

**PHILIPS**

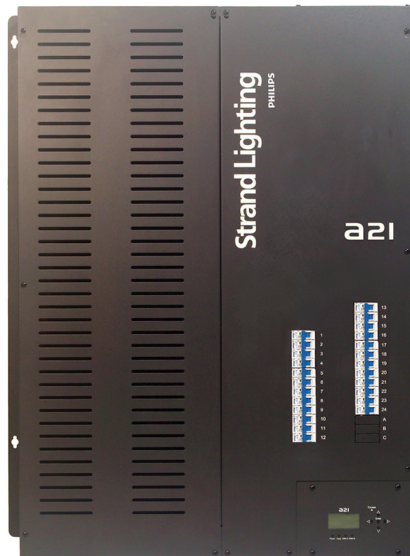
# Strand Lighting

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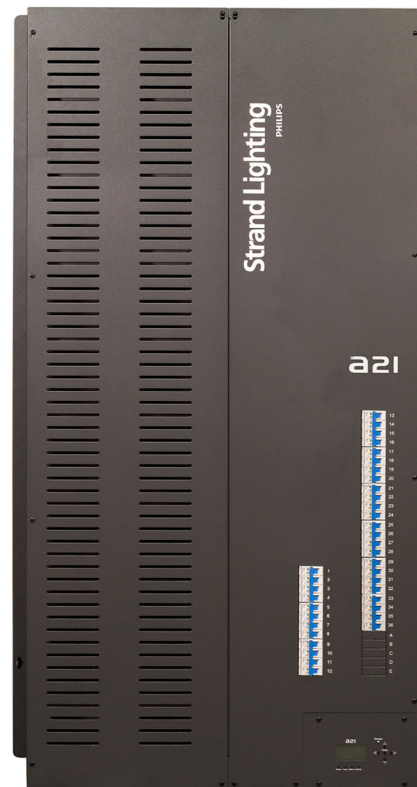
120/277V Lighting Control Panels



3-Space Panels



6-Space Panels



9-Space Panels

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## A21 Lighting Control Panel Installation & Operation Guide

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## IMPORTANT SAFEGUARDS

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When using electrical equipment, basic safety precautions should always be followed including the following:



- a. **READ AND FOLLOW ALL SAFETY INSTRUCTIONS.**
- b. Do not use outdoors.
- c. Do not mount near gas or electric heaters.
- d. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
- e. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- f. Do not use this equipment for other than intended use.
- g. Refer service to qualified personnel.

**SAVE THESE INSTRUCTIONS.**



**WARNING:** You must have access to a main circuit breaker or other power disconnect device before installing any wiring. Be sure that power is disconnected by removing fuses or turning the main circuit breaker off before installation. Installing the device with power on may expose you to dangerous voltage and damage the device. A qualified electrician must perform this installation.

**WARNING:** If replacing the fuse in this unit, you must replace fuse with exact same type and rating (600V, 10 Amp, Time Delay).

**WARNING:** Refer to National Electrical Code® and local codes for cable specifications. Failure to use proper cable can result in damage to equipment or danger to persons.

**WARNING:** This equipment is intended for installation in accordance with the National Electric Code® and local regulations. It is also intended for permanent installation in indoor applications only. Before any electrical work is performed, disconnect power at the circuit breaker or remove the fuse to avoid shock or damage to the control. It is recommended that a qualified electrician perform this installation.

**CAUTION:** Wire openings **MUST** have fittings or lining to protect wires/cables from damage. Use 90° C copper wire only! Aluminum wire may not be used.

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# PREFACE

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## 1. About This Guide

The document provides installation and operation instructions for the following A21 products:

- 74121 A21 Lighting Control Panel, 3-Space
- 74123 A21 Lighting Control Panel, 6-Space
- 74130 A21 Lighting Control Panel, 9-Space

### Notes:

- A21 dimmer cabinets may be populated with either 120V or 277V modules, but not both.
- A21 dimmer cabinets may be ordered factory configured for UL924 circuits.
- 120V and 277V dimmer modules are not interchangeable, and must be installed in the appropriate voltage A21 Lighting Control Panel.

Please read all instructions before installing or using this product. *Retain this guide for future reference.*

## 2. Additional Manuals

Individual installation documents are available for each A21 Relay and Dimming Module.

# OVERVIEW

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## 1. About A21 Lighting Control Panels

Strand Lighting A21 Lighting Control Panels are high-performance, wall mounted lighting control panels which offer a wide range of dimming and relay modules to accommodate any lighting control application. All A21 Lighting Control Panels accept any combination or mixture of LED, incandescent, and fluorescent dimming or non-dim modules to fit any project needs.

A21 Lighting Control Panel IGBT Dimming Modules contain an on-board, intelligent microprocessor that adjusts and maintains proper voltage and current in response to changes detected in the load and electrical service, which serves to extend lamp life. The microprocessor also automatically suppresses surges, and protects against short circuits. IGBT dimmers significantly reduce neutral harmonics and when configured to operate in Low Harm® mode.

## 2. Installation Overview

The following steps are required to successfully install an A21 Lighting Control Panel:

- 1) Review this document completely before starting the installation.
- 2) Unpack and inspect equipment. Compare the equipment you received with your packing list. If these do not match, contact Strand Lighting Customer Service at: 1-800-4 STRAND (U.S.) or 1-214-647-7880.
- 3) Gather tools. Refer to ["Tools List" on page 5](#).
- 4) Chose an appropriate location for installation. The Lighting Control Panel(s) should be installed in an area of "office" level cleanliness. The room in which it is installed should have sufficient volume to allow exhaust air to circulate and cool. For more details and clearance requirements, refer to ["Location and Clearances" on page 5](#).
- 5) Plan the wire routings and connection order. Decide where the Feed, Load, and Control wiring will enter the Lighting Control Panel(s).
- 6) Remove access panels and knockouts in the Lighting Control Panel(s) as required for conduit or busway entry. Perform all conduit connections to the panel before it is permanently installed. Be sure to remove all knockout debris.
- 7) Securely mount the Lighting Control Panel and terminate all Feed, Load, and Control wiring following the directions in this manual. Clean up the work site and Lighting Control Panel(s) for checkout by Strand Lighting Technical Services (see ["Notice To Contractor" on page 34](#)).
- 8) Contact Strand Lighting when Lighting Control Panel(s) is installed and ready for checkout.

### 3. Tools List

The following is a basic list of tools recommended for this installation:

- Drill (for mounting holes)
- Hammer (for removing knockouts)
- Phillips screwdriver
- Small flat screwdriver
- Adjustable wrench
- Ratchet and assorted sockets
- Wire cutter
- Wire stripper
- Heat shrink tubing
- Pencil
- Knife
- Conduit and fittings
- Digital voltmeter / True RMS

### 4. Location and Clearances

When installing A21 Lighting Control Panels, the location site MUST meet the following requirements:

- Wall must be capable of supporting the weight of the lighting control panel.
- Minimum clear ventilation spacing for side-by-side mounting: 6 inches
- Minimum clear ventilation spacing for mounting next to an adjacent wall: 6 inches
- Only the 3-Space Lighting Control Panels may be stacked. Minimum clear ventilation spacing between panels for vertical stacking: 12 inches
- **All cabinets require 12 inches of clear ventilation space above and below.**
- Do not recess (flush mount) the panel. Panel must be surface mounted to provide proper ventilation.
- Do not hang the panel horizontally. Panel must be installed vertically to provide proper ventilation.
- Indoor Use Only: The unit **MUST** be installed indoors.
- Dry Locations Only: The unit can only be installed in an “office clean” area that is never exposed to moisture of any kind. Strand Lighting is not responsible for damage to equipment caused by moisture, paint, dust, solvents or cleaning supplies.
- Installation location should have sufficient volume to allow exhaust air to circulate and cool.
- Refer to National Electrical Code® and local codes to determine whether additional requirements must be met.



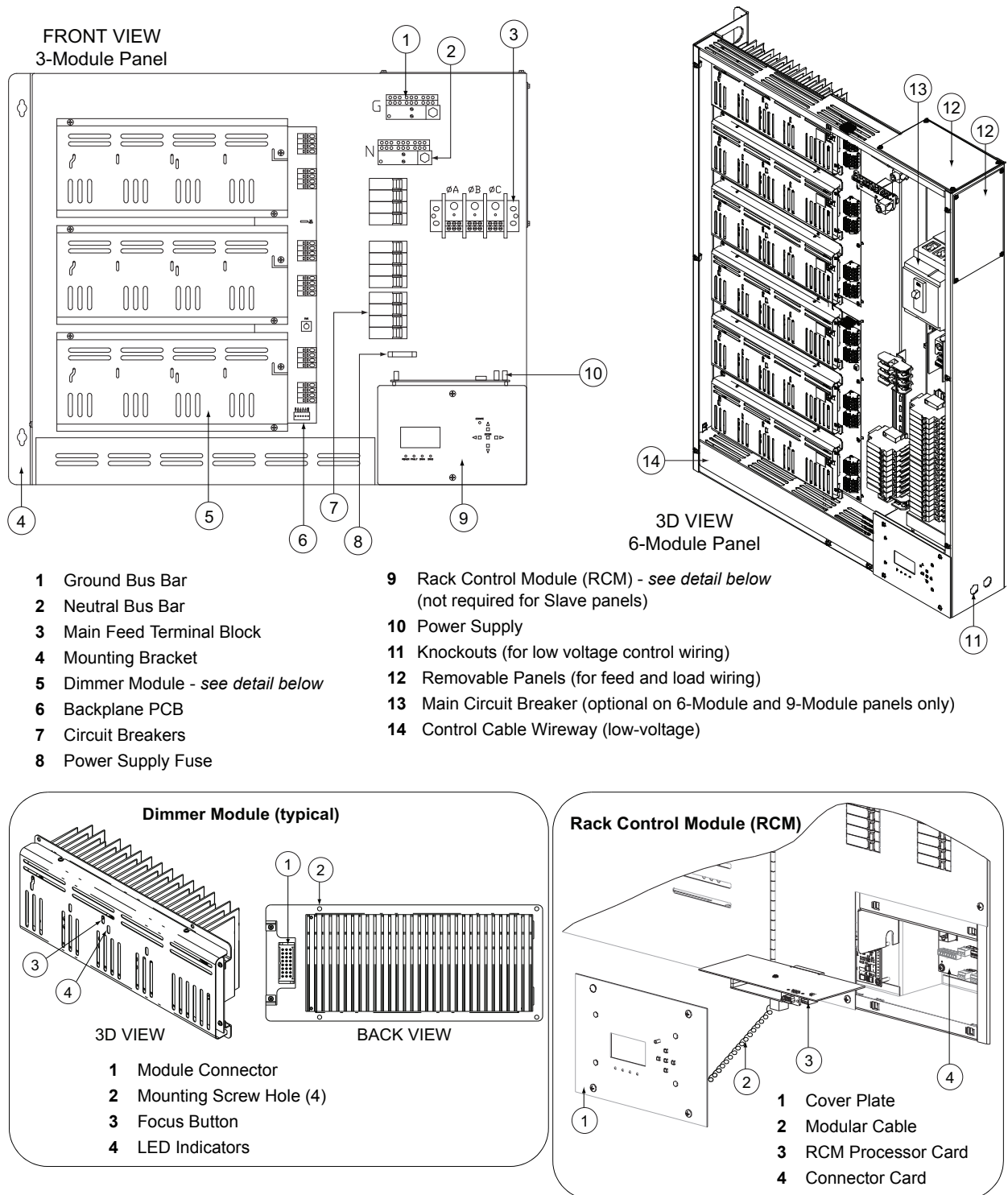
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**CAUTION:** 6- and 9-Module Panels should never be stacked due to thermal requirements.

