



SIERRA VIDEO CORPORATION

## **SIERRA VIDEO**

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RS-485 Pushbutton Control Panels

Models 804047, 804048, 804148, 804036, 804037, 804014,  
804348, 804015, 804084, 804085, 804715, 804785, 804050

# User's Manual



**SIERRAVIDEO**

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RS-485 PUSHBUTTON CONTROL PANELS

# User's Manual

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# Introduction

## Before You Begin

There are several terms and acronyms that you should become familiar with before reading this manual. They are shown below.

Term/Acronym	Definition
Crosspoint	The electronic switch that assigns one of the inputs on the matrix crosspoint modules to an output.
Destination	The output of a routing switcher connected to a device that receives signals from the output of the switcher.
Input	Connected to the source that provides the signal to the switcher.
Matrix	The crosspoint array of the switcher module that selects which input is selected to an output.
Output	Connects the signal to the destination device.
Protocol	The command structure used on a serial bus to effect a switch or multiple switches on the routing switcher.
Routing Switcher	Consists of one or more crosspoint modules that switch together, or sometimes independently, to connect the desired signals through the switcher.
Source	The signal that is connected to the input of the routing switcher.
Serial Port	The 9-pin RS232 connector that allow you to control the switcher using a standard personal computer or other external device. Sends control protocol commands in ASCII.

# Regulatory Warnings & Safety Information

The information in the following section provides important warnings and safety guidelines for both the operator and service personnel. Specific warnings and cautions may be found throughout this manual. Please read and follow the important safety precautions noting especially those instructions relating to risk of fire, electrical shock and injury to persons.

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

## Warnings

- Heed all warnings on the unit and in the operating instructions.
- Disconnect AC power before installing any options.
- Do not use this product in or near water.
- Disconnect AC power before installing or removing device or servicing unit.
- This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting inputs or outputs.
- Route power cords and other cables so that they are not likely to be damaged, or create a hazard.
- Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch unsafe connections and components when the power is on.
- To avoid fire hazard, use only the specified type, correct voltage, and current rating of fuse. Always refer fuse replacement to qualified service personnel.
- Have qualified personnel perform safety checks after any completed service.
- To reduce risk of electrical shock, be certain to plug each power supply cord into a separate branch circuit employing a separate service ground.
- If equipped with redundant power, this unit has two power cords. To reduce the risk of electrical shock, disconnect both power cords before servicing.
- Operate only with covers and enclosure panels in place – Do Not operate this product when covers or enclosure panels are removed.
- This is an FCC class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take necessary measures.

## Cautions

- Use the proper AC voltage to supply power to the switcher. When installing equipment, do not attach the power cord to building surfaces.
- To prevent damage to equipment when replacing fuses, locate and correct trouble that caused the fuse to blow before applying power.



## Cautions (continued)

- Use only the recommended interconnect cables to connect the switcher to other frames.
- Follow static precautions at all times when handling the equipment.
- Power this product only as described in the installation section of this manual.
- Leave the side, top, and bottom of the frame clear for air convection cooling and to allow room for cabling. Slot and openings in the frame are provided for ventilation and should not be blocked.
- Only an authorized Sierra Video technician should service the switchers. Any user who makes changes or modifications to the unit without the expressed approval of Sierra Video will void the warranty.
- If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).
- Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- Use a shielded data cable connection between the parallel data ports and peripherals of this equipment.
- Other connections between peripherals of this equipment may be made with low voltage non-shielded computer data cables.
- Network connections may consist of non-shielded CAT 5 cable.
- Do not cover chassis ventilation slots or block enclosure openings.

### **FCC Notice**

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the expense of the user.

The user may find the following publication prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems” (Stock number 004-000-00345-4).

Available exclusively from the Superintendent of Documents, Government Printing Office, Washington, DC 20402 (telephone 202 512-1800).

### **Warning**

Changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC Rules could void the user's authority to operate the equipment.

## Power Supply

Use only power cord(s) and power supplies supplied with the unit.

The RS-485 Pushbutton Control Panels use an external power supply. The power supplies are 9VDC 500mA.

