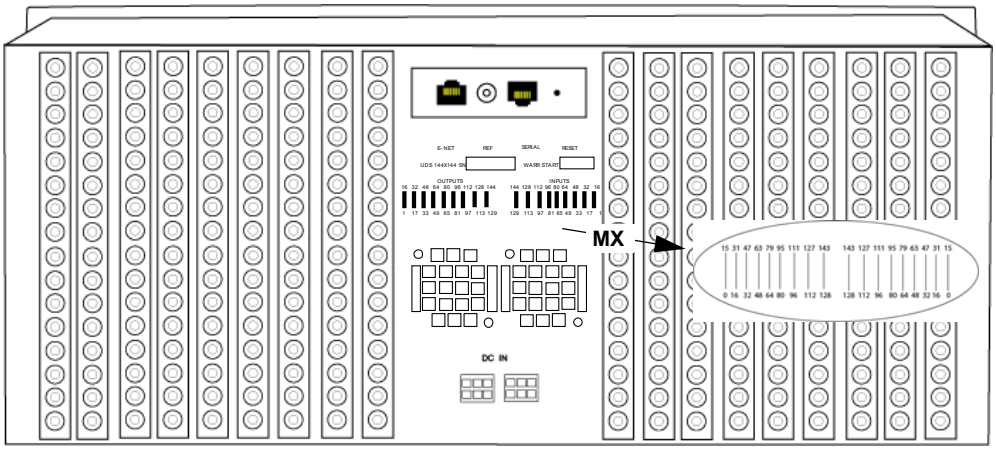


Figure 1-3. UTAH-100/UDS 144 - Rear

Contents

- 1 Crosspoint card (permanently mounted internally)
- 9 Input Card Slots.
- 9 Output Card Slots.
- 1 Control Card Slot (MX-Bus or Internal Controller)
- 2 12 VDC Power Supply Inlets.
- 2 internal cooling fans located on chassis rear. Air is drawn from the front and exhausted through the rear.

64x64 UDS System

Figure 1-4. UTAH-100/UDS 64 - Front

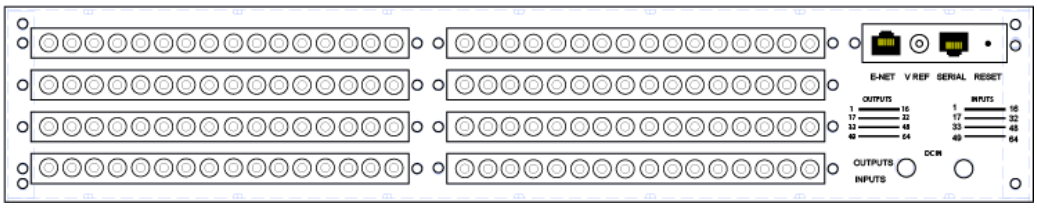


Figure 1-5. UTAH-100/UDS 64 - Rear

Contents

- 1 Crosspoint card (permanently mounted internally)
- 4 Input Card Slots.
- 4 Output Card Slots.
- 1 Control Card Slot (MX-Bus or Internal Controller)
- 2 12 VDC Power Supply Inlets.
- 1 internally mounted cooling fan
- Air is drawn from the left front and exhausted out the right side.

32x32 UDS System

Figure 1-6. UTAH-100/UDS 32 - Front

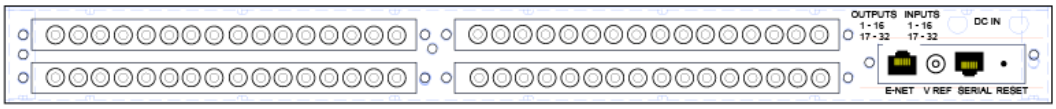


Figure 1-7. UTAH-100/UDS 32 - Rear

Contents

- 1 Crosspoint card (permanently mounted internally)
- 2 Input Card Slots.
- 2 Output Card Slots.
- 1 Control Card Slot (MX-Bus or Internal Controller)
- 2 12 VDC Power Supply Inlets.
- 2 internally mounted cooling fans. Air is drawn in the front and exhausted out the sides.

Hardware Installation

Initial Inspections

Check the contents of the shipment for completeness and possible transport damage.

If the contents are incomplete or damaged, contact Utah Scientific Inc immediately for repairing or replacement parts of the equipment.

Before Applying Power

Verify that the product is configured to match the available main power source per the input power configuration instructions provided in this manual.

The modules of the UTAH-100/UDS frame may only be installed in specific positions. Interchanging power and function modules may harm the UTAH-100/UDS frame permanently.

The modules of the UTAH-100/UDS frame shall always have the components facing to the right. Failure may occur if modules are installed incorrectly.

Service

Servicing, adjustments, maintenance or repair of this product may be performed by qualified personnel only. Adjustments described in this manual may be performed with power supplied to the product while protective covers are removed. Energy available at many points may, if contacted, result in personal injury. Capacitors inside this product may still be charged even when disconnected from their power source.

Initial Setup

1. Remove the chassis and inspect the unit carefully for damages that may have occurred during transport.
2. Check that the frame is installed so the airflow though the unit is unrestricted. No forced ventilation is required under normal operating conditions.
3. Connect the external power cord to the corresponding power connector on the rear side of the UTAH-100/UDS frame. Check that the Power LED on the front panel is lit. Blue LEDs indicate normal operation, while Red LEDs indicate a failure condition. If a failure occurs; potentially related to no power, inoperative fan, or temperature range, please disconnect power and contact UTSCI support for assistance. The UTAH-100/UDS series contains three power supplies supporting the UDS 32 and external control panel, the UDS 64, and the UDS 144.

32x32 Router or UDS-CP
#140033-08

64x64 Router
#140033-07

144x144 Router
#94001-0012

Figure 1-8. UDS power supplys

Connecting Cables

Video Cables

Use high quality coaxial cable with HDBNC ends to connect to the UDS system. The input and output numbers are silk-screened on the rear of the chassis.

IMPORTANT NOTE: *SC4 and SC400 control systems are zero based. This means that SC4 input 0 corresponds to the input labeled 1 on the router, 1 corresponds to 2, etc. Make sure to take that into account when connecting cables.*

MX Bus Based Systems

The UDS system, when used with the 121348-1 MX-Bus control module, has self-terminating MX-Bus ports. This means that only two UDS systems may be connected to the same SC-4 or SC-400 without utilizing an MX-Bus Hub (USI Part Number 80263-3). Below are some sample configurations. (Note that the black lines below represent USI Part Number 80229-xx cable assemblies).

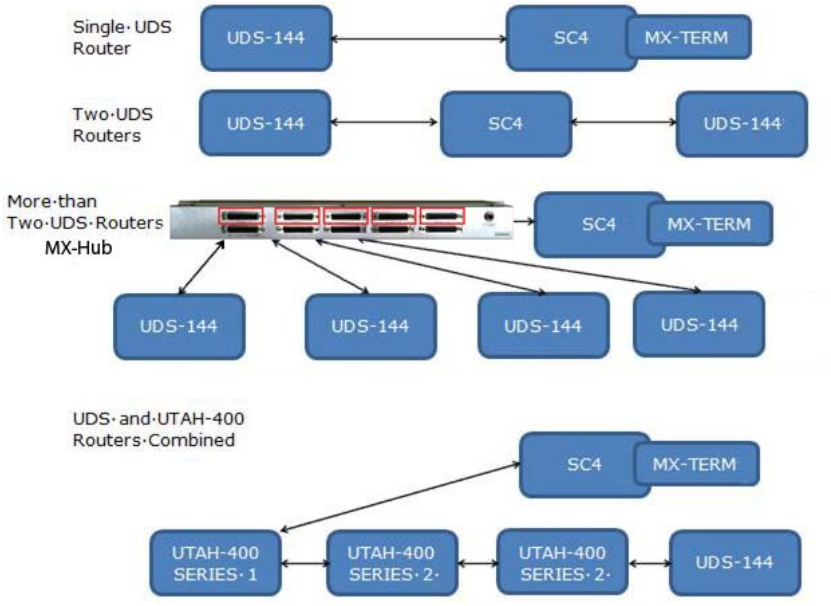


Figure 1-9.

Note the necessary termination on the MX Hub in the above illustration (red outline).

Internal Controller Based Systems

The UDS system Internal Controller card (USI PN 121343-1) has three control connections –

- Ethernet, used for control and status, on a standard 10/100 RJ45.
- Serial, used for control and status, on anRJ-45 with a custom pinout.
- A BNC that accepts bi-level or tri-level analog reference signals so that the switches will occur in the proper vertical interval as per SMPTE RP-168-2009.

Ethernet Port

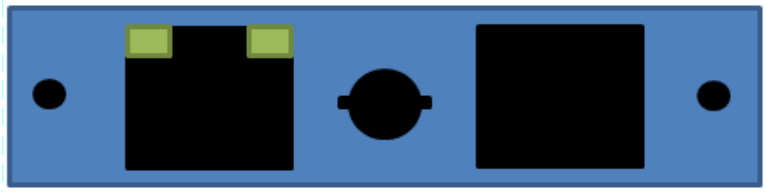


Figure 1-10. 10 /100 Ethernet SYNC Serial (1 RCP-1, 1 DEBUG)

Connect the Ethernet port to standard 802.11 Ethernet switch or router.

Connect an analog reference signal aligned to house reference to the sync port using a coax cable with an HD-BNC end. If vertical interval switching is not important, this port can be left open.

Note: *The serial port is a shared port for remote serial device connections and debug diagnostic commands. Each uses different pins from the RJ45 connector for the transmit and receive lines, which are detailed on the next two pages.*

The pinout of the RJ-45 used for serial communication is as follows:

RJ45·Pin·Number	Signal·Description	RS-232·MODE	RS-422·MODE
1	DEBUG_TX	DEBUG_TX	NOT·AVAILABLE
2	GROUND	GROUND	GROUND
3	SERIAL·0	TX	TX·+
4	SERIAL·1	RTS	TX·-
5	SERIAL·2	RX	RX·+
6	SERIAL·3	CTS	RX·-
7	GROUND	GROUND	GROUND
8	DEBUG_RX	DEBUG_RX	NOT·AVAILABLE

An RJ-45 to DB9 adapter (USI PN 94005-0020) can be used to adapt this pinout to any desired DB9 pinout.

RCP-1 RS232/422 Adapter - USI Part Number 140033-14

Two DB-9 to RJ-45 adapters are included in each router system along with a 10 foot CAT 5 cable. These adapters are pre-wired to give you access to either the diagnostic port, or the RCP-1 serial port based on the one connected.

Note: *This serial port is for use with remote serial devices for automated or manual switching applications.*

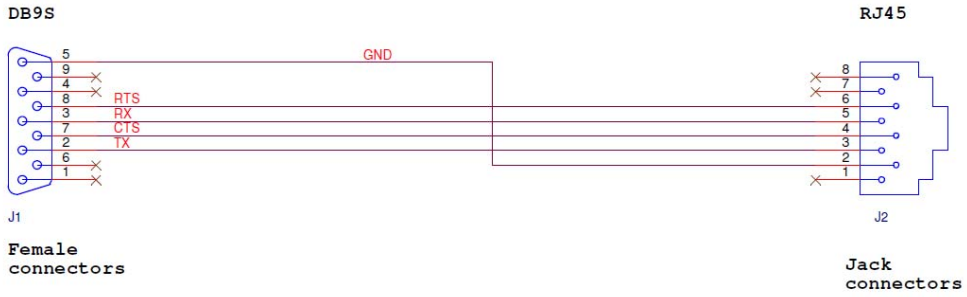


Figure 1-11.

DB9S to RJ45				
232 Name	422 Name	PIN	Wire Color	PIN
GND	GND	5	Orange	2
TX	TX+	2*	Black	3
RTS	TX-	7*	Red	4
RX	RX+	3	Green	5
CTS	RX-	8	Yellow	6

** Connectors are swapped from a typical pin-out configuration. A non-standard RS-422 cable must be used to accommodate this connection.*

UDS Diag Port - USI Part Number 140033-15

Note: *This serial port is used to access the debug menu for diagnostic purposes.*

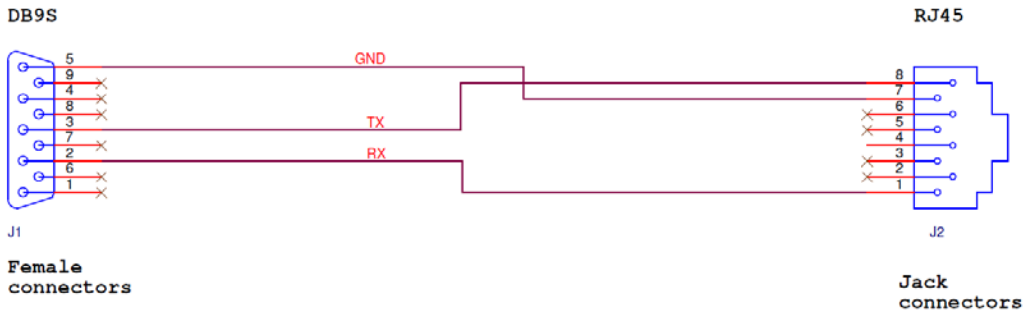


Figure 1-12.

DB9S to RJ45			
Name	PIN	Wire Color	PIN
GND	5	Brown	7
RX	2	White	1
TX	3	Blue	8

UDS Control Panel

All UDS Control Panels utilize the same 121343-1 control card as in internal controller based routers. The only connection required is the Ethernet port. Reference and Serial ports are not used in the control panel application.

UDS GPIO Panel

The UDS-GPIO connection box is designed to provide a Ethernet based interface point for triggering opto-isolated inputs and controlling relay closure outputs. The box provides sixteen GPIs and sixteen GPOs located at the rear of the unit.

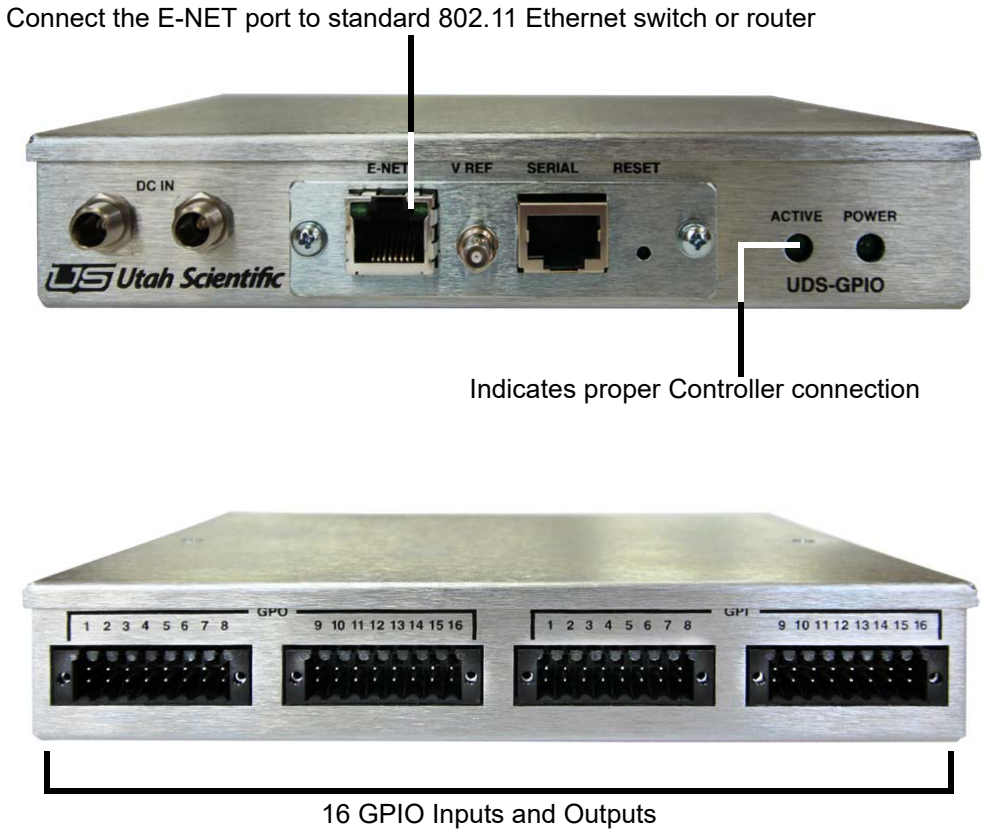


Figure 1-13.

The UDS-GPIO is programmable from the Control Applet for mapping the individual contacts to specific source/destination combinations.

Note: *The default IP address is 192.168.5.181*

Double-click the GPIO applet icon (below).

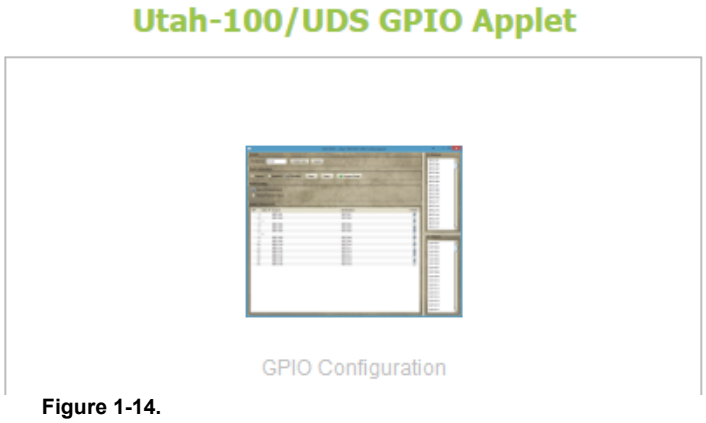


Figure 1-14.

When the Router icons appears, select “Router Configuration”.

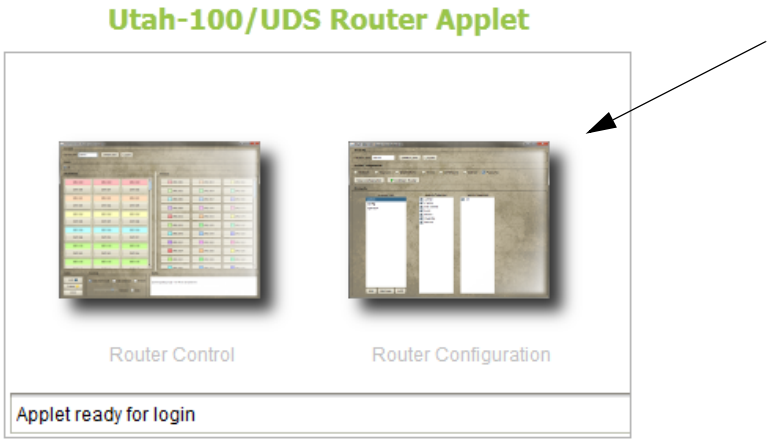
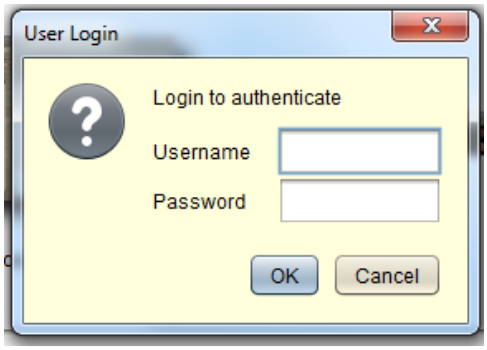


Figure 1-15.

Note: *You will only be able to connect if the browser window indicates “Applet ready for login.”*

Enter Username “admin” (default) - *in the username entry box*



Enter Password “admin” (default) - *in the password entry box*

Use the radio buttons in the Panel Configuration section to navigate through the configuration screens; *System*, *Network* and *Encoding*.

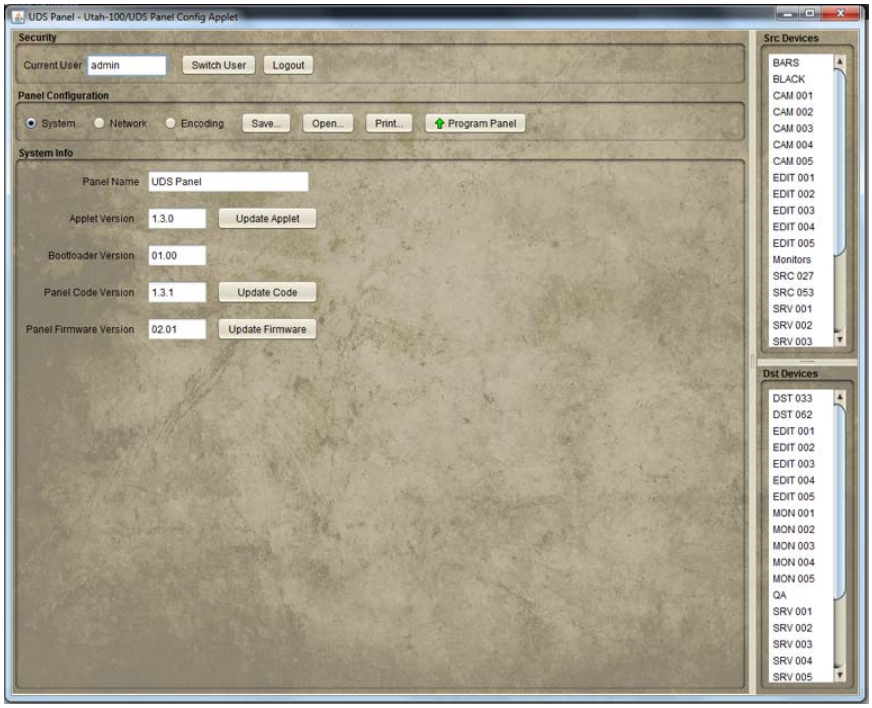


Figure 1-16.

System

When selected, the **System** radio button displays the current panel configuration detail (System Info area).

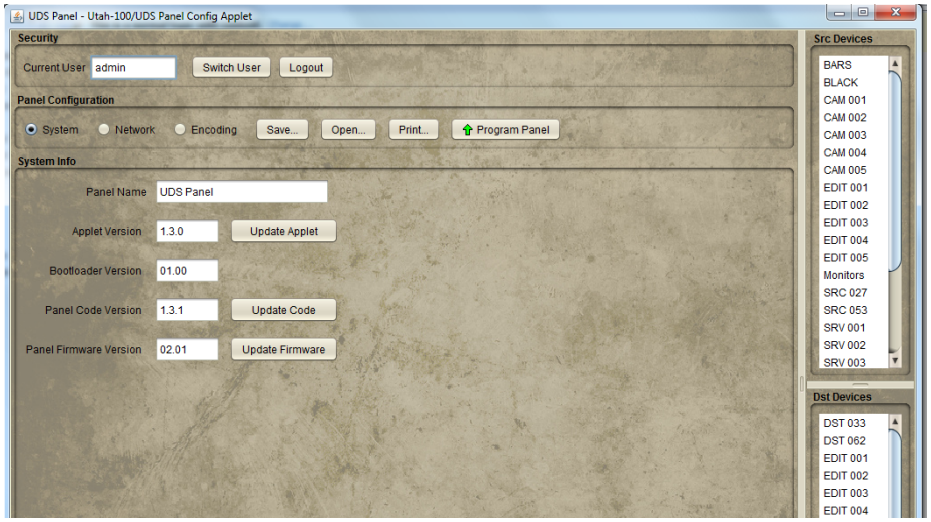


Figure 1-17.

You can edit the System Name, view the system version number, and update system components from the System Info screen.

Network

Network configuration is essentially the same as network setup during Router configuration, with the exception that the user must specify the router IP address.

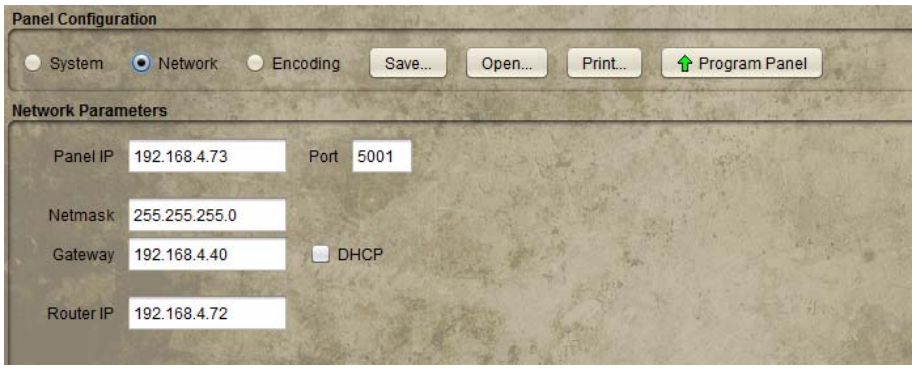


Figure 1-18.

Network Parameters

Panel ID and address configuration is entered at the top of the display. 5001 is the Port default.

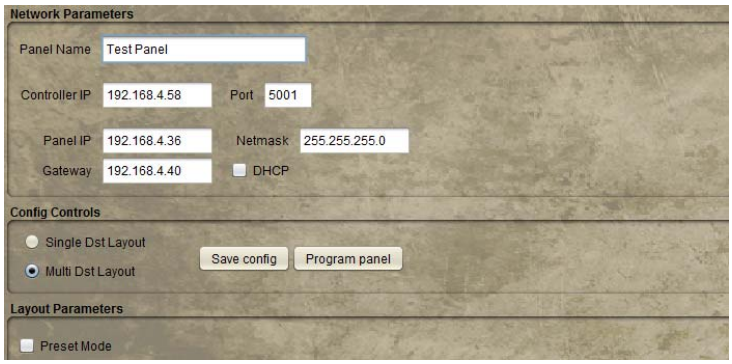


Figure 1-19.

When indicated, the DHCP checkbox will allow the program to complete its own designation.

Once the above steps are complete, the router can be placed on the target network and configured as needed.

Encoding

Input Designation

Sources and Destinations to be controlled are dragged from their scrolling columns at right side of the dialog window to their corresponding columns in the input area.

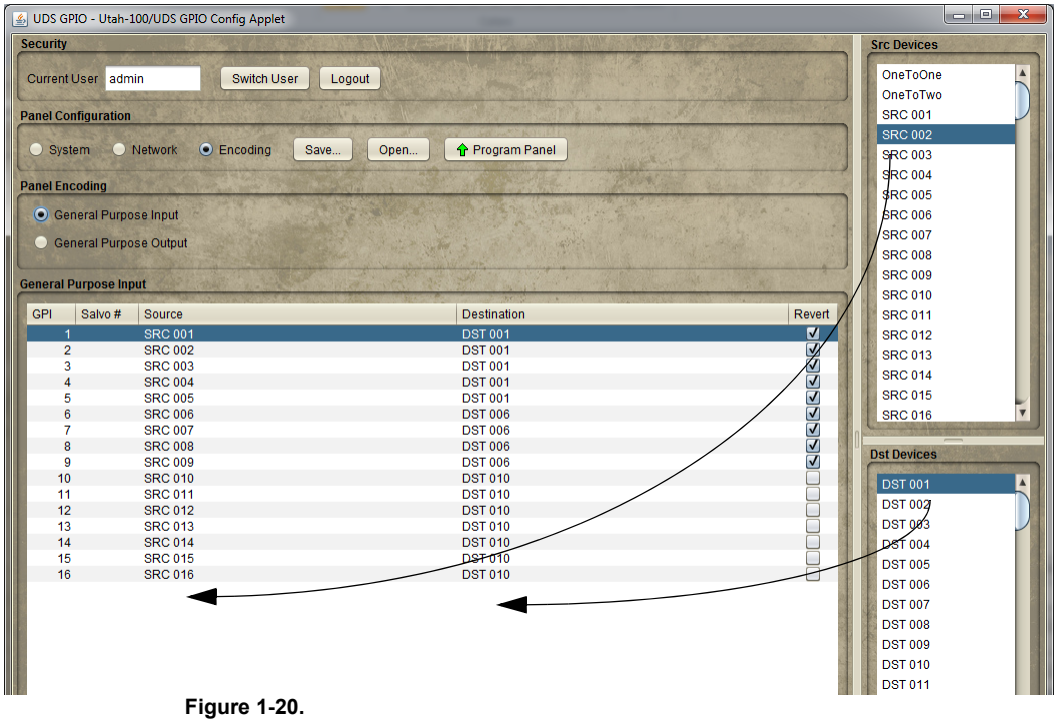


Figure 1-20.

Output Designation

Sources and Destinations to be controlled are dragged from their scrolling columns at right side of the dialog window to their corresponding columns in the output area.

