



Series 500

Installation Guide

PS510
Under Table
Presentation Switcher

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Getting Started

Installation Guide Overview

This manual will provide detailed instructions to assist an installer with a typical under table installation of a PS510 presentation switcher. This process is best outlined by the following steps.

1. Unpack the switcher from the box and separate all components.
2. Install input cards (if necessary)
3. Locate and pre-drill mounting holes.
4. Mount the switcher under the table.
5. Attach input and output devices to the switcher.
6. Power up the unit and test the unit manually.
7. Make adjustments to the system as necessary.
8. Test the system again using external control devices as necessary.

Package Contents

Below is a list of items enclosed in each Series 500 enclosure.

Quantity	Description
1	PS510 Presentation Switcher
1	Installation Guide (PN: DOC-000005-xxx) (This manual)
1	5 Connector Terminal Block Stereo Audio Connector, Line Level Audio
6	Wood Screws, #6 X 3/4", Pan-Head, Philips
1	Power Cord (US Only)

Installation Tools

- Drill
- 3/32" Drill Bit for Softwood or 7/64" Drill Bit for Hardwood
- #2 Philips Head Screw Driver
- 1/8" Flat Blade "Tweaker" Screw Driver

Inserting Input Cards

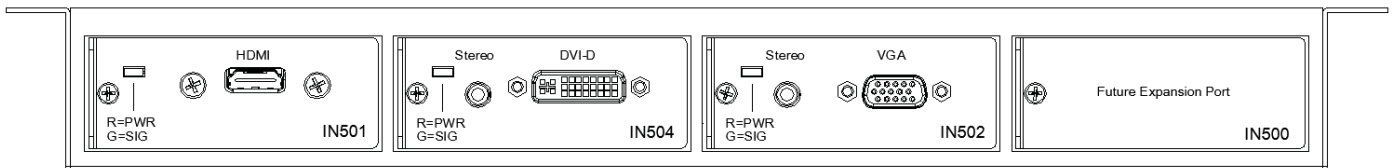
Inserting an Input Board Assembly

In the United States and Canada, input cards are installed prior to leaving the factory. In some countries cards are shipped separately. This section explains the process necessary to install input card assemblies into a PS510 presentation switcher.

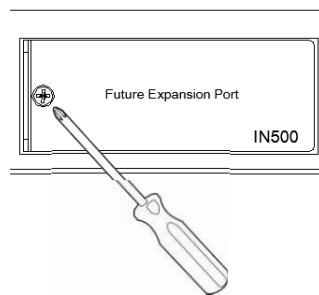


WARNING: While “hot swapping” of input cards is possible, it is recommended to disconnect power from the PS510 enclosure to prevent accidental shock to yourself or to the equipment.

The drawing below shows a sample layout of a PS510 enclosure. In this case, the system type is a PS510 with HDMI, DVI, and VGA inputs.



1. Using a #1 Philips Head screw driver, remove the screw that holds the IN500 - Future Expansion Plate in place.



2. Unpackage the new input board assembly from the shipping container and set aside.



CAUTION: This product, like all microcontroller products, uses semiconductors that can be damaged by electrostatic discharge (ESD). When handling, care must be taken so that the device is not damaged. Damage due to inappropriate handling is not covered by the warranty.

The following precautions must be taken.

- a. Do not open the protective conductive packaging until you have read the following, and are at an approved anti-static work station.
 - b. Always discharge yourself by touching a grounded bare metal surface before picking up an ESD - sensitive electronic component.
-

3. Remove the input board assembly from the protective conductive packaging.
4. Insert the new input board assembly into the enclosure while aligning card within the guides on the left and right of the opening. Press the card firmly (about 10 lbs of force) into the card slot.
5. Using the screw extracted from the IN500 Future Expansion plate, fasten the new input board assembly in place.
6. Connect power cord to enclosure and turn system on.
7. The system is now ready for use and the new input is active.