## EMC Regulatory Notices

Federal Communications Commission (FCC) Part 15 Information: This device complies with Part 15 of the FCC standard rules. Operation is subject to the following conditions:

This device may not cause harmful interference

This device must accept any interference received including interference that may cause undesirable operations.

## Delivery Damage Inspection

Carefully inspect the frame and exterior components to be sure that there has been no shipping damage. Make sure all modules are seated correctly and have not detached during shipment. Also, make sure the input buffer modules on the rear panel are secure.

# RS-485 Control Panels Overview

## Introduction

### **A Router Is Only As Good As Its Control System...**

A good control system is reliable, yet flexible enough to allow the switcher to be controlled in a variety of ways. It will allow the use of a large number of different control panels, intelligent software GUIs, and third-party automation systems. Sierra Video universal control system gives you all of that, and more. From simple Push Button control panels to fully programmable panels customized to your individual installation, SVS offers a panel and software for every application.

Routing switchers like [Lassen](#), [Sierra PRO](#), [Tahoe](#), [Shasta](#), [Yosemite](#), and [Sequoia](#) use a powerful 3-port control system. The physical network structure is RS-485 extended to accommodate a total of up to 64 panels on a common bus of up to 5,000 feet. The Control System uses a serial protocol that allows for controlling video and audio levels, AFV, or breakaway. The panel network software is based on fast polling protocol, the most reliable software method for networking devices on a common bus. Control panels on the bus can never take over the bus. Instead, the polling master -- which also is the network interface to the routing switcher -- is always in control.

The Button per Input control panels come in a variety of configurations. These less complex and easy-to-use panels simply assign a single button to a single input. Single-Bus buttons are assignable to one output and any combination of levels; the single operation of pressing a switch selects the desired input. XY Matrix panels have two groups of switches: First press an OUTPUT button to enable the desired output, then use the row of IN or SOURCE Buttons to initiate the switch.

## Model Designations

Model Designations	
XY	Button Per Input and Button Per Output
Single Bus	Button Per Input Controlling a Single Output