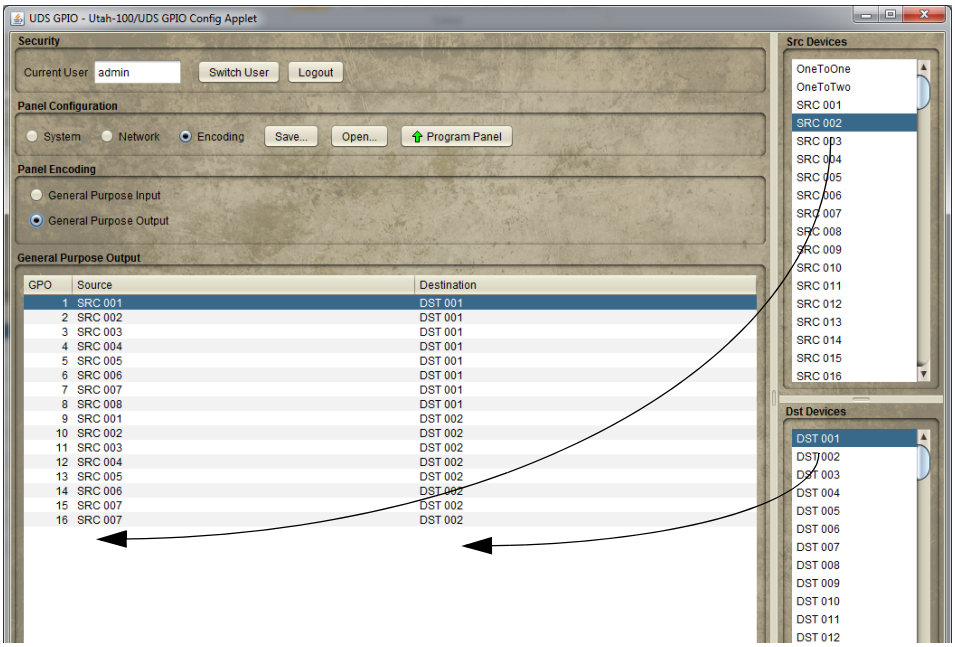


Figure 1-21.

Revert

Revert functions in this way - a Take is made while the mouse button is being held down. A release of the mouse button activates a trigger allowing the take to return to its previous status.

Save and Program

The Save button function saves the configuration to a uniquely named file in a specified directory. This is useful if multiple versions of the panel configuration are needed.

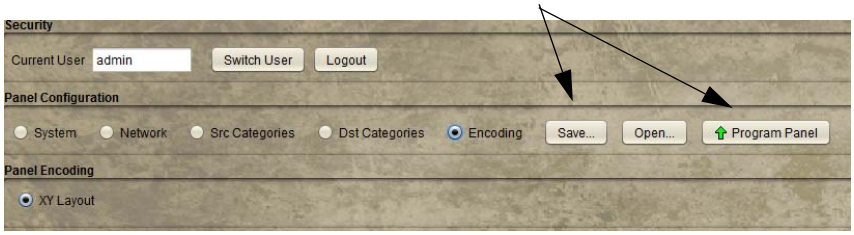


Figure 1-22.

Program commits any modifications to the router.

Configuration and Operation

MX Bus Based Systems

Setting the router level

All systems, unless otherwise specified, are shipped at router level 1, the first level in the SC4 control system. In systems where multiple routers reside on the same SC4, the level may need to be changed. This is accomplished by the following procedure –

• Power Off the router.

• Using a Phillips screwdriver, remove the two screws that hold the MX Module in place.

• Remove the module from the frame.

• Locate dipswitch S1, and set to the desired level using the table below.

SC4·Level	LEVEL·1	LEVEL·2	LEVEL·4	LEVEL·8
1	OFF	OFF	OFF	OFF
2	ON	OFF	OFF	OFF
3	OFF	ON	OFF	OFF
4	ON	ON	OFF	OFF
5	OFF	OFF	ON	OFF
6	ON	OFF	ON	OFF
7	OFF	ON	ON	OFF
8	ON	ON	ON	OFF
9	OFF	OFF	OFF	ON
10	ON	OFF	OFF	ON
11	OFF	ON	OFF	ON
12	ON	ON	OFF	ON
13	OFF	OFF	ON	ON
14	ON	OFF	ON	ON
15	OFF	ON	ON	ON
16	ON	ON	ON	ON

Figure 1-23.

- Re-Insert the card, ensuring that it mates correctly with the internal connector.
- Re-install screws and apply power.

Components

32x32 Crosspoint Card 121346-1

General

This assembly is the central component in the 32x32 UDS routing switcher. All input, output and control cards, as well as power, connect to this assembly and are signals are distributed by the board. The heart of the crosspoint card is a 32x32 6.5Gb/Sec capable crosspoint chip that routes signals from the input cards to the output cards based on commands from the Control Module

Figure 1-24.

Circuit Description

Power supplies

Incoming 12 volt power is regulated down to 1.2V and 3.3V on the board by U6 and U5 respectively.

A USI Scangate electronic serial number component on the board stores MAC and serial number information for use by the controller.

The U1 crosspoint chip receives differential pairs of video signals from the input cards (J3 and J5) and switches them as per control commands to the output card slots (J2 and J6).

Controls and Indicators

Switch 1, an 8 position dipswitch, is currently unused.

Left hand LED's DS3 and DS4 and right hand LED's DS1 and DS2 are used to communicate status out of the vents in the front of the chassis. See the Operations section for detail.

64x64 Crosspoint Card 121345-1

General

This assembly is the central component in the 64x64 UDS routing switcher. All input, output and control cards, as well as power, connect to this assembly and are signals are distributed by the board. The heart of the crosspoint card is a 64x64 3.2Gb/Sec capable crosspoint chip that routes signals from the input cards to the output cards based on commands from the Control Module.

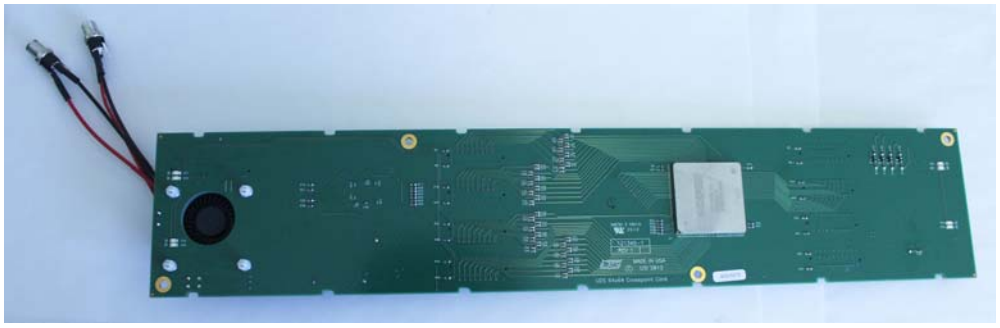


Figure 1-25.

Circuit Description

Power supplies

Incoming 12 volt power is regulated down to 1.2V, 3.3V and 5V on the board by U5, U7 and U6 respectively.

A USI Scangate electronic serial number component on the board stores MAC and serial number information for use by the controller.

The U1 crosspoint chip receives differential pairs of video signals from the input cards (J1, J5, J7, J9) and switches them as per control commands to the output card slots (J2, J6, J8, J10).

Controls and Indicators

Switch 1, an 8 position dipswitch, is currently unused.

Left hand LED's DS1-3 and DS5 and right hand LED's DS4 and DS6-8 are used to communicate status out of the vents in the front of the chassis. See the Operations section for detail.

144x144 Crosspoint Card 121342-1

General

This assembly is the central component in the 144x144 UDS routing switcher. All input, output and control cards, as well as power, connect to this assembly and are signals are distributed by the board. The heart of the crosspoint card is a 144x144 3.2Gb/Sec capable crosspoint chip that routes signals from the input cards to the output cards based on commands from the Control Module.

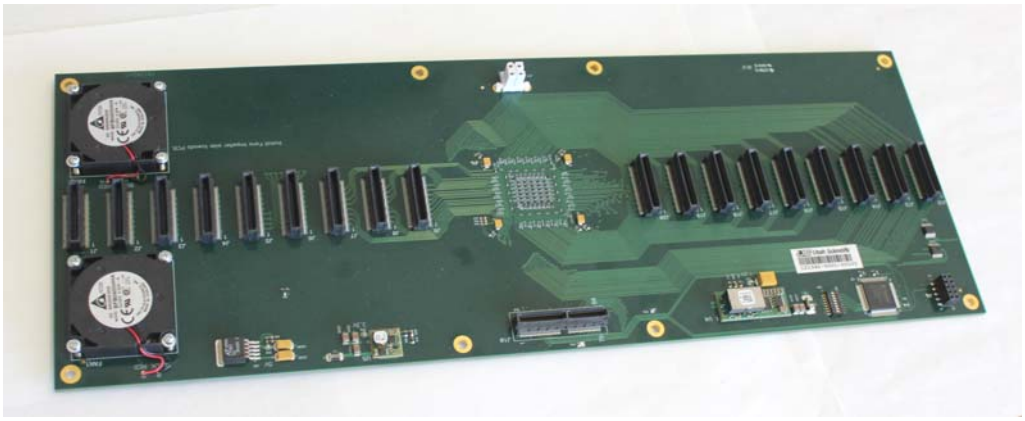


Figure 1-26.

Circuit Description

Power supplies

Incoming 12 volt power is regulated down to 1.2V, 3.3V and 5V on the board by U4, U5 and U9 respectively.

A USI Scangate electronic serial number component on the board stores MAC and serial number information for use by the controller.

The U1 crosspoint chip receives differential pairs of video signals from the input cards (J1-J9) and switches them as per control commands to the output card slots (J12-J20).

Controls and Indicators

Switch 1, an 8 position dipswitch, is currently unused.

Left hand LED's DS1, 3, 5 and DS7 and right hand LED's DS2, 4, 6 and DS8 are used to communicate status out of the vents in the front of the chassis. See the Operations section for detail.

Coax Input Card 121340-1

General

The SDI Coax input card is responsible for receiving, reclocking, and presenting the input signals to the crosspoint card. It has 16 HDBNC connectors, 16 SDI Cable equalizers, and four quad reclocking components on it. The reclocking components automatically detect, lock to and re-time the incoming SDI signals. If a non-standard signal is presented to the card, the reclocker will automatically bypass and allow the signal thru without re-timing it.

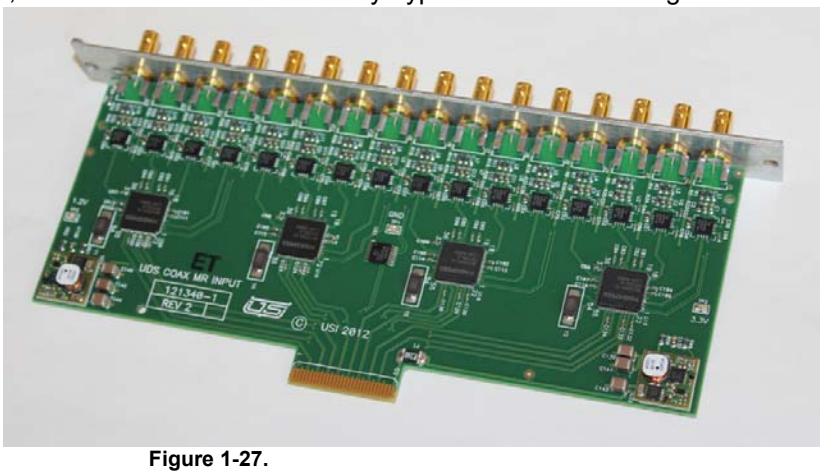


Figure 1-27.

Circuit Description

12 V is received by this card and regulated down to 1.2V by U23 and 3.3V by U22.

Components U1-U16 are SDI cable equalizers, capable of equalizing more than 100 meters of 1694 cable when using SMPTE424 3G signals.

The equalized outputs of U1-U16 are presented to the Quad Reclocker components, U17,18,20 and 21. These components perform signal conditioning based on signal type and then drive the signal to the edge connector.

U19 is an I2C based IO expander that identifies the card to the control system. Along with I2C communication to each of the Quad Reclocker parts, this component allows the system to provide status of IO card functionality to the user interface.

Controls and Indicators

This card has a single Power OK indicator, DS1, which shines thru the rear of the chassis to indicate the card is active.

Coax Output Card 121341-1

General

The SDI Coax Output card is responsible for driving the switched video signals down coaxial cables in a SMPTE compliant fashion. It has 16 HDBNC connectors and 16 SDI Cable drivers on it.

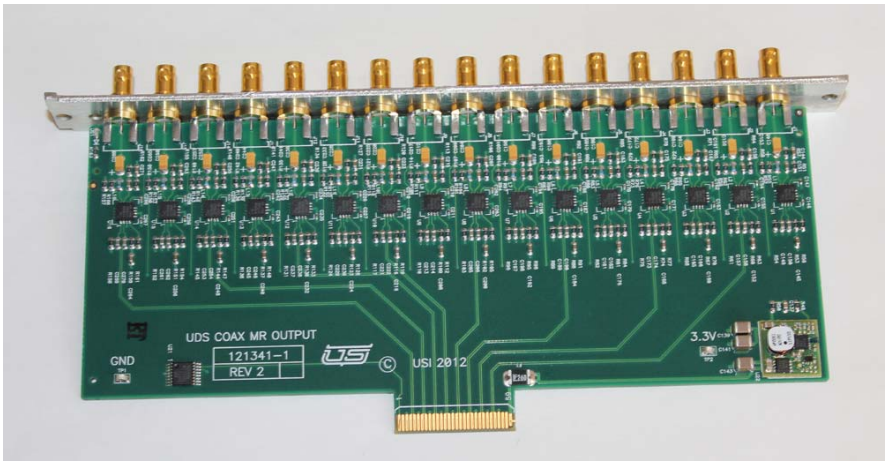


Figure 1-28.

Circuit Description

12 V is received by this card and regulated down 3.3V by U22.

Components U1-U16 are SDI cable drivers, with a nominal output of 800mV.

U21 is an I2C based IO expander that identifies the card to the control system. Controls and Indicators.

This card has a single Power OK indicator, DS1, which shines thru the rear of the chassis to indicate the card is active.

Fiber Input Card 121347-1

General

This card can be populated with a variety of SFP receiver devices to allow for different functionality. It allows for 8 dual DFP connections, allowing 16 total inputs. The list of SFP module types is –

1. DUAL Single mode 1220-1620nM SFP – 94061-01.
2. DUAL CVBS to SDI Converter (HDBNC) – 94061-06.
3. DUAL SDI Receiver with reclocking – 94061-09.
4. DUAL Multi Mode 850nM SFP – 94061-11.
5. HDMI Receiver with HDMI connectors. 14003-40
6. HDMI Receiver with DVI connector. 140033-41

Note: *The HDMI Receiver occupies both ports in the SFP cage, making 1 input inaccessible. The receiver uses the upper input. (i.e., if the slot corresponds to inputs 1 and 2, the signal will display on the router input 2).*

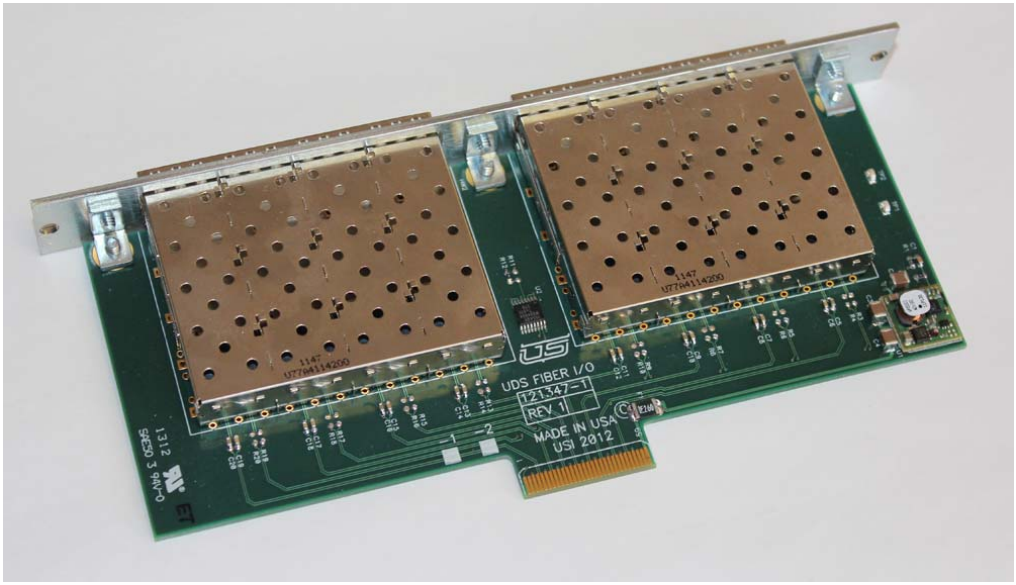


Figure 1-29.

Circuit Description

Component U1 receives and regulates 12V into 3.3V to be used by the SFP's.

Component U2 is the system identifier I2C based IO expander, which allows board presence to be communicated to the user.

Controls and Indicators

None.

Control Interface

Figure 1-30. HDMI SFP

Fiber Output Card 121347-2

General

This card can be populated with a variety of SFP transmitter devices to allow for different functionality. It allows for 8 dual DFP connections, allowing 16 total outputs. The list of SFP module types is –

1. DUAL Single mode 1310nM SFP – 94061-02.
2. DUAL SDI to CVBS Converter (HDBNC) – 94061-03.
3. DUAL SDI Transmitter reclocking – 94061-05.
4. DUAL Multi Mode 850nM SFP – 94061-12.
5. CWDM Modules of different frequencies are also available.
6. HDMI Transmitter with HDMI connector – 140033-42
7. HDMI Transmitter with DVI connector – 140033-43

Note: *The HDMI transmitter occupies both slots in the SFP cage, making 1 output inaccessible. The transmitter uses the lower port. (i.e., if the slot corresponds to router outputs 1 - 2, the SFP will output the signal switched to output 1.*

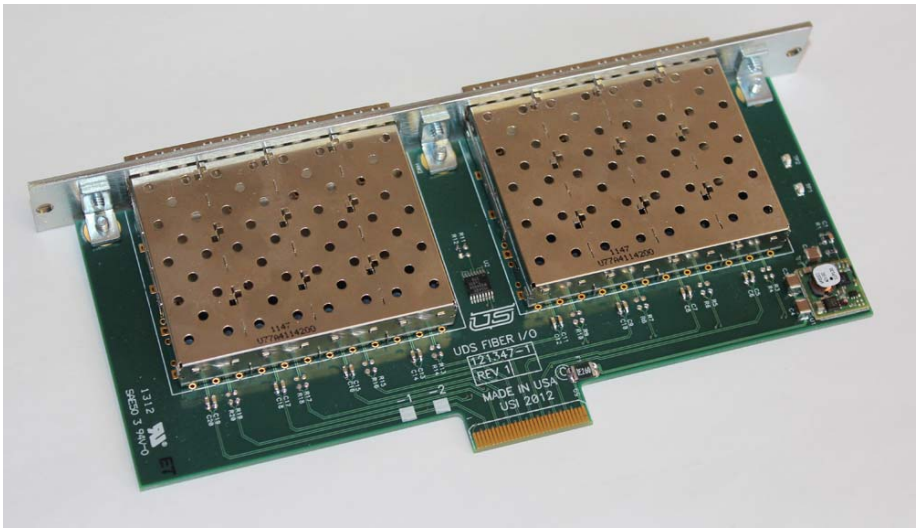


Figure 1-31.

Circuit Description

Component U1 receives and regulates 12V into 3.3V to be used by the SFP's.

Component U2 is the system identifier I2C based IO expander, which allows board presence to be communicated to the user.

Controls and Indicators

None.

Control Interface

Figure 1-32. HDMI SFP

MX-Bus Control Module 121348-1

General

The MX-Bus control module controls the switching of the 32, 64 or 144 routers crosspoint's when operating under SC4 control. It contains power regulation circuitry and an FPGA that receives commands from an SC4 and switches the crosspoint with discrete lines accordingly.

Figure 1-33.

Circuit Description

12 V Power is delivered to the card, fused, and converted to 1.2V, 3.3V and 5V by U4, U6 and U3 respectively.

Config PROM u7 and FPGA U9 make up all of the programmable logic on the board. The logic operates in two main blocks. One block decodes the data from the MX-Bus (SC4) and sends appropriate commands based on that data to the crosspoint control block. The crosspoint control block actually performs the switches when commanded. There is a third control loop, a multiport I2C bus structure that gathers status data from the IO cards and controls the LED's on the front of the card.

Controls and Indicators

Dipswitch SW1 is used to set the level in the MX-Bus that the card is supposed to respond to.

Internal Control Module 121343-1

General

The Control Module is a multi purpose assembly that is used as the heart of the router control system when the SC4 is not present, and as the control element within the UDS control panels. This general purpose module has a 32bit ARM processor, supporting a 10/100 Ethernet port, two serial ports and an external data bus to communicate to peripherals. These peripherals include an FPGA that can have variable firmware builds installed for different applications, and a large external battery backed memory.

Figure 1-34.

Circuit Description

12V is delivered to the card and regulated to 1.2V and 3.3V by U8 and U16 respectively.

Processor U1 orchestrates the operation of the board by reading its configuration and operating files from the SD card socket. Router configuration changes and switches are received via the serial ports or the Ethernet port, and then driven to the FPGA, U4.

In a router application, the FPGA has the functionality of controlling the crosspoint switch itself, and reading status information from the IO cards. In a panel application, the FPGA reads switches and lights LED’s based upon commands from the processor.

Controls and Indicators

DS1 and DS2 are debug status LED's on the PCB.

The Ethernet RJ45 J5 has two LED's which are used to indicate speed and activity.

Jumpers JP1 and JP2 are for use during testing and debug only.

121422-1 Digital Audio Input Card

General

The Digital Audio Input card is responsible for receiving and conditioning an un-balanced digital audio signal before sending the signal to the crosspoint card where it can be directed to an output. This card contains 16 separate HD BNC connectors.

Figure 1-35.

Circuit Description

The card receives one +12 volt DC power supply from the crosspoint card that it plugs into. From that supply it creates a 3.3V supply for onboard logic. Good power supply levels are indicated by the green LED DS1.

An I2C component communicates with the crosspoint card and indicates that this board is installed and operational in addition to the board's part number.

Each audio path consists of an ST3485EC digital audio receiver component. The device contains one driver and one receiver in half duplex configuration. The card transmits and receives at a guaranteed data rate of at least 12 Mbps and sends the signal to a high speed differential line driver.

Audio Format

48 kHz. 16 - 24 Bit, AES / EBU; AES-3

121394-1 Analog Breakout Adapter

General

This assembly is for those customers who prefer to wire to a terminal block instead of to the DB-25 connector on the Analog Audio input and output cards.

Usage

The adapter is installed onto one of the DB25 connectors and secured with the captive screws in the D connector. The black breakout connector can then be used to insert individual wires in, and the female part of the terminal block can be removed completely from the assembly by unscrewing the two hold down screws at either end.

Terminal Block Pinouts

Note: *Note: Depending on the I/O card's connector to which the breakout adapter is placed, the I/O numbers below will be offset by 8, 16, or 24.*

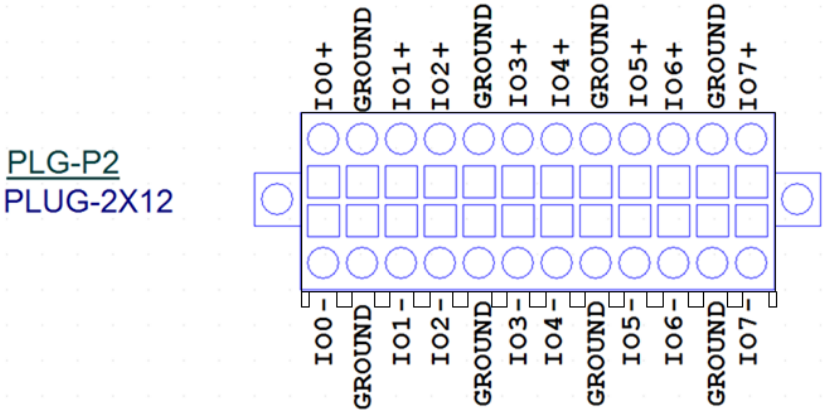


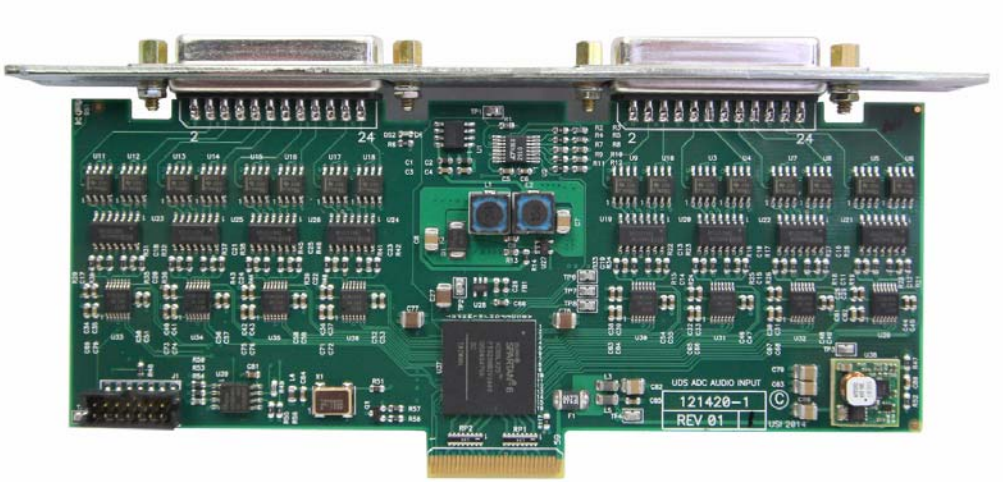
Figure 1-36. Breakout Connector Pinout

121420-1 ADC Analog Audio Input Card

General

The Analog Audio Input card is responsible for receiving and conditioning a balanced or single ended analog audio signal and then sending it to the crosspoint card where it can be directed to an output. This card handles 16 separate audio signals, on two separate D connectors.

Each Analog audio input signal is buffered and converted to a digital format, and then formatted into an AES signal that can be sent to an DAC output card or a standard SDI output as an AES signal.



Circuit Description

The card receives one +12 volt DC power supply from the crosspoint card that it plugs into. From that supply it creates –

- A 3.3V supply for onboard logic (U38).
- A -12V supply for the analog audio processing (U27).
- A 5V power supply for audio processing (U1).
- A 1.2V power supply for the FPGA core (U28).

Power supply levels are monitored by U2. If all supplies are within tolerance DS2 will illuminate.

DS1, which can be seen at the rear of the chassis, illuminates when both the power supplies are good and when the FPGA is operational.

Analog Audio signals are buffered via NE5532 op amps and then fed to a differential receiver (INA2137). They are then fed into an PCM1808 analog to digital conversion component. The resulting I2S dual channel audio signal is then fed into an FPGA U37.