Pre-Drill Mounting Holes

Locating the Switcher

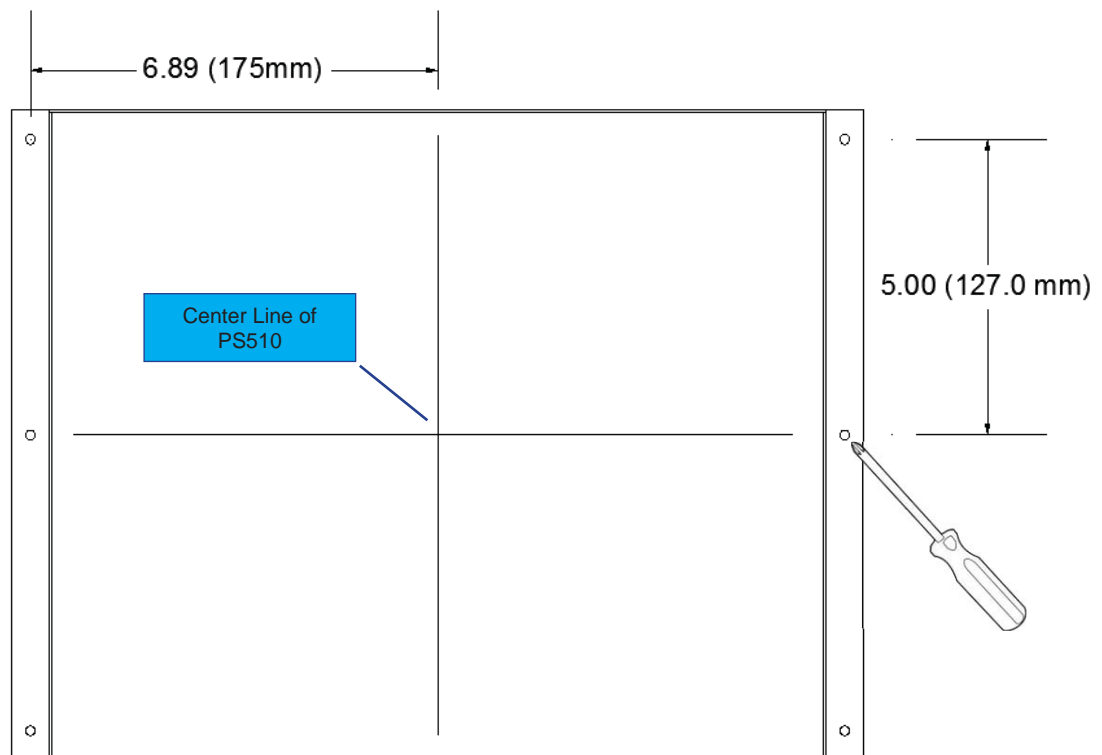
Locate the switcher under the table toward the center line of the table. Ensure switcher is far away from potential contact with people's legs or knees.



WARNING: Keep product away from potential contact with human legs, knees, and other body parts. A PS510 is made of metal and can harm people if struck with sufficient force.

Pre-Drill Mounting Holes As Shown

1. Using a 3/32" drill (for softwood) or 7/64" drill (for hardwood), drill each hole approximately 5/8" in depth.

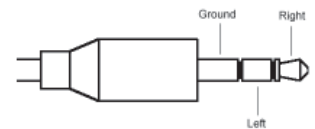
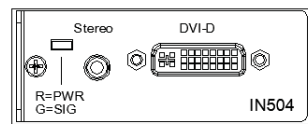


2. Using #2 Phillips screw driver, fasten all 6 screws.

Connecting Devices

Input Devices / Sources

Connect input devices or audio-visual sources as you would most AV Receivers. In most cases, one source is connected per input board assembly and includes both the video and audio components.



3.5mm Connector

In the example above, a DVI-D board, part number IN504 in this case, is located in input slot number 2. Connect the video portion to the DVI connector and the audio component to the 3.5mm connector located just above the video connector. This device is now considered “Input #2”.



Note: The LED located just above the stereo connector will illuminate red when power is present on the card. The LED will illuminate green when an active video signal is recognized on the DVI video connector. This LED is present on most input board assemblies.

Continue the process of connecting input devices until all sources are attached.

Connecting Display or Video Output Devices

The PS510 presentation switcher is equipped with HDMI and VGA connectors. These connectors are located on the opposite side of the input card assemblies.



The HDMI and VGA outputs are simultaneous outputs and output the same resolutions at all times.

EDID and Image Resolutions

By default, image resolution is set to XGA (1024 X 768) using Table Select mode. The installer can override this feature by selecting an image resolution from a table or by selecting EDID Passthru Mode.

In Passthru mode, the source negotiates directly with the display device to determine the best possible display resolution.