**Model 804050**

8x8 1RU XY LED remote control panel



**Model 804047**

16x1 1RU Single bus LED remote control panel



**Model 804048**

16x16 1RU XY LED remote control panel



**Model 804148**

16x16 2RU XY LED remote control panel



**Model 804036**

20x1 1RU Single bus LED remote control panel



**Model 804037**

20x20 2RU XY LED remote control panel



## Model 804014

32x1 1RU Single bus LED remote control panel



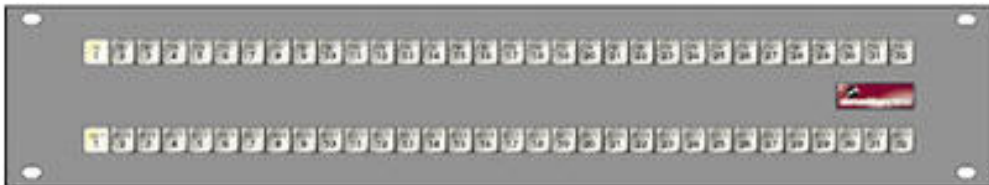
### Model 804348

32x1 2RU Single bus LED remote control panel



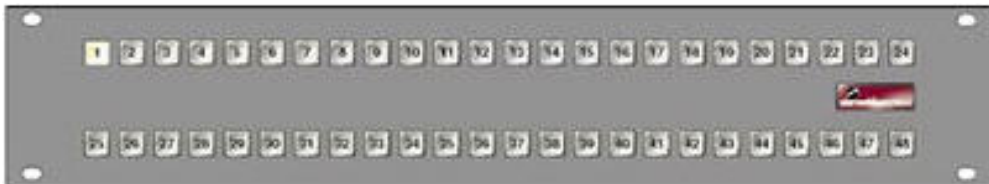
### Model 804015

32x32 2RU XY LED remote control panel



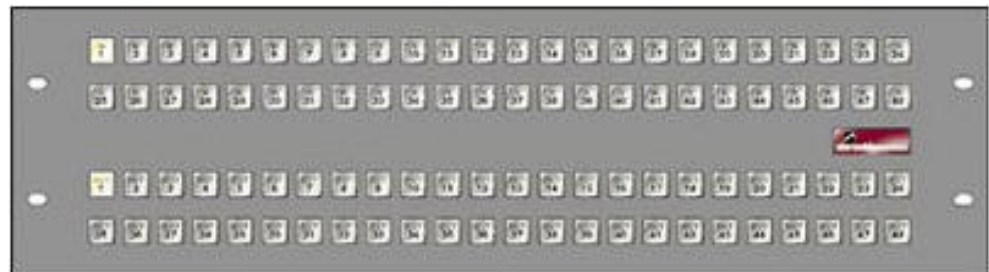
### Model 804084

48x1 2RU Single bus LED remote control panel



### Model 804085

48x48 3RU XY LED remote control panel



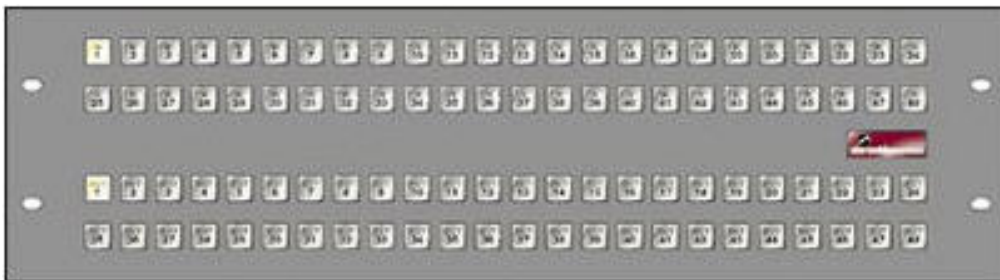
### Model 804715

64x1 2RU Single bus LED remote control panel



### Model 804785

96x1 3RU Single bus LED remote control panel



## Factors Affecting Quality of Results

There are many factors affecting the quality of results when signals are transmitted from a source to a destination.

- Signal cables — Use only the best quality cables to avoid interference and degraded signal quality and elevated noise levels.
- Sockets and connectors of the sources and destinations — Use only the highest quality, since "zero ohm" connection resistance is the target. Connectors should also match the required impedance (75 ohm in video) to minimize return loss.
- Amplifying circuitry — Must have quality performance when the desired end result is high linearity, low distortion, and low noise.
- Distance between sources and destinations — Plays a major role in the final result. For long distances (over 15 meters) between sources and destinations, special measures should be taken to avoid high frequency cable losses. These measures include using higher quality cables and/or adding line cable equalizing amplifiers.
- Interference from neighboring electrical appliances — These can have an adverse affect on signal quality. Balanced audio lines are less prone to interference, but unbalanced audio should be installed away from any main power lines, electric motors, transmitters, etc. even when the cables are shielded.

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### **CAUTION!**

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*Only an authorized Sierra Video technician can service the switchers. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void the warranty*

*Use the proper AC voltage to supply power to the switcher.*

*Use only the recommended interconnect cables to connect the switcher to other frames.*



# Installation

## Introduction

In routers with processor software version 7.1 or newer the RS-485 pushbutton control panels can be configured to “block” outputs and to allow or prevent specific levels from being switched. For older software versions contact Sierra Video.

The Sierra Video TyLinx Pro software program is used to setup the “general settings” of the control panel. Refer to the TYLINX PRO manual, “Control Panel, General Settings” section of the TYLINX PRO manual for details.

Installation procedures are similar for all units covered under this manual. Exceptions, if any, have been noted in each of the following paragraphs.

## Rack Mounting

Carefully inspect the control panel to ensure that there has been no shipping damage. Make sure all shipping material is removed from the unit.

Each of the control panels described in this manual can be rack mounted in a standard 19" (RU) EIA rack assembly and includes rack "ears" at the ends of the front of the panel. None of the control panels require spacing above or below the unit for ventilation.