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## 5. Components

**Note:** 3-Module and 6-Module Panels are shown in **Figure 1**, however, these components are typical for all models.



**Figure 1: A21 Panel Overview**



# INSTALLATION

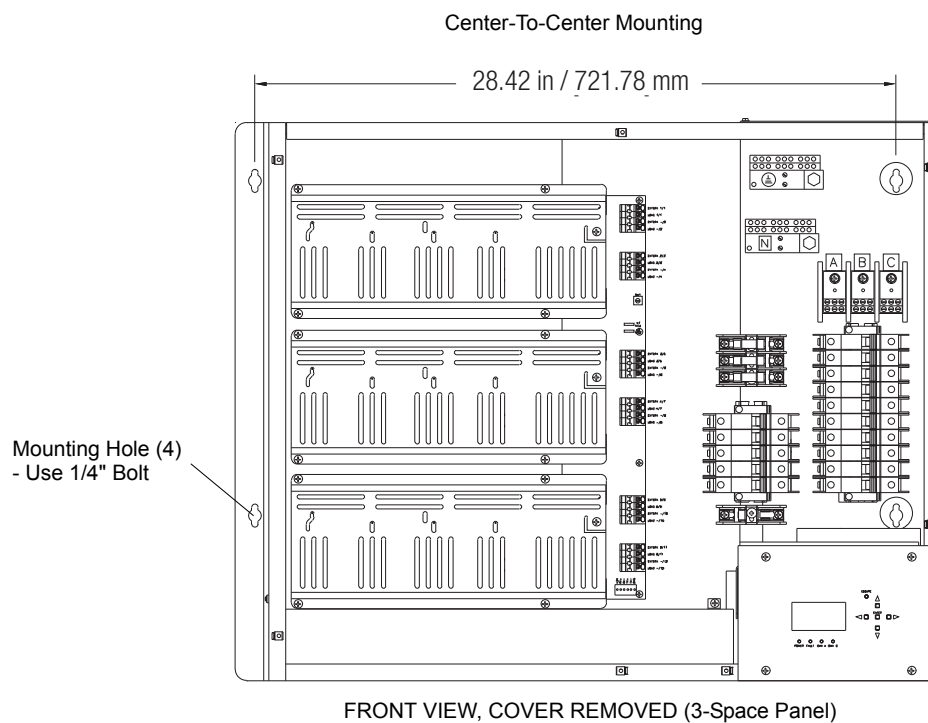
## 1. Mounting Panel to Wall

A21 Lighting Control Panels are intended for wall mounting for un-obstructed, natural convection cooling.

### To mount the panel:

- Step 1. Determine position and spacing for each type of A21 Lighting Control Panel. Refer to "[Location and Clearances](#)" on page 5 and "[Appendix B: Specifications](#)" on page 29.
- Step 2. Ensure that wall is capable of supporting the weight of the lighting control panel.
- Step 3. Remove front cover.
- Step 4. Mark hole placement on wall.
- Step 5. Using four 1/4" bolts - or six 1/4" bolts for 9-Module Panels - (not included), secure panel in place.
- Step 6. Repeat for all other panels.

**Note:** The A21 3-Module Panel is used to illustrate the installation in **Figure 2**. However, the horizontal spacing dimensions apply to all A21 Lighting Control Panels including the 6- and 9-Module versions. For overall dimensions for each model, refer to "[Appendix B: Specifications](#)" on page 29.



**Figure 2: Mounting the Panel**

## 2. Feed (Line Power) Wiring



**WARNING:** You must have access to a main circuit breaker or other power disconnect device before installing any wiring. Be sure that power is disconnected by removing fuses or turning the main circuit breaker off before installation. Installing the device with power on may expose you to dangerous voltage and damage the device. A qualified electrician must perform this installation.

**WARNING:** Refer to National Electrical Code® and local codes for cable specifications. Failure to use proper cable can result in damage to equipment or danger to persons.

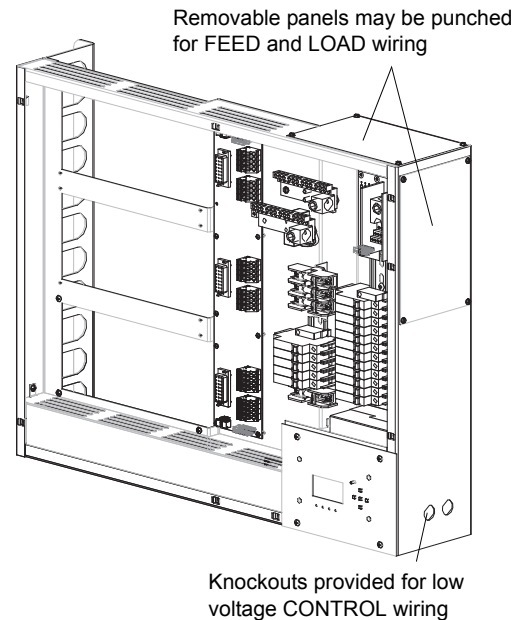
**CAUTION:** Wire openings **MUST** have fittings or lining to protect wires/cables from damage. Use 90° C copper wire only! Aluminum wire may not be used.

**CAUTION:** Use a separate wire for each neutral. **DO NOT use common neutrals.**

**CAUTION:** Failure to use the proper torque when tightening the set screws will cause premature failure of the equipment!

### To connect feed wiring:

- Step 1. Disconnect main power to A21 Panel.
- Step 2. Route FEED wires from power source to top or side of panel. (Feed wires cannot be fed through bottom of the unit.)
- Step 3. Remove wire access panel(s) as required. See **Figure 3**.
- Step 4. Install conduit fittings or insert lining materials in the access panel opening.
- Step 5. Replace wire access panel if using conduit.
- Step 6. Pull feed cables through prepared openings.
- Step 7. Strip 1-3/8 inches of insulation from end of each cable.
- Step 8. Strip 7/16 inch of insulation and connect Phase, Neutral, and Ground wires to appropriate terminals. (Line connections are labeled A, B and C.)
- Step 9. Tighten main lug set screws to proper torque termination as shown in the table below:



**Figure 3: Wiring Inputs**

TERMINAL	TIGHTENING TORQUE
Neutral Bus	350kcmil - #6 AWG Torque @ 275 in-lbs #4-14 AWG Torque @ 45 in-lbs
Ground Bus	350kcmil - #6 AWG Torque @ 275 in-lbs #4-14 AWG Torque @ 45 in-lbs
Power Distribution Block (3-Space Racks Only)	2/0 AWG - #14 AWG Torque @ 120 in-lbs #2-14 AWG Torque @ 20 in-lbs
Power Distribution Block (6- & 9-Space Racks Only)	350kcmil - #6 AWG Torque @ 275 in-lbs #10-14 AWG Torque @ 15 in-lbs

- Step 10. Remove all knockout pieces and debris.

**Note:** Refer to **Figure 4** on the following page for complete feed wiring diagram.

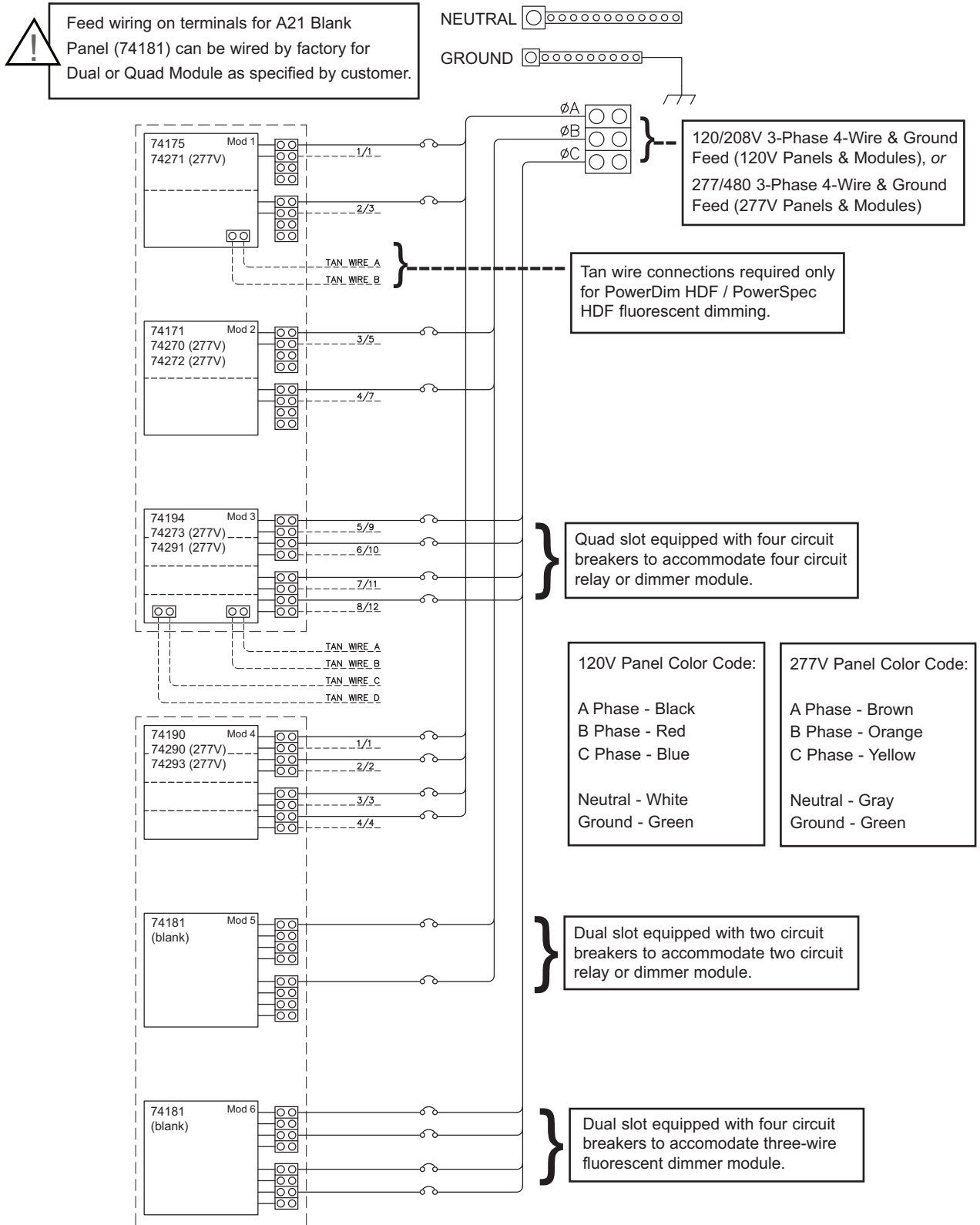


Figure 4: Feed Wiring Diagram

### 3. Installing Dimmer Modules

Any combination of A21 dimming and relay modules may be installed in the Lighting Control Panel. A21 Panels may be populated with either 120V or 277V Dimmer Modules, but not both. Blank covers (74181) MUST be installed in any unused spaces.

**Note:** If Dimmer Modules were not included with the initial installation package, proceed directly to Load Wiring section. Dimmer Modules may be installed at a later time.

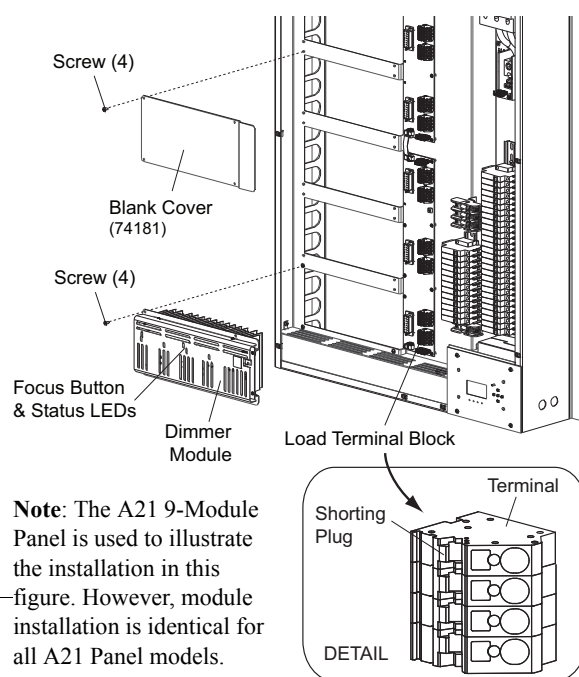
The A21 Lighting Control Panel has been shipped from the factory with shorting plugs installed on all circuits. These shorting plugs are located in the load connection terminal blocks (the shorting plug is the red tab protruding from the green terminal block). The shorting plugs allow circuits to be energized by operating the associated circuit breaker, even if a dimmer module has not been installed.