Audio on HDMI Connector

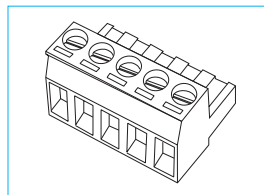
When connecting to the HDMI connector, audio from the input device or source selected will pass directly to the display device. This includes audio from analog sources that are digitized and embedded onto the HDMI stream.

HDCP Encrypted Sources

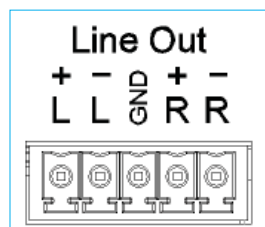
Signals which are encrypted using HDCP will pass directly to the HDMI connector in all situations. The VGA connector will indicate a disconnected signal and audio will not be present on the Line Level output.

Connecting Audio Output Devices

The PS510 is equipped with a line level stereo audio output. Line level audio, by default, is a stereo audio balanced output. Using the male audio connectors provided (shown below), connect the audio signals as indicated below. Tighten with a 1/8" flat head screw driver (tweezer).



Line Out Audio Connector (Male Connector)



Audio Pin Configuration (Female Connector)

Connecting Control Devices

In addition to the standard front panel controller, the Series 500 provides additional control methods. Serial (RS-232) and Ethernet provides connection to third-party controllers such as Crestron and AMX.

Crestron or AMX Control Systems

Connection to a 3rd party (AMX/Crestron etc) control system can be accomplished using RS232 or Ethernet. Settings can be adjusted using the Configuration Utility discussed in more detail later in this guide.

The default baud rate for the serial port is 115200.

Display Control

The PS510 has a simple control system for controlling a display device (LCD, Plasma, or Projector). The serial port is connected directly to the display device. Codes are uploaded and stored in the PS510 using the PS500 Display Control Utility. When the system is shutdown and a input source is selected the projector is sent a “power on” command. When the signal is shut down and signal is lost, the PS510 issues a “power down” command.

Uploading commands to the Series 500 is described in more detail later in this guide.

Configuring the PS510

The Configuration Software

The PS510 Configuration Software is available on the website on the PS510 produce web page. This application requires a connection to the PS510 using RS-232.

The screenshot shows the 'PS510 Configuration Tool' window. It has a menu bar with 'File', 'View', 'Communication', and 'Help'. The interface is divided into several sections:

- Switching:** Contains a checked checkbox for 'AutoSwitch'.
- Network:** Includes a 'DHCP' section with 'Enabled' selected and 'Disabled' unselected. Below are input fields for 'IP Address' (169, 254, 1, 10), 'Subnet Mask' (255, 255, 255, 0), 'Gateway Address' (169, 254, 1, 1), 'Primary DNS' (169, 254, 1, 1), and 'Secondary DNS' (0, 0, 0, 0).
- Audio:** Titled 'INPUT LEVEL', it shows four sliders for 'Input 1', 'Input 2', 'Input 3', and 'Input 4', all set to 100%.
- EDID:** Contains dropdowns for 'Port' (HDMI), 'Method' (Table Select), and 'Select Resolution' (1024x768 60Hz). Below is an 'EDID Bypass' section with checkboxes for 'Input 1', 'Input 2', 'Input 3', and 'Input 4', all of which are unselected.
- Communication:** Includes dropdowns for 'BAUD Rate' (115200) and 'Protocol' (PSI PS500), and a checked checkbox for 'UnSolicited Feedback'.
- Switcher Commands:** A section at the bottom with two buttons: 'Program' and 'Set Factory Defaults'.

At the very bottom of the window, there is a status bar with three buttons: 'No COM', '115200,N,8,1', and an empty button.

Switching - “Auto-Switch”

Microprocessors on each input card are constantly “sensing” for a new video connection. When a user connects to the PS510 the PS510 automatically switches that signal to the display device creating an Auto-Switch. This feature can be problematic in some situations and can be turned off.

Ethernet Settings

In this section, network settings can be adjusted to meet connectivity requirements of the Ethernet network. DHCP, the process of automatically acquiring an IP address from the host, can be enabled or disabled. Static address values, such as IP, Subnet, Gateway, or DNS values, can also be defined in this section.

Audio Input Levels

Sometimes it is necessary to attenuate (or lower) audio levels of certain inputs.