To rack mount any of the control panels, simply place the unit's rack ears against the rack rails of the rack, and insert proper rack screws through each of the holes in the rack ears. Always rack mount the control panel prior to plugging the unit into a power receptacle or attaching any cables.

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**CAUTION!**

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*The operating temperature range of this product is 0 to 40°C. Do not exceed the maximum (40°C) or minimum (0°C) operating temperature.*

If installed in a closed or multi-rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (YMRA).

Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

# Setup

## DIP switch settings

The panels have DIP switches that set the panel's ID number and baud rate. ID numbers are randomly set at the factory. If you need to change any values, follow the table below.

Switch 8 is unused

Switch 7 is Port Speed:

OFF = 9,600 bps

\*ON = 31,250 bps (factory default)

Switches 1 through 6 are to set ID number. (Switches are in binary).

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### **CAUTION!**

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*Each Control Panel must have its own ID number. No panels may have the same ID number.*



**Disconnect the panel's power** and remove the rear cover to access the DIP switches. The table below shows the settings available:

Binary	1	2	4	8	16	32
<b>ID 0</b>	1 Off	2 Off	3 Off	4 Off	5 Off	6 Off
<b>ID 1</b>	1 On	2 Off	3 Off	4 Off	5 Off	6 Off
<b>ID 2</b>	1 Off	2 On	3 Off	4 Off	5 Off	6 Off
<b>ID 3</b>	1 On	2 On	3 Off	4 Off	5 Off	6 Off
<b>ID 4</b>	1 Off	2 Off	3 On	4 Off	5 Off	6 Off
<b>ID 5</b>	1 On	2 Off	3 On	4 Off	5 Off	6 Off
<b>ETC.</b>						
<b>ID 62</b>	1 Off	2 On	3 On	4 On	5 On	6 On
<b>ID 63</b>	1 On	2 On	3 On	4 On	5 On	6 On

## Connection

Once the panels DIP switch settings are compatible with the system (i.e. each panel has its own unique ID number), the panel can be connected to the RS-485 network and power applied.

The panel has two mini XLR connectors. The mating connectors used are Switchcraft TA3F. If these are not available locally, they can be purchased from Sierra Video.

The cable entry hole into these connectors is quite small and we have found that Belden 8451 cable fits quite well through the strain relief.

The pinout of the connector is as follows:

- Pin 1.....RS-485 +**
- Pin 2.....Ground**
- Pin 3.....RS-485 –**

The two connectors on the back of the control panel are connected in parallel. This allows the panels to be looped (“daisy chained”) together. If it is more convenient, you can build a fan-out panel or box so that only one cable needs to run to each panel. In either case, the total cable length cannot exceed 5,000 feet at 31,250 baud or 10,000 feet at 9,600 baud.

If you make your own interconnect cables, Pin 2 is Ground. Pin 1 and 3 connect pin for pin.



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**Warning!**

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Lights “scrolling” on a panel indicate that the panel is not communicating with the router. Check the control panel cable and baud rate settings.

## Output and Level Setup

The output(s) and levels the control panel will switch can be setup using the Sierra Video TyLinx Pro software.

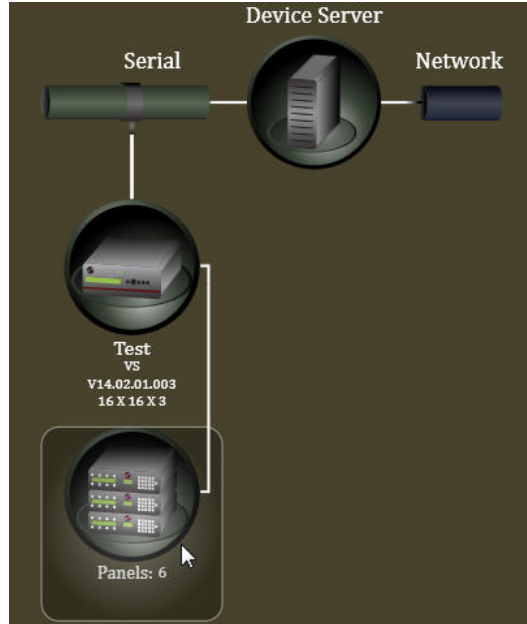
Follow the instructions in the TyLinx Pro manual to retrieve the router settings and discover the control panels connected to the router.