The FPGA packages the digital audio into 16 individual AES streams for delivery to the crosspoint. The AES audio is arranged as per the following table. Note that this is based upon the input numbers in the first slot –

Router Input #	AES Left Signal	AES Right Signal
0	0 (DB1 Signal 1)	8 (DB2 Signal 1)
1	1 (DB1 Signal 2)	9 (DB2 Signal 2)
2	2 (DB1 Signal 3)	10 (DB2 Signal 3)
3	3 (DB1 Signal 4)	11 (DB2 Signal 4)
4	4 (DB1 Signal 5)	12 (DB2 Signal 5)
5	5 (DB1 Signal 6)	13 (DB2 Signal 6)
6	6 (DB1 Signal 7)	14 (DB2 Signal 7)
7	7 (DB1 Signal 8)	15 (DB2 Signal 8)
8	8 (DB2 Signal 1)	0 (DB1 Signal 1)
9	9 (DB2 Signal 2)	1 (DB1 Signal 2)
10	10 (DB2 Signal 3)	2 (DB1 Signal 3)
11	11 (DB2 Signal 4)	3 (DB1 Signal 4)
12	12 (DB2 Signal 5)	4 (DB1 Signal 5)
13	13 (DB2 Signal 6)	5 (DB1 Signal 6)
14	14 (DB2 Signal 7)	6 (DB1 Signal 7)
15	15 (DB2 Signal 8)	7 (DB1 Signal 8)

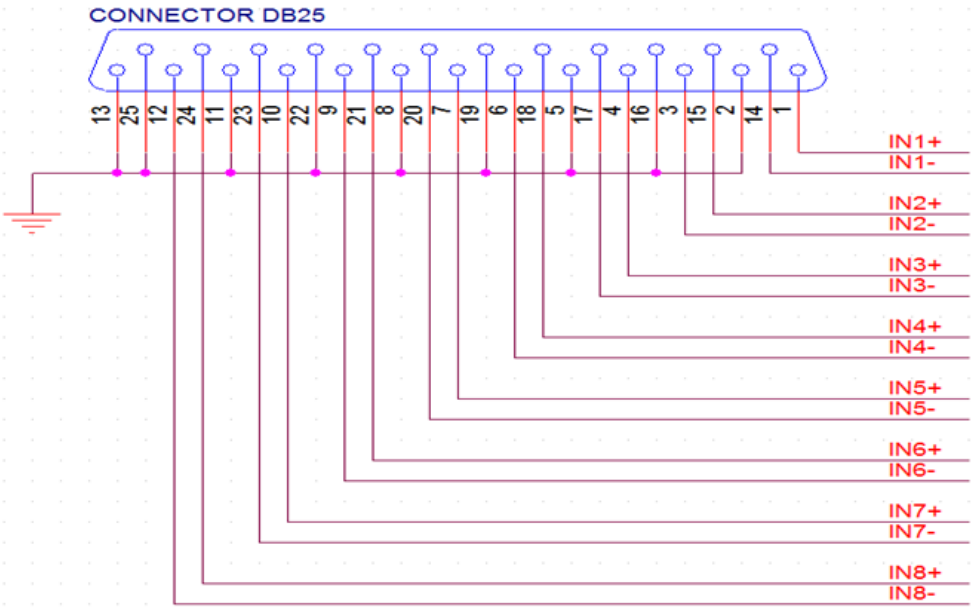
This signaling arrangement allows the signals coming out of this card to be used to feed AES outputs directly or to feed DAC output cards in a mono or stereo configuration depending upon the router encoding.

DB-25 Pinouts

The two DB-25 connectors on the board each support 8 audio signals. Each signal consists of an in phase (+), inverted phase (-), and ground signal. If you intend to use this product with unbalanced analog audio signals, you should present that signal to the + connection, and tie the – connection to ground.

The left hand or lower D connector when viewed from the rear has the lower 8 signals, and the right hand or upper D connector has the upper 8 signals. For example, if the card is installed in the input 0-15 slot of the router, the left hand D connector has audio inputs 0-7 and the right hand has audio signals 8-15.

Below is a drawing and a table indicating the pinouts of the DB-25 connector. Note that it follows the TASCAM standard, but all connections in the UDS router are female DB25.



UDS Analog Audio Input Connector Pinout

Signal·Number	+·Input·Pin	- Input·Pin	Ground·pin
1	1	14	2
2	15	3	16
3	4	17	5
4	18	6	19
5	7	20	8
6	21	9	22
7	10	23	11
8	24	12	25

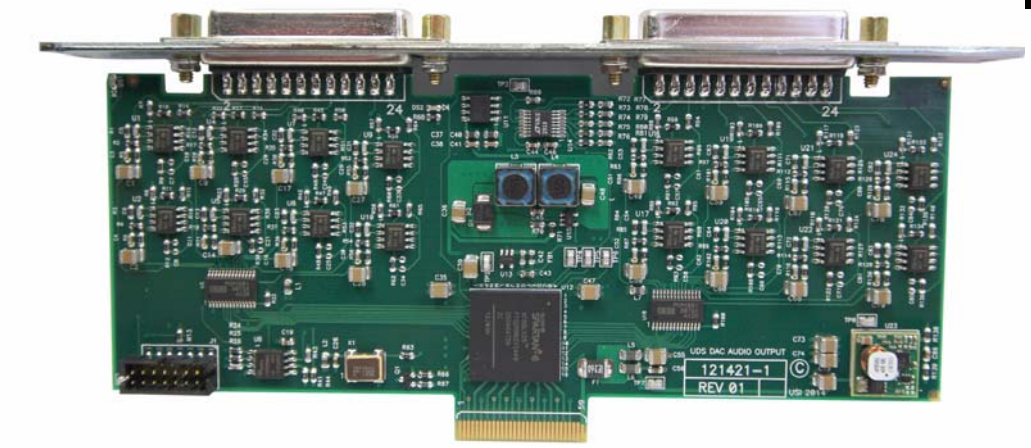
Analog Specifications

Max Input Level	+23 dBU
Input Impedance	> 100K
THD @ 23 dBU, 20 KHz	< .1%
Hum and Noise	< -75 dBU
CMRR @ 60 Hz	< -60 dBU
Gain Uniformity	+/- .1 dBU

121421-1 DAC Audio Output Card

General

The DAC Audio Output card receives 16 AES signals from the crosspoint card and converts the LEFT channel signal from each of those AES pairs into an analog audio signal and drives it out of a pair of DB25 connectors.



Circuit Description

The card receives one +12 volt DC power supply from the crosspoint card that it plugs into. From that supply it creates –

- A 3.3V supply for onboard logic (U38).
- A -12V supply for the analog audio processing (U27).
- A 5V power supply for audio processing (U1).
- A 1.2V power supply for the FPGA core (U28).

Power supply levels are monitored by U2. If all supplies are within tolerance DS2 will illuminate.

DS1, which can be seen at the rear of the chassis, illuminates when both the power supplies are good and when the FPGA is operational.

FPGA U12 receives 16 AES pairs from the crosspoint it is installed in. It uses the LEFT signal from each of these AES pairs to feed U18 and U3, PCM1861 quad DAC parts.

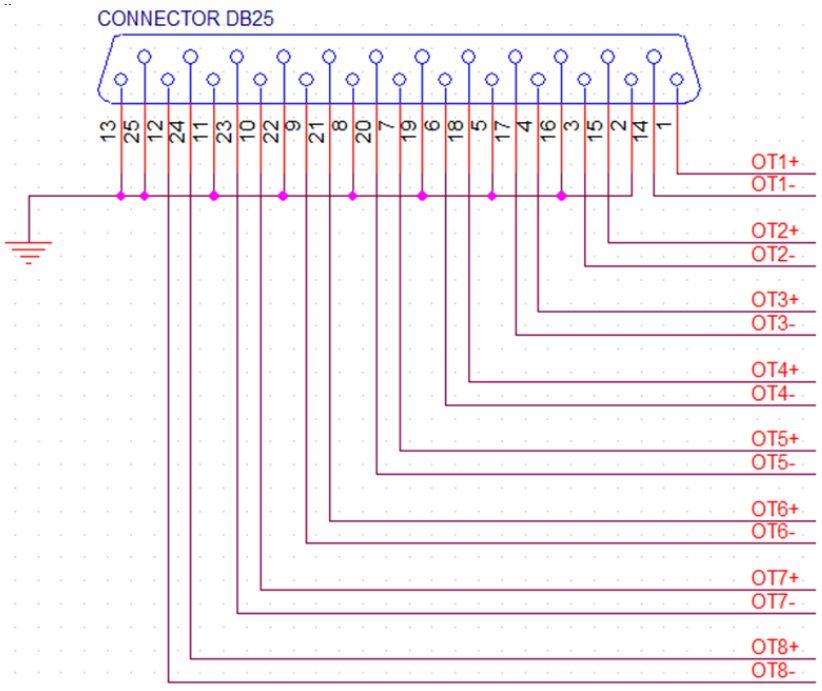
The resulting analog audio outputs are buffered and made into balanced signals and then presented to the two DB25 connectors.

DB-25 Pinouts

The two DB-25 connectors on the board each support 8 audio signals. Each signal consists of an in phase (+), inverted phase (-), and ground signal. If you intend to use this product with unbalanced analog audio signals, you should leave the (-) output unconnected.

The left hand or lower D connector when viewed from the rear has the lower 8 signals, and the right hand or upper D connector has the upper 8 signals. For example, if the card is installed in the output 0-15 slot of the router, the left hand D connector has audio outputs 0-7 and the right hand has audio outputs 8-15.

Below is a drawing and a table indicating the pinouts of the DB-25 connector. Note that it follows the TASCAM standard, but all connections in the UDS router are female DB25.



UDS Analog Audio Output Connector Pinout

Signal·Number	+·Output·Pin	- Output·Pin	Ground·pin
1	1	14	2
2	15	3	16
3	4	17	5
4	18	6	19
5	7	20	8
6	21	9	22
7	10	23	11
8	24	12	25

Analog Specifications

Max Output Level	+23 dBU
Output Impedance	< 20 Ohms
THD @ 23 dBU, 20 KHz	< .1%
Hum and Noise	< -75 dBU
Gain Uniformity	+/- .2 dBU

UDS CQ Module

General

The UDS CQ module is a special function SDI output module that installs in any UDS series router. It has 12 standard SD/HD/3G outputs, 3 special purpose Clean/Quiet outputs, and one output that is used as a reference to the module.

The reference output is the first output of the card, the clean/quiet outputs are 2-4 and the normal outputs are 5-16. These numbers increment by 16 depending on which slot of the router the card is installed in.

Important note – The UDS system has two different control options, Internal Controller based and MX Bus based. The router IO numbers begin at 1 for Internal Controller systems, and 0 for MX Bus based systems. Refer to the rear panel labeling of your router to determine exactly which outputs are the reference and clean/quiet outputs.

Clean Quiet Operation

The 3 clean/quiet outputs perform special processing on the video signal when they detect a switch in the crosspoint core of the router. The switch is detected by means of CRC errors in the video signal, which are induced when a router switch occurs. When a switch is detected, the output will-

- Hold the current video frame.
- Fade the embedded audio signals within it down to a mute level over a 1024 sample period.
- Wait until the next video frame is acquired.
- Begin outputting that new video signal.
- Fade the audio signals up to unity gain.

The module must buffer a full frame of video to allow for this processing, so these three outputs have an inherent 1 frame of delay built in to them.

Referenced/Non Referenced Operation

The reference output is used for an additional function of the clean/quiet outputs, the ability to re-align the three clean/quiet outputs to a common timebase. There are two ways to use it -

Referenced operation. In this mode, a house reference signal is switched from a router input to the reference output of the module. This reference signal must be an SDI signal that is the same format as the signals that will pass thru the three clean/quiet outputs. When the module detects this reference signal, it will align the three clean/quiet output signals to this reference, resulting in an output that both switches cleanly and is automatically timed to house, regardless of the timing of the input signal.

Important Note - It is recommended that this output be locked after the reference source is switched to it, to prevent it from being inadvertently switched away.

Non-Referenced operation. In this mode, nothing should be switched to the reference output of the module. This results in 3 outputs that still perform clean/quiet switching, but the timing of their output signals is based on the timing of the input signal.

It is important that whichever mode you wish to use, the reference output must remain stable. Changes to that signal will result in changes to the alignment mechanism of the 3 clean/quiet outputs

UDS-CQ Module Components

The UDS-CQ Module is made up of two circuit boards, the 121393-1 Carrier card and the 121332-1 SDI I/O Module.

121393-1 CQ Carrier Card

General

The CQ carrier card provides 16 HD-BNC outputs that support SD/HD/3G SDI signals and the necessary support circuitry for the 121332-1 SDI I/O module. That support circuitry includes –

- Video and Memory Clocks
- Configuration dipswitch
- JTAG programming connector

Figure 1-37. Card Top View

Figure 1-38. Card Rear View

Circuit Description

Power. 12V is received and fused by F1 and then distributed to U22 and U28 to create the 3.3V and 5V on board power supplies. LED DS1 shines out of the hole on the rear panel of the card if the voltages are within tolerance.

Video Path

The card receives 16 video signals via differential pairs from the crosspoint card within the frame. 12 of these signals are delivered directly to cable driver components which send the signals out of BNC's 5-16. Signals 1-4 from the crosspoint are delivered to the 121332-1 SDI I/O module via connector J19. After processing, the SDI I/O module drives differential pairs out to cable driver components that generate outputs 1-4.

Clocks

There are 4 clocks that are delivered to the SDI I/O module

- 27 MHz single ended, from U26, video clock.
- 148.5 MHz differential, from U23, video clock.
- 148.35 MHz differential, from U24, video clock.

200 MHz differential from U25, memory clock.

Controls

SW1 is an 8 position dipswitch that controls the functionality of the CQ module. The individual switches are labeled 1 thru 8, and the on position is towards the word ‘ON’ on the dipswitch body. The individual switch definitions are –

- 1 and 2 TX Source – OFF-OFF = Normal operation. ON-OFF = Loopback test. OFF-ON = Internal Generator test. ON-ON = Frame Buffer Test.
- 3 Audio Embedder Source – OFF = Frame Buffer Video. ON = Internal gen.
- 4 Frame Store Grab – OFF = Free Run. ON = Grab Frame.
- 5 Bad Frame Output Video – OFF = Black Frame. ON = Repeat Last Frame.
- 6 Reference Source – OFF = Self Reference. ON = Master Channel Reference.
- 7-8 Unused.

For normal operation, the switch should be set to –

- 1 - OFF
- 2 - OFF
- 3 - OFF
- 4 - OFF
- 5 - ON
- 6 - ON
- 7 - ON
- 8 - ON

Indicators

DS1, a power OK LED, illuminates when the board power supplies are good. This LED can be viewed from the rear of the chassis when a board is installed in the system.

121332-1 SDI Module

General

The SDI I/O module is a general purpose 4 in x 4 out SD/HD/3G Video processing module. It is used on various carrier cards to perform video processing functions.

Circuit Description

Power Supplies

This module receives 3.3V from its carrier card on J1, and regulates it to the following voltages for use in the FPGA –

- 1.5V Via U7.
- 1.8V via U6.
- 1.2V via U1.
- 1.0V via U2.
- 1.0V ‘B’ supply via U4.

All of these voltages are monitored by U9, and DS6 will light if all supplies are within tolerance.

FPGA

The central component of this module is a Xilinx XC7K-160T FPGA, U3. It has support components consisting of a BPI FLASH memory for configuration (U5) and two DDR3 components for storage of video data (U8 and U10).

At power up, the FPGA will configure and if successful will light the yellow LED DS1.

Video IO

Video signals are presented to and leave the FPGA on MGT paths detailed on page 3 of the schematic.

Controls

Controls to this module are either thru dedicated pins or processor reads and writes. They are defined on the carrier cards where this module is used.

Indicators

DS6 – On for power supply OK.

DS1 – On for configuration done.

Note that the following definition is for UDS CQ module status only -

DS5 – Reference channel video locked when on.

DS2 – CQ Channel 1 locked when on. Video asynchronous when flickering.

DS4 – CQ Channel 2 locked when on. Video asynchronous when flickering.

DS3 – CQ Channel 3 locked when on. Video asynchronous when flickering.

Section 2

UTAH-100/UDS Browser Utility

Network Configuration

Introduction

This guide describes the network configuration for the UTAH-100/UDS Router and Panel. Using two setup scenarios; New Configuration on an Independent Network, and New Configuration on an Existing Network. These are the first steps required to configure and control the system.

System Setup Requirements

- Windows™ operating system 7
- Java 7.07™ or newer
- Internet Explorer™, Firefox™, or Chrome™
- Ethernet connection

All UDS devices - PC, Router, and Panel - connect over Ethernet on a house network, or within a stand-alone (direct) mode. The system will provide default IP address during setup, or you can use unique IP addresses if required within your operation.

UTAH-100/UDS Network Configuration

New Configuration on Independent Network

This scenario consists of a router and a panel working in a stand-alone mode with one or more PC to complete an independent, stand alone network.

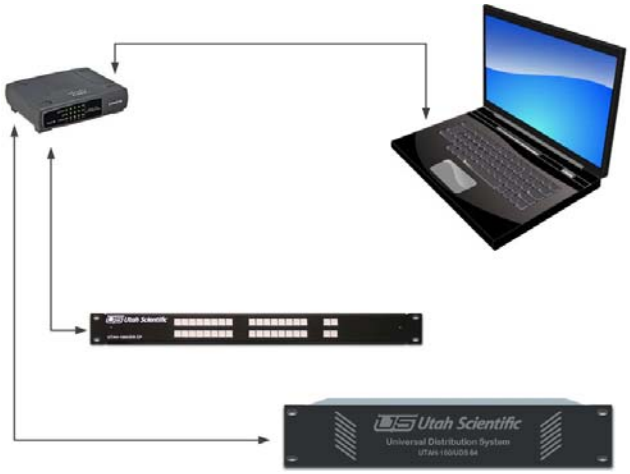


FIGURE 1.

New configuration on an independent network is relatively simple, involving Ethernet connection between the PC and devices (router and panel) only, as a stand alone network. Simply connect all devices together as shown in Figure 1 for basic setup. In this case you will only need to set the PC address to the same subnet as the router and panel. This will facilitate applet operation and table configuration. The following default IP addresses (below) ship from the factory. The numbers will be consecutive in the case of multiple panels; i.e., .182, 183, etc.

Routers - 192.168.5.180
Panel - 192.168.5.181

To change the devices to use non default addresses, see *New Configuration on an Existing Network* (next). Also note, the PC and devices (router and panel) must occupy the same subnet.[1] See your network administrator for configuration assistance if no default subnet appears.

1. All routers and panels require separate IP addresses.

Online instruction is also available by accessing the HTML help file located within the applets, which will also provide details for setup and configuration of the router and panel tables.

New Configuration on an Existing Network

This procedure describes new configuration on an existing network. Use this routine if you need to modify the router or panel's network parameters. The steps below are based on the default set of parameters.

On the PC, click Control Panel, Network and Internet, Network Sharing Center, then Change Adapter Settings.[1]

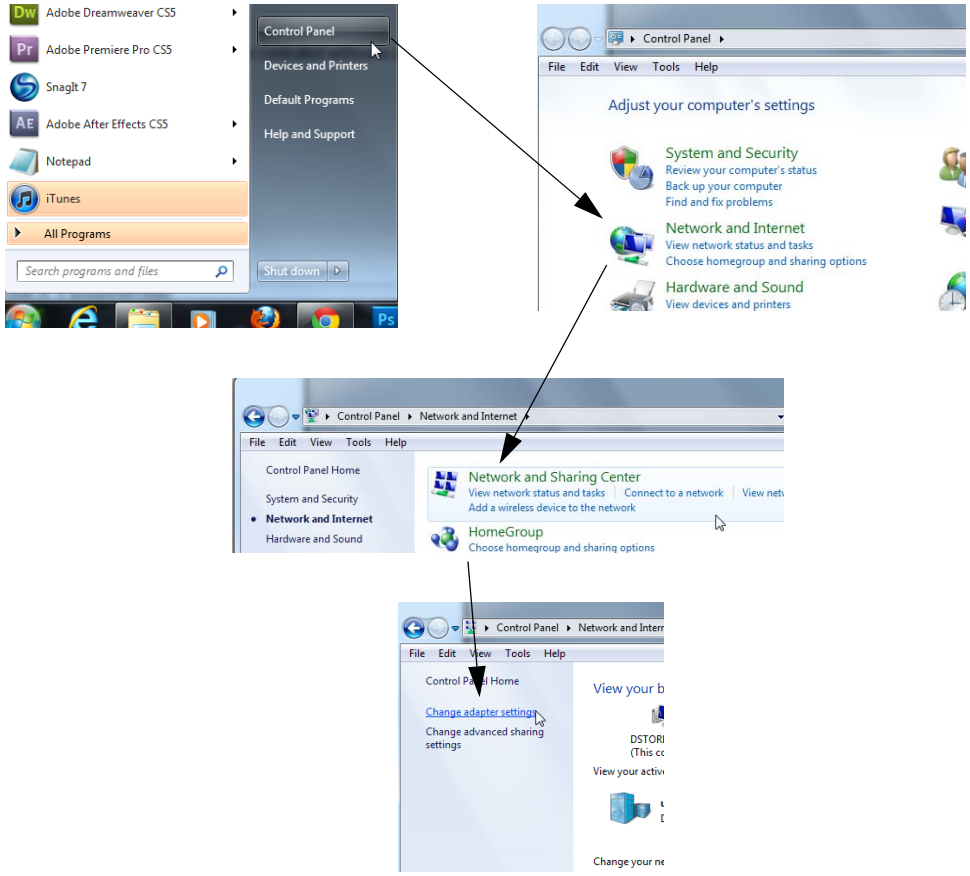


FIGURE 2.

1. These steps are based on Windows 7 operation.

When the following window appears, right-click the icon to produce the drop-down menu, then select *Properties*.

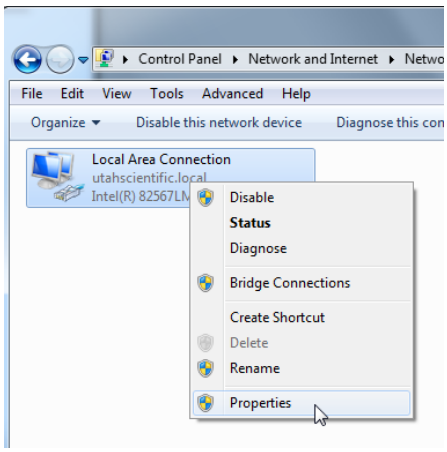


FIGURE 3.

The following window will appear.

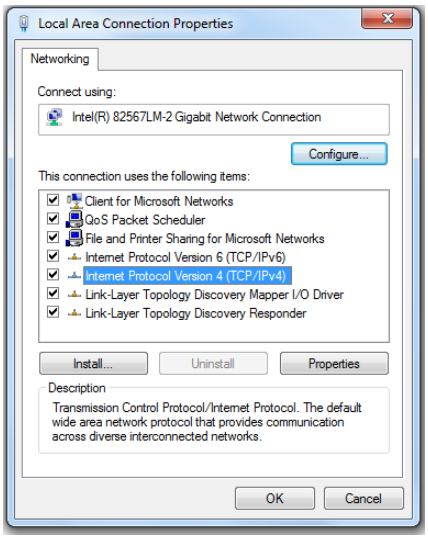


FIGURE 4.

Select Internet Protocol Version 4, then click the Properties button. The following window will appear.

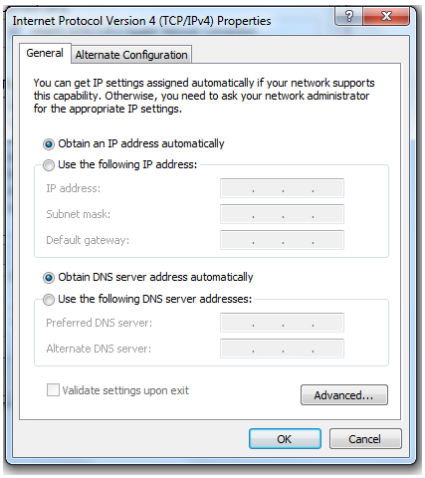


FIGURE 5.

Click the second radio button down to set a static IP address.

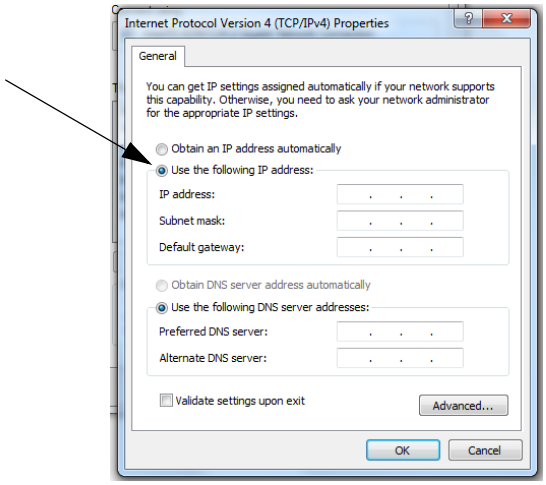


FIGURE 6.

Enter the following address into the indicated cell (192.168.5.2)[1]

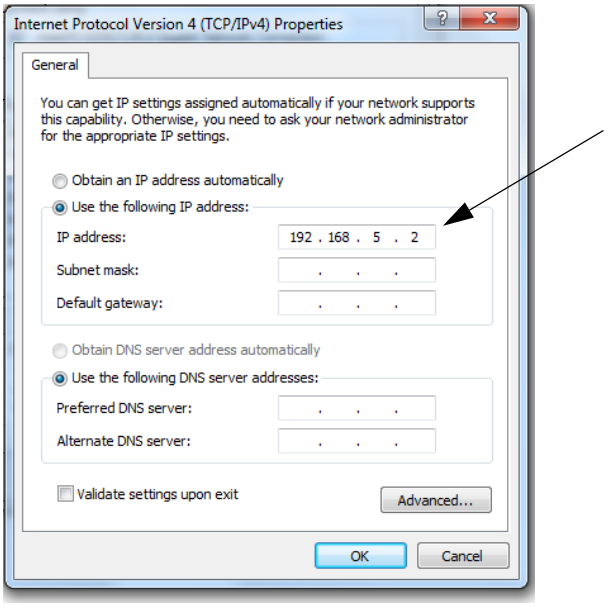


FIGURE 7.

Accept the Subnet mask default, then click OK.

Now connect your PC or laptop to the router with a standard Ethernet cable.

Note: *A crossover cable (typically used with an Ethernet connection) is not necessary as the signal 'switch' is done internally.*

1. This is the subnet default address. You can substitute the last digit if required for your system. If your system contains a completely different subnet for the PC, routers, and panels, substitute the correct addresses where applicable.

Router Applet Activation and Configuration

Launch your preferred browser and complete the following steps:[1]

a. Log into the Router Applet by entering 192.168.5.180 into your browser's URL line (default). If your router is using a different address than the default, enter it into the browser.

NOTE: If the applet does not activate, try pinging the system by opening your command prompt and typing the router's IP address (address number ending in .180) to determine whether or not the connection is good. If you are unable to ping the device, check the connections or see the network administrator for additional help.

In addition, if you are unsure of the IP address, you may need to default the router to the factory IP address of 192.168.5.180.

b. Accept the following advisory (checkbox) then click Run to continue

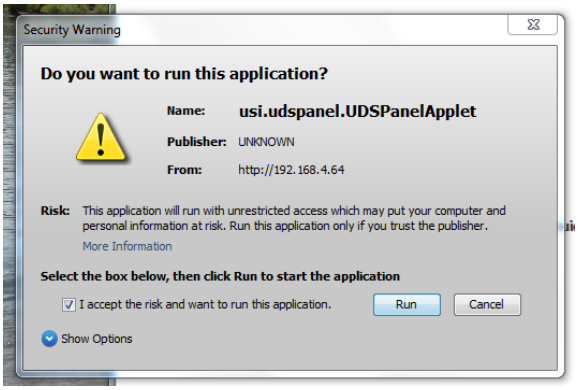


FIGURE 8.

1. IMPORTANT: You must use Java version 7 or later.

c. When the Router icons appears, select “Router Configuration”.

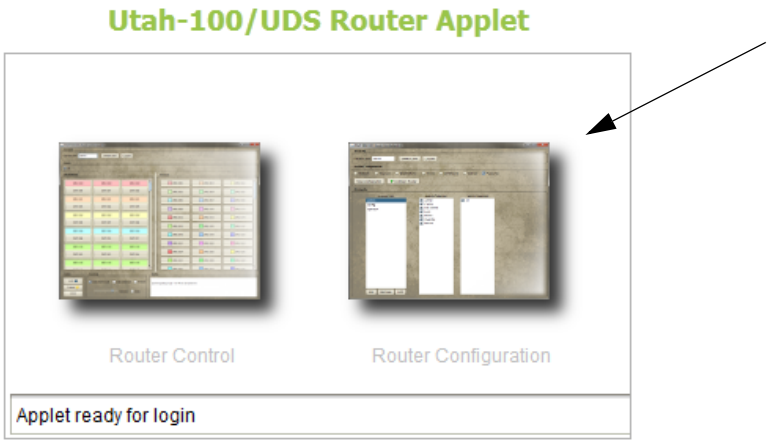
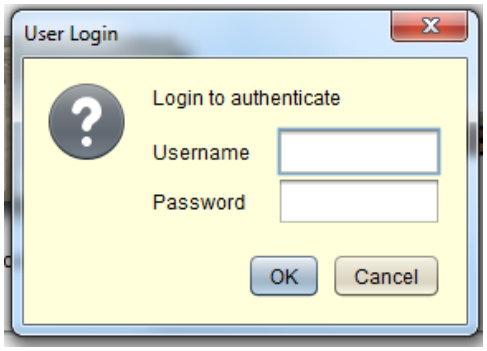


FIGURE 9.