For example, a cable receiver box may produce audio levels that are always high. If this were the case, users of the system would immediately lower the audio in the room. However, switching to another source would sound too low and require turning the audio back up. The Audio Input Levels feature of the PS510 would allow you to set the audio level of the cable receiver box slightly lower such that all source devices have the same “nominal” level.

EDID Settings

EDID, or Extended Display Identification Data, is information that define the capabilities of a display. This information is used to tell source devices, such as laptop computers, what resolution to output.

Table Select. Table select creates an EDID block of a specific resolution and offers that information to all inputs. The only exception is those selected for EDID Bypass.

EDID Passthru. This method instructs the source devices to communicate directly with the display to obtain the EDID information and negotiate an output resolution. EDID Bypass has no effect in this case.

Port. This setting tells the PS510 which display port (HDMI or VGA) in which to extract EDID display information.

Communication (RS-232) Settings

Baud Rate. This is the communications speed of the RS-232 port. All other parameters are 8 bit, no parity, and 1 stop bit.

Protocol. The PS510 can speak two languages. The PSI PS500 is an AMX[®]/AutoPatch[™] BCS derivative. But, the PS510 also understands the Extron[®] SIS[™] protocol and can be set using this command.

Unsolicited Feedback. This feature is especially important to 3rd party programmers. When an auto-switch occurs or a switch using the Ethernet port, a record of that change is sent out the RS-232 port. This feature is particularly important when a control panel is used and when current configuration status is maintained. Without the unsolicited feedback, the programmer would have to constantly ask the PS510 if anything has changed, often called a “polling” routine. Polling routines are costly and often interfere with the performance or responsiveness of the control panel.

Uploading the Settings

To configure the PS510, press the button “Program”. This uploads the configuration settings to the PS510.

PS500 Display Control

The PS510 has a simple control system for controlling a display device (LCD, Plasma, or Projector). The serial port is connected directly to the display device. Codes are uploaded and stored in the Series 500. When the system is inactive and an input source is selected the projector is sent a “power on” command. When the signal is lost and a predetermined amount of time passes, the Series 500 issues a “power down” command.

Main Form

The screenshot shows the 'PS Series 500 Display Control (LG_LCD.txt*)' window. It features a menu bar (File, View, Communication, Screen, Test, Help) and a toolbar with icons for file operations, communication, and testing. The main area is divided into several sections:

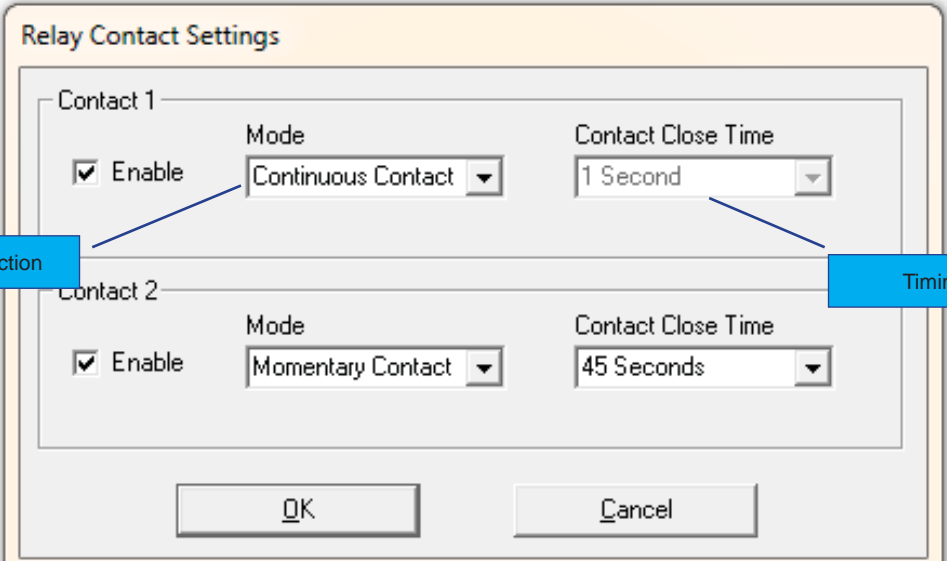
- Display Control Commands:**
 - ☒ Display / Enter Commands in Hex (Checked) or Text (Not Checked)
 - Power ON Code (in Hex Codes):** 0D 6B 61 20 30 20 30 31 0D
 - Power OFF Code (in Hex Codes):** 0D 6B 61 20 30 20 30 30 0D
 - Input Select Code (in Hex Codes):** 0D 78 62 20 30 20 39 30 0D
 - No Signal Power Off:** 5 Minutes
 - No Activity Power Off:** 5 Hours
 - Time Between Commands:** 5 Seconds
- Display COM Settings:**
 - BAUD Rate:** 9600
- Switcher Commands:**
 - Program** button
 - Read** button