For proper operation of the A21 Dimmer Modules, shorting plugs must be removed prior to use.

#### To remove a shorting plug:

- Step 1. Disconnect main power to A21 Panel.
- Step 2. Open the dimmer module side of the panel's front cover.
- Step 3. Identify the circuits that will require removal of the shorting plug.
- Step 4. Firmly grasp the exposed red tab of the shorting plug (**Figure 5**).
- Step 5. Gently pull on the tab of the shorting plug.
- Step 6. It is recommended that all shorting plugs be saved for future use. (In the event service is needed on any module, the jumper can be re-installed to provide constant power to the load circuit.)
- Step 7. Close panel cover.
- Step 8. Energize panel.

**Note:** Shorting plugs may be left in all empty dimmer slots and may be used as constant current circuits within the approved current rating of the circuit breaker.



**Note:** The A21 9-Module Panel is used to illustrate the installation in this figure. However, module installation is identical for all A21 Panel models.

**Figure 5: Installing Modules and Blank Covers**

#### To install modules:

- Step 1. Unpack module and properly recycle or discard packaging materials. (Be sure to keep the instruction sheet for future use.)
- Step 2. Disconnect main power to A21 Panel.
- Step 3. Open the dimmer module side of the panel's front cover.
- Step 4. Determine proper mounting location for the Dimmer Module. When possible, lower modules should be installed first.
- Step 5. If present, remove blank cover (74181) from location where module is to be installed. See **Figure 5**.
- Step 6. Gently insert module into lighting control panel, heatsink first. Secure module using four screws (provided).
- Step 7. *For PowerDim/HDF modules only:* Connect tan control wire to screw terminal on module. (Circuit #1 on module will be top screw.) Tighten screw to a torque of 5 in-lbs.
- Step 8. *For Mark 7 dimmer modules only:* Connect violet/grey control wire to screw terminal on module. (Circuit #1 on module will be top screw.) Tighten screw to a torque of 5 in-lbs.
- Step 9. Close panel cover.

## 4. Load Wiring



**WARNING:** You must have access to a main circuit breaker or other power disconnect device before installing any wiring. Be sure that power is disconnected by removing fuses or turning the main circuit breaker off before installation. Installing the device with power on may expose you to dangerous voltage and damage the device. A qualified electrician must perform this installation.

**WARNING:** Refer to National Electrical Code® and local codes for cable specifications. Failure to use proper cable can result in damage to equipment or danger to persons.

**CAUTION:** Wire openings **MUST** have fittings or lining to protect wires/cables from damage. Use 90° C copper wire only! Aluminum wire may not be used.

**CAUTION:** Use a separate wire for each neutral. **DO NOT use common neutrals.**

**CAUTION:** Failure to use the proper torque when tightening the set screws will cause premature failure of the equipment!

The A21 Panel will need to be wired for the Load circuits. Use #10 AWG Solid Core or #12 AWG Stranded Core Max.

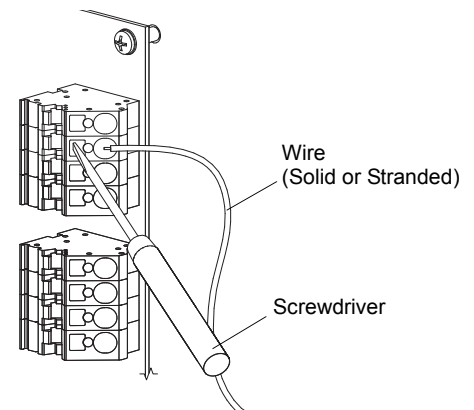
### To connect load wiring:

- Step 1. Disconnect main power to A21 Panel.
- Step 2. Route all LOAD wiring to side of panel. (Load wires cannot be fed through bottom of the unit.)
- Step 3. As required, remove wiring covers or knockout holes to accommodate wiring (see **Figure 3** on page 8).
- Step 4. Route LOAD GROUND wires, if any, to Ground Bus. Strip 7/16 inch of insulation and terminate using torque values as shown in the table below.
- Step 5. Separate LOAD NEUTRAL wires and route to Neutral Bus (see **Figure 1** on page 6). Strip 7/16 inch of insulation and terminate using torque values as shown in the table.
- Step 6. Route LOAD HOT wires to their individual terminals located on the Backplane PCB (see **Figure 6** below). Strip 7/16 inch of insulation and terminate in spring-cage terminals using small flat screwdriver (no torque setting required).



**CAUTION:** Do not attempt to "push" load wires into spring-cage terminals without first inserting the screwdriver into the appropriate slot (**Figure 6**). *Failure to install load wires as directed may damage the spring-cage connector, and may void manufacturers warranty!*

TERMINAL	TIGHTENING TORQUE
Neutral Bus	#4-14 Torque @ 45 in-lbs
Ground Bus	#4-14 Torque @ 45 in-lbs
Backplane PCB	Spring-Cage Connection (no torque required)



**Figure 6: Backplane Load Wiring Terminals**

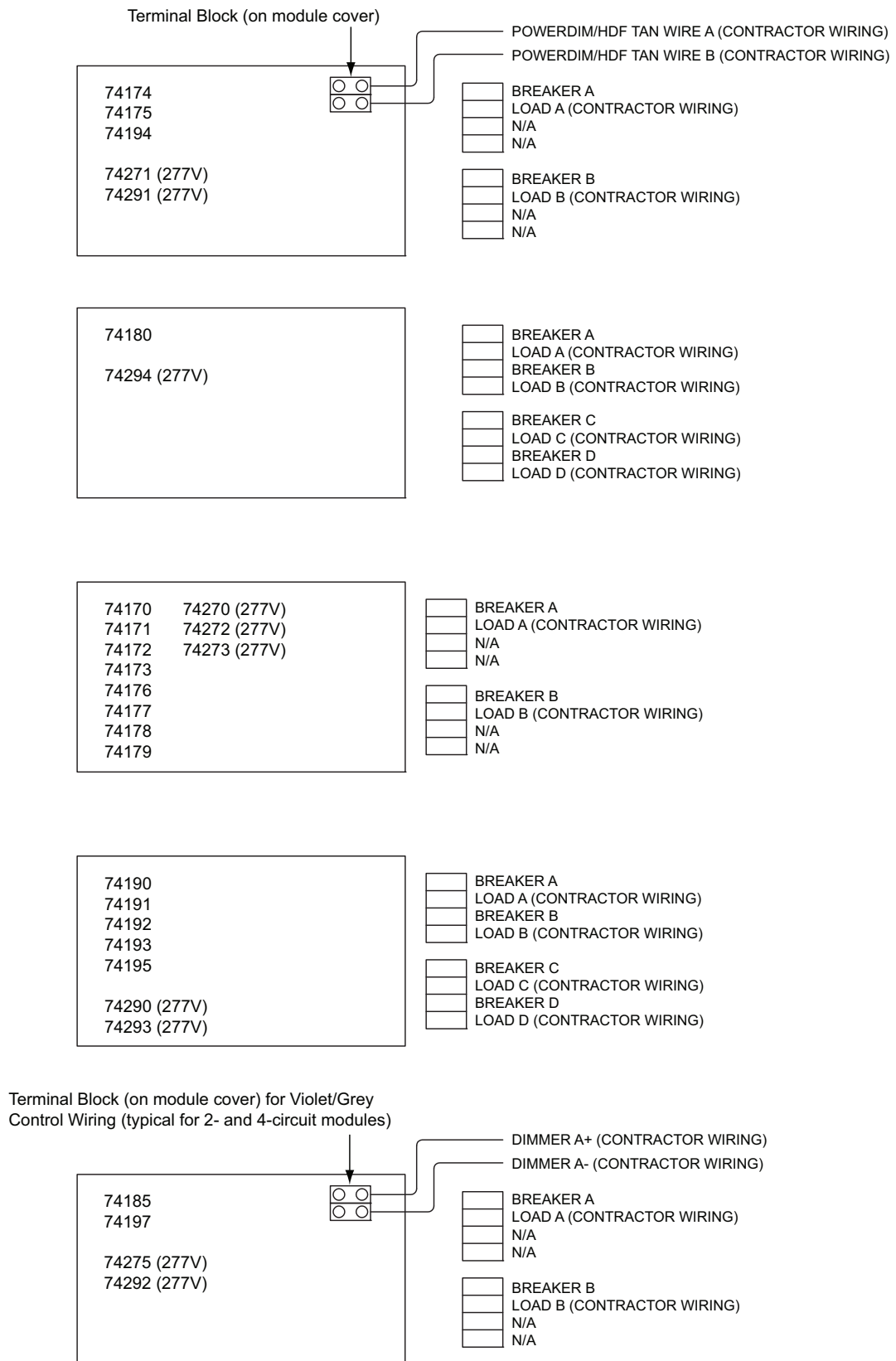


Figure 7: Module Load Wiring Diagram

## 5. Control Wiring

A21 Lighting Control Panels may be controlled by the following methods:

- DMX512
- Vision.net
- Optional ShowNet Ethernet (10/100BaseT)
- Auxiliary inputs: Panic Control and Fire Alarm Signal
- Local control through Rack Control Module (RCM)

For approved wire types per control method, refer to "[Appendix A: Standard Wiring](#)" on page 25.

Each Lighting Control Panel contains a Control PCB for connection of control wiring. The Control PCB also contains jumpers for termination of DMX512 signal and connection to Slave panels.

### To connect control wiring:

- Step 1. Route control wiring from source to side of Lighting Control Panel.
- Step 2. Remove knockout(s) as required. See **Figure 1** on [page 6](#).
- Step 3. Install conduit fittings or insert lining materials in the knockout opening.
- Step 4. Pull control wiring through prepared openings.



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**CAUTION:** Wire openings must have fittings or linings to protect wire and cable insulation.

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- Step 5. Prepare cabling as shown in "[Appendix A: Standard Wiring](#)" on page 25.
- Step 6. Connect wiring to appropriate location on Control PCB. See **Figure 8** on the following page.
- Step 7. Set DMX A Thru termination jumper as required.