Note: You will only be able to connect if the browser window (shown in Figure 9) indicates “Applet ready for login.”

d. Enter Username “admin” (default) - *in the username entry box*



e. Enter Password “admin” (default) - *in the password entry box*

f. Click the Data Comm (radio button) to change the network configuration.

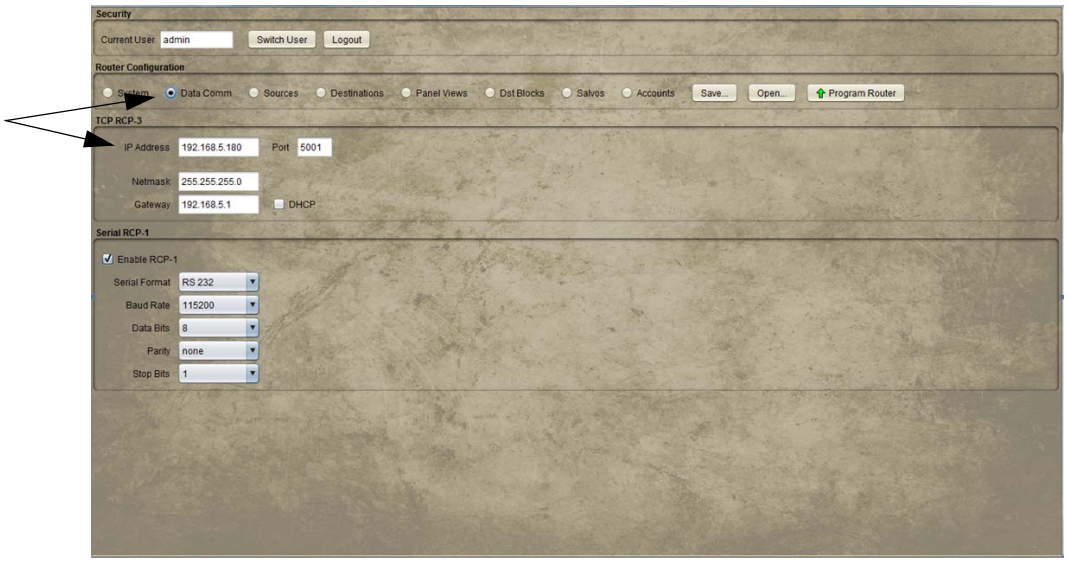


FIGURE 10.

Note: The program will display the router's IP address (IP Address cell, above). It is important however that Net mask and Gateway remain constant among all devices, and to keep the DHCP box unchecked.

g. Enter the desired IP address in the space provided.

h. Verify the Port setting of 5001.

i. Make sure the DHCP box is unchecked.

j. Click the "Program Router" button when the network configuration is complete.

k. A dialog will appear prompting you to reset the device. To make the IP changes active, reset the router by pressing (and quickly releasing) the small button at the far right side of the control module on the back of the router.

Note: There is no need to restart the browser when the router is reset.

Once the above steps are complete, the router can be placed on the target network and configured as needed.

Panel Applet Activation and Configuration

Make sure the panel is plugged into the same network as the PC, and that the PC is set to the same subnet as the panel. This procedure allows the configuration from the Panel Applet in the absence of a physical router connection.

Log into the Panel Applet first by bringing up a web browser and entering 192.168.5.181 (factory default setting) in the URL browser box. Click the Panel Configuration icon to log in, as shown in the figure below.

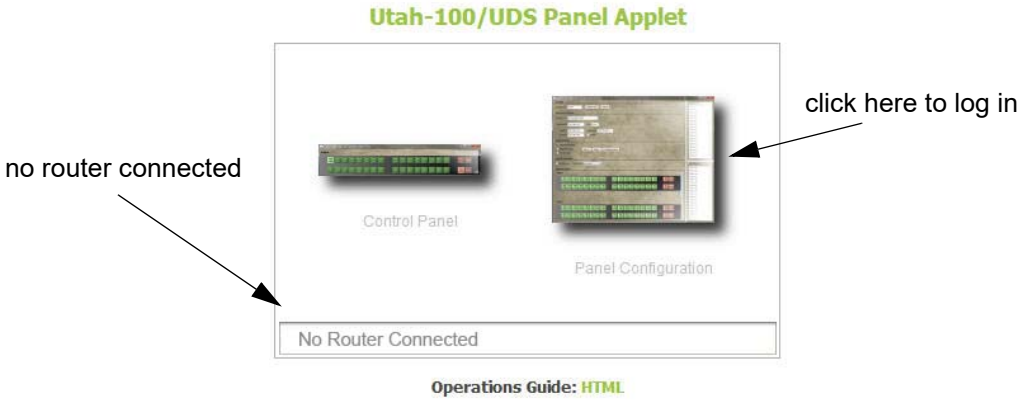


FIGURE 11.

In this mode, the Panel Applet dialog will indicate the router's absence.[1]

The following dialog will appear (with no router connected).

FIGURE 12.

1. This is a simple operational scenario with no router currently connected. You will be taken directly to the Configuration screen when the router and panel are simultaneously connected.

Since there is no router connected, click Cancel to dismiss this dialog.

The following window will appear, which will give you an opportunity to designate the necessary configuration detail.

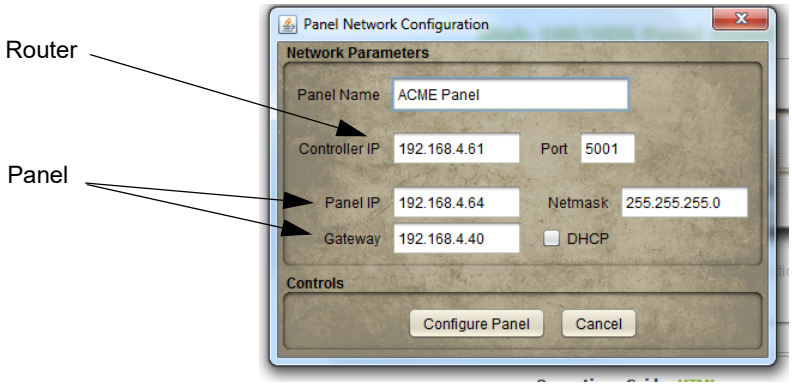


FIGURE 13.

The above illustration contains a default IP address (your address may be different). The Controller IP corresponds to the router address, while the Panel IP and Gateway are associated with the panel that you are using. Enter the correct addresses as needed.

Click **Configure Panel** when the correct addresses are in place, then reset the system.

A dialog will appear prompting you to reset the device. To make the IP changes active, cycle the power to the panel or reset the panel by pressing (and quickly releasing) the small button at the far right side of the control module (rear of panel).

Once the above steps are complete, the panel can be placed on the target network and configured as needed.

You can now log in to the router and panel applets to configure you system as needed using the newly configured IP addresses. The default username and password is ***admin***, in both cases. Once you have logged in, click the configuration icons to activate the configuration dialogs.

For additional assistance, please contact Utah Scientific Customer Service - 1(800) 447-7204.

Section 3

UTAH-100/UDS Browser Utility

The Router Applet

Router Configuration

Router Configuration is activated by launching the browser applet (using the supplied default IP address). This section contains the steps involved in activation and operation of the UTAH-100/UDS Router Applet.

The Router applet must be connected to the actual router to communicate properly. Once the necessary hardware is in place, start the application with the provided IP address, then launch the applet by clicking the Router Configuration icon.

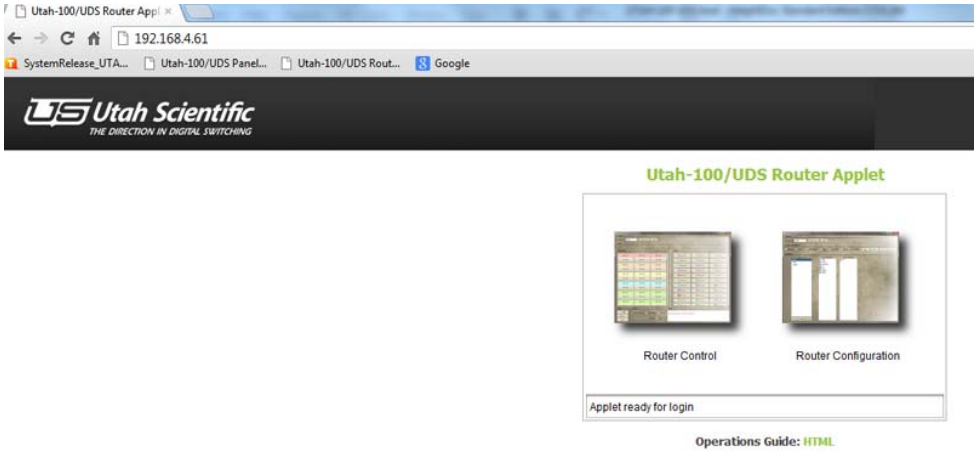


Figure 3-1.

You will be prompted to log in with your username and password. The default is admin/admin).

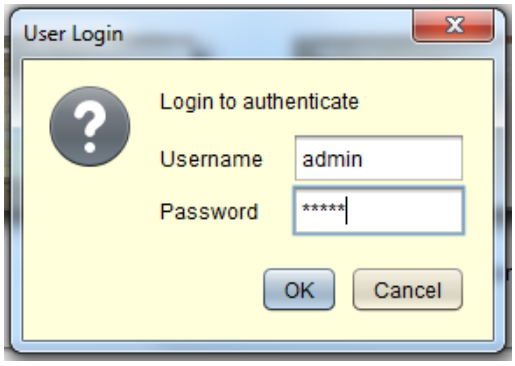


Figure 3-2.

This will activate the setup window. During a successful login, all associated accounts are loaded into the system at the time of the initial launch (*Current User*).

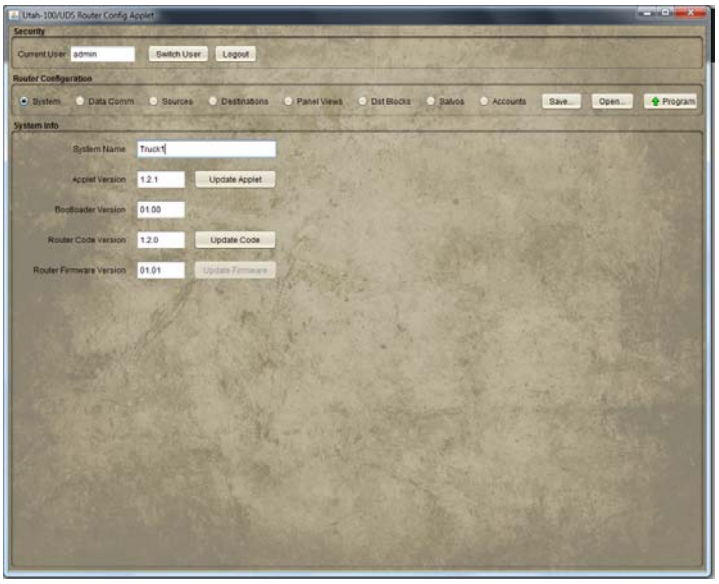


Figure 3-3.

Security

The default user is listed in the 'Current User' cell. You can change users from the list of previously designated users (Switch User button). Users are *selected* from this dialog but not configured.

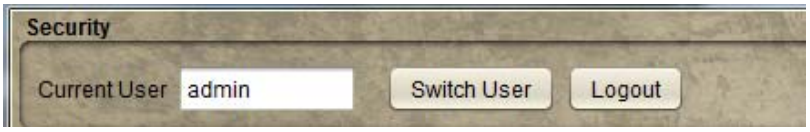


Figure 3-4.

Data Comm

TCP RCP-3 (Network)

This dialog is used to set Device Communications parameters. Network IP address, netmask, and gateway parameters are edited at this location along with the RCP-3 port setting. Alternatively, you can select DHCP to automatically set network parameters. The only way to verify the IP address setting in DHCP mode is to access the DHCP server.

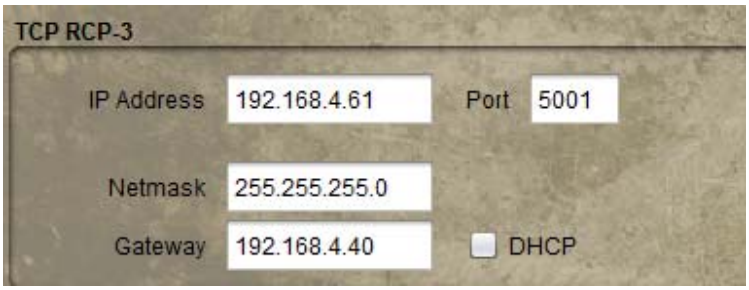


Figure 3-5.

Serial RCP-1

This area allows for enabling or disabling RCP-1 (checkbox) and assigning the parameters associated with serial format, baud rate, data bits, parity, and stop bits.

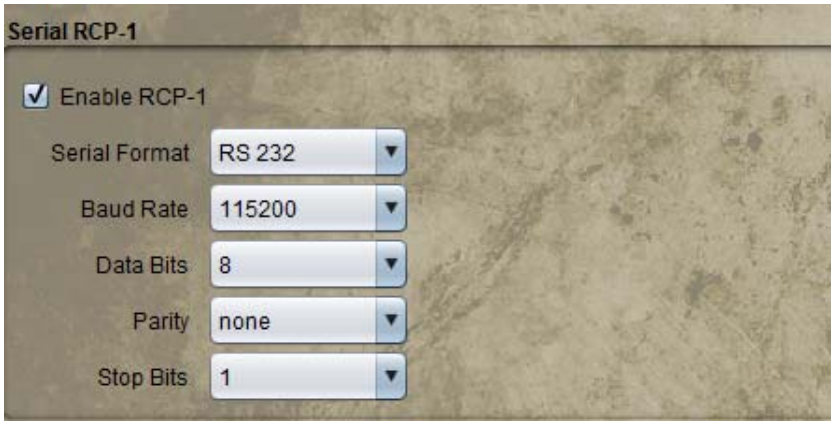


Figure 3-6.

DHCP

In certain circumstances the default IP address is unusable and DHCP connectivity is expected. Click the DHCP box to activate the connection. The address cells will gray out when the box is clicked. The only way to verify the IP address setting in this mode is to monitor the DHCP server via serial connection.

Once network modifications are complete (IP changes), click the **Program Router** button.

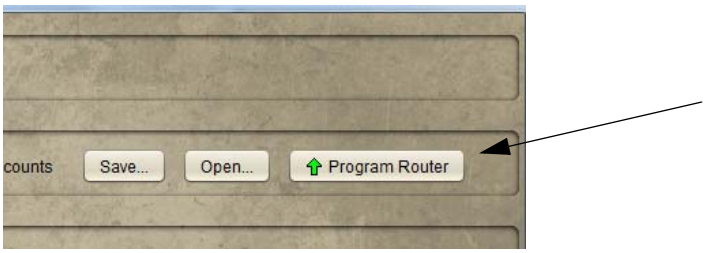


Figure 3-7.

The ‘configuration successful’ dialog will appear.

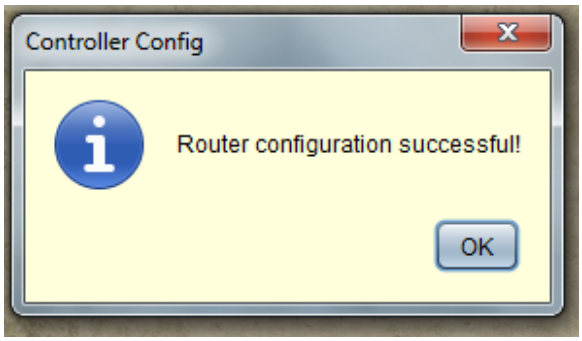


Figure 3-8.

Sources

The program defaults with all sources configured. Since this is not the likely desired configuration, highlight the unwanted sources and click the Remove button.

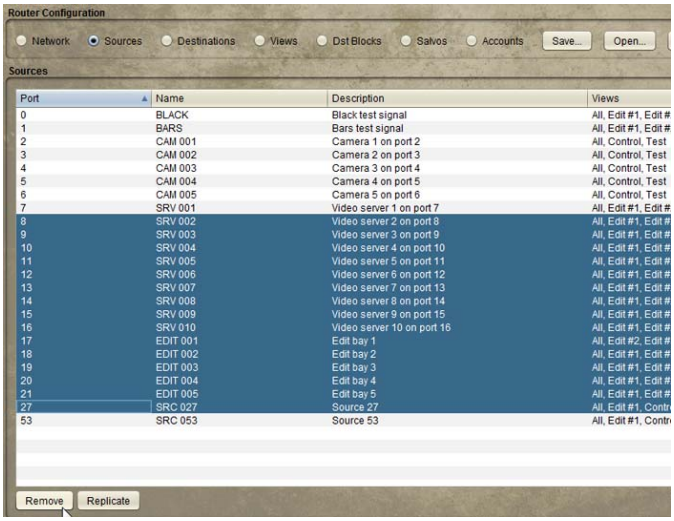


Figure 3-9.

Source Creation

New Sources are defined and added by clicking the Replicate button.

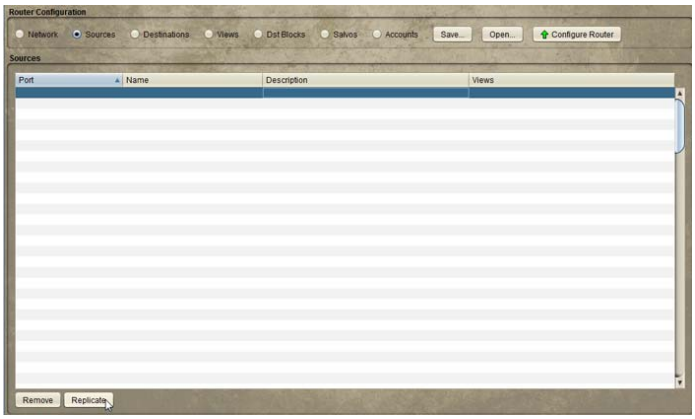


Figure 3-10.

Also, the Source table can be sorted by clicking on the desired column header.

In this example, the prefix is the three character descriptor for camera. Numeric suffix start is the 3 digit end definer associated with the device. Increment, and starting port number are all assigned as number ‘1’. The Description is a long form identifier, with ‘suffix’ placed inside ‘less than’ and ‘greater than’ symbols to allow the system to properly increment the devices in the listing. ‘All’ views are selected, and the number of devices requested for the list count is ‘5’.

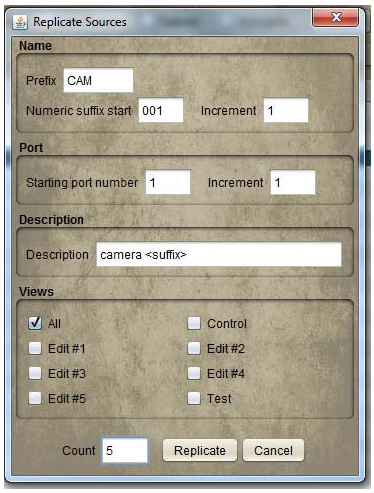


Figure 3-11.

The resulting list display is illustrated below.

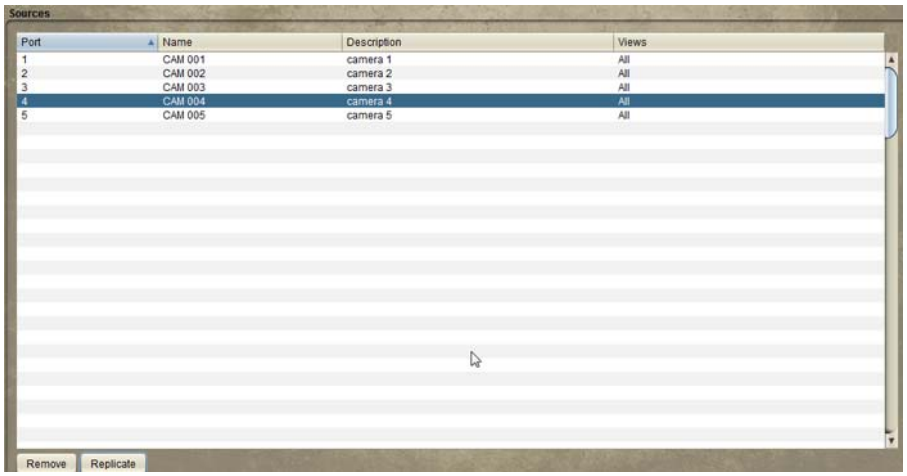


Figure 3-12.

Source creation from within the list

Highlight the line and enter the definitions for Port, Name, and Description.

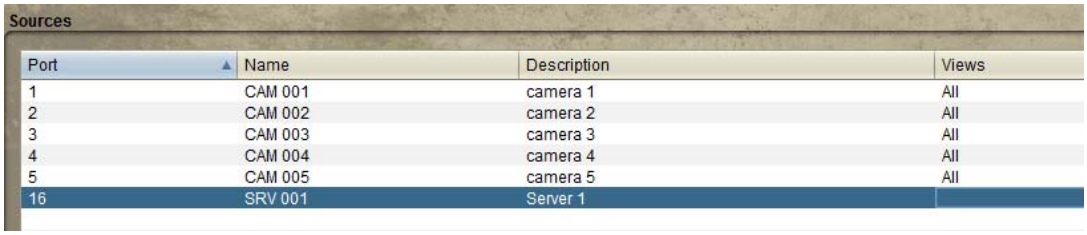


Figure 3-13.

Using this option to add Sources will not allow you to manually enter the View method. Click the View radio button to make this modification.

Figure 3-14.

Click the checkbox associated with the new Source, then highlight the desired view type within the View list.

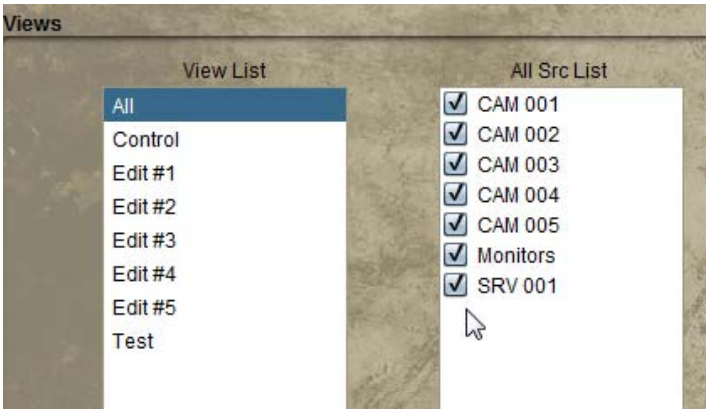


Figure 3-15.

Your new view will be associated when you return to the Sources window.

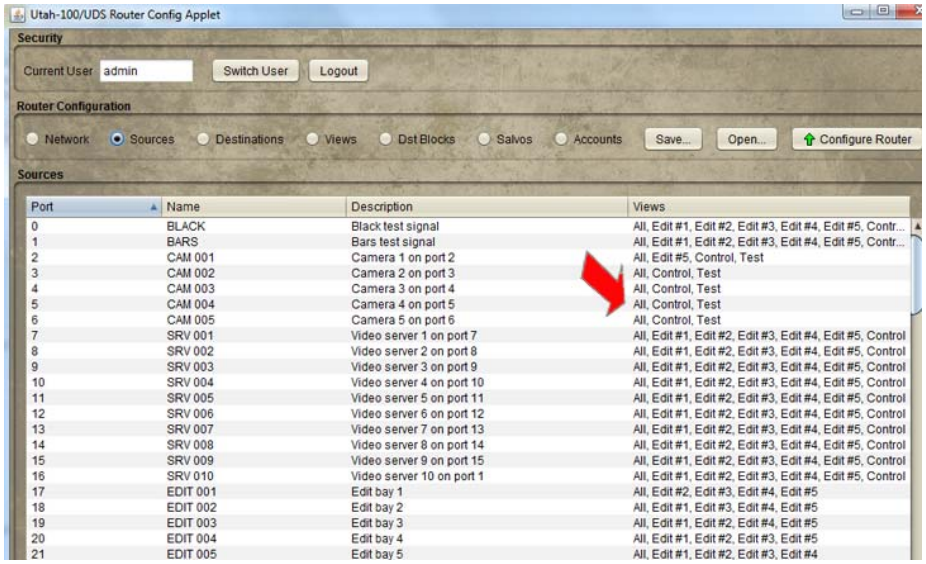


Figure 3-16.

Destinations

The program defaults with all destinations configured. Since this is not the likely desired configuration, highlight the unwanted sources and click the Remove button.

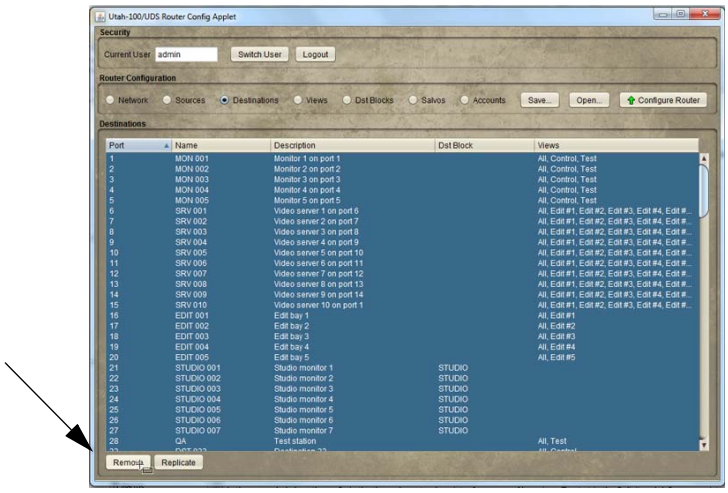


Figure 3-17.

Destination creation

New Destinations are defined and added by clicking the Replicate button, or by entering data in the table directly. In addition, the Destination table can be sorted by clicking the desired column header.

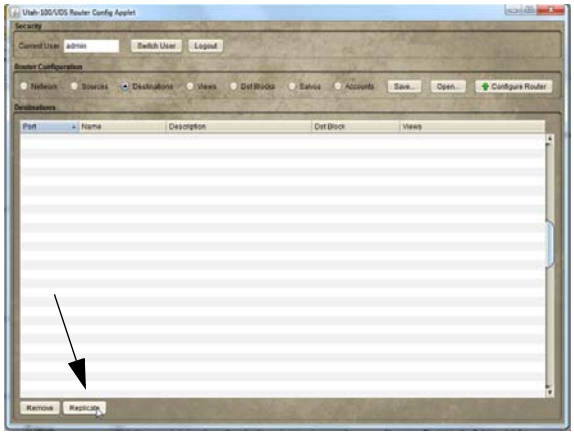


Figure 3-18.

In this example, the prefix is the three character descriptor for camera. Numeric suffix start is the 3 digit end definer associated with the device. Increment, and starting port number are all assigned as number ‘1’. The Description is a long form identifier, with ‘suffix’ placed inside ‘less than’ and ‘greater than’ symbols to allow the system to properly increment the devices in the listing. ‘All’ views are selected, and the number of devices requested for the list count is ‘5’.

Figure 3-19.

The resulting list display is illustrated below.

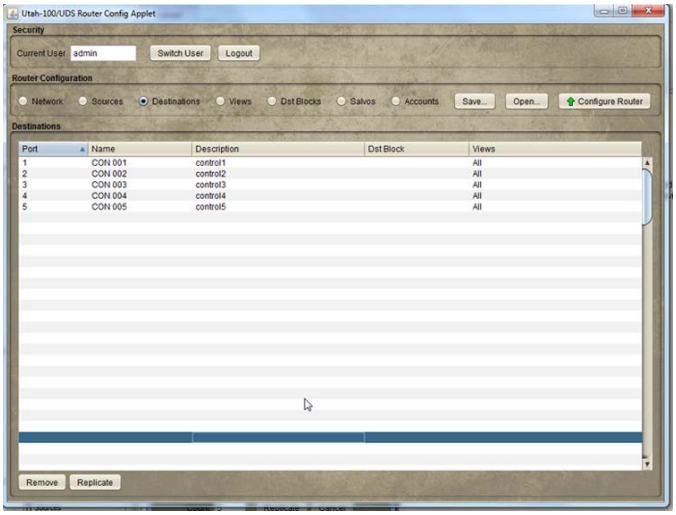


Figure 3-20.