Callouts point to the following elements:

- Enter Codes in Text or HEX:** Points to the checkbox in the Display Control Commands section.
- Power On Codes:** Points to the Power ON Code text field.
- Input Select Code:** Points to the Input Select Code text field.
- Serial Speed of Display:** Points to the BAUD Rate dropdown.
- Power Off Codes:** Points to the Power OFF Code text field.
- Time to Wait with No Signal Before Shutting Down:** Points to the No Signal Power Off dropdown.
- Projector / LCD Bulb Life Fail Safe:** Points to the No Activity Power Off dropdown.
- Upload to the Switcher:** Points to the Program button.
- Read from the Switcher:** Points to the Read button.

Relay Form

The PS510 does not support relays. This screen is not applicable to the PS510 and was originally designed for the PS500, 7 slot rack mount systems. (Ignore references to Relays.)

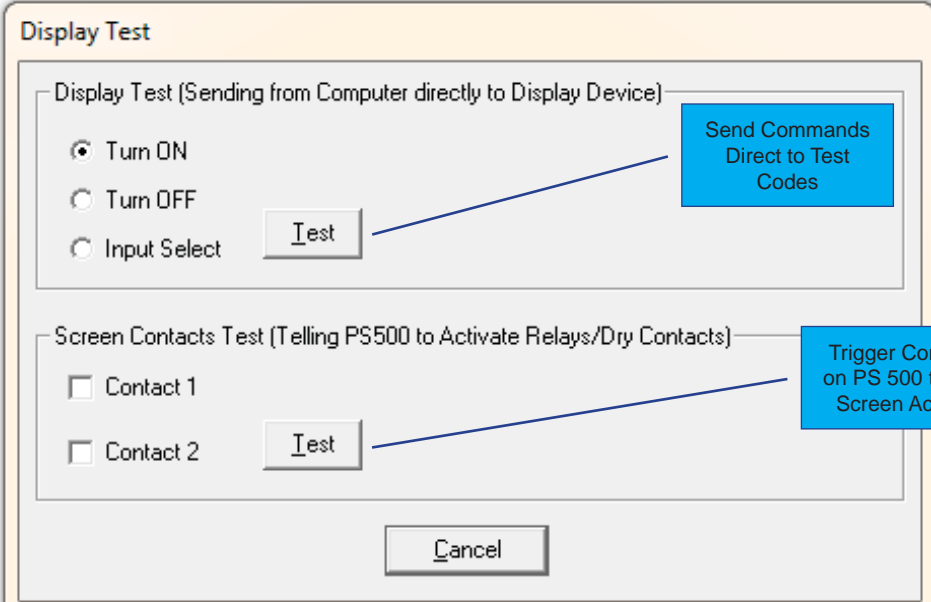


The "Relay Contact Settings" dialog box contains two sections for "Contact 1" and "Contact 2". Each section has an "Enable" checkbox (checked), a "Mode" dropdown menu, and a "Contact Close Time" dropdown menu. For Contact 1, the Mode is "Continuous Contact" and the time is "1 Second". For Contact 2, the Mode is "Momentary Contact" and the time is "45 Seconds". At the bottom are "OK" and "Cancel" buttons. Two blue callout boxes with arrows point to the "Mode" dropdowns: "Contact Action" points to Contact 1's mode, and "Timing" points to Contact 1's time.

Contact	Enable	Mode	Contact Close Time
Contact 1	<input checked="" type="checkbox"/>	Continuous Contact	1 Second
Contact 2	<input checked="" type="checkbox"/>	Momentary Contact	45 Seconds

Test Form

Select the Test pull down menu to access this form. This routine is used to test the commands you have entered. Be sure to save your file first. The Test button actuates or triggers the test.