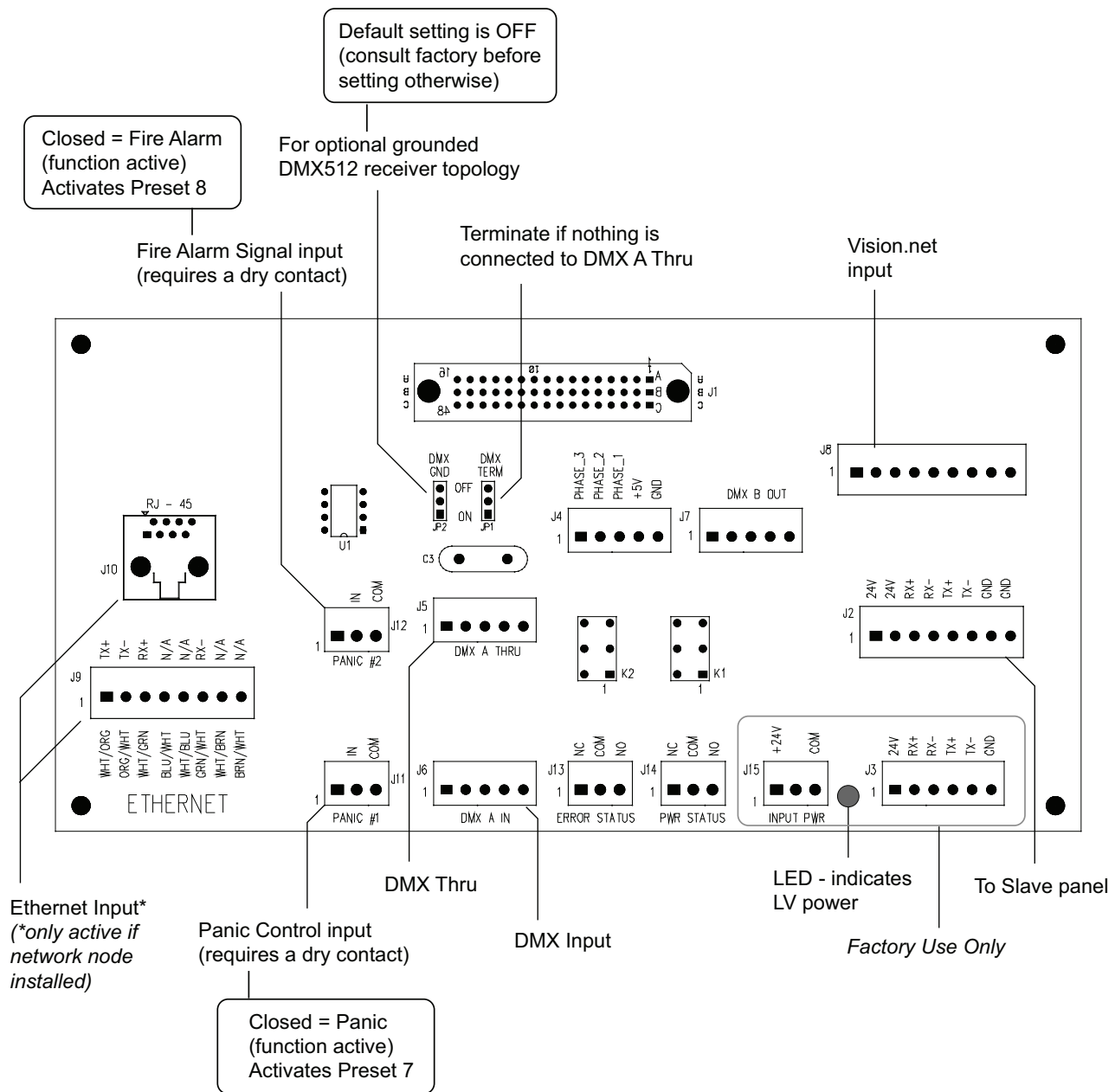


Figure 8: Control PCB

**Note:** Refer to "Appendix A: Standard Wiring" on page 25 for complete control wiring pin-out and termination requirements.



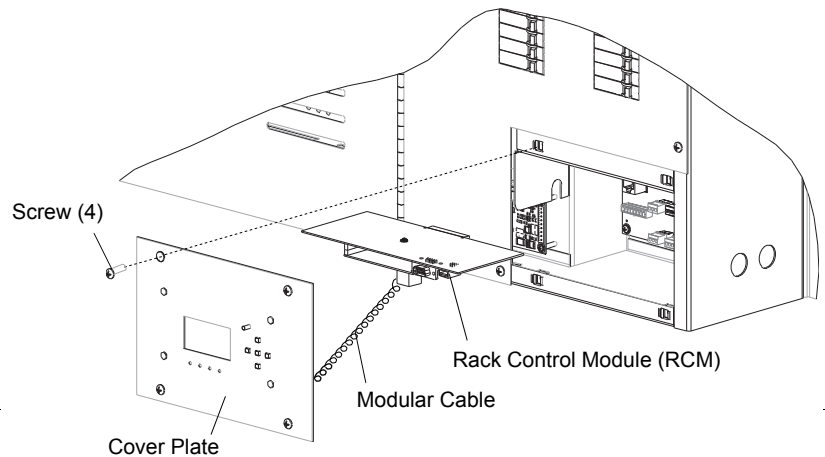
## 6. Installing Rack Control Module (not required for slave cabinets)

A21 Lighting Control Panels are controlled by the A21 Rack Control Module (RCM).

### To install RCM:

- Step 1. At required panel, remove control module cover plate by removing four screws (Figure 9).
- Step 2. Install RCM.
- Step 3. Connect modular cable from RCM board to display board on cover plate.
- Step 4. Re-install head-end cover plate and secure with four screws.

**Note:** Slave Cabinets do not require an RCM to be installed.



**Figure 9: Installing Rack Control Module**

## 7. Addressing/Configuring the Backplanes

**Note:** Backplane PCBs are pre-configured for your application at the factory. This information is included as reference only in the event a Backplane PCB requires re-configuration or changing in the future.

A21 Dimmer Modules are connected to a Backplane PCB(s), which is pre-installed in the panel. Each Backplane PCB accommodates up to three module connections. Depending on your dimming system, there may be up to 16, three-module Backplane PCBs connected together, and cannot contain more than 96 dimmers (Dual Dimmer Module = 2 dimmers; Quad Dimmer Module = 4 dimmers) total when panels are used in a Master/Slave configuration. Before any dimmer modules are installed, it will be necessary to address the Backplane PCB(s).

- Each Backplane has a rotary switch that is used to set the Backplane's address (0-15).
- Each Backplane has a set of jumpers that allow it to be configured as a Dual or a Quad Backplane. Set to Dual only if all dimmer modules to be connected to the backplane are Dual dimmers.
- Each Backplane also has a termination header. The termination is set to Term only on the first and last Backplane (all others are set to Thru).

The first Backplane is the top Backplane in the cabinet that contains the A21 Rack Control Module (RCM). The Backplanes will be addressed from top to bottom in the first cabinet. If another slave cabinet (no RCM) is to be added, continue the addressing from top to bottom as well. Continue this method of addressing until the last Backplane in the last cabinet is connected. Slave cabinets are connected to the first cabinet and to additional slave cabinets using an 8-conductor (CAT5e UTP) cable, no longer than 1000 feet system wide.

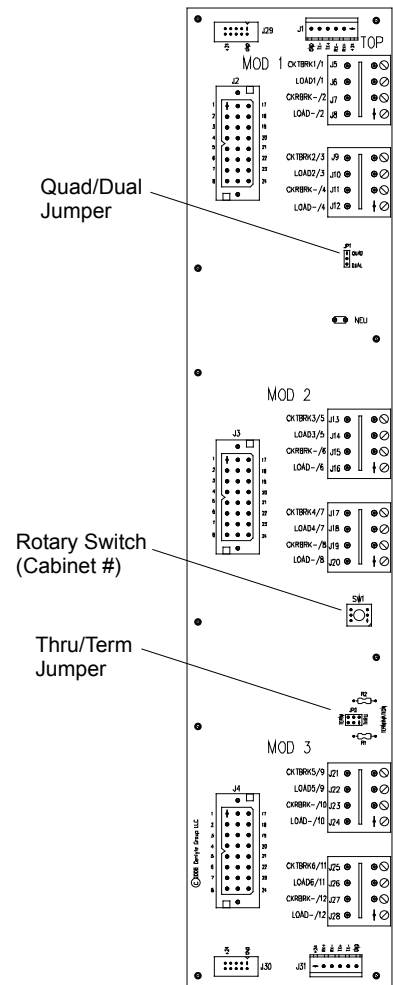
**To address/configure Backplanes:**

First Backplane:

- Step 1. Set rotary switch of first Backplane to 0. (Refer to **Figure 10.**)
- Step 2. Set Backplane configuration jumper to either Dual or Quad.
- Step 3. Set Termination jumpers to Term.

Next Backplane:

- Step 1. a) If previous Backplane is set to Dual, then set rotary switch on this Backplane to the previous Backplane's setting plus 1.  
Example: If previous setting was 0, then set this switch to 1.  
  
b) If previous Backplane is set to Quad, then set rotary switch on this Backplane to previous Backplane's setting plus 2. Example: If previous setting was 0, then set this switch to 2.
- Step 2. Set Backplane configuration jumper to either Dual or Quad.
- Step 3. If this is not the last Backplane to be configured, then set Termination jumpers to Thru. If this is the last Backplane to be configured, then set the Termination jumpers to Term.
- Step 4. Repeat the above 3 steps for all Backplanes.



**Figure 10: Backplane PCB**

# CONFIGURATION USING RCM LCD MENU

## 1. Overview

The A21 Lighting Control System can be configured directly at the Rack Control Module (RCM) using the built-in LCD Menu.

Please note that while the built in LCD menu will display all system status information, it provides only basic configuration capabilities. Strand Lighting's Dimmer.net software provides an advanced interface for configuring A21 Lighting Control System options. Where applicable, refer to the Dimmer.net manual for full explanations of each configuration option. Dimmer.net software and manuals may be downloaded at [www.strandlighting.com](http://www.strandlighting.com).

## 2. Menu Operation

The RCM LCD Menu provides local control for accessing all system status information and for making a limited amount of configuration changes to that particular RCM. (If there are multiple RCMs in the system, changes would need to be made at each RCM.)

Upon power up, the LCD Menu will display the Philips logo followed by the current RCM software version and RCM name. After briefly displaying this information, the MAIN MENU will appear.

**Note:** To return to the power up screen after boot up, press the [Escape] button.

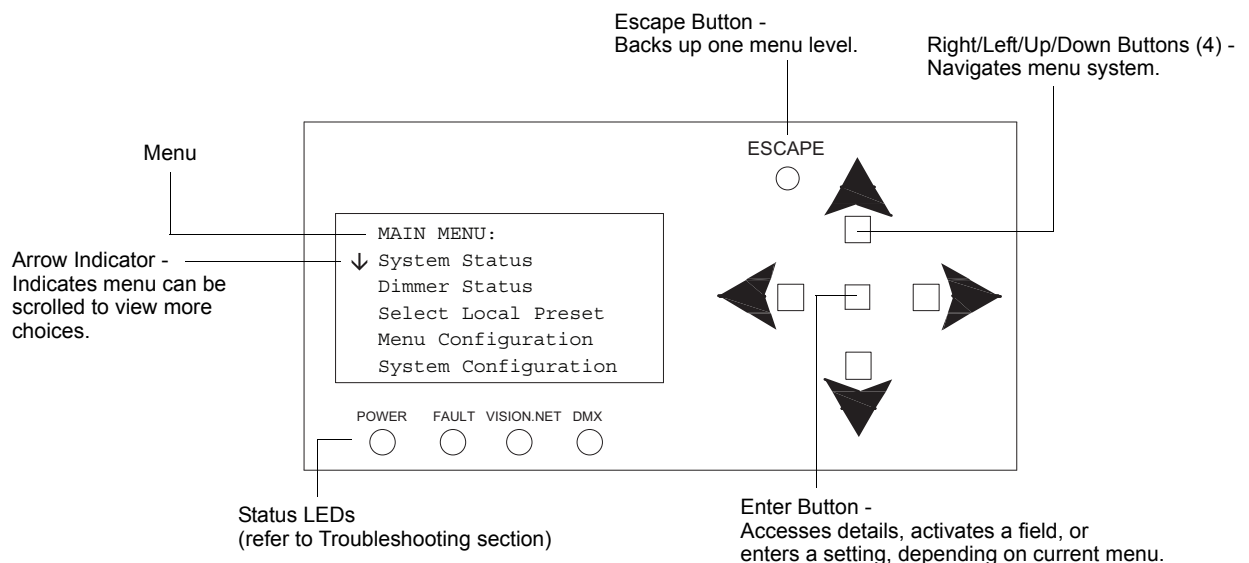


Figure 11: LCD Menu

## 3. LCD Menu System

The Head-End Processor LCD Display Menu system consists of eight main categories. To navigate the menus, press the four navigation buttons as required (**Figure 11**). When the desired menu is reached, press [Enter] to display the menu options. Use navigation and [Enter] buttons to view status and configure the LCD Menu as required.