Destination Creation from Within the List

Highlight the line and enter the definitions for Port, Name, and Description.

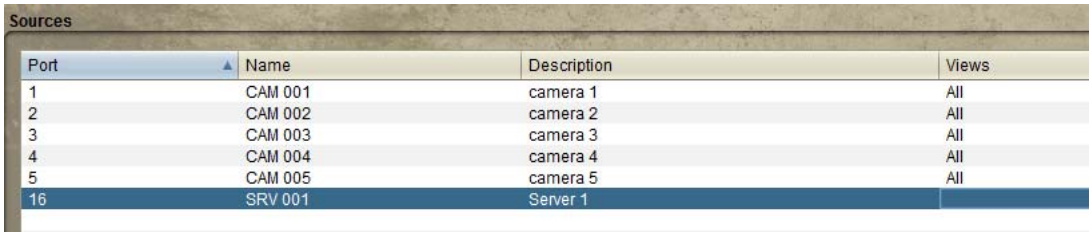


Figure 3-21.

Do this to overwrite the lines contents when the cursor becomes active.

Using this option to add Destinations will not allow you to manually enter the View method. Click the View radio button to make additional modifications.

Figure 3-22.

Click the checkbox associated with the new Destination, then highlight the desired view type within the View list.

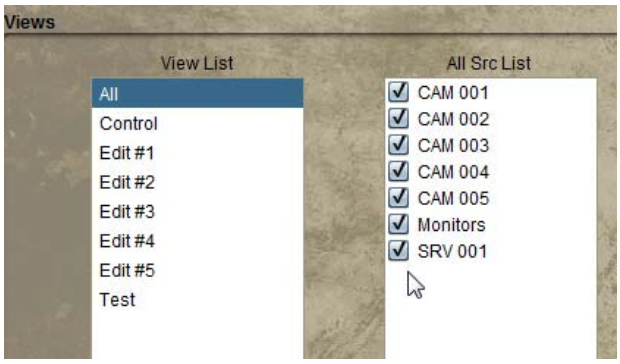


Figure 3-23.

You can also click the Destinations radio button and ‘Replicate’ in the same manner as with Sources. This involves adding Destinations to the list in the correct sequence.

The Replicate dialog window contains a pop down menu at the bottom, which will contain any previously created Destination blocks.

Click the **Configure Router** button when the needed destination blocks have been created.

Panel Views

Organizing

The *Views* selection is a way to organize Sources and Destinations into manageable groups for the router control window. Views will appear within the Source and Destination lists immediately after editing.

To facilitate this, click the *Panel Views* radio button, select the desired View from the list on the left, then click the checkboxes within the next two devices you would like associated with the View.

You can also create a whole new view by clicking the **Add** button at the bottom of the left-hand list.

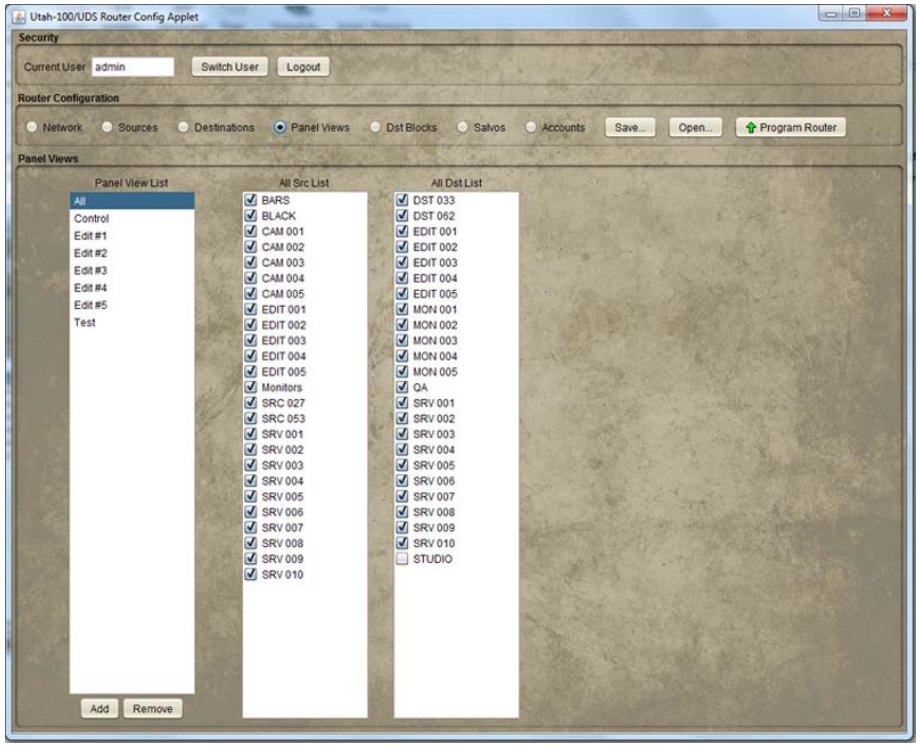
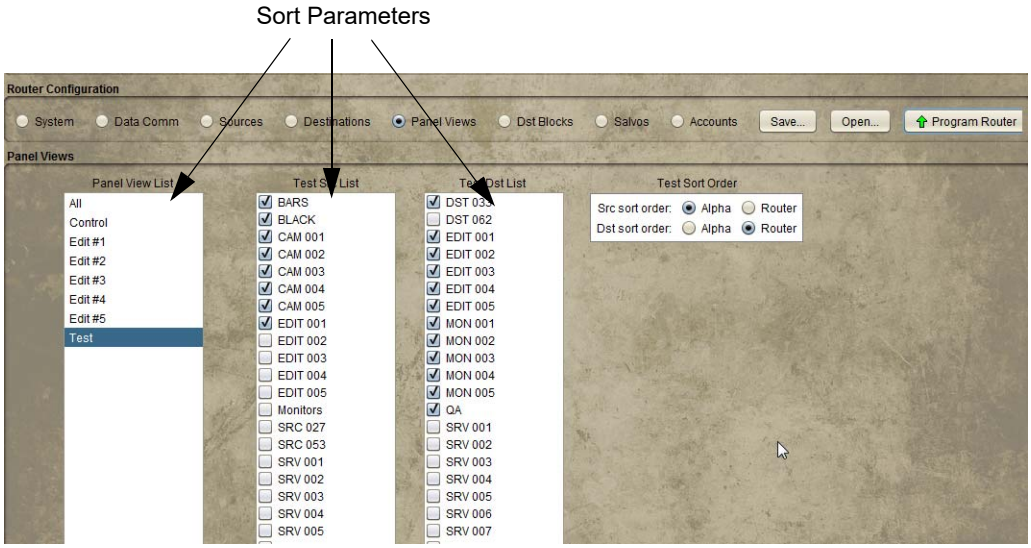


Figure 3-24.

Sorting Option

With **Panel Views** selected, the *Sorting Option* is a way to organize Sources and Destinations into display lists (*Router Control* applet) based on a router or alphabetic port designation.

To access the sorting option, click the Panel Views radio button, the parameters you would like to sort within, then indicate the *All Sort Order* (Alpha or Router) and click the **Program** button.



Router Sort

This is an example of the display that will appear within the Router Control Applet when Router Sort is indicated (Config Applet). Sorting is completed by *router port*.

Figure 3-25. Router Sort

Alpha Sort

And this is an example of the display that will appear within the Router Control Applet when Alpha Sort is indicated (Config Applet). Sorting is completed by *alpha numeric port*.

Figure 3-26. Alpha Sort

Destination Blocks

The Destination Block is essentially a way to assign a destination grouping as a DA. Any pre-configured destination blocks will display in the drop down list inside this dialog window. This saves time by assigning an entire group, or block at once.

Click the Dst Block checkbox to activate this feature. Provide a name when the dialog appears.

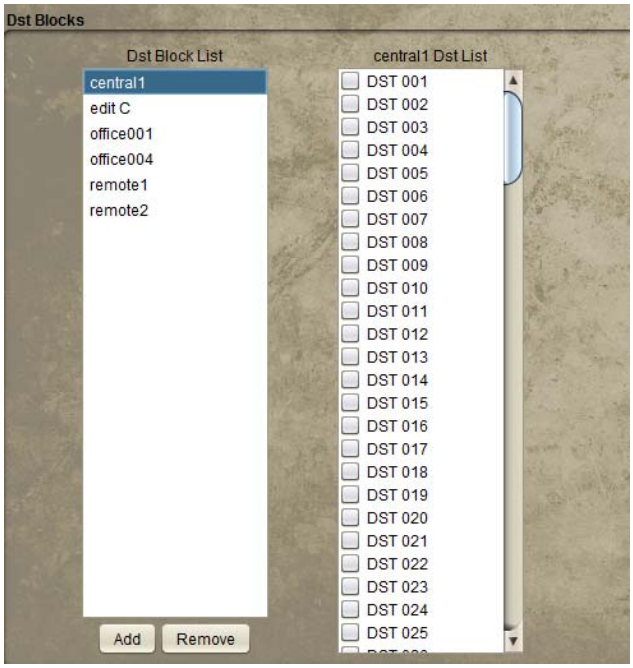


Figure 3-27.

The block will appear as one single destination in the system when a destination block is created. The new name will appear within the left listing and the options (to include) will appear within the right listing.

When Takes are made on the DA block, the take source will be immediately switched up to all of the destinations in the block.

The router will report the total number of takes corresponding to the number of replicated destinations whenever takes are made on the DA block.

Note: *Destinations assigned to specific Destination Blocks cannot be assigned to additional Destination Blocks. A dialog will appear, asking if you wish to reassign, in the event this is attempted.*

Salvos

The Salvo is a mechanism for storing multiple takes to be conveniently triggered at a later time. Salvos will appear as new sources in the system and will trigger the configured takes when selected.

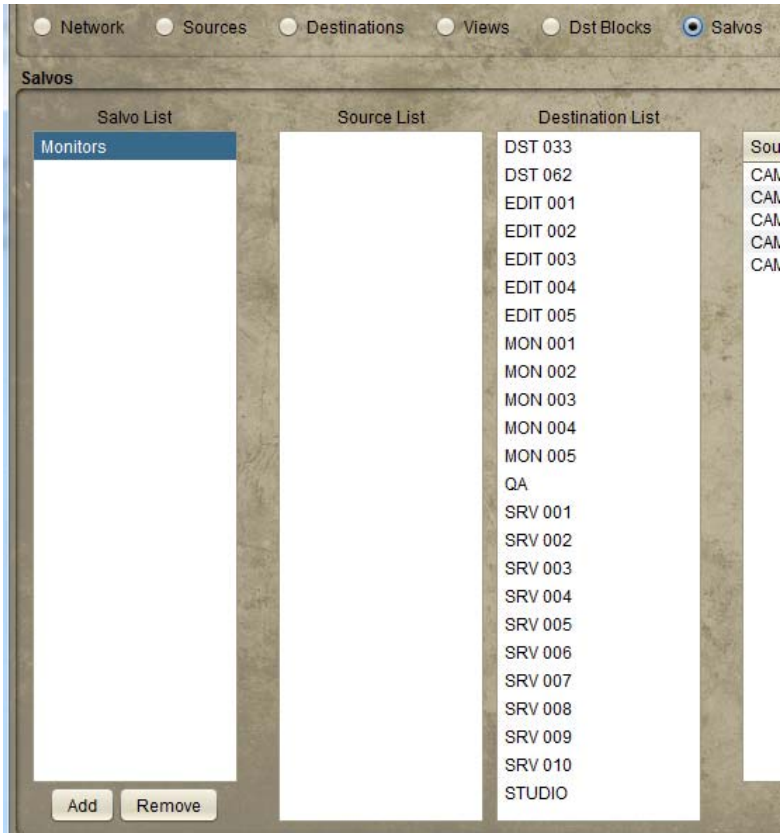


Figure 3-28.

Select the desired Source and Destination from the lists, then click the “Add” button to place the new Salvo to the listing on the right.

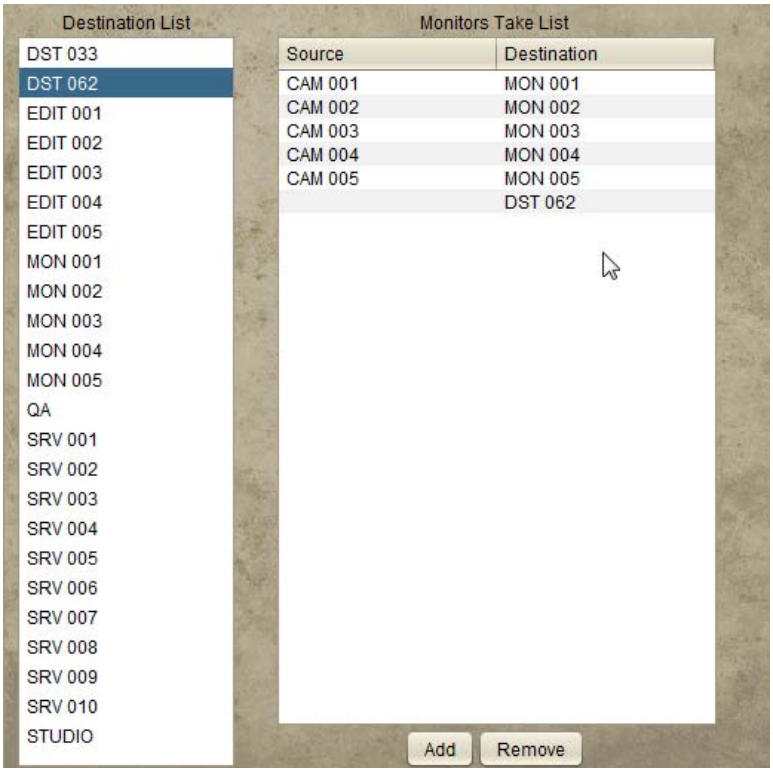


Figure 3-29.

You can now verify your new Salvo by accessing the View dialog area (View radio button). Note that a new Source is listed within the corresponding column.

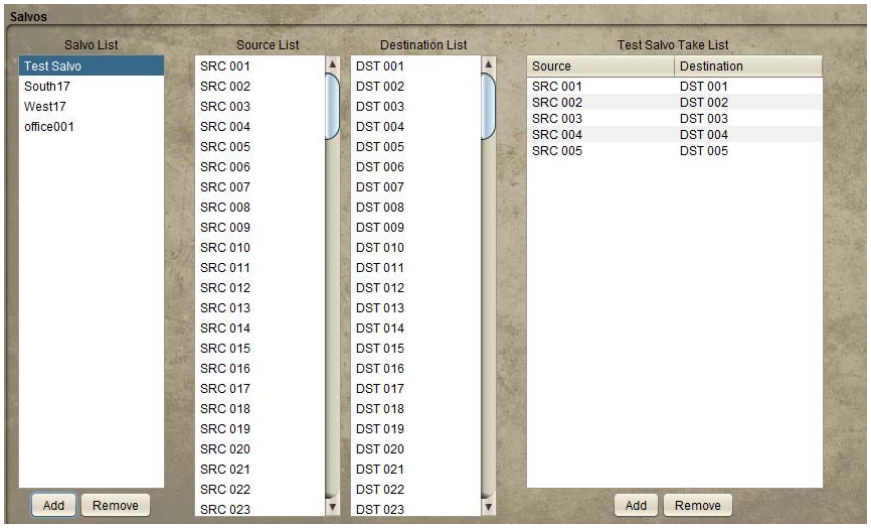


Figure 3-30.

Your new Salvo will also be displayed inside the Router Control applet.

Accounts

The ‘UDS System’ defaults with 3 pre-defined use accounts. You can edit the passwords, modify, delete, or add accounts as needed for your operation.

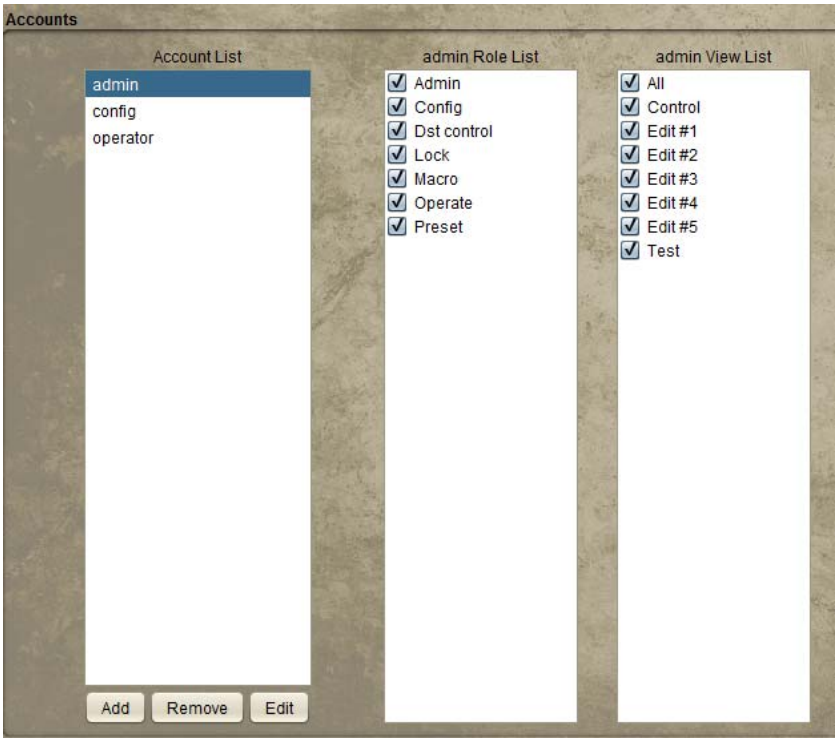


Figure 3-31.

- Roles allow permissions for various system attributes; the actual creation, modification, or deletion of accounts (admin).
- Config allows router and panel configuration. Dst control allows for control over the Dst reset and Dst select all checkboxes (Router Control area).
- Lock gives the associated account control over actual lock status.
- Macro allows macro editing while in preset mode.
- Operate controls the ability to make Takes.

- Preset controls the ability to turn preset on or off; Preset ON allows constant preset activation if needed.

Views to be associated with given accounts are defined by the checkboxes in the admin View List. While all layouts are available to any user for status view, destination selection and the ability to make takes are defined within this listing.

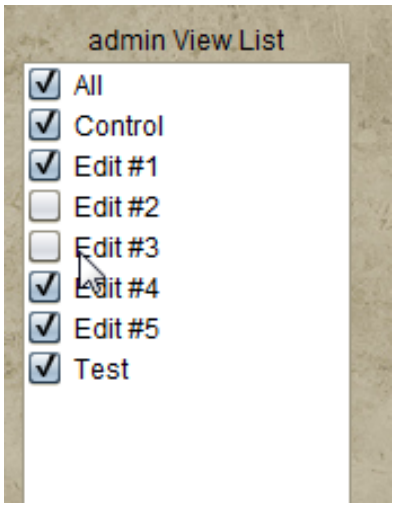
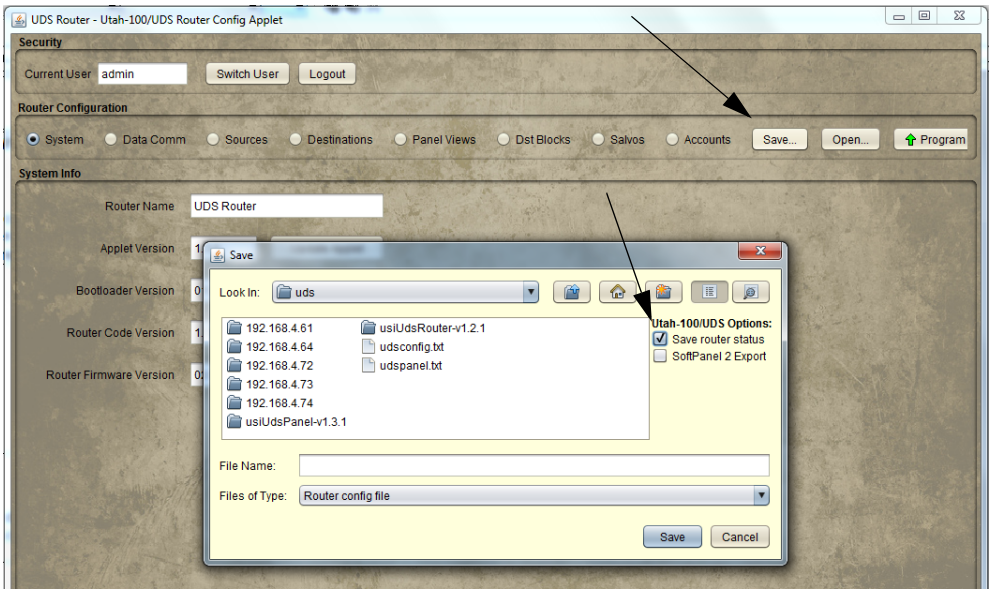


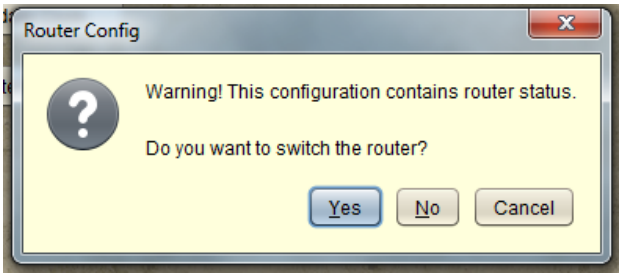
Figure 3-32.

Save Button

The router configuration is saved to a file on your computer. If you want to save the current state of the router connections, make sure the corresponding check box is indicated within the Router Configuration dialog window (right side).



Note: *When you program the router (Program Router button), a warning dialog will appear indicating that the current configuration 'Contains Router Status - Do you wish to Switch the Router?'*



Clicking 'No' indicates the configuration will be saved without the Router.

Clicking 'Yes' indicates the configuration is saved and the Router Outputs will be stored.

Router Control

Source and Destination Management

Destination buttons are contained on the left side of the display, with the Source status indicated above each button.

The Control panel layout (illustrated below) will follow your own panel configuration. Destinations are selected on the left side of the display by clicking the labeled button, then the intended Source is selected (clicked) on the right side of the display.

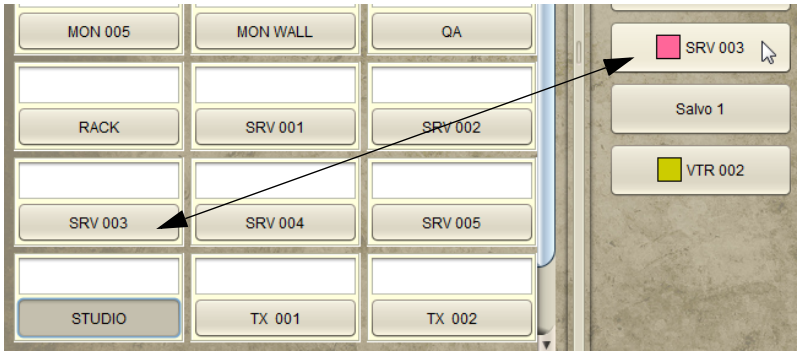


Figure 3-33.

When you select a Destination and make a Take, the Destinations will automatically reset if the checkbox below is set.

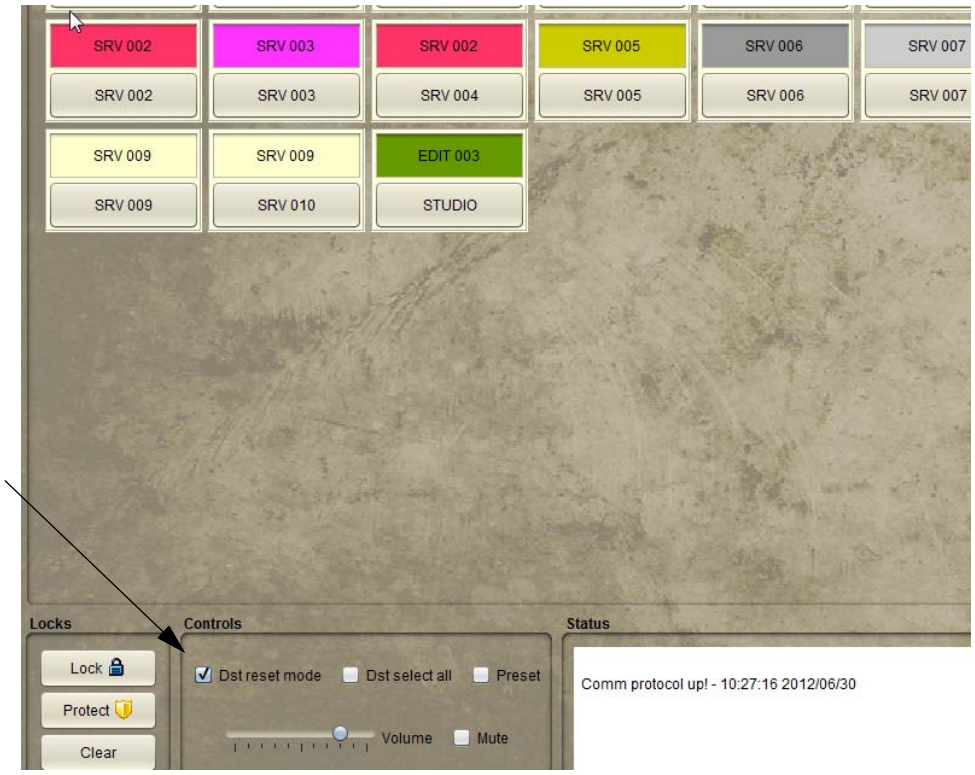


Figure 3-34.

Otherwise the Destinations will remain selected allowing you to make multiple takes on the same Destinations without having to re-select each one.

Destinations can be locked or protected by clicking the corresponding buttons within the lower-left of the display.

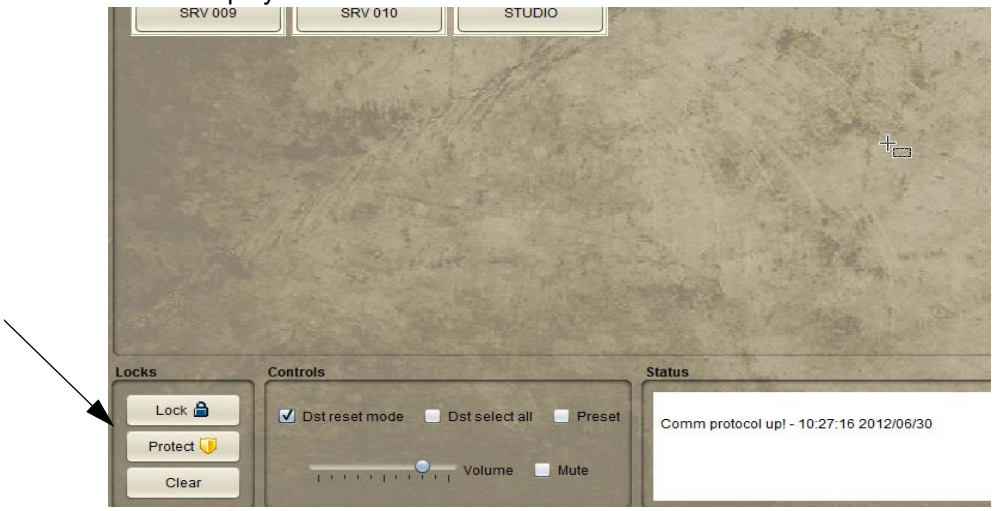


Figure 3-35.

Takes can still be made on Destinations in Protect mode locally, while remote users will not have access to protected Destinations. Locked Destinations are not switchable by anyone until the lock is actually cleared.

The status window (lower right above) will display all Controller activity.

Preset (checkbox)

If the Preset box is checked (Controls group area), the ‘Take’ button (lower right) will blink, waiting for the user to activate the take by a button click.