The "Display Test" dialog box has two main sections. The first section, "Display Test (Sending from Computer directly to Display Device)", contains three radio buttons: "Turn ON" (selected), "Turn OFF", and "Input Select". A "Test" button is next to them. A blue callout box with an arrow points to this "Test" button, containing the text "Send Commands Direct to Test Codes". The second section, "Screen Contacts Test (Telling PS500 to Activate Relays/Dry Contacts)", contains two checkboxes: "Contact 1" and "Contact 2", both of which are unchecked. A "Test" button is next to them. A blue callout box with an arrow points to this "Test" button, containing the text "Trigger Contacts on PS 500 to Test Screen Actions". At the bottom is a "Cancel" button.

Section	Options	Action
Display Test (Sending from Computer directly to Display Device)	Turn ON (selected), Turn OFF, Input Select	Test
Screen Contacts Test (Telling PS500 to Activate Relays/Dry Contacts)	Contact 1, Contact 2	Test

Connecting to the Switcher

Connect from a PC to the switcher using a RS-232 straight serial cable. A null-modum cable will not work.

Setting Communication Baud Rates

Using the Communications pull down menu, set the baud rate to the speed of the switcher. The switcher defaults to 115,200 baud.

The screenshot shows the 'PS Series 500 Display Control (LG_LCD.txt)*' window. It features a menu bar with 'File', 'View', 'Communication', 'Screen', 'Test', and 'Help'. Below the menu bar is a toolbar with icons for file operations and testing. The main area is divided into several sections:

- Display Control Commands:** Contains a checkbox 'Display / Enter Commands in Hex (Checked) or Text (Not Checked)' which is checked. Below it are four text input fields for hex codes: 'Power ON Code (in Hex Codes)' with '0D 6B 61 20 30 20 30 31 0D', 'Power OFF Code (in Hex Codes)' with '0D 6B 61 20 30 20 30 30 0D', 'Input Select Code (in Hex Codes)' with '0D 78 62 20 30 20 39 30 0D', and 'Time Between Commands' with a dropdown set to '5 Seconds'. To the right of these are two dropdown menus: 'No Signal Power Off' set to '5 Minutes' and 'No Activity Power Off' set to '5 Hours'.
- Display COM Settings:** A section with a 'BAUD Rate' dropdown menu currently set to '9600'.
- Switcher Commands:** A section containing two buttons labeled 'Program' and 'Read'.

Entering Display Codes

Hexidecimal or Text

Display codes can be entered on the main form using hexadecimal numbers or text (ASCII) characters. One can transition between text and hexadecimal by checking or unchecking the "Display / Enter commands in hex" checkbox. Text already entered will be converted to hex and vice versa as one check and unchecks the box.



When entering in hexadecimal, put a space between each number. When entering in text, enter non-printable characters (such as a carriage return) with their ASCII equivalent number with parenthesis surrounding the number.

For example, the hexadecimal codes on the left are equivalent to the text codes to the right.

Hexidecimal	Text / ASCII
0D 6B 61 20 30 20 30 31 0D	(13)ka 0 01(13)
50 52 4F 4A 4F 4E	PROJON

Input Select

The input select command is sent at the selected timing after the power on command to ensure that the device is on the correct input.

No Signal Power Off

This field indicates a period of time the switcher will wait without a valid output signal before it powers down the display. This delay is created for times when an input is errantly selected or when transitioning between sources.