If new control panels are added select “ReSync” on the device map screen of TyLinx Pro to discover the new panels.

## General Settings

The “General” window allows you to set the output(s) and level(s) you want the panel to control.

From the Device Map window on TyLinX Pro, double click on the control panel icon.



Select the Panel number (ID) of the SCW-116 panel you want to program.

The screenshot shows the TyLinX Pro software interface. On the left, there is a list of 'Online Panels' with '1: Panel 1' selected. The main window is divided into three sections:

- Panel Information:** Name: Panel 1, Location: [empty], Panel ID: 1, Software Version: [empty], Type: Single Bus.
- Allowed Levels:** A list of levels: Y (Level: 1), C (Level: 2), NTSC (Level: 3). A 'Tally Level' dropdown is set to 'Y'.
- Allowed Destinations:** A grid of 16 destination buttons (Dst 1 to Dst 16) with their respective destination numbers. 'Dst 1' is highlighted.

Buttons for 'Select All' and 'Deselect All' are present in the Allowed Destinations section.

You can enter a panel name and/or location (optional).

Select the level(s) the panel is to control (toggle on and off).

Select the output(s) the panel is to control.

The image shows a software interface for configuring a control panel. It is divided into two main sections: 'Panel Information' and 'Allowed Levels'.

**Panel Information:**

- Name:** Panel 1
- Location:** (empty text box)
- Panel ID:** 1
- Software Version:** Type Single Bus

**Allowed Levels:**

- Y:** Level: 1 (toggle button)
- C:** Level: 2 (toggle button)
- NTSC:** Level: 3 (toggle button)
- H Sync:** Level: 4 (toggle button)
- V Sync:** Level: 5 (toggle button)
- Audio R:** Level: 6 (toggle button)
- Audio R:** Level: 7 (toggle button)

**Tally Level:**

- Y (dropdown menu)

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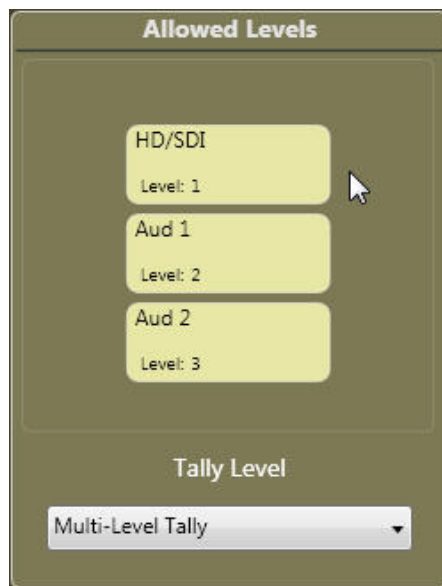
**Note:**

***Some older versions of Control Panel software do not allow TyLinx Pro to identify the control panel type.***



Select the output(s) you want this panel to control.

Panels can also have levels blocked. “Enable/Disable” the levels you want this panel to control by clicking on the level boxes in the lower part of the screen.



The “LED Tally Level” section does not apply to the SCW-116 control panel.

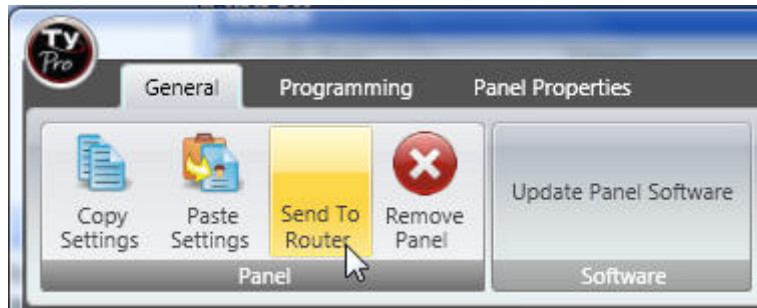
If the panel is to be a “Single Bus” (only controls 1 output), place a check in the “Single Bus” box.