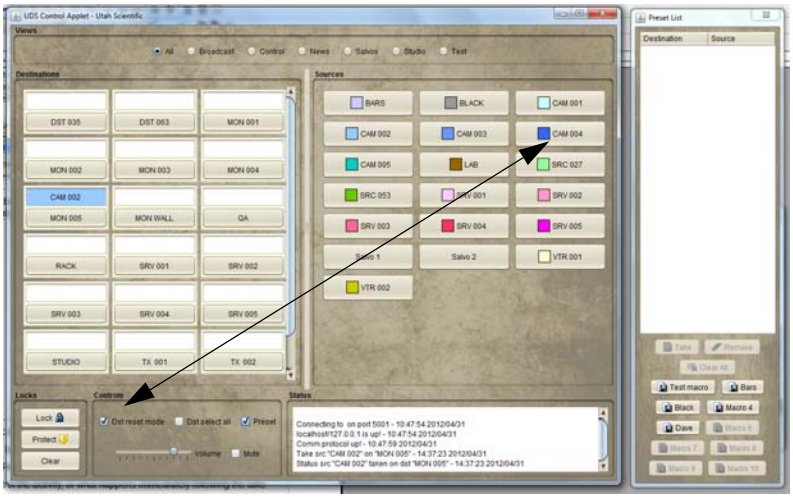


Figure 3-36.

The ‘status’ will alternate between what currently exists, and what the action will be once the Take commences.

Takes will occur immediately if the Preset box is not checked.

When this window is active all actions will be directed to the preset list (right side list window), rather than immediately affecting the router.

All UDS Control activity is logged in the Status box in the lower right portion of the display.

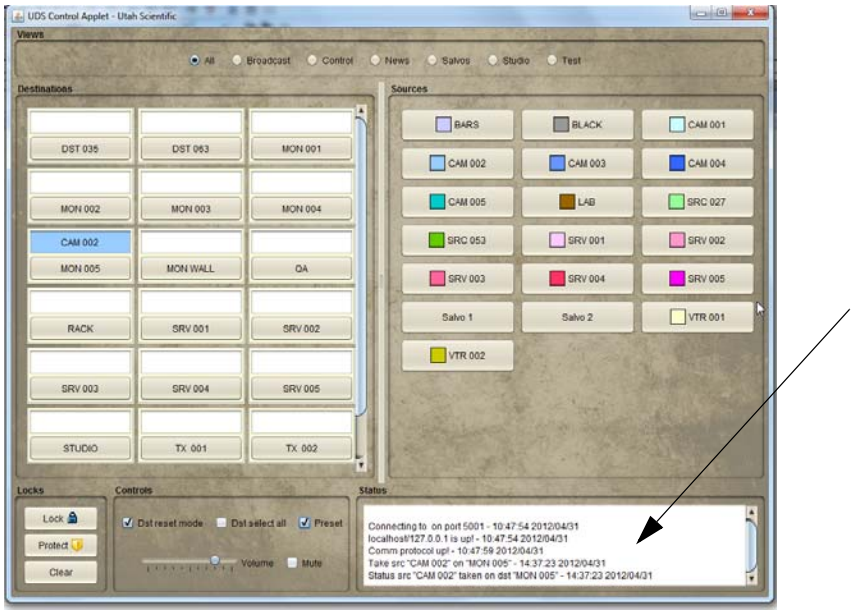


Figure 3-37.

Changing the Button Color Scheme

Changing the Source button color schemes is useful for designating status colors for different equipment sets. Right-click on a Source button to produce a color picker window.

Use the **Auto** button to [ask the system to] uniquely color all Source buttons. This is useful when original button colors are needed quickly. (A prompting dialog will appear before all buttons are colored.)

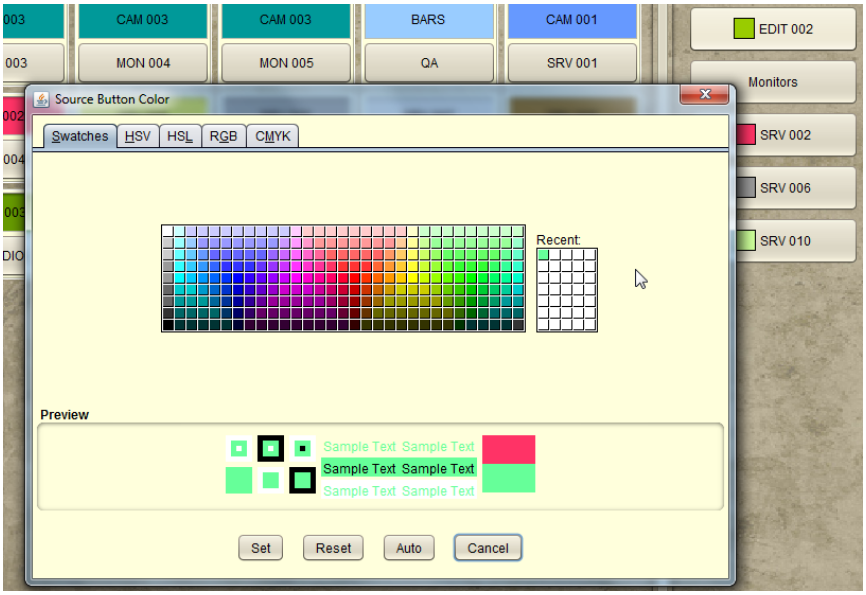


Figure 3-38.

Use the **Auto** button to [ask the system to] uniquely color all Source buttons. This is useful when original button colors are needed quickly. (A prompting dialog will appear before all buttons are colored.)

Destination Reset Mode (checkbox)

The Destination Reset Mode checkbox (Dst reset mode) will control the activity, or what happens immediately following the take. Specifically, when checked, the Destination button itself is no longer selected (or highlighted) after the Take is made. If not checked, the Destination button will remain selected after the Take is made. This features allows the user to continually make new selections and takes on the same button without having to reset the button each time.

> *When the box is checked, you will need to select (or highlight) the Destination on every instance prior to making a new Source indication. When the box is unchecked you can continually make new Source selections without having to re-highlight the Destination button (box) each time.*

Multiple Destination Selection

You can select (or highlight) multiple Destination buttons, then select a Source to simultaneously affect all selected destinations.

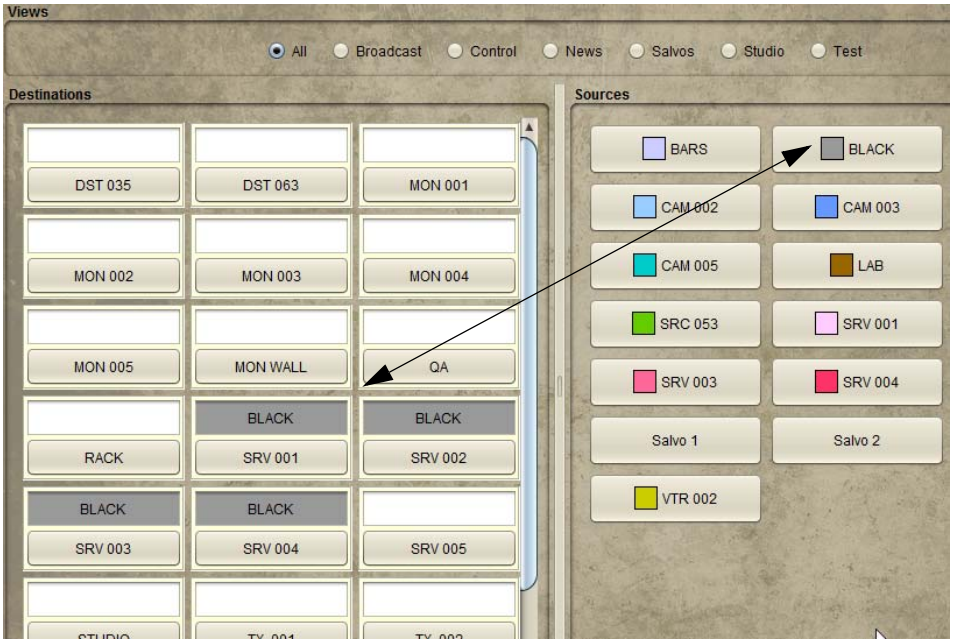


Figure 3-39.

Audio

Take status is indicated by the audio control at the bottom of the display. If the Mute box is unchecked, takes are heard and controlled with the corresponding audio slider bar.

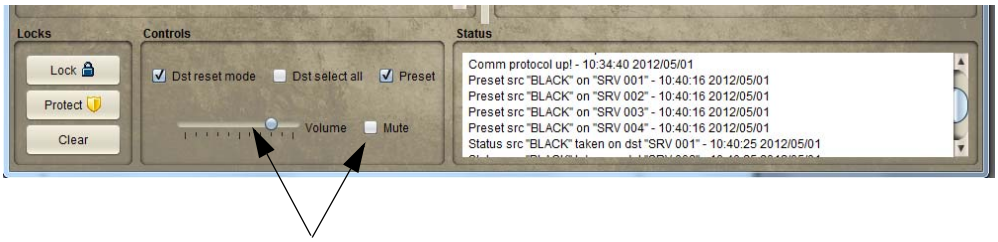


Figure 3-40.

Macro buttons

A series of Takes can be saved as a Macro while in the Preset mode. Macros work like Salvos, but are saved to the PC where they are configured and cannot be used system wide. To save a Macro, right click on the Macro switch and select **Save**.

The Macro buttons allow you to save the take action prior to the actual take being made. Macros can be customized by name, or edited as needed. Macros work on a local basis at each control station.

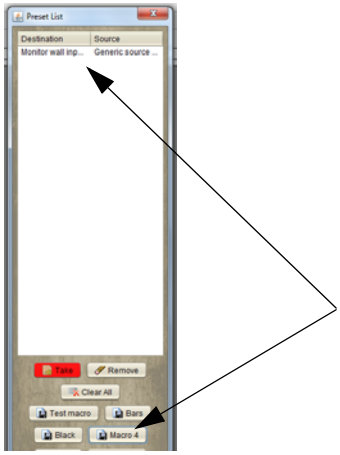


Figure 3-41.

Macros are saved in the listing, or renamed by clicking the selection at the bottom of the pop up window.

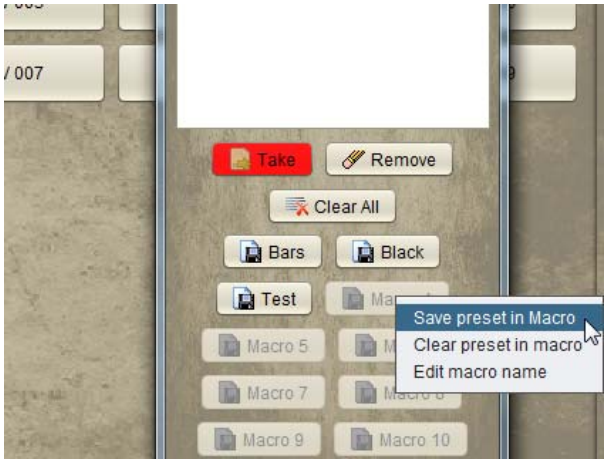


Figure 3-42.

Salvos

The Salvo buttons inside the Sources group area allow you to activate Takes on multiple Destinations. As an example, one Salvo button may control multiple Destinations with pre-configured Sources for each salvo destination.

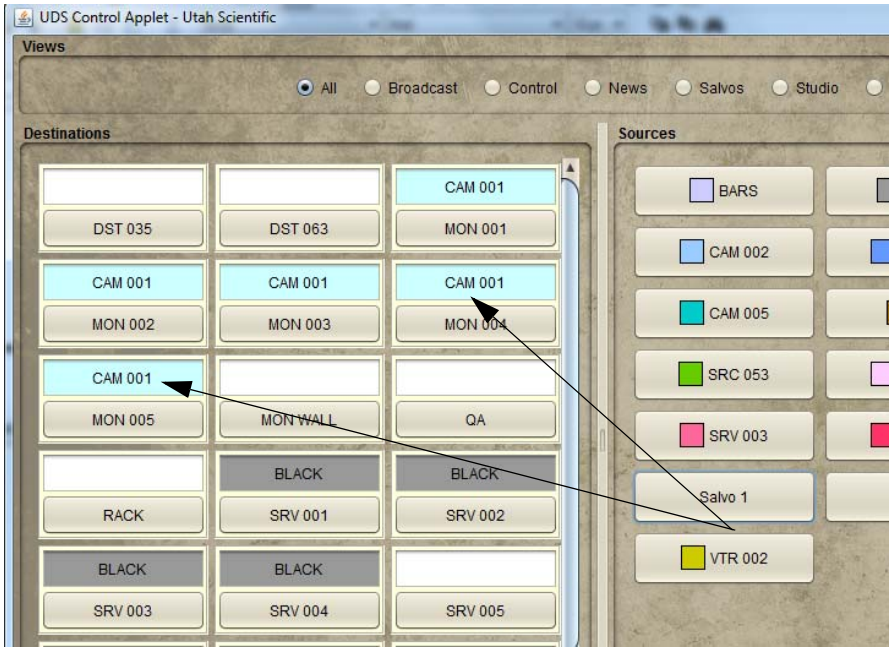


Figure 3-43.

Salvos are set up on a system-wide basis with the configuration window.

Preset List Window

The waiting takes will be listed within the display once a Destination and Source have been selected.

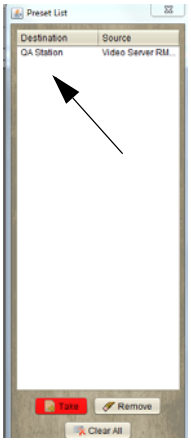


Figure 3-44.

Please continue on to the next section, Hardware Based Control Panel Configuration and Operation, for UDS panel setup and maintenance detail.

Section 4

The Control Applet

Introduction

As discussed in Section 3, the UTAH-100/UDS can be controlled and monitored using a virtual control via a built-in web interface, or external hardware control panel via Ethernet. This section describes the setup, configuration and operation of the optional external control panel.

The UTAH-100/UDS CP

The external hardware control panel and virtual control via Ethernet extends the functionality of the system to local and remote users as necessary.

Front View

Figure 4-1.

Rear View

Figure 4-2.

Setup

Use the following steps to install the Utah-100/UDS Systems into the rack frames:

1. Determine the vertical layout of your frames before you begin the installation.
2. Once your layout is determined, install the Utah-100/UDS chassis' in the 19" rack frame.
3. Connect the Ethernet cable for network communications.

Panel Configuration

Panel Configuration is activated by launching a web browser and entering the panel's IP address as the URL. The panel must be connected to the network in order to communicate properly.

Click the Config icon to activate the UDS Panel Config applet.

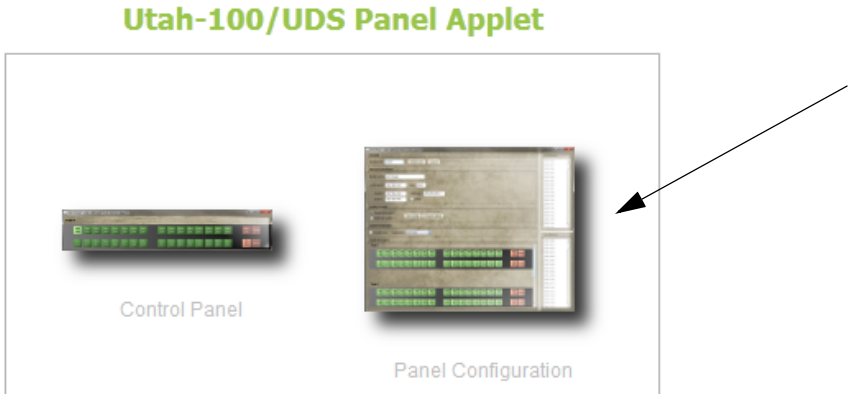


Figure 4-3.

Enter the default username and password (admin/admin).

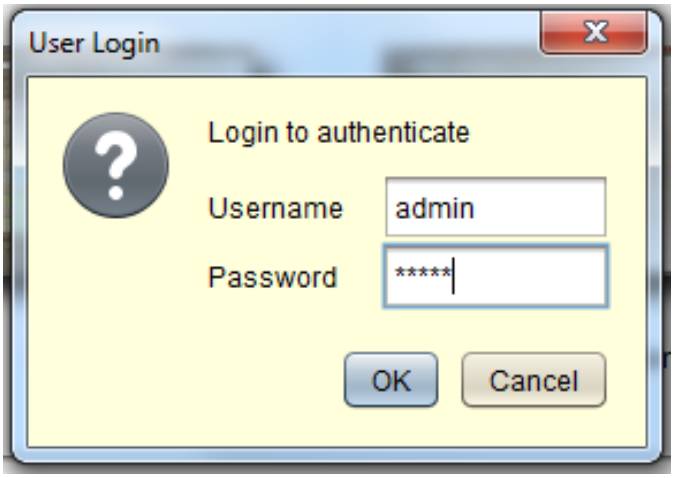


Figure 4-4.

The following window will appear (next).

Use the radio buttons in the Panel Configuration section to navigate through the configuration screens; *System*, *Network* and *Encoding*.

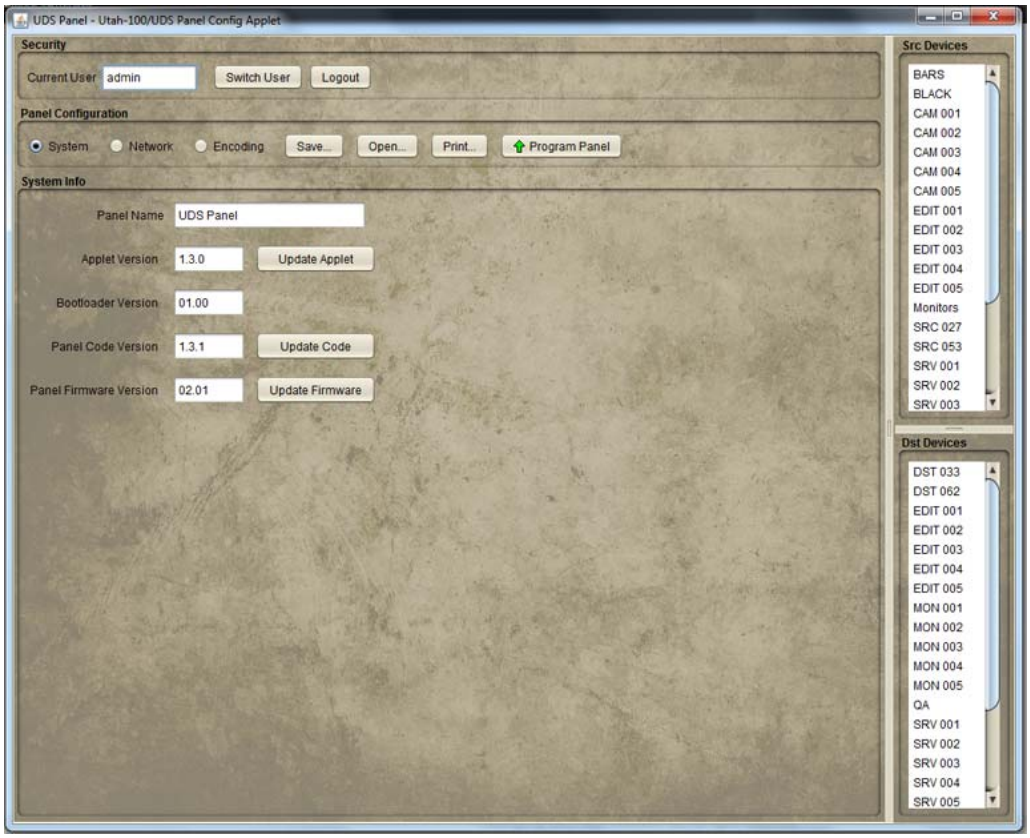


Figure 4-5.

Save - Saves the current panel configuration to a file on your computer.

Open accesses the directory containing previously saved panel configuration files.

Print allows you to produce a listing of all buttons and assignments when encoding is complete. Printing will produce the entire list along with a button label reference sheet that can be helpful for operators.

System

When selected, the **System** radio button displays the current panel configuration detail (System Info area).

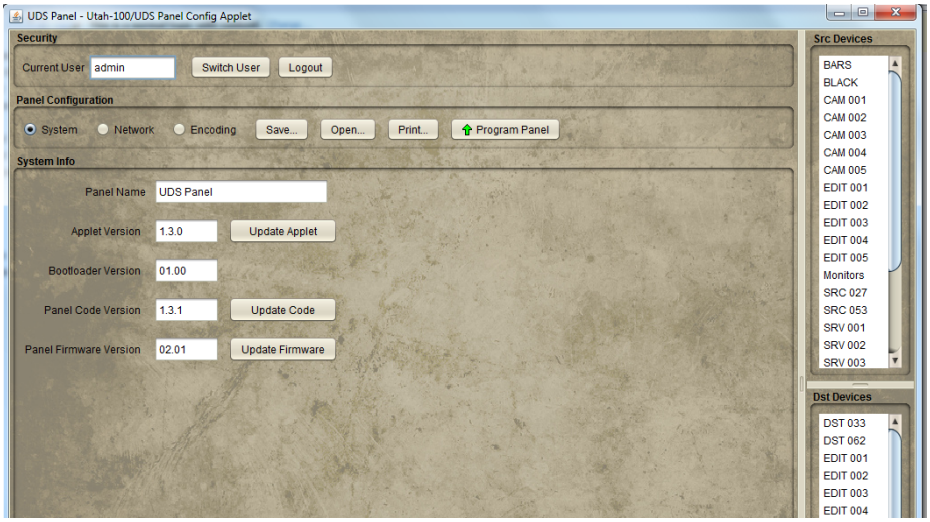


Figure 4-6.

You can edit the System Name, view the system version number, and update system components from the System Info screen.

Network

Network configuration is essentially the same as network setup during Router configuration, with the exception that the user must specify the router IP address.

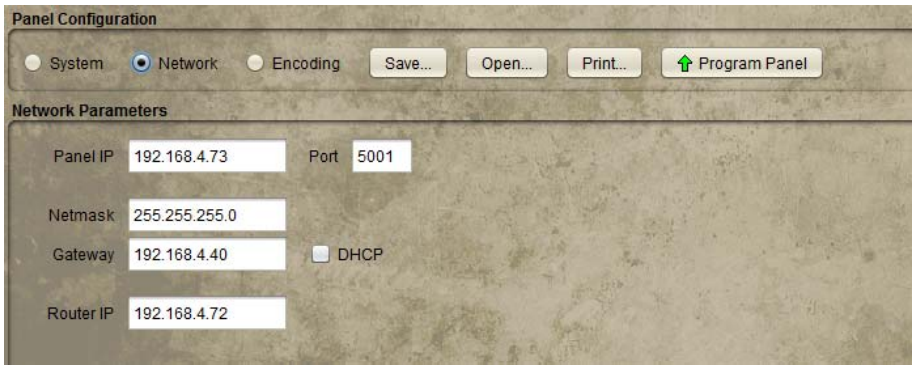


Figure 4-7.

Network Parameters

Panel ID and address configuration is entered at the top of the display. 5001 is the Port default.

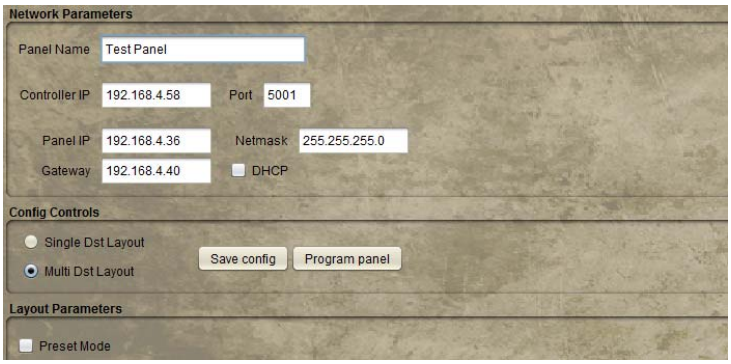


Figure 4-8.

When indicated, the DHCP checkbox will allow the program to complete its own designation.

Encoding

Once you have logged in and the window is open, the activated panel layout will mimic the setup actions of the external control panel itself.

Figure 4-9.

Panel Layout - Config Controls

The current panel's IP address is displayed, along with the controller to which the panel is connected.

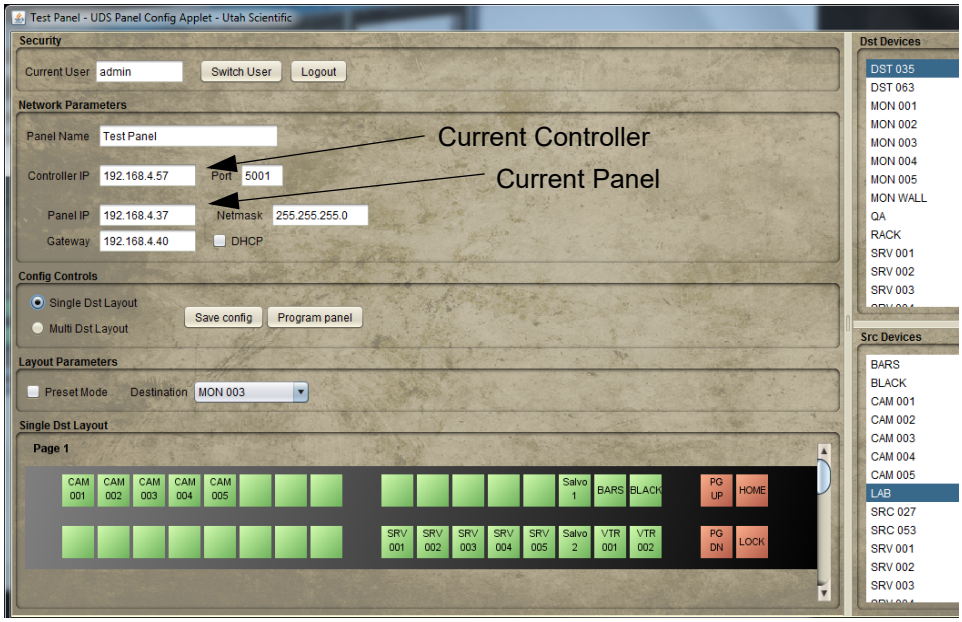


Figure 4-10.

This sets the destination applied to a single panel.

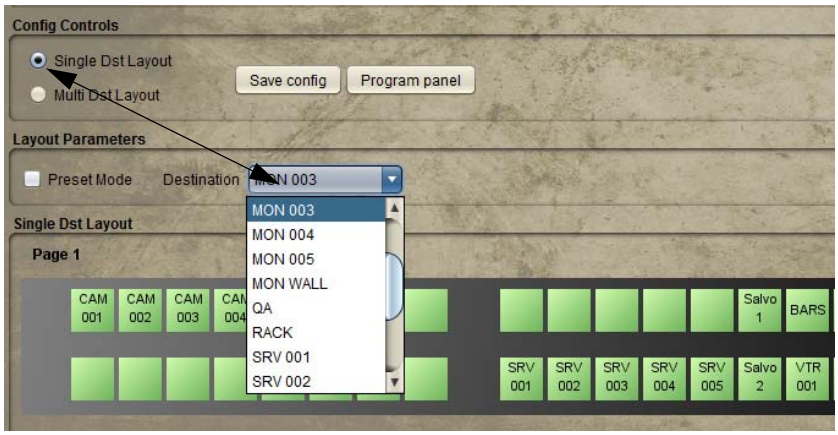


Figure 4-11.

Buttons are assigned by highlight device selections (1 or more), then dragging the list items to the individual buttons.