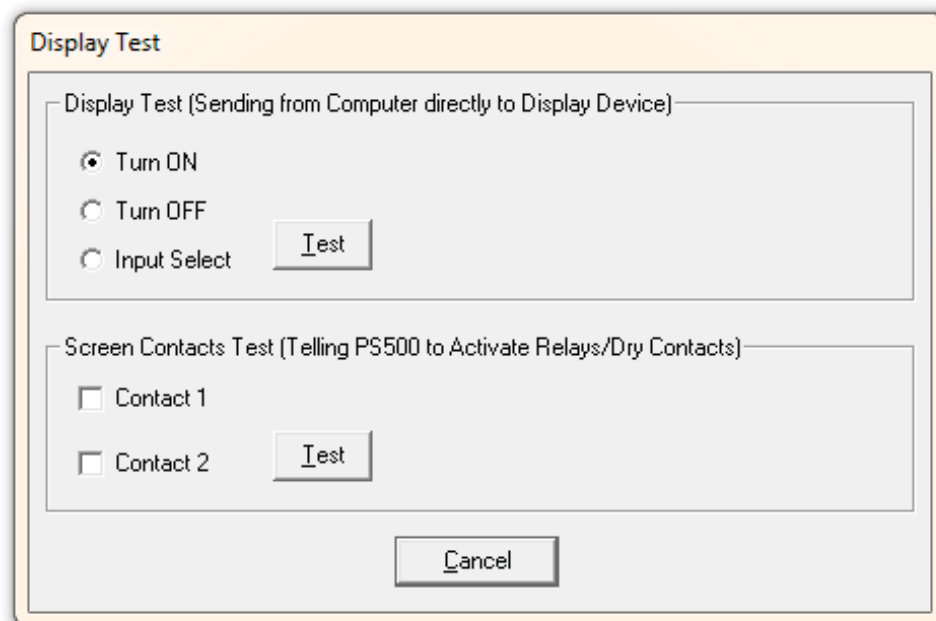
Time Between Commands

Some projectors need a little more time than others when processing commands. This field indicates how long the switcher will wait between commands.

Note: This delay is relavent only between power on, input select, and power off commands. The switcher does not put delays within a command, such as a power on command.

No Activity Power Off

This time period is considered the “fail safe” time. When there is an active video signal and there is no activity either in front panel activity, serial port, or Ethernet, the system will issue a power off sequence. This routine is intended to save power and bulb life should a system be left on and nobody using the system - especially if a home room computer goes to sleep and displays a black screen.



Testing the Display Codes

Connecting Directly to the Display Device

When testing display codes, the PC must be connected directly to the display device using a RS-232 cable. Ensure that the baud rate listed on the main form matches the baud rate of the display.

Select the Code

Select “Turn On” first then press the Test button. The display device should turn on. If it does not, verify the codes are correct, cabling is correct, and communications parameters are correct and repeat the test. Repeat the process for each command.

Enabling or Disabling the Display Control Feature

The Display Control feature is automatically turned on when one has successfully uploaded codes using the PS 500 Display Control application.

However, the Display Control feature may be enabled or disabled using the Configuration Software as described in previous chapters.

Appendix

Series 500 Programming Codes	21-22
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Series 500 Programming Codes

Remove all spaces in sending string. "T" is the terminator. A Carriage Return is not required/accepted. Commands follow the AMX/AutoPatch standard of switcher communications - when possible.

[] = Optional items

= Replace with a number

| = OR

Input / Source Select

CI # T		Change current input selection to #.
Examples		
Send	Response	
CI3T	None	Select input number 3.
CI5T	None	Select input number 5.

Get Current Input / Source

SO # T		Get the current input selected by the switcher.
Examples		
Send	Response	
SO1T	(3)	Requested status on output number 1 reveals 3 as the current selected input.
SO1T	(5)	Requested status on output number 1 reveals input 5.

Volume Up (Incremental)

+		Increase volume by 1 step. 100 steps is volume maximum.
Examples		
Send	Response	
+	None	Increased by 1 step.
+++	None	Volume is increased by 3 steps.

Volume Down (Incremental)

-		Decrease volume 1 step. 0 is mute.
Examples		
Send	Response	
-	None	Volume is decreased 1 step.
---	None	Reduced by 3 steps.

Volume, Set Absolute

VA # T		Set volume to step level #. 100 steps is volume maximum. 0 is mute.
Examples		
Send	Response	
VA40T	None	Set volume to step level 40.
VA25T	None	Set volume to step level 25 or 25% of the volume available.

Get Current Volume Level		
SV T		Get current volume level, in steps (0 to 100).
Examples		
Send	Response	
SVT	(25)	Get current volume returns a level of 25.
SVT	(0)	Get current volume returns zero or system is muted.
Mute Audio		
VM T		Mute audio output.
Examples		
Send	Response	
VMT	None	Turns Audio Off.
Un-Mute Audio		
VU T		Unmutes audio to audio level in pace before mute.
Examples		
Send	Response	
VUT	None	Volume level returns to audio level prior to mute.
Mute Video		
ZM T		Mute video output. Image shows disconnected.
Examples		
Send	Response	
ZMT	None	Turns Video Off.
Un-Mute Video		
ZU T		Unmutes video.
Examples		
Send	Response	
ZUT	None	Video image is restored.
Power Saving Mode		
OFT		Enable power savings mode. RST is only way to return to normal operation.
Examples		
Send	Response	
OFT	None	Put PS510 in power savings mode.
Reset System		
RST		Reset System. Reboot.
Examples		
Send	Response	
RST	None	Performs soft reset on system and hard reset on cards.



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