## LCD Menu Structure

### MAIN MENU

- System Status (SYSTEM STATUS)
- Dimmer Status (DIMMER STATUS)
- Select Local Preset (SELECT PRESET)
- Menu Configuration (MENU CONFIG)
- System Configuration (SYSTEM CONFIG)
- Dimmer Options Config (DIMMER OPTIONS)
- Dimmer Input Config (DIMMER INPUT)
- Dimmer Presets Config (EDIT PRESETS)

MAIN MENU:  
 ↓ System Status  
 Dimmer Status  
 Select Local Preset  
 Menu Configuration  
 System Configuration

### SYSTEM STATUS (status information shown, no user-selectable options)

Sub Menu	Options	Comments
Type	N/A	Displays product type
Dimmer Status	N/A	Displays either OK (no errors) or Errors
Dimmer Present	N/A	Displays the number of dimmers in the dimmer cabinet
Dimmers with Errors	N/A	Displays the number of dimmers with errors
Firmware	N/A	Displays Processor's current firmware version as: 86-XXXX vX.XX

### DIMMER STATUS (status information shown, no user-selectable options)

Sub Menu	Options	Comments
Slot	N/A	Displays dimmer information being viewed (and its DMX512 address)
Level	N/A	Displays dimmer's current operational level (in percentage)
TMP	N/A	Displays current temperature of dimmer (displayed in both C and F)
Line	N/A	Displays input line voltage (in VAC)
Load	N/A	Displays connected load to dimmer (displayed in watts)
Status	N/A	Status of dimmer Normal, Non-Dim, or Breaker Off? (if no power to dimmer)
Errors	N/A	Displays if the dimmer is experiencing any errors
Mod	N/A	Displays module type
Version	N/A	Displays dimmer's firmware version

If [Enter] button is pressed, the following fields change in Dimmer Status as follows:

Level	N/A	[0] to [255]
Status	N/A	[00] Config: [XX]
Errors	N/A	[00] Panel: [XX]

Continued next page

## LCD Menu Structure (continued)

Continued from previous page

**SELECT PRESET**

Sub Menu	Options	Comments
Select a Preset	None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	Manually selects a preset via the unit's processor (as in testing processor communication and dimmer operation)

**MENU CONFIG**

Sub Menu	Options	Comments
Backlight On (min) (in minutes)	Always (always on) / 1 to 60 minutes (in 1 minute increments)	Sets the amount of time the unit's processor LCD display backlight is on after the last button press
LED ON (MIN)	Always (always on) / 1 to 60 minutes (in 1 minute increments)	Set the amount of time the status LEDs flash during operation. The Power LED normally flashes (as a heartbeat) when set to Always. When the option is set to a specific time, the LED will only flash in the time increment (e.g., every five minutes).
Display Contrast (%)	0 to 100% (in 1% increments)	Sets the contrast level of the LCD Display

**SYSTEM CONFIG**

Sub Menu	Options	Comments
DMX A	Enabled / Disabled	Enables or disables the DMX A port
DMX B (Pathport)	Enabled / Disabled	Enables or disables the DMX B port
Vision.net Network	Enabled / Disabled	Enables or disables the Vision.net Network port
Vision.net Station ID	Off / 1 thru 255	Sets Vision.net Station ID for the unit
DMX Hold (hh:mm) (in hours:mins)	None / 0:01 / 0:05 / 0:10 / 0:15 / 1:00 / 2:00 / 4:00 / 12:00	Sets the amount of time the dimmer cabinet will keep and adhere to the last DMX512 levels
Power-up Preset	None / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	Sets what preset the dimmers go to when dimmer cabinet is initially powered
Power-up Hold	Forever / 0:01 / 0:05 / 0:10 / 0:15 / 1:00 / 2:00 / 4:00 / 12:00 / 24:00	Sets the amount of time the dimmers will go and stay at the preset level (if set) when the dimmer cabinet is initially powered. Will follow DMX512 commands at anytime.
Preset Clear	None / DMX	Sets how Presets are cleared either never or via DMX512
Config Port	Ethernet / RS232	Sets configuration port to Ethernet or RS232 input
Panic Inputs	Normally Open / Normally Closed	Sets panic inputs to open or closed

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## LCD Menu Structure (continued)

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### DIMMER OPTIONS

<i>Sub Menu</i>	<i>Options</i>	<i>Comments</i>
<b>Slot</b>	N/A	Displays dimmer (1 through X) for the dimmer to be configured, and its DMX512 address (DMX XXX)
<b>Mode</b>	RPC (Reverse Phase Control) / FPC (Forward Phase Control) / Non-Dim / LED - RPC, LED-FPC	Sets dimmer operation. Also allows user to set the dimmer to Non-Dim operation (as a On or Off device). LED mode is for line voltage LED fixtures that require locked reverse phase control dimming (set at 400µS).
<b>Non-Dim%</b>	0 to 100%	When dimmer is in non-dim mode, this option sets the dimmer's threshold level (selection 0 to 100%). Levels below this will turn the dimmer off and levels equal to or above this percentage will turn them on.
<b>Voltage at Full (VAC)</b>	100 / 110 / 115 / 120	Sets dimmer operational voltage. Using a lower voltage than lamp specification can prolong lamp life.
<b>Transition (µS) (in microseconds)</b>	400 / AUTO*	Options available (in both FPC and RPC) are either 400µS (set) or AUTO (automatically and continuously adjusts between 400µS to 800µS)
	*Note, when "LED" option is selected in "Mode", the dimmer is set to 400 µS and cannot be changed to AUTO.	
<b>Response (ms) (in milliseconds)</b>	N/A	Sets response time in milliseconds
<b>Dimmer Curve</b>	Linear / Square Law / Invert / Slow Bottom / Fast Bottom / Fast Top / Full at 1 / Out at 100 / Preheat 5% / Preheat 10% / Hot Patch / Adv Mark 10 (Advance Mark 10 fluorescent ballasts)	Sets dimmer curve (dimming operation) for each dimmer in the dimmer cabinet
<b>High Trim</b>	1 to 100%	Sets the top end of the dimmer operational limit
<b>Low Trim</b>	0 to 99%	Sets the low end of the dimmer operational limit
<b>Always On</b>	Yes or No	If set to "Yes", then the dimmer stays on to the Low Trim setting.
<b>Preheat</b>	Yes or No	Allows dimmer to be set to preheat mode. Normally preheat mode is used to "speed up" large wattage lamps so they behave more like smaller ones

Continued next page

## LCD Menu Structure (continued)

Continued from previous page

### DIMMER INPUT

<i>Sub Menu</i>	<i>Options</i>	<i>Comments</i>
<b>Dimmer</b>	N/A	Dimmer number
<b>DMX A</b>	N/A	Dimmer number specified for DMX A
<b>DMX B (Ethernet)</b>	N/A	Dimmer number specified for DMX B
<b>Room</b>	N/A	Room number
<b>Channel</b>	N/A	Channel number
<b>DMX A Priority</b>	None / Primary / Fallback	Sets priority level for DMX A
<b>DMX B Priority</b>	None / Primary / Fallback	Sets priority level for DMX B
<b>Present Priority</b>	None / Primary / Fallback	Sets priority level for Present

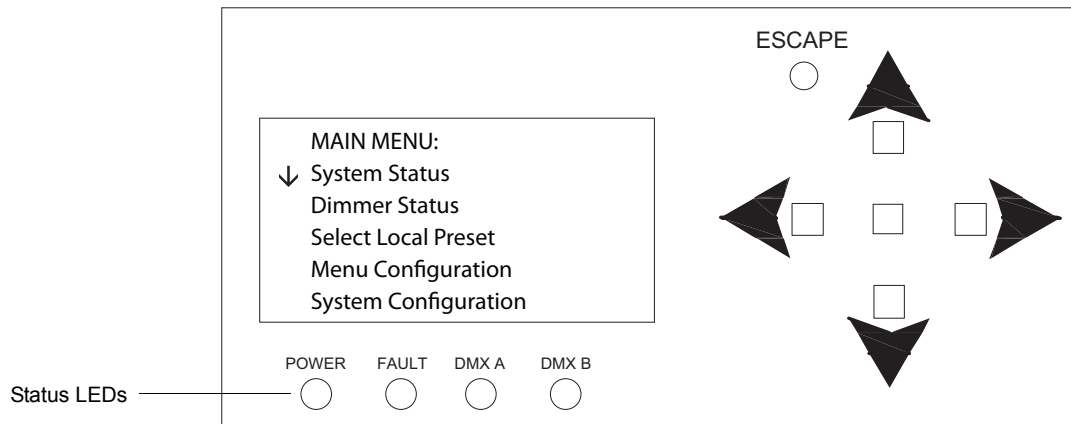
### EDIT PRESETS

<i>Sub Menu</i>	<i>Options</i>	<i>Comments</i>
<b>Dimmer</b>	N/A	Set dimmer number
<b>Slot</b>	N/A	Displays dimmer (1 through X) for the dimmer to be configured (and its DMX512 address)
<b>Preset</b>	1 / 2 / 3 / 4 / 5 / 6 / 7 / 8	Selects the preset to be programmed
<b>Level (%)</b>	0 to 100% (in 1% increments)	Selects the preset level of the dimmers (each dimmer is individually programmable)
<b>Dimmer Set</b>	One / All / Capture (Yes / No)* * Next selection is "Capture ALL Dimmers? (Yes / No)	Allows users to set preset to one or all dimmers (at the same time) or Capture (snapshot) a look from all dimmers

# TROUBLESHOOTING

## 1. Status Indicators

LED status indicators located at the Head-End Processor provide feedback for power input, control input, and error conditions.



**Figure 12: Head-End Processor**

The status indications are as follows:

LED	Condition	Meaning
POWER	Flashing Green	Indicates power is active to the Rack Control Module (RCM). Fast flash indicates Vision net command has been received. It will return to a steady blink after completion of Vision net command.
FAULT	Flashing or Steady Red	Indicates an error condition in the cabinet. If illuminated, remove power to the panel, wait 15 seconds, and re-energize panel. If error condition persists, please contact Strand Lighting Technical Support.
DMX A	Illuminating Yellow	Indicates presence of DMX512 control signal on DMX Input A.
DMX B	Illuminating Yellow	Indicates presence of DMX512 control signal on DMX Input B (if Network Node installed).



## 2. Troubleshooting Procedures

### To physically examine the system:

- Step 1. Check LEDs at front of RCM. (Refer to **Figure 11** on [page 17](#).)
- Step 2. At main circuit breaker(s), check for tripped circuits.
- Step 3. Disconnect power to the system.
- Step 4. Check for damaged or loose control and/or load connections.

### To further troubleshoot:

Refer to the Troubleshooting Flow Chart below.