Placing a check in the “Single Bus” box will cause the panel to only access and switch the single selected output.

If there is no check in the box and only one output is selected for the panel to control, the panel can status the blocked outputs but only switch the selected output.

When selection of allowed outputs and levels is complete, click on “Send to Router”.



## Collaborative Panels

It is possible for multiple single bus pushbutton panels to work together as a group to form a single *logical* control panel. Panels working together are called *collaborative panels*, and a collaborative panel is said to be operating in a *collaborative mode*. The group that works together to form one logical panel is called a *collaborative group*. A single router may have many collaborative groups connected to it.

An example of a collaborative group is two 16x1 control panels connected to a 32 input router where one panel controls inputs 1 through 16 and the other panel is set to control inputs 17 through 32 and the same output.

Each collaborative group of panels must be assigned panel ID's that are grouped together in a particular way which differs depending on the type of collaborative panel.

Each panel in a collaborative group shows up as a separate control panel in the router's list of active control panels.

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**CAUTION!**

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*The same panel personality settings must be assigned to **every panel** in a collaborative group.*

## Collaborative Single Bus Panels

Any standard single bus panel (except the 20 button and 40 button panels) can operate in a collaborative mode. A single bus panel automatically operates in a single bus mode if the number of buttons on the panel is equal to, or fewer than, the number of inputs on the router. (This refers to the maximum number of inputs per level that the router is set to and not the number of inputs that any particular level of that router might actually have, which could be less).

It is mandatory that every panel in a single bus collaborative group have the same number of buttons on it. (Different collaborative groups on a single router could conceivably have different sized panels, however).

For example, a 32 input router might have two 16 button panels that operate together in a collaborative single bus mode to form a single 32 input single bus panel.

Using the example above, the first panel in the group needs to be set at an Odd ID number to control inputs 1 through 16. The second panel in the group is set to an even number ID and will control inputs 17 through 32.

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**CAUTION!**

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*A control panel set to ID 0 will only control inputs starting with 1.*



# Operation

## Introduction

For the XY control panel, the output must be selected first. The selected output button will light up to indicate that the output has been selected. An input button will also light indicating the source currently connected to the selected output (status).

Pressing an input button causes the panel to ask the router to “take” that input to the selected output. If the take is successful, the input button that was pressed will light to indicate status of the selected output.

The single bus panel switches by selecting the desired input.

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**Note:**

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*For the single bus control panel, the panel output is assigned at the router using the SVS TYLINX PRO program.*

All takes are performed on every level that the panel controls. The controlled levels are assigned at the router via the TYLINX PRO program (see the section on setup in this manual).

If a “take” is requested by pressing an input button, and the router cannot perform the take for some reason, such as because of a destination lockout or an invalid source, the pressed button and the current input button will flash.

To cancel the flashing either:

1. Press either of the flashing buttons. This cancels the flashing instead of requesting another take.
2. Press a non-flashing button to request a different take.





# Troubleshooting

## Introduction

The most common problem in a system with multiple control panels attached is panels with the same ID number. **Each Control Panel must have its own ID number. No panels may have the same ID number.**

Upon start-up the panel lights will randomly flash while the panel receives information from the router.

In a multi-frame system the control panels must be connected to the “master” frame.