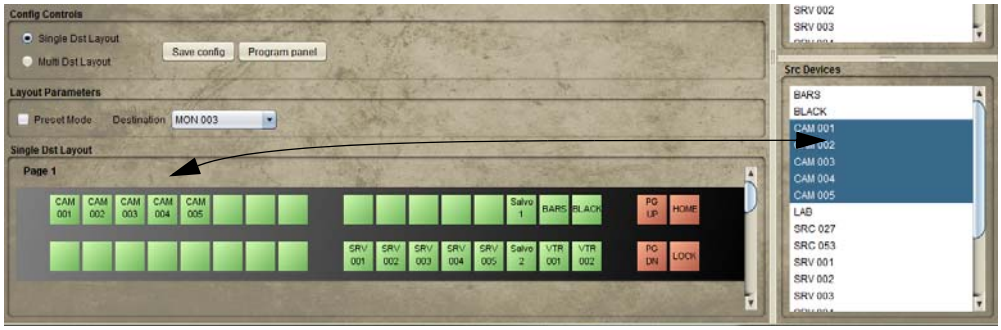
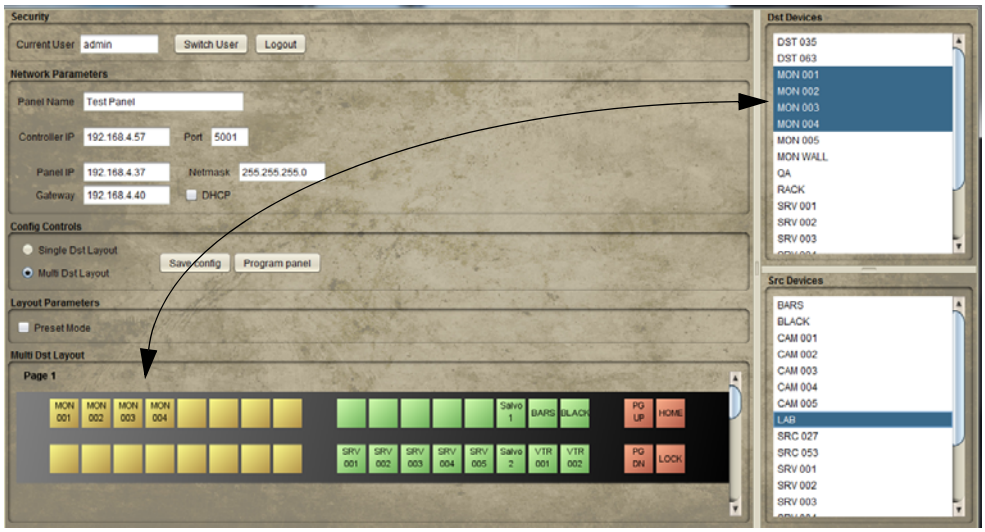


Figure 4-12.

A Multi Dst Layout with more than one destination assigned to the panel's destination buttons.



Layouts - Single and Multi-Dest

Single Destination

When indicated, 32 Sources are defined with one Destination selected for control. In this configuration you can drag Sources one at a time or double-click Sources from the list area (Dst and Src Devices list area).

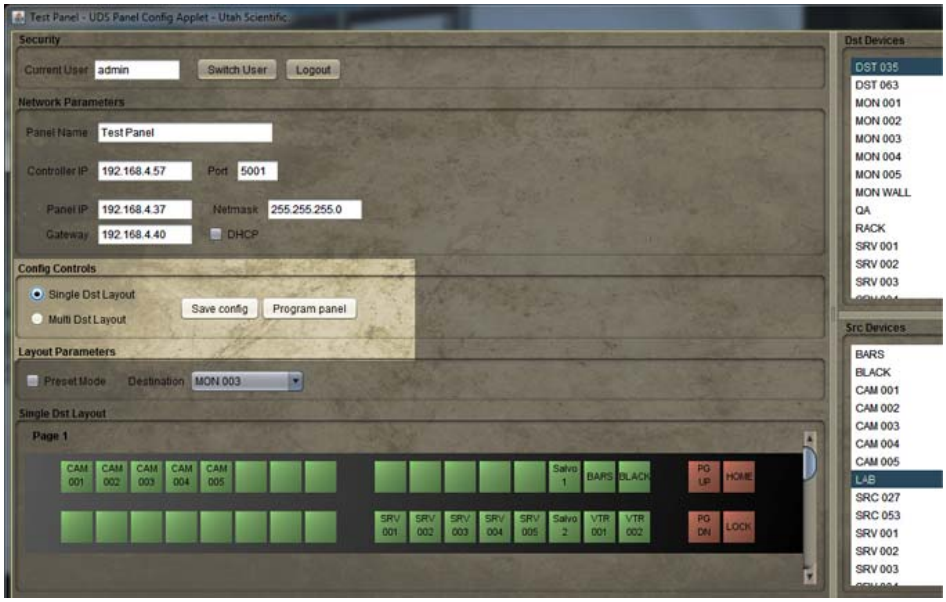


Figure 4-13.

The hardware panel will support up to three pages using these buttons, with the page and home buttons navigating through individual pages.

Multi-Dest layout

Multi-Dest mode allows the user to simultaneously control 16 Destinations and 16 Sources. As with Single Destination mode, the page navigation includes three pages for operation.

Figure 4-14.

In this mode you may drag destinations or sources to the panel buttons, with Destinations on the yellow buttons and Sources on the green buttons. The program will alert when a ‘Wrong Device Type’ is attempted. Right-clicking will clear the button display

Changes are committed once ‘Save Config’ is clicked, and actual hardware programming occurs when ‘Program Panel’ is clicked.

XY-32 Configuration

Click the corresponding radio button to activate the XY-32 Layout.

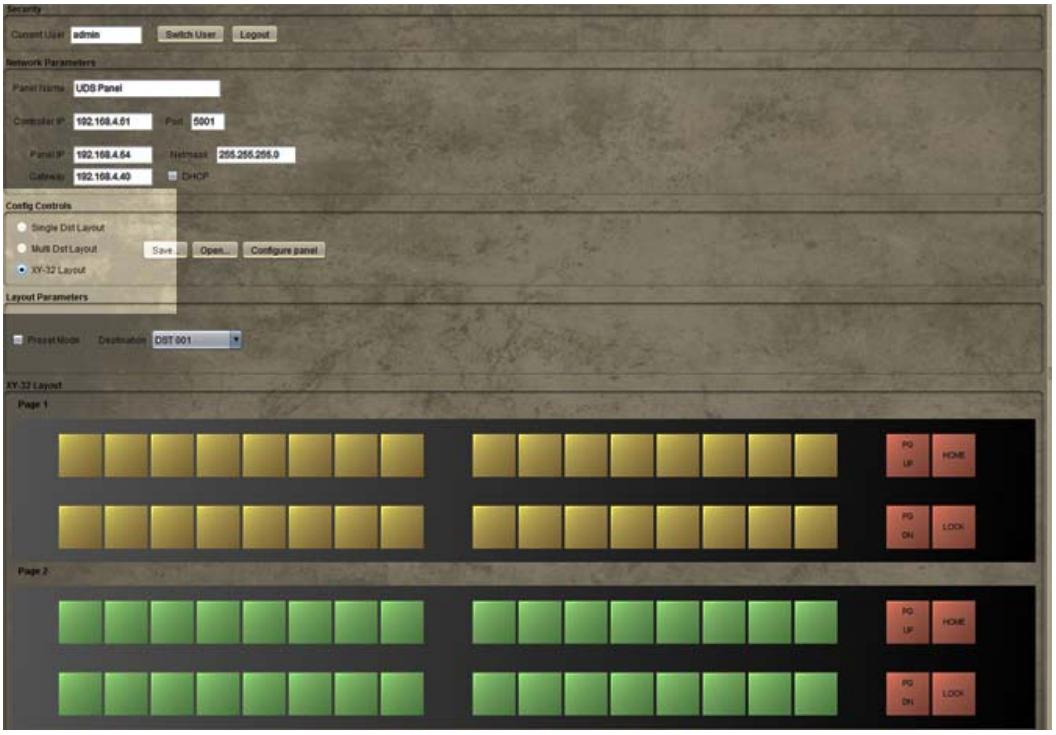


Figure 4-15.

This layout contains two pages; one page for 32 Destinations and one for 32 Sources.

Dragging Destinations from the listing (lower right) will apply to one button block only. In this way, list selections will never overflow into the next button block.

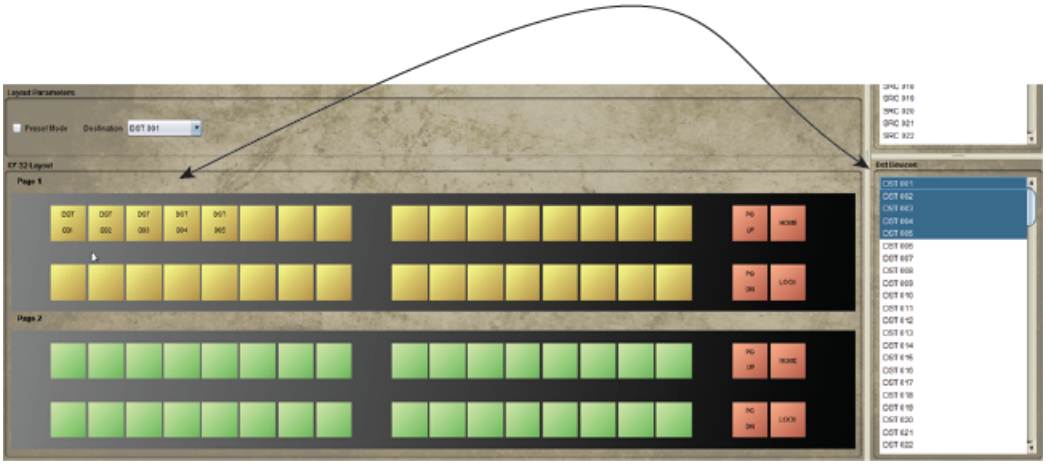


Figure 4-16.

Click the Page Up and Page Down buttons to view the configured panel pages.

Figure 4-17.

Click the **Configure Panel** button when button population for both Destination and Source buttons are complete.

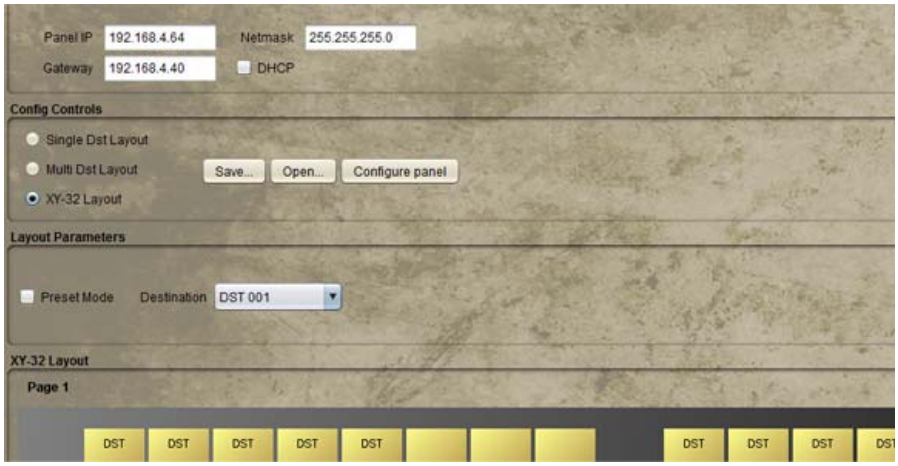


Figure 4-18.

Print Option

The Panel Configuration contains a Print option that allows you to produce a listing of all buttons and assignments when encoding is complete. Clicking the **Print** button in the listing dialog will allow you to print the actual listing along with a button label reference sheet that can be helpful for operators.

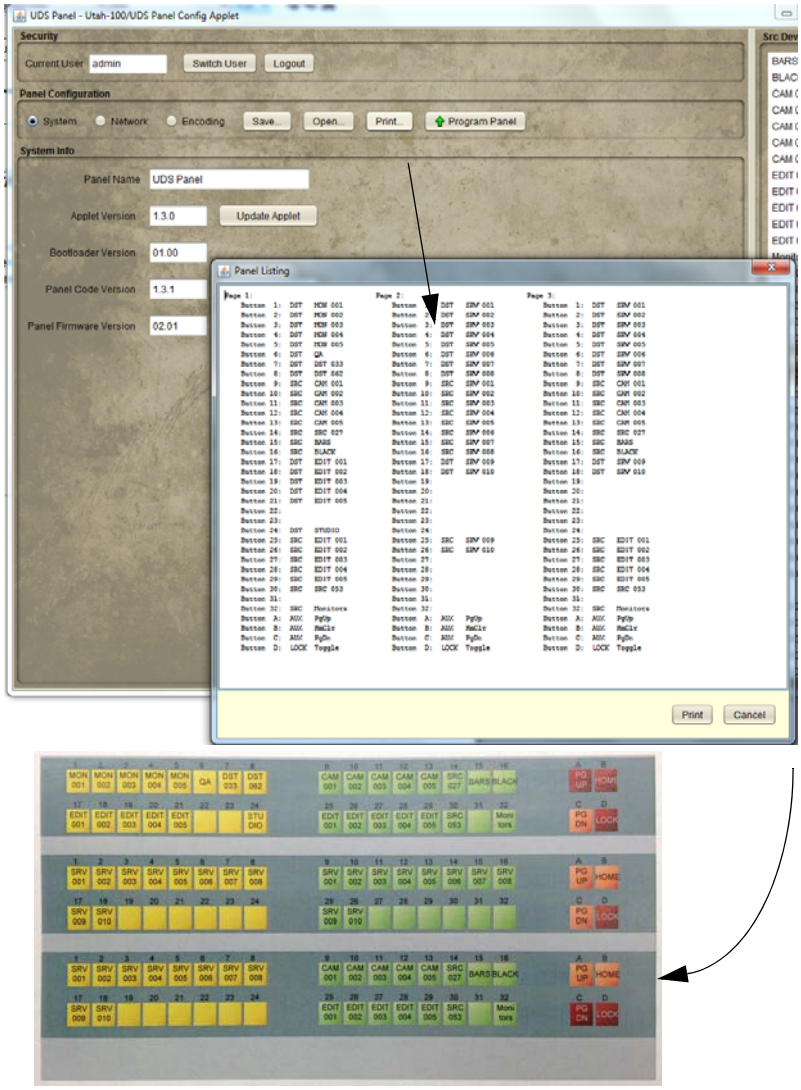


Figure 4-19.

Control Panel

Click the Control Panel icon to activate the UDS Panel applet.

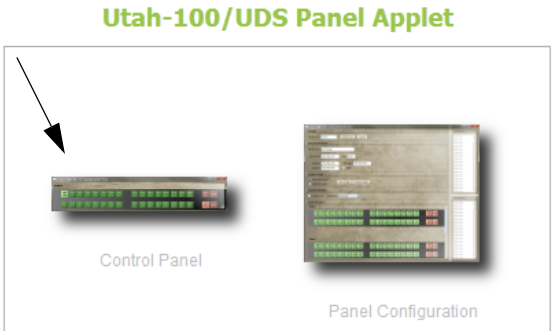


Figure 4-20.

Once you have logged in and the window is open, the activated panel layout will mimic the setup actions of the external control panel itself.

Figure 4-21.

The panel is presented and operational at this time.

Section 5

Specifications and Alarms

Frame Specifications

Width

19” Rack Mount

Depth

3.4”

Sizes

1RU -- Capacity: 32 inputs, 32 outputs

Power Consumption: <30W

2RU -- Capacity: 64 inputs, 64 outputs

Power Consumption: <50W

4RU -- Capacity: 144 inputs, 144 outputs

Power Consumption: <100W

Power Supply

External

Redundant supply optional

Control Connections: RJ-45 Ethernet

RJ-45 Serial

Vertical Interval Reference

Noise

Series UDS	dbA
UT-100 / UDS-32	45
UT-100 / UDS 64	50
UT-100 / UDS 144	52

I/O Module Specifications

Multi-Rate Digital Input Card

Number of ports per card: 16

Formats supported: From 18Mbps up to 3Gbps

Connector Type: HD-BNC

Multi-Rate Digital Output Card

Number of ports per card: 16

Formats supported: From 18Mbps up to 3Gbps

Reclocking: All SDI rates up to 3Gbps

Connector Type: HD-BNC

Conforms to SMPTE 259C, 292, and 424

FLEX-I/O Option

Number of ports per card: 16 (8 SFP cages)

Dual-Channel SFPs support the following:

SDI up to 3Gbps on coax

SDI up to 3Gbps on fiber

PAL / NTSC Analog composite video

DVI/HDMI (single-port SFP)

IP-encapsulated DVB-ASI signals

Alarm Conditions

The UDS will enter a *temperature alarm* condition when the internal temperature exceeds the allowable limit. A temperature alarm is most likely caused by fan failures.

The Blue LED on the front left of the unit will turn Red when the UDS enters a temperature alarm condition. The alarm will clear when the temperature drops below the limit. The left LED will remain Blue when the UDS is not in temperature alarm.

The UDS will enter a *power supply* alarm condition when a redundant power supply fails. The alarm will clear on a system reset, or when the redundant supply returns to normal operation.

The Blue LED on the front right of the unit will turn Red when the UDS has entered a power supply alarm. The right LED will remain Blue when the UDS is not in a power supply alarm condition.

Addendum A

RCP1 Protocol for UDS

This addendum contains additional detail associated with serial interfacing; describing the basic commands supported for serial-to-router communications.

Matrix Refresh Report Enable

ASCII CODE HEX

Command Code: ESC @ 1B, 40

Response: None

The ESC @ sequence causes the System Controller to routinely report crosspoint information to the external computer.

Refresh data is provided on an unsolicited basis with the data format as follows:

STX OOOO <Matrix Input> <Matrix Output> <Checksum> CR

Related Commands:

MATRIX REFRESH REPORT DISABLE

Matrix Refresh Report Disable

ASCII CODE HEX

Command Code: ESC A 1B, 41

Response: None

Matrix Refresh reporting is described in the previous section. To disable the function, the Matrix Refresh Report **Disable Command** is provided.

Issuing the command string ESC A will disable Matrix Refresh Reporting.

Related Commands:

MATRIX REFRESH REPORT ENABLE

Matrix Change Report Enable

ASCII CODE HEX

Command Code: ESC B 1B, 42

Response: None

The **Matrix Change Report Function** causes the controller to issue a **status update** whenever a change occurs in the Matrix Status. A change in status occurs when a Take is made resulting in a change to the status of the matrix. If a Take is made to a destination requesting the same sources that is already selected, then this will not cause a change in status, and consequently this will not be reported.

The ESC B Sequence causes the System Controller to **enable** the Matrix Change Reporting Function. Until the function is disabled, the controller will report changes in status without further request.

The change report data format is as follows:

FS OOOO <Matrix Input> <Matrix Output> <Checksum> CR

Related Commands:

MATRIX CHANGE REPORT DISABLE

Matrix Change Report Disable

ASCII CODE HEX

Command Code: ESC C 1B, 43

Response: None

Matrix Change Reporting is described in detail in the previous section.

The ESC C Command sequence disables the Matrix Change Reporting Function.

Related commands:

MATRIX CHANGE REPORT ENABLE

Matrix Take Report Enable

ASCII CODE HEX

Command Code: ESC D 1B, 44

Response: None

The **Matrix Take Report Function** causes the controller to issue a **status update**, whenever a Take occurs, regardless of whether the Take changes the state of the matrix. Only takes from the connection are reported.

The ESC D sequence causes the system controller to report any change in router matrix status (Take Reporting) to the ECD.

The Matrix Take Report format is as follows:

SOH OOOO <Matrix Input> <Matrix Output> <Checksum> CR

Related Commands:

MATRIX TAKE REPORT DISABLE

Matrix Take Report Disable

ASCII CODE HEX

Command Code: ESC E 1B, 45

Response: None

The Matrix Take Report is described in detail in the previous section. The ESC E command sequence disables the Take reporting function.

Related commands:

MATRIX TAKE REPORT ENABLE

Matrix Section Refresh

ASCII CODE HEX

Command Code: ESC L 1B, 4C

Response: None

The **ESC L sss eee** sequence causes the System Controller to report cross-point information to the external computer for the outputs between sss and eee (inclusive).

The controller will respond with a report consisting of a sequence of status messages ordered by output number, with each message formatted as follows:

STX OOOO <Matrix Input> <Matrix Output> <Checksum> CR

The report is terminated by the system controller with the ASCII Code US (Hex 1F).

To obtain Status of a Single Matrix Output, the command string should be terminated with a CR immediately following the starting matrix output number:

ESC L <Start Output> CR

The controller will respond with a single status message formatted as follows:

STX OOOO <Matrix Input> <Matrix Output> <Checksum> CR

Matrix Take Command

ASCII CODE HEX

Command Code: SOH 01

Response: None

Making a take.

Switcher cross points are changed by using the Matrix Take Command. The Input Number and Output Number identify each cross point. (This protocol supports levels, UDS does not support levels, any level set per the level mapping as will make a take.). The command message is structured as follows:

SOH <@@ | OO> <@@ | OO> <Matrix Input> <Matrix Output> |<Checksum>| or |CR|

To generate a Matrix Take Command, issue the command SOH followed by the code for enabled levels “OOOO” (note that this is the letter upper case O) input and output selection and terminated by either the optional checksum or carriage return (C/R). The following example, uses the Matrix Take Command to select input 45 to output 123.

Symbol SOH O O 0 4 5 1 2 3 C/R

HEX 01 4F 4F 30,34,35 31,32,33 0D

NOTE: This protocol allows control of routers with levels, for the UDS does not support levels, if any level is set, then the router will switch, use OO to make a take. Setting the level to none (use @@), will simply request status of the cross-point.

Related commands:

MATRIX STATUS REQUEST

CALCULATE <Checksum>

A single-byte checksum in the range 20 hex through 7F hex calculated as follows:

Start with the hexadecimal value of the first byte (control code). To that value, Exclusive OR the second byte, Exclusive OR the third byte, etc. until all bytes have been Exclusive OR'ed. Finally, OR a hexadecimal 20 to the final Exclusive Or'ed value of all the bytes. By OR'ing in the 20 you ensure that the checksum is greater than or equal to a hexadecimal 20. This must be done to ensure an ASCII Control Code is NOT generated as the checksum.

MISC items

The UDS does not allow 7 bit data and no parity.

Unknown sources are reported as 31F

- SC4 vs UDS:
- SC4 is 0 relative on sources and destinations, UDS is 1 relative.
- SC4 switches indexes, UDS switches ports.

SC4 has levels. UDS does not use levels. The RCP1 protocol includes levels. The UDS will accept any level from he protocol and switch on it. Status is always reported with all levels set.

Addendum B

System Update

Introduction

This addendum contains instruction for updating the device code and applets on Utah Scientific UDS devices using a PC running Windows™. There are three major steps involved in updating each device:

- First you must run the installer in order to place the files in the default location on the PC.
- Next, perform the update using the applet's device configuration windows.
- Finally, you must reset the device and allow the update to be burned into the device flash.

The device configuration and status will not be changed by the update. But as a precaution, you should save the configuration of the device to a file before proceeding with the update.

The router device code will be updated to version 1.2.1 and the router applet will be updated to version 1.3.0. The panel device code will be update to version 1.3.1 and the panel applet will be update to version 1.3.0.

System Setup Requirements

- The router must contain version 1.2.0 software and version 1.2.1 applet.
- The panel must contain version 1.3.0 software and version 1.2.1 applet.
- A Windows PC connected to the devices via Ethernet.
- A web browser to access the device applets.
- The installer file for the device you want to update:
    - usiUdsRouter-v1.2.5.exe for the router
    - usiUdsPanel-v1.3.2.exe for the panel

    These files can be dlwnloade from ftp://dcust:cust2pwd@ftp.utahscientific.com

Settings File Update

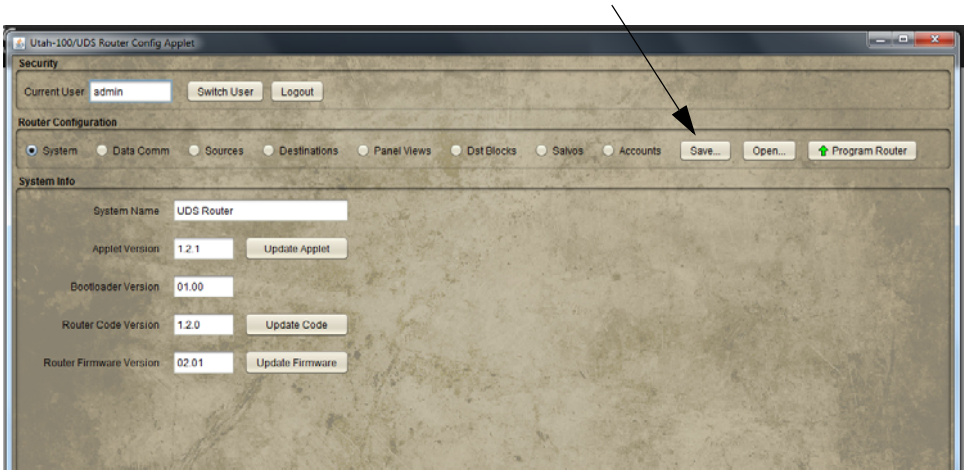
Warning - Read Before Proceeding

This update supports unique settings for each router connection. Settings consist of source status colors, and macros. As a result, existing settings will be lost following the update. You can simply reconfigure the settings as you prefer, or to restore the original settings, follow the steps below after completing the update.

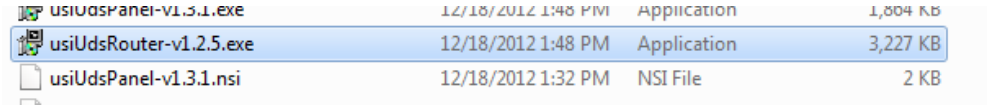
If you would like to use your router settings (source status colors and macros) saved prior to the upgrade, you will need to copy the settings file to the correct router subfolder. The previous settings file can be found in your home directory under usi/uds/uds.settings. Copy it to the subfolder that corresponds to your router's IP address. For example, if your router's IP address were 192.168.4.180 and your home directory were C:\Users\usiuser, then you would copy the uds.settings file from C:\Users\usiuser\usi\uds to C:\Users\usiuser\usi\uds\192.168.4.180.

Updating the Router Config Applet

1. As a precaution before continuing, open Router applet's Configuration window (below) and save the configuration of the device to a file on the PC. By doing so you can easily restore the device configuration *if necessary.*[1] (Please see Appendix C - Troubleshooting - for assistance with Configuration restoration.)



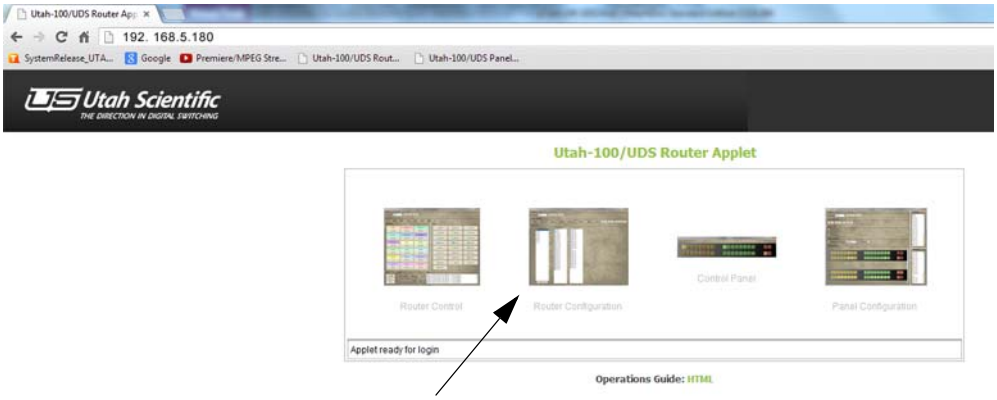
2. Run the appropriate installer on the PC.



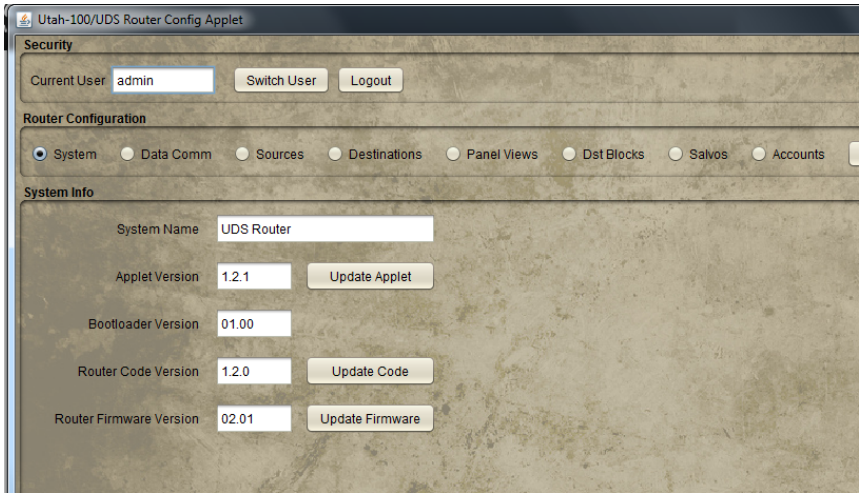
Leave the default installation path. Take note of the path of the .uus file in the instructions as you close the installer. You will use this file in step 6 (below).

1. Early hardware version may require configuration restoration following a system reset.

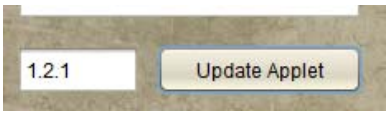
3. Using the web browser on the PC, access the device applet and open the configuration window.