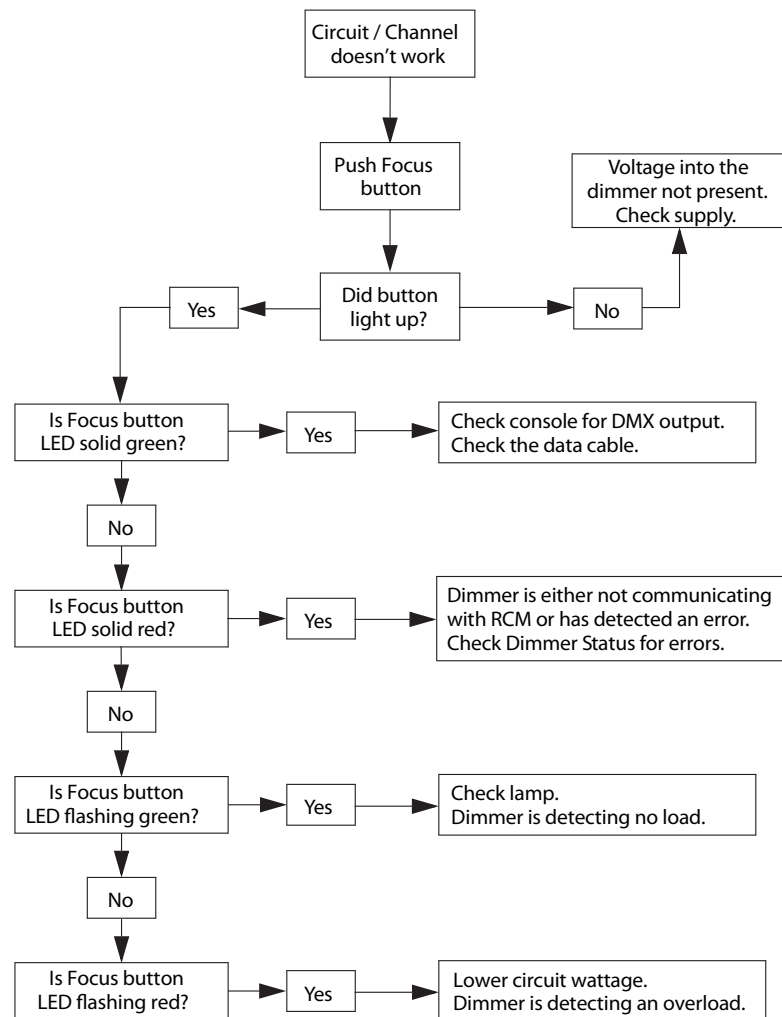


Figure 13: Troubleshooting Flow Chart

# EMERGENCY LIGHTING OPERATION (UL924)



**IMPORTANT!** UL924 operation applies only to A21 Panels which have been configured at the factory for Emergency Lighting Operation. If a previously installed A21 Panel is required to operate emergency lighting and needs to be updated in the field, please contact Strand Lighting Technical Support at 1-214-647-7880.

## 1. Overview

When required, the A21 Lighting Control Panel may be used to energize emergency lighting circuits in the event of a loss of power. A21 Panels may be custom configured at the factory with special software and hardware to allow the unit to comply with UL924 Electronic Bypass. When configured in this mode, the A21 Panel allows select circuits to be energized at 100% output upon activation by a control signal. Circuits not identified as emergency may be locked "Off" or can "Ignore" the emergency state and still respond to local controls.

When A21 Panels are used as part of an emergency lighting control system, feed power supplied to the A21 Panel must be switched by an upstream UL1008 Listed Transfer Device.

To trigger the A21 Panel to enter the emergency mode, a control signal (Contact-Closure, open) must be provided to the panel, and connected to the Panic #1 input, located on the Control PCB. Strand Lighting recommends the use of a 3-phase UL924 or UL 1008 compliant phase loss relay interface to monitor normal power and provide a control signal to the A21 Panel in the event of a disruption of any phase of the normal power feed.

When the A21 Panel is in an active emergency mode, the LCD display will read EMERGENCY MODE ACTIVE and the display backlight will flash.

## 2. Testing Panel Emergency Mode Operation

To test the UL924 operational mode of a A21 Lighting Control Panel, you must remove the provided Emergency Bypass Test Connector from the PANIC #1 connector on the Control PCB as shown in **Figure 8** on [page 14](#) and **Figure 14** below.

- When the Emergency Bypass Test Connector is inserted into PANIC #1 connector on Control PCB, the panel will *NOT* operate in Emergency Mode.
- When the Emergency Bypass Test Connector is *NOT* installed *AND* a UL1008 Transfer Switch is *NOT* connected to the panel, a UL924 configured panel will go into emergency mode.

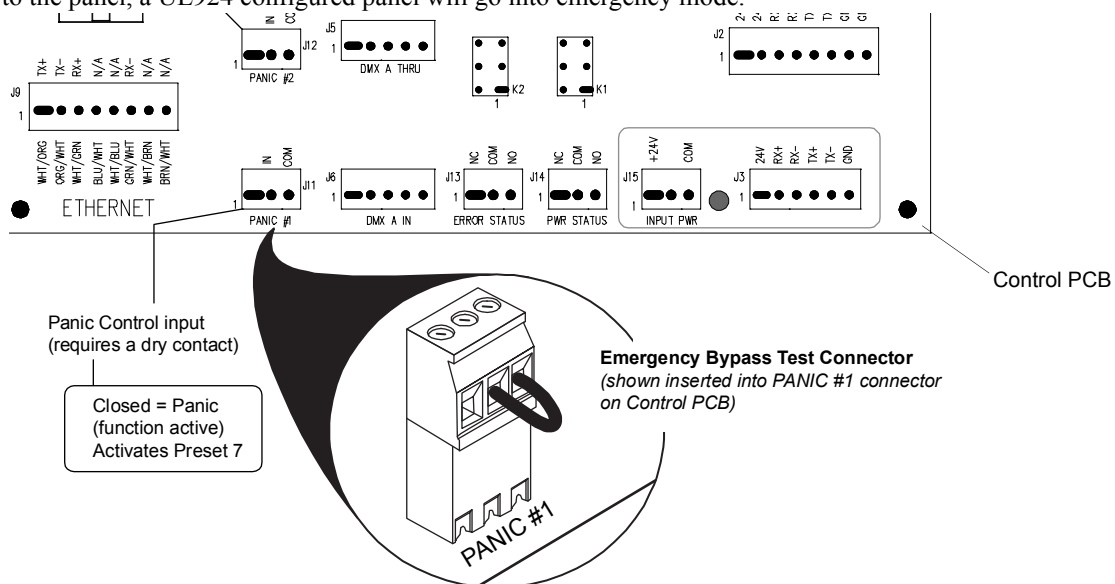


Figure 14: Emergency Bypass Test Connector

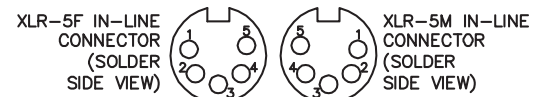
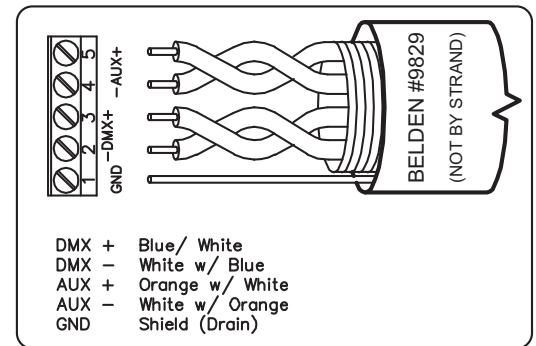
## APPENDIX A: STANDARD WIRING

### 1. DMX512

DMX512 Terminal	XLR Pin Name	WE Color Code (e.g., Belden #8132)	IECA Color Code	Belden Standard Color Code	CAT5e Color Code
GND	1	Drain Wire (Shield)	Drain (Shield)	Drain (Shield)	Brown (8) White/Brown (7)
DMX -	2	White w/ Blue	Black	Black (of Red pair)	Orange (2)
DMX +	3	Blue w/ White	White	Red	White/Orange (1)
AUX -	4	White w/ Orange	Red	Black (of White pair)	Green (6)
AUX +	5	Orange w/ White	Green	White	Green/White (3)

Contractor is Responsible for All Terminations

- Only approved EIA-485 cable types may be used.  
Approved types are:  
Belden #9829 and TMB Proplex #PC224T  
An acceptable plenum rated cable is: Belden #89729
- Category 5e cable may be used for DMX512. Approved types are: Belden #1583A and Belden #1585A (Plenum).
- Cable **MUST** be terminated exactly as shown here.
- DMX512 cable runs **MUST** be routed in a "Daisy-Chain" configuration as shown in your drawing set, if provided. **DO NOT** convert these cables to home runs.
- DMX512 cable runs should all be in metal conduit.  
Runs in exposed areas must be in metal conduit.  
Maximum cable run should not exceed 1000 feet.



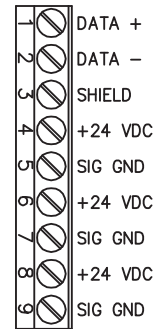
#### Additional Resources for DMX512

For more information on installing DMX512 control systems, the following publication is available for purchase from the United States Institute for Theatre Technology (USITT), "Recommended Practice for DMX512: A Guide for Users and Installers, 2nd edition" (ISBN: 9780955703522). USITT Contact Information:

**USITT**  
**315 South Crouse Avenue, Suite 200**  
**Syracuse, NY 13210-1844 USA**  
**1-800-938-7488 or 1-315-463-6463**  
[www.usitt.org](http://www.usitt.org)

## 2. Vision.net Networks (SVN/485)

Pin Number	Signal Name	CAT5e Wire Color
1	Data +	White w/ Orange
2	Data -	Orange
3	SHIELD	Shield
4	+24 VDC	White w/ Green
5	Signal GND	Green
6	+24 VDC	White w/ Blue
7	Signal GND	Blue
8	+24 VDC	White w/ Brown
9	Signal GND	Brown



Contractor is Responsible for All Terminations

- 1) Only approved cable types may be used. Approved types are: Belden #1583A and Belden #1585A
- 2) Cable **MUST** be terminated exactly as shown here. Total length of cable in Vision.net Network Wiring must NOT exceed 1000 feet.
- 3) Cable runs should be routed in a "Daisy-Chain" configuration as shown in your drawing set, if provided. **DO NOT** convert these cables to home runs.
- 4) Maximum station quantity subject to power supply and system requirements. Please consult factory for specific information.

## 3. Termination of Shielded Cable

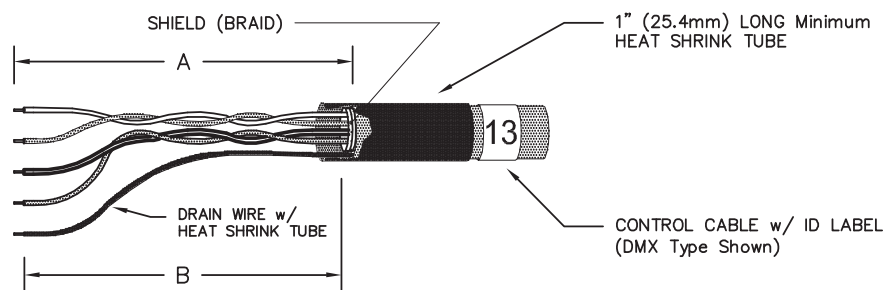
Dimension	Name	Minimum	Maximum for Terminal	Maximum for LXR (In-Line)
A	Remove Cable Jacket	1" (25.4mm)	2-1/4" (60mm)	1-1/4" (31.8mm)
B	Drain Wire Heatshrink	Dim 'A' - 1/8" (3.2mm)	-	-

To terminate shielded cable:

Step 1. Strip off specified length of outer jacket.

Step 2. Cut shield (foil or braid) flush to outer jacket. **DO NOT** cut drain wire.

Step 3. Fit specified length of 1/16" heat shrink tubing over the drain wire.



Step 4. For solder connections, fit a 1/2" length of 1/16" heat shrink tubing over each conductor.

Step 5. Fit a 1" length of 3/8" heat shrink tubing over the entire cable. Position it so that 3/4" of its length is over the cable jacketing, and 1/4" of its length is over the loose conductors.

Step 6. Strip 1/8" inch of the insulation from each of the conductors.

Step 7. Terminate the conductors on the terminal block, or solder the terminals as specified.

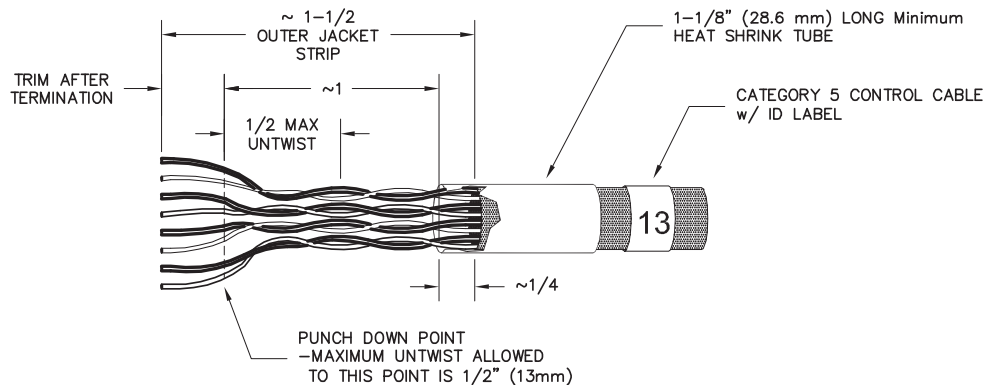
Step 8. For solder connections, shrink the individual 1/2" lengths of heat shrink tubing over the solder terminals.