Problem	Remedy
No power	<ul style="list-style-type: none"> <li>Confirm that the external power supply is supplying 9VDC.</li> </ul>
Panel Lights Scrolling	<ul style="list-style-type: none"> <li>“Scrolling” panel lights are an indication of the panel not communicating with the router. Check the RS-485 cable and baud rate settings of the panel and the router panel port.</li> </ul>
Input Lights Flashing	<ul style="list-style-type: none"> <li>Check that the destination is locked or you have selected an invalid source.</li> </ul>
Input Lights not Showing Correct Status	<ul style="list-style-type: none"> <li>The panel “tally” lights are not configured correctly- see panel “general settings” setup in TYLINX PRO.</li> </ul>
Panel Not Switching Correct Levels	<ul style="list-style-type: none"> <li>The panel is not correctly setup- see panel “general settings” setup in TYLINX PRO.</li> </ul>



# Warranty

## **A. General**

Buyer assumes all responsibility for ascertaining the suitability of Sierra Video (hereinafter "SVS") products for Buyer's intended use. No product sold by SVS is designed or manufactured for use in any manner or under any conditions other than those described in SVS's instruction manuals and other printed material for each particular product. If any product is used or applied in a manner or under conditions not specifically authorized by such written materials or if any product is used by unqualified or improperly trained personnel, Buyer agrees that SVS shall have no liability of any kind arising from such use, and Buyer agrees to indemnify and hold SVS harmless from any claims of third parties arising from such use, and Buyer shall provide SVS with counsel of SVS's choice to defend against such claims.

## **B. Limited Warranty**

1. This limited warranty applies only to the original purchaser and is non-transferable. This limited warranty begins on the date of purchase and will be in effect for seven (7) years for new equipment and for three (3) years for "Factory Refurbished" equipment. Power Supplies and fans are warranted for three (3) years from the date of purchase for new equipment and two (2) years for "Factory Refurbished" units, from the date of purchase.

Buyer must obtain a Return Material Authorization ("RMA") number from SVS prior to returning a product for repair. If, in SVS' sole discretion, the product is found to be defective during the term of this warranty, SVS will at its option: (a) provide free replacement parts, and/or (b) repair the unit at an SVS facility. During the warranty period, SVS will make every reasonable effort to support critical emergencies by supplying no-cost loan equipment while the defective unit is being repaired. SVS will provide replacement parts and/or factory service at no charge. Buyer bears the cost of shipping products returned to SVS under this warranty. SVS will bear the cost of shipping repaired products or replacement parts to the Buyer.

This limited warranty shall not apply to any of SVS's goods which have been altered or which have been subjected to misuse, mishandling, improper storage or negligence. The aforementioned provisions do not extend the original warranty period of any goods which have been replaced by SVS. This limited warranty shall not apply to any goods not of SVS's manufacture, Buyer to be entitled only to the warranty set forth in the original manufacturer's limited warranty.

THIS LIMITED WARRANTY IS EXPRESSED IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED OR STATUTORY, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND OF FITNESS FOR A PARTICULAR PURPOSE, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON SVS'S PART.

SVS neither assumes nor authorizes any other person to assume for SVS any other liabilities in connection with the sale of products of its own manufacture.

2. SVS's liability hereunder on any claim of any kind, except as set forth herein for any loss, injury to person or property or damage, shall in no case exceed the price allocable to the goods which give rise to such claim.

3. In no event shall SVS be liable for any damages or injuries to person or property if any goods do not meet the above limited warranty, including, without limitation, incidental expenses or consequential or special damages, except as set forth in such limited warranty. The foregoing states the exclusive remedy of Buyer and the exclusive liability of SVS for any breach of the foregoing limited warranty.

### **C. Cancellation**

Except as provided in paragraph B immediately above, all sales are final, and Buyer may cancel this order or return products only upon written consent of SVS.

### **D. General**

In the event of a breach of any of the terms hereof, the non-breaching party shall be entitled to recover all of its costs, fees, and expenses, including, without limitation, reasonable attorney's fees, from the breach party incurred as a result of such breach, regardless of whether or not a suit is actually filed to enforce the terms hereof.

The provision hereof shall be governed by the laws of the State of California (excluding its choice of law provisions).

The headings are for convenience only and do not limit or amplify the terms and provisions hereof.

In case any one or more of the provisions set forth herein shall be held to be invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby.

No waiver, alteration, or modification of any of the provisions hereof shall be binding unless in writing and signed by an authorized Officer of SVS.

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#### **NOTE:**

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*All products returned to SVS for service must have prior approval. Return authorization requests may be obtained from your SVS dealer.*