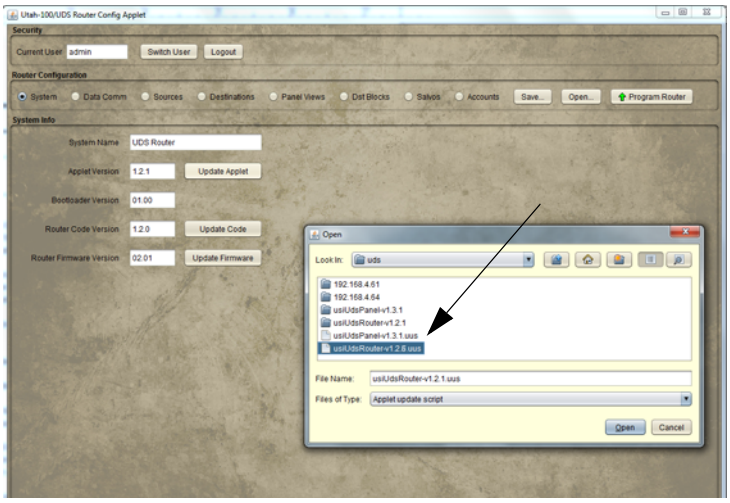
4. Select the ‘System’ screen in the config window.



5. Click the ‘Update Applet’ button.



6. Select the appropriate .uus file installed in step 2 (usiUdsRouter-v1.2.1.uus).

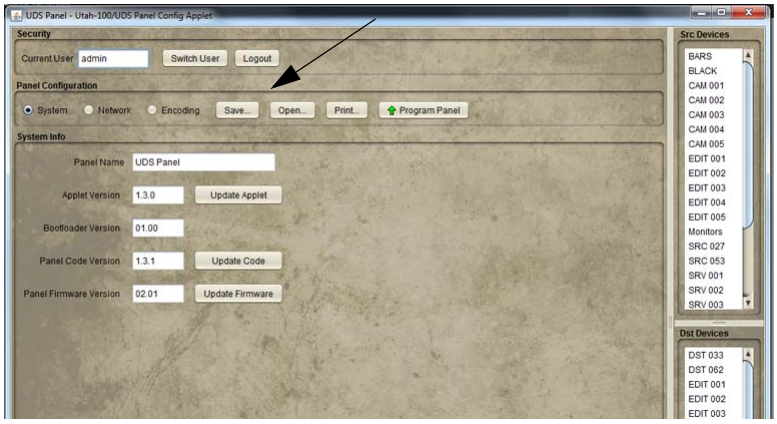


7. Several files will be transferred to the device. When the file transfer is complete, close any open web browser windows and reset the device by pressing the chassis reset button. The device will take a bit longer to reboot as the update is burned into the device flash.

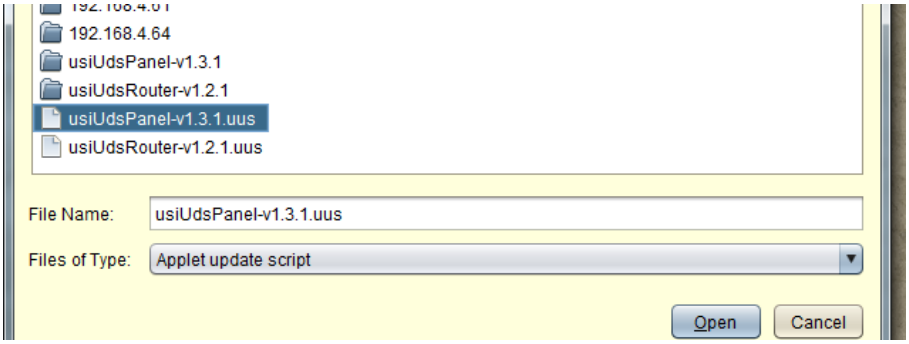
8. The update is complete once the device has finished rebooting. The system will now operate with the new device software and a new version of the device applet.

Updating the Panel Config Applet

1. As a precaution before continuing, open the Panel applet's Configuration window (below) and save the configuration of the device to a file on the PC. By doing so you can easily restore the device configuration if the file is somehow lost.[1] Please see Appendix C - Troubleshooting - for assistance with Configuration restoration.)



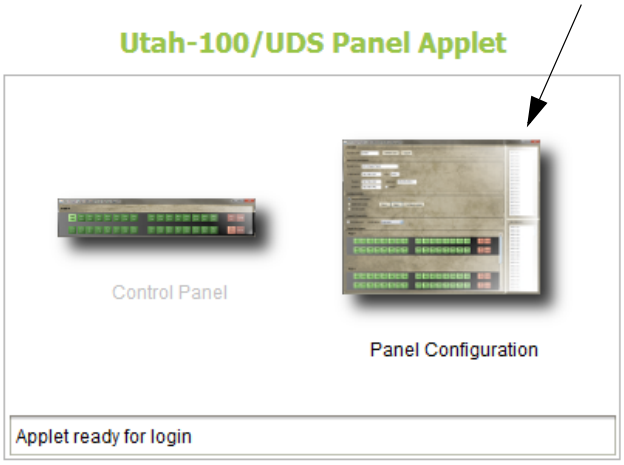
2. Run the appropriate installer on the PC.



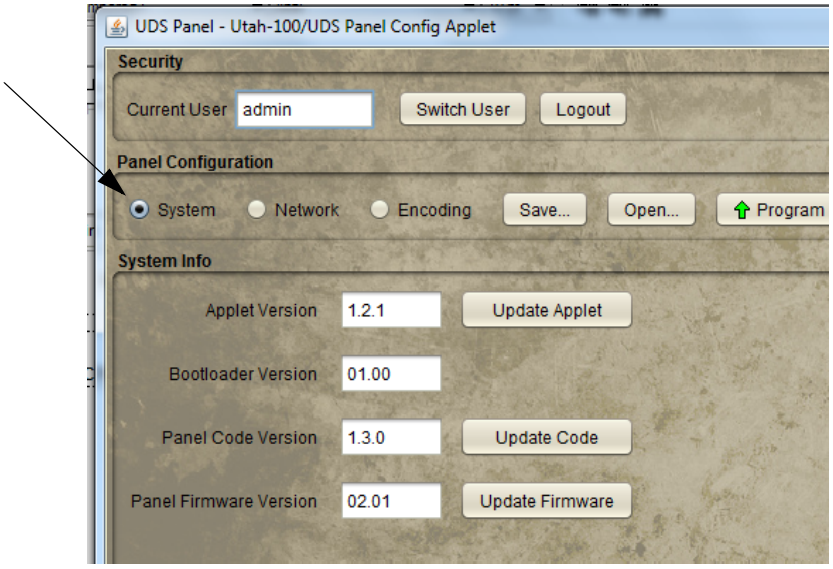
Leave the default installation path. Take note of the path of the .uus file in the instructions as you close the installer. You will use this file in step 6 (below).

1. Early hardware version may require configuration restoration following a system reset.

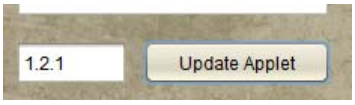
3. Re-launch the PC's web browser, access the device applet, then open the configuration window.



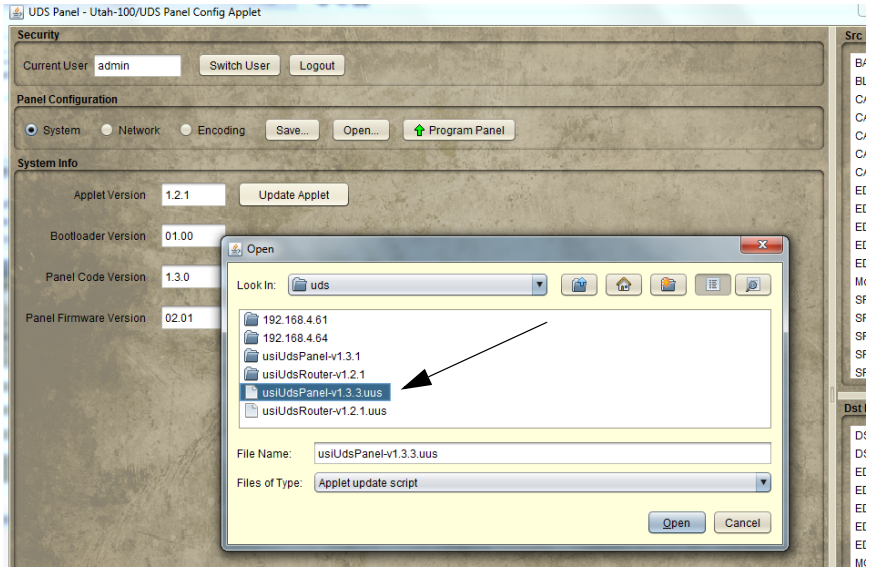
4. Select the 'System' screen in the config window.



5. Click the ‘Update Applet’ button.



6. Select the appropriate .uus file installed in step 2 (usiUdsPanel-v1.3.1.uus).



7. Several files will be transferred to the device. When the file transfer is complete, close any open web browser windows and reset the device by pressing the chassis reset button. The device will take a bit longer to reboot as the update is burned into the device flash.

8. The update is complete once the device has finished rebooting. The system will now operate with the new device software and a new version of the device applet.

Addendum C

UDS GPIO Box - Setup and Operation

The GPIO control box is designed to provide an Ethernet or Serial-based interface point for triggering opto-isolated inputs and controlling relay closures. The box provides 16 GPIs and 16 GPOs located on the front of the unit.

UCP GPIO is programmable through the UCON software by designating specified sources and destinations. During an input the box receives a voltage on one of the GPIs and performs a ‘take’ on one of the GPIs that correspond to that particular source or destination combination. The GPO will close the ‘take’ at the conclusion of the command sequence.

GPIO operation is a means for customizing a setup for external device control, as during the implementation of an emergency alert system. In this case a given voltage is directed toward the external device, which in turn triggers the input, or GPI. This triggering mechanism activates a switch, which then activates the on-screen message. At the conclusion of the message the program sends another voltage, which alternatively, sends another voltage trigger to the output, prompting the system to close the display routine.

The inputs and outputs are labeled on the front of the unit; 16 outputs placed on the left side of the box and 16 inputs placed on the right side of the box. The ethernet and serial connections are located at the rear of the box, with the serial connection doubling as a debug port as well.

The active light indicates the presence of GPIO activity.

Note: *The GPI’s contained within the UDS are designed as a simple closure to trigger the GPIO’s. Put simply, an input is triggered when two pins are shorted together on the actual GPI input. In this way, GPI’s can be directly wired to relay GPO’s from other devices. The bottom pin of the GPI is an internal ground, while the top pin is used to trigger the GPI when grounded (externally, or to the bottom pin.)*

Box Layout

The UDS-GPIO connection box is designed to provide an Ethernet based interface point for triggering opto-isolated inputs and controlling relay closure outputs. The box provides sixteen GPIs and sixteen GPOs located at the rear of the unit.

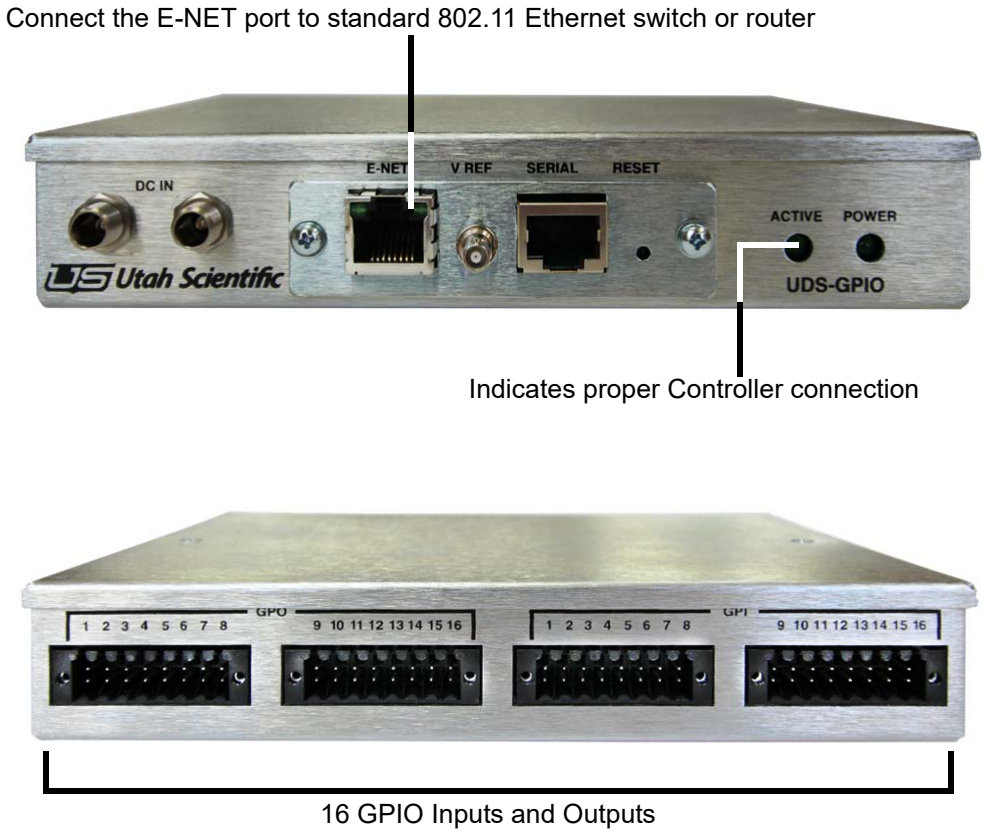


Figure C-1.

The UDS-GPIO is programmable from the Control Applet for mapping the individual contacts to specific source/destination combinations.

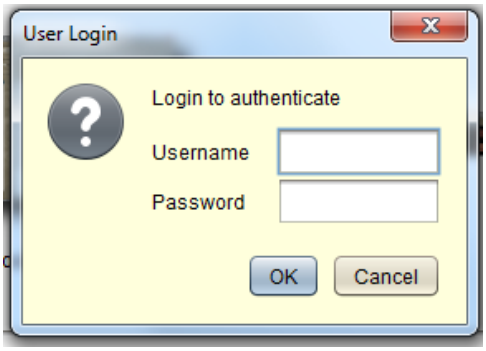
Note: *The default IP address is 192.168.5.181*

Double-click the GPIO applet icon (below).

Figure C-2.

Note: *You will only be able to connect if the browser window indicates "Applet ready for login."*

Enter Username "admin" (default) - *in the username entry box*



Enter Password "admin" (default) - *in the password entry box*

Use the radio buttons in the Panel Configuration section to navigate through the configuration screens; *System*, *Network* and *Encoding*.

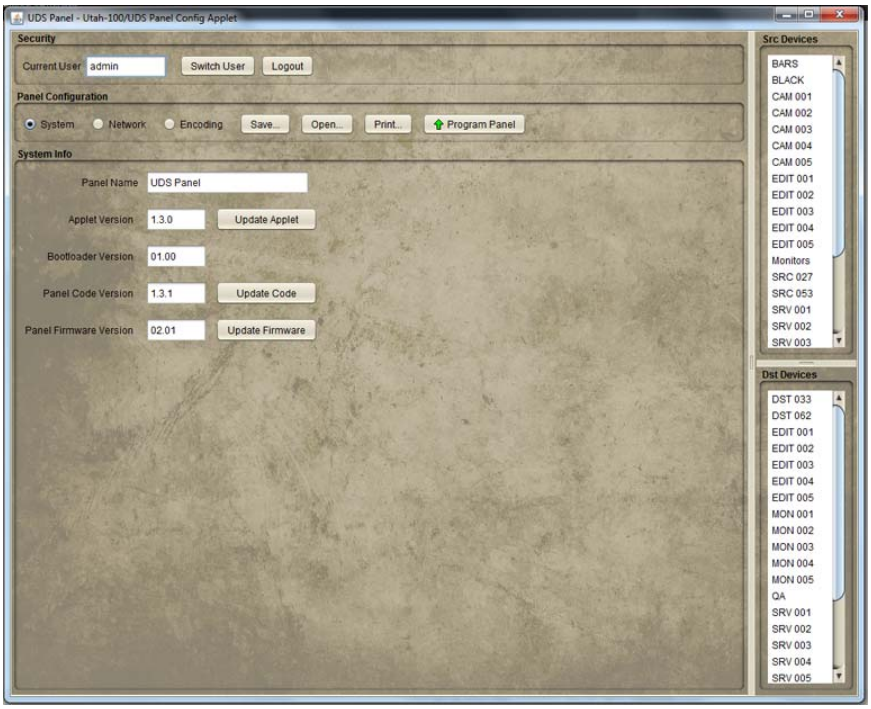


Figure C-3.

System

When selected, the **System** radio button displays the current panel configuration detail (System Info area).

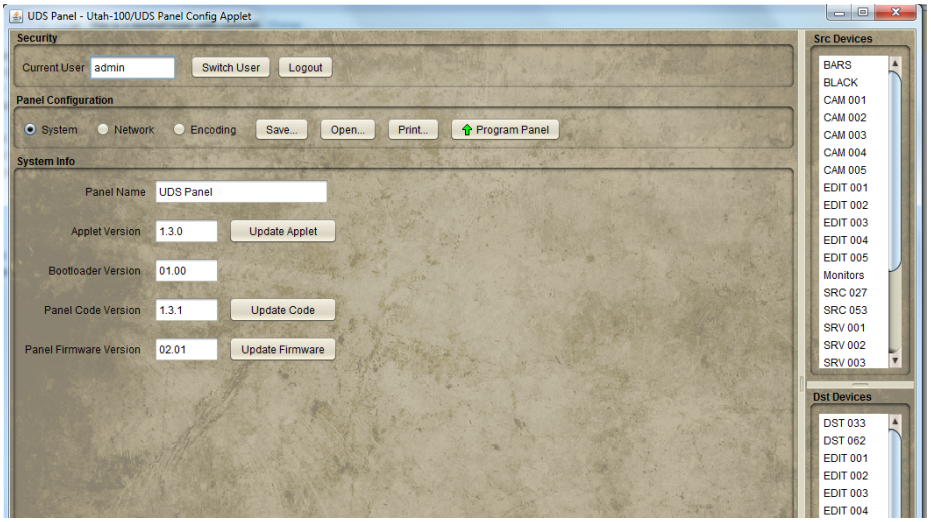


Figure C-4.

You can edit the System Name, view the system version number, and update system components from the System Info screen.

Network

Network configuration is essentially the same as network setup during Router configuration, with the exception that the user must specify the router IP address.

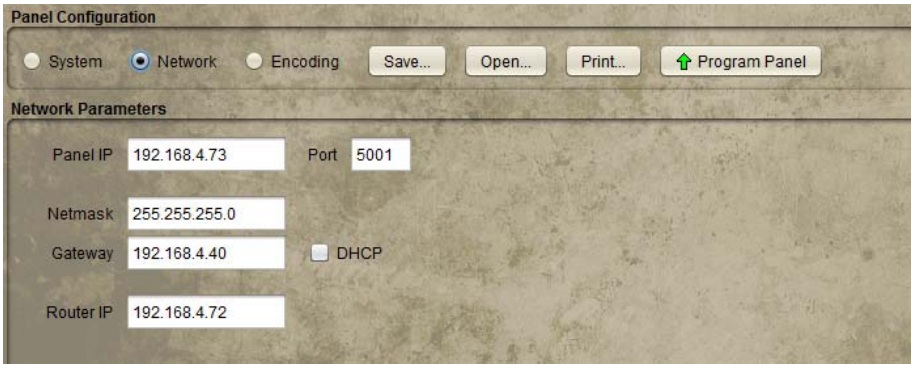


Figure C-5.

Panel ID and address configuration is entered at the top of the display. 5001 is the Port default.

When indicated, the DHCP checkbox will allow the network to provide an IP address to the GPIO panel.

Once the above steps are complete, the GPIO can be placed on the target network and configured as needed.

Encoding

Input Designation

Sources and Destinations to be controlled are dragged from their scrolling columns at the right side of the dialog window to their corresponding columns in the input area.

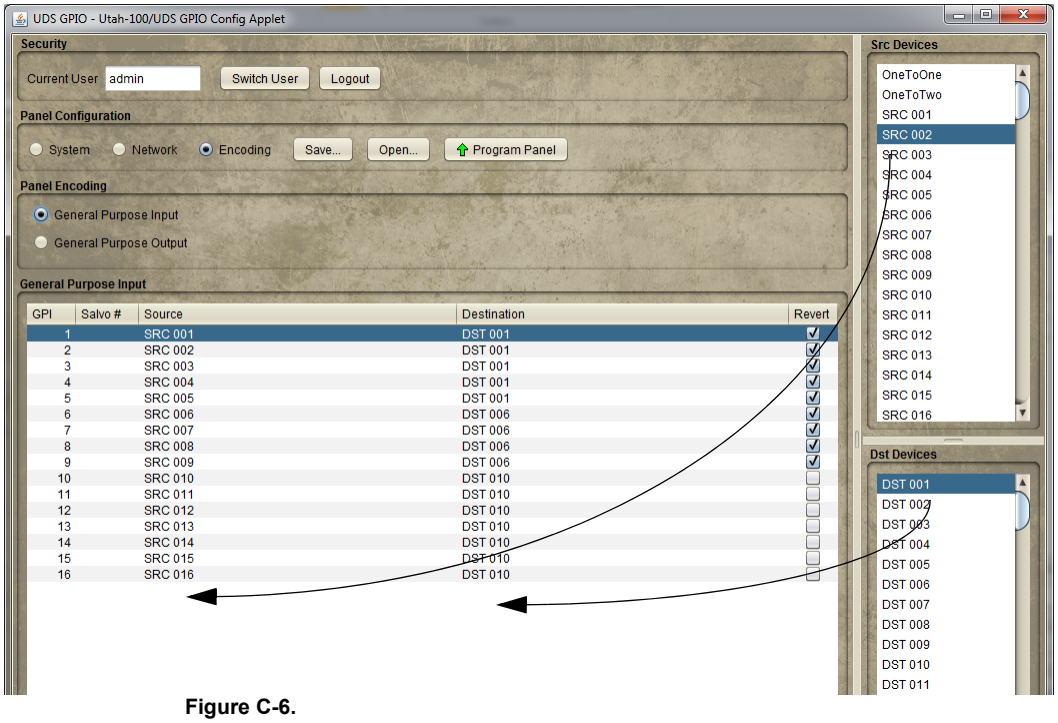


Figure C-6.

Revert

Revert functions in this way - a Take is made while the mouse button is being held down. A release of the mouse button activates a trigger allowing the take to return to its previous status.

Output Designation

Sources and Destinations to be controlled are dragged from their scrolling columns at right side of the dialog window to their corresponding columns in the output area.

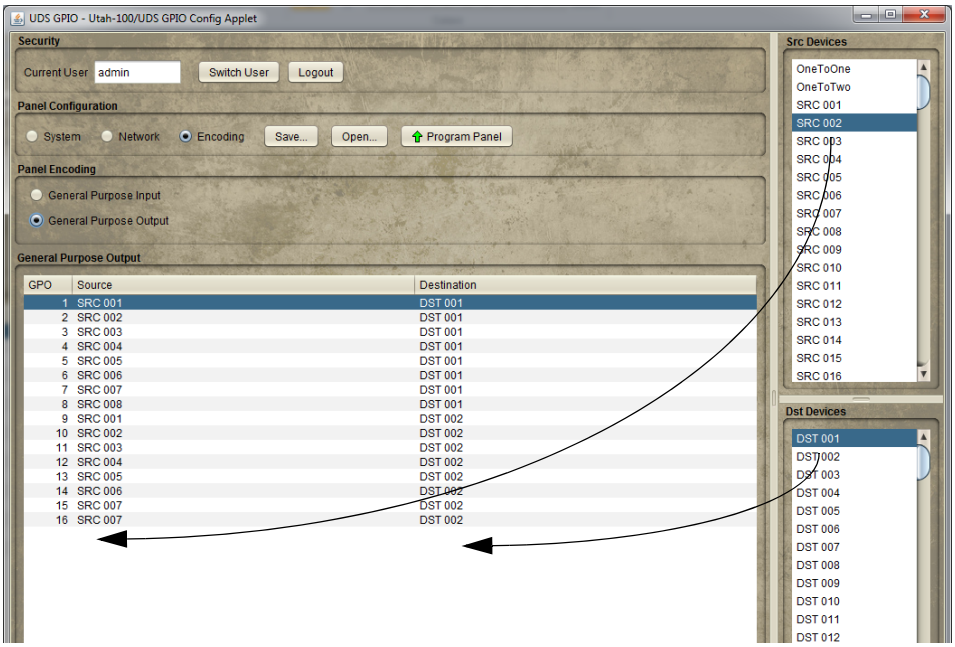


Figure C-7.

Save and Program

The Save button function saves the configuration to a uniquely named file in a specified directory. This is useful if multiple versions of the panel configuration are needed.

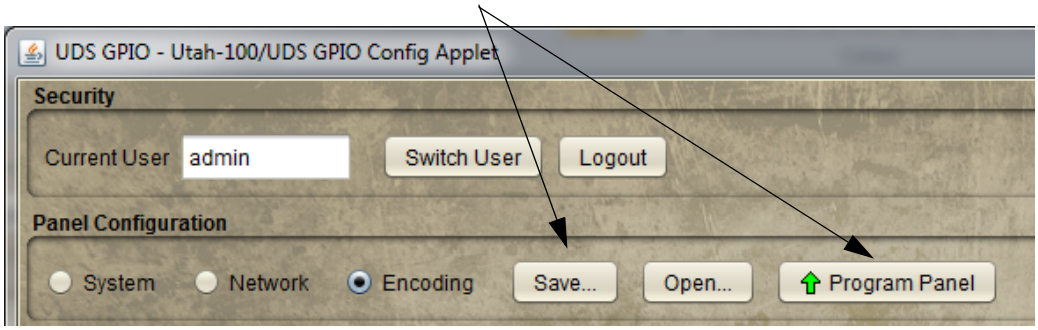


Figure C-8.

Program commits any modifications to the GPIO panel.

Addendum D
Troubleshooting

Hard Reset

(This resets the device and implements changes to software and network settings that are changed without putting it back to the factory default settings)

- Locate the small hole on the rear of the device and press the button within releasing it quickly, using a small tool such as a paper clip.
- If the reset button is not easily accessible, power cycle the device by removing the AC end of the cord and not directly at the device.

Factory Reset

(This resets the device and rewrites all of the data parameters such as IP addresses and router tables to the default settings)

- Locate the small hole on the rear of the device and press and hold the button within for 5 seconds or longer. NOTE: the LED's on the Ethernet port of the unit should go dim while the button is pressed.

Serial Port Network Configuration

(These steps will temporarily set the network parameters so that the device applet can access the device in the event that the network settings in the device do not match the settings of the network that the device is connected to.)

1. Locate the RJ45 to 9pin adapter labeled 'UDS Diag' provided with the system
2. Connect a straight through CAT5 cable between one side of adapter and the 'Serial' port on the back of the device.
3. Connect the 9pin side of the adapter to the computer.
4. Use terminal program such as TeraTerm or HyperTerminal and set the serial port settings to 115,200 baud and 8 data bits, no parity and one stop bit.

5. At the shell prompt, type ‘ipconfig(space)staticip(space)<enter IP address here>(space)<enter network subnet here, such as 255.255.255.0>(space)<enter optional gateway address here>
6. Press the enter key to temporarily implement the settings in step 5. Note: this is temporary and only valid until the device is rebooted. You must program the device from the device applet in order to permanently set the network configuration.
7. The device should now be accessible using the device applet from the web browser.

System Fails to Reboot Properly

There are earlier versions of router and panel hardware that had the potential of corrupting the device configuration, causing the device to not reboot properly. If this occurs,

1. Perform factory reset as shown above.
2. If your device is not using the default network configuration, then use the quick start documentation or follow the ‘Serial Port Network Configuration’ steps above to temporarily set the network parameters in the device so they can be accessed and configured via the device applet.
3. Open the saved device configuration file to restore the configuration and program the device.

Applet Opens with Wrong or Old View

- After programming the update to the device, sometimes the status and other operations don’t work properly. Either refresh the browser window using the browser refresh button or simply close and re-open the browser and access the device applet.

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