Step 9. Shrink the remaining heat shrink tubing.

Step 10. Apply the appropriate ID label to the cable at the end of the outer heat shrink tubing.

## 4. Termination of Ethernet Cable

Function	Pair #	Pin Out (T568B)	Wire Color
(T1) (R1)	1	5 4	White w/ Blue Blue
Tx + (T2) Tx - (R2)	2	1 2	White w/ Orange Orange
Rx + (T3) Rx - (R3)	3	3 6	White w/ Green Green
(T4) (R4)	4	7 8	White w/ Brown Brown



Cable Type (10/100 Base-T Ethernet)	Description
Belden #1583A Nominal O.D. 0.214" (5.54 mm)	CATEGORY 5e: Non-plenum rated 4-Unshielded Twisted Pairs (UTP) #24 AWG
Belden #1585A Nominal O.D. 0.206" (5.23 mm)	CATEGORY 5e: Plenum rated 4-Unshielded Twisted Pairs (UTP) #24 AWG

### To terminate Ethernet cable:

- Step 1. Strip off outer jacket - approximately 1-1/2" (37.6mm)
- Step 2. Fit a piece of 1-1/8" (28.6mm) long heat shrink tubing over the cable extending out 1/4" (8.25mm) from outer jacket.
- Step 3. Terminate approximately 1/2" (12.2mm) from end of conductors on Type 110 punch down block or connector per schedule (T568B)
  - Maximum untwist of conductors to terminations is 1/2" (12.2mm)
  - Trim excess leads.
- Step 4. Shrink tubing and add appropriate ID label to the cable at the end of the heatshrink tubing.

System topology and labeling should follow TIA/EIA-568B and TIA/EIA-606 as applicable.

Per TIA/EIA-568B, Maximum length of any horizontal cable run (i.e. between Ethernet RJ-45 receptacle (work area) and Patch Panel) is 90 meters; Maximum length of any CATEGORY 5e cables at the Ethernet RJ-45 receptacle (work area) is 3 meters.

Ethernet equipment (e.g. Patch Panels, Hubs or Switches) should be maintained in an environment of 18°-24° C (64° - 75° F) and 30% - 55% relative humidity per TIA/EIA-569-A.

Maximum length of any segment (cable run - including device cables - between Hub or Switch and Node) is 90 meters. Maximum network diameter (distance between any two Nodes) is 180 meters.

## 5. Master/Slave Wiring (DIM96)

Pin Number	Signal Name	CAT5e Wire Color
1	+ 24 VDC	White w/ Orange
2	+24 VDC	Orange
3	+ RX	White w/ Green
4	- RX	Green
5	+ TX	White w/ Blue
6	- TX	Blue
7	GND	White w/ Brown
8	GND	Brown

Contractor is Responsible for All Terminations

- 1) Only approved cable types may be used. CAT5e is the only approved type.
- 2) Cable MUST be terminated exactly as shown here. Total length of cable in Master/Slave wiring MUST NOT exceed 1000 feet.
- 3) Cable runs MUST be routed in a "Daisy-Chain" configuration as shown in your drawing set, if provided.
- 4) Total number of dimmers (Dual Dimmer Modules = 2 dimmers; Quad Dimmer Modules = 4 dimmers) in Master/Slave system MUST NOT exceed 96 total dimmers.

## 6. Panic Input

Pin Number	Signal Name
1	<i>Not Used</i>
2	IN
3	COM

Contractor is Responsible for All Terminations

- 1) To be used with PANIC INPUT: Fire Alarm Input or Panic Input Closure.
- 2) To be used with Dry Contact Input only.

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**Note:** If the Contact Panel is UL924 enabled, the input must be set to Normally Open in the System Configuration.

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**IMPORTANT!** If multiple A21 panels are to be triggered via the alarm dry contact closure, these closure inputs must be isolated with a distance not to exceed 500 feet.

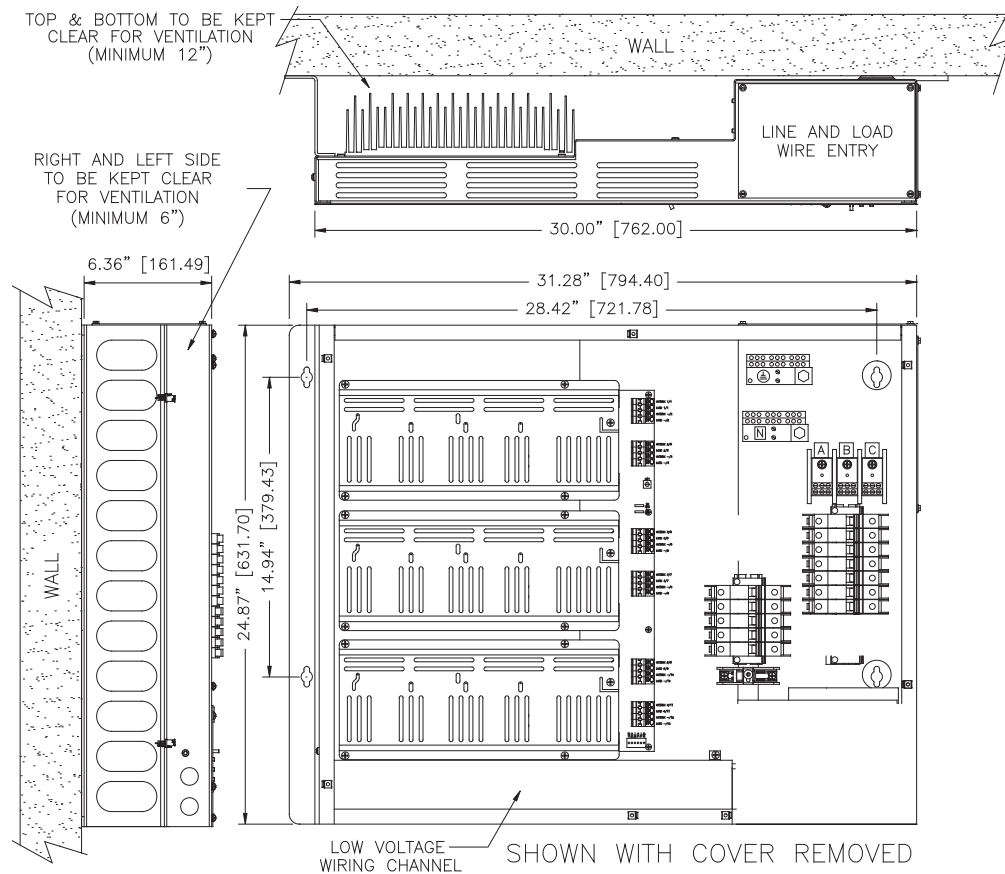
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# APPENDIX B: SPECIFICATIONS

## 1. 3-Space Panel

Number of Circuits:	Up to 12	Load Connection:	Terminal Strip
Maximum Output Voltage:	120VAC or 277VAC	Line Connection:	Main Lug Only
Min./Max. Dimmer Load:	0.5W to Full Load (Rating on Dimmer)	Control Communications:	Vision.net, DMX512 and Strand ShowNet (optional)
Transition Time (IGBT):	800 $\mu$ s (Forward or Reverse Phase)	Branch Circuit Protection:	15 or 20A
A/C Rating:	10,000 AIC @ 120/277V	Cooling:	Natural Convection Cooling
Supply Voltage:	120VAC or 277VAC	Ambient Temperature:	0 to 40° C
Frequency:	50 / 60 Hz	Relative Humidity:	5 to 95% Non-condensing
Load Types:	Incandescent (Tungsten, Halogen), Magnetic Low- Voltage, Electronic Low- Voltage, Neon, Non-Dim, Fluorescent, and LED	Compliance:	ETL Listed to UL508 and UL924
		Weight:	75.2 lbs / 34.2 kg *

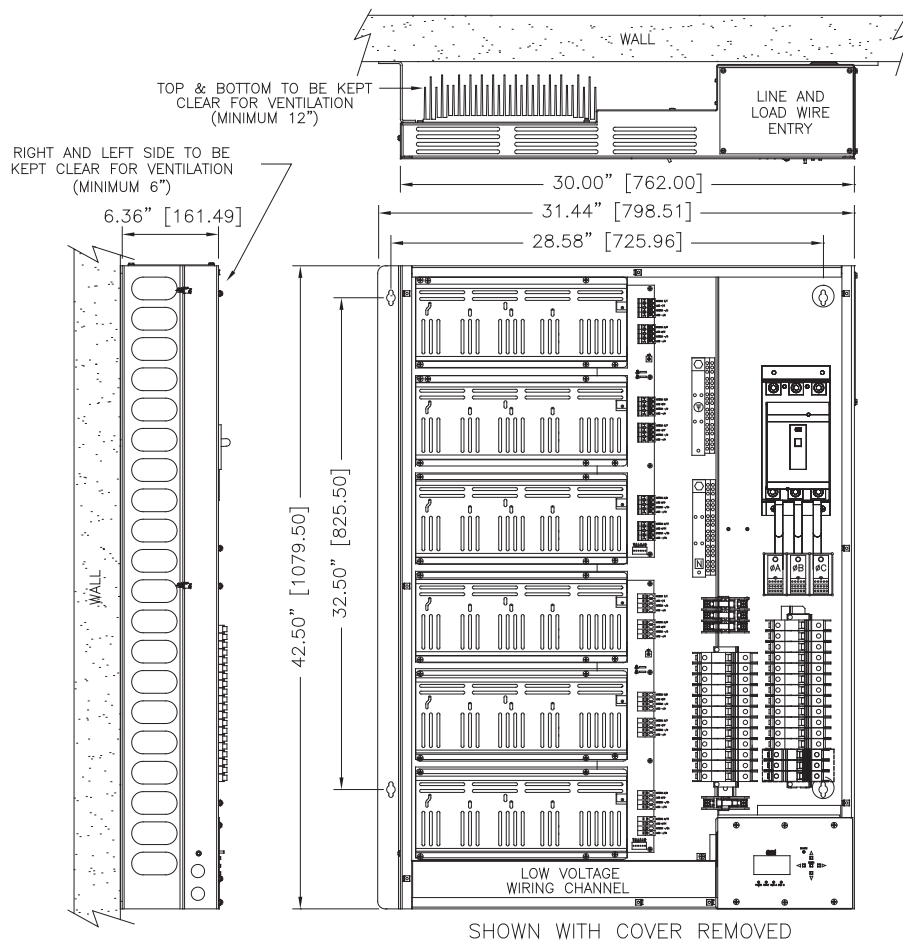
\* The weight specification is for a fully populated cabinet with quad SCR dimmer modules (heaviest possible configuration). Actual weight of installed cabinet may be less if using IGBT or non-dim modules.



## 2. 6-Space Panel

Number of Circuits:	Up to 24	Load Connection:	Terminal Strip
Maximum Output Voltage:	120VAC or 277VAC	Line Connection:	Main Lug Only
Min./Max. Dimmer Load:	0.5W to Full Load (Rating on Dimmer)	Control Communications:	Vision.net, DMX512 and Strand ShowNet (optional)
Transition Time (IGBT):	800 $\mu$ s (Forward or Reverse Phase)	Main Breaker (optional):	60, 80, 100, 125, or 150 Amps
A/C Rating:	10,000 AIC @ 120/277V	Branch Circuit Protection:	15 or 20A
Supply Voltage:	120VAC or 277VAC Single Phase 3-Wire (optional); Three Phase 4-Wire	Cooling:	Natural Convection Cooling
Frequency:	50 / 60 Hz	Ambient Temperature:	0 to 40° C
Load Types:	Incandescent (Tungsten, Halogen), Magnetic Low-Voltage, Electronic Low- Voltage, Neon, Non-Dim, Fluorescent, and LED	Relative Humidity:	5 to 95% Non-condensing
		Compliance:	ETL Listed to UL508 and UL924
		Weight:	130.4 lbs / 59.3 kg *

\* The weight specification is for a fully populated cabinet with quad SCR dimmer modules (heaviest possible configuration). Actual weight of installed cabinet may be less if using IGBT or non-dim modules.



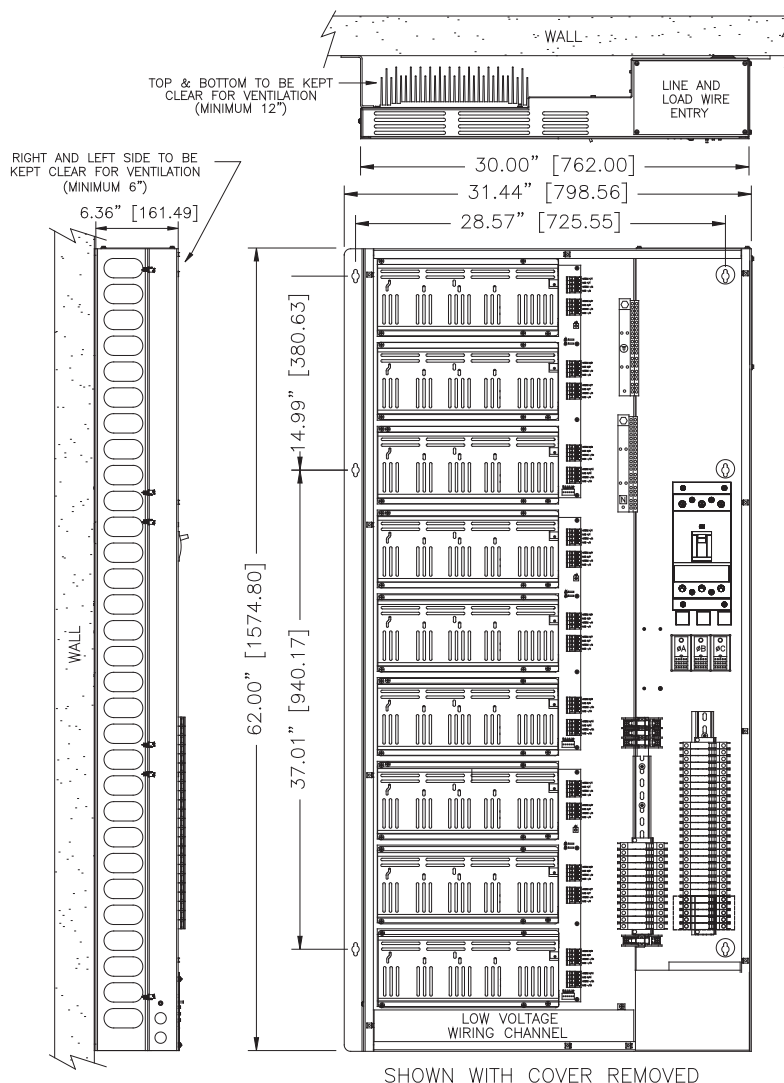
NOTE: Cabinet shown with optional main breakers.



### 3. 9-Space Panel

Number of Circuits:	Up to 36	Load Connection:	Terminal Strip
Maximum Output Voltage:	120VAC or 277VAC	Line Connection:	Main Lug Only
Min./Max. Dimmer Load:	0.5W to Full Load (Rating on Dimmer)	Control Communications:	Vision.net, DMX512 and Strand ShowNet (optional)
Transition Time (IGBT):	800 μs (Forward or Reverse Phase)	Main Breaker (optional):	60, 80, 100, 125, 150, or 200 Amps
A/C Rating:	10,000 AIC @ 120/277V	Branch Circuit Protection:	15 or 20A
Supply Voltage:	120VAC or 277VAC	Cooling:	Natural Convection Cooling
	Three Phase 4-Wire	Ambient Temperature:	0 to 40° C
Frequency:	50 / 60 Hz	Relative Humidity:	5 to 95% Non-condensing
Load Types:	Incandescent (Tungsten, Halogen), Magnetic Low-Voltage, Electronic Low- Voltage, Neon, Non-Dim, Fluorescent, and LED	Compliance:	ETL Listed to UL508 and UL924
		Weight:	188.6 lbs / 85.7 kg *

\* The weight specification is for a fully populated cabinet with quad SCR dimmer modules (heaviest possible configuration). Actual weight of installed cabinet may be less if using IGBT or non-dim modules.



NOTE:  
Cabinet shown with optional main breakers.

## APPENDIX C: CATALOG NUMBER REFERENCE

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### 1. A21 Ordering Guide

#### Dimmer Panels, 120/277 Volt

74121	A21 Lighting Control Panel, 3-Space, 120V
74123	A21 Lighting Control Panel, 6-Space, 120V
74130	A21 Lighting Control Panel, 9-Space, 120V

*Note: A21 dimmer panels may be populated with either 120 or 277V dimmer modules, but not both.*

#### Dimmer Modules, 120 Volt

74170	Dual 1800 Watt IGBT Dimmer Module, 120V
74171	Dual 2000 Watt IGBT Dimmer Module, 120V
74172	Dual 1800 Watt (15A) SCR Dimmer Module, 120V
74173	Dual 2400 Watt SCR Dimmer Module, 120V
74178	Dual 1800 Watt Non-Dim Module, 120V
74179	Dual 2400 Watt Non-Dim Module, 120V
74190	Quad 1000 Watt IGBT Dimmer Module, 120V
74191	Quad 2000 Watt SCR Dimmer Module, 120V
74192	Quad 1800 Watt SCR Dimmer Module, 120V
74195	Quad 2400 Watt Non-Dim Module, 120V

#### Fluorescent Dimmer Modules, 120 Volt

74174	Dual 1800 VA (15A) PowerSpec HDF Dimmer Module, 120V
74175	Dual 2400 VA PowerSpec HDF Dimmer Module, 120V
74176	Dual 1800 VA Advance Mark 10 Dimmer Module, 120V
74177	Dual 1500 VA Advance Mark 10 Dimmer Module, 120V
74180	Dual 2000 VA 3-Wire Fluorescent, 120V
74185	Dual 2000 Watt VA Mark 7, 0-10VDC Fluorescent Dimmer Module, 120V
74193	Quad 1500 VA Advance Mark 10 Dimmer Module, 120V
74194	Quad 2000 VA PowerSpec HDF Dimmer Module, 120V
74197	Quad 2000 Watt VA Mark 7, 0-10VDC Fluorescent Dimmer Module, 120V

#### Dimmer Modules, 277 Volt

74270	Dual 4000 VA SCR Inductive Dimmer Module, 277V
74273	Dual 4000 Watt Non-Dim Module, 277V
74274	Dual 2000 VA IGBT Dimmer Module, 277V
74290	Quad 4000 VA SCR Dimmer Module, 277V
74293	Quad 4000 VA Non-Dim Module, 277V
74295	Quad 1000 VA IGBT Dimmer Module, 277V

#### Fluorescent Dimmer Modules, 277 Volt

74271	Dual 4000 VA PowerSpec HDF Dimmer Module, 277V
74272	Dual 3000 VA Advance Mark 10 Dimmer Module, 277V
74275	Dual 4000 VA Mark 7, 0-10VDC Fluorescent Dimmer Module, 277V
74291	Quad 2000 VA PowerSpec HDF Dimmer Module, 277V
74292	Quad 3000 VA Advance Mark 10 Dimmer Module, 277V
74294	Dual 4000 VA 3-Wire Fluorescent Module, 277V
74296	Quad 4000 VA Mark 7, 0-10VDC Fluorescent Dimmer Module, 277V

**Accessories**

<b>74160</b>	Emergency Power Sense (120V)
<b>74160-277</b>	Emergency Power Sense (277V)
<b>74161</b>	ShowNet Ethernet Option
<b>74181</b>	Blank Dimmer Module
<b>74140</b>	A21 3 & 6 Space Auxiliary Circuit Breaker Kit (3 Breakers), 15A, 120V
<b>74141</b>	A21 3 & 6 Space Auxiliary Circuit Breaker Kit (3 Breakers), 20A, 120V
<b>74142</b>	A21 3 & 6 Space Auxiliary Circuit Breaker Kit (3 Breakers), 15A, 277V
<b>74143</b>	A21 3 & 6 Space Auxiliary Circuit Breaker Kit (3 Breakers), 20A, 277V
<b>74144</b>	A21 9 Space Auxiliary Circuit Breaker Kit (5 Breakers), 15A, 120V
<b>74145</b>	A21 9 Space Auxiliary Circuit Breaker Kit (5 Breakers), 20A, 120V
<b>74146</b>	A21 9 Space Auxiliary Circuit Breaker Kit (5 Breakers), 15A, 277V
<b>74147</b>	A21 9 Space Auxiliary Circuit Breaker Kit (5 Breakers), 20A, 277V
<b>74163</b>	UL 924 Breaker expansion kit with 4 breaker security locks

# NOTICE TO CONTRACTOR

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## 1. Technical Services Checkout Procedure



### **DO NOT APPLY POWER TO THE LIGHTING CONTROL SYSTEM!**

No part of this system may be energized or operated until the installation has been approved by a Strand Lighting Technical Services Representative. Violation of this Requirement may damage components and therefore constitute misuse under standard warranty terms. Such misuse may relieve Strand Lighting of any and all further obligations under the terms of this warranty.

**Equipment MUST be installed per the Strand Lighting drawings.**

**All installation and wire terminations MUST be completed per the Strand Lighting drawings prior to the arrival of the Technical Services Representative:**

- 1) Input power must be connected to the system, but not energized.
- 2) All loads must be connected and all lighting instruments must be lamped.
- 3) All control wiring must be installed and terminated - including DMX512, Ethernet and Vision.net.
- 4) All equipment, including controllers, accessories, keys, cables and manuals must be in place.
- 5) Personnel for training (i.e. the users), as well as any other personnel required by contract and/or specification must be available for training at the completion of the Checkout and Energizing.
- 6) An owner (or authorized representative), as well as any other personnel required by contract and/or specification will be present to accept the system.
- 7) specification will be present to accept the system.

**The Technical Services Representative will only be able to:**

- Ensure that the system is properly installed and functions correctly, including troubleshooting and providing guidance to the contractor to correct any problems.
- Train personnel in the operation of the Lighting Control System.

**The Technical Services Representative will not be able to:**

- Install equipment or make electrical connections required of the installing contractor, including DMX512, Ethernet, Vision.net, and/or any other connections that require a licensed electrician.
- Return to instruct any personnel who missed the original training session.

If the above requirements have not been met, the Technical Services Representative will be required to leave the job site. Return trips to complete the Technical Services Checkout require a separate Purchase Order and will be invoiced at the cost of travel (including per diem and travel time door-to-door), hourly labor, and a minimum daily on-site charge. Rescheduling will require 3 weeks notice, subject to Technical Services Representative availability.

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Please feel free to contact Strand Lighting Technical Support (1-214-647-7880) should there be any questions regarding the installation of the equipment or requirements regarding the Technical Services Checkout.

When all requirements have been met and the system is ready for inspection, please complete a *Field Service/Commissioning Request Form* (available in Adobe PDF format). This form is available in the Support Section of the Strand Lighting web site ([www.strandlighting.com](http://www.strandlighting.com)) or from Strand Lighting Technical Support

## Notes

## Notes

## Notes

**PHILIPS**

# Strand Lighting

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