

# LynTec RPC

Instruction Bulletin

Remote  
Power  
Controller



Retain for future use.

## HAZARD CATEGORIES AND SPECIAL SYMBOLS

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

### **DANGER**

DANGER indicates an immediately hazardous situation which, if not avoided, **will result in** death or serious injury.

### **WARNING**

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.

### **CAUTION**

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

### **CAUTION**

CAUTION, used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, **can result in** property damage.

*NOTE: Provides additional information to clarify or simplify a procedure.*

## PLEASE NOTE

Electrical equipment should be installed, operated, serviced and maintained only by qualified electrical personnel. This document is not intended as an instruction manual for untrained persons. No responsibility is assumed by LynTec for any consequences arising out of the use of this manual.

## Class A FCC Statement

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## Chapter 1--Introduction

### OVERVIEW

This bulletin explains how to install and operate the LynTec Remote Power Controller (RPC) and the RPCR relay panel. The controller uses remotely operated circuit breakers to control up to 167 remotely operated branch circuits. In the case of the RPCR, the controller can control up to 64 relays. Control signals originate externally from commands received via the communications network or from dry contact inputs. Acceptable communications protocols include TCP/IP, RS-232, Telnet, sACN and DMX-512.

### CONTENTS

Each RPC comes standard with the following components installed:

- RPC Controller
- Power Supply
- Capacitive Buffer (optional on RPCR)
- Isolated technical ground (panels only)
- 15A unmotorized breaker(panels only)
- Voltage Transducer (panels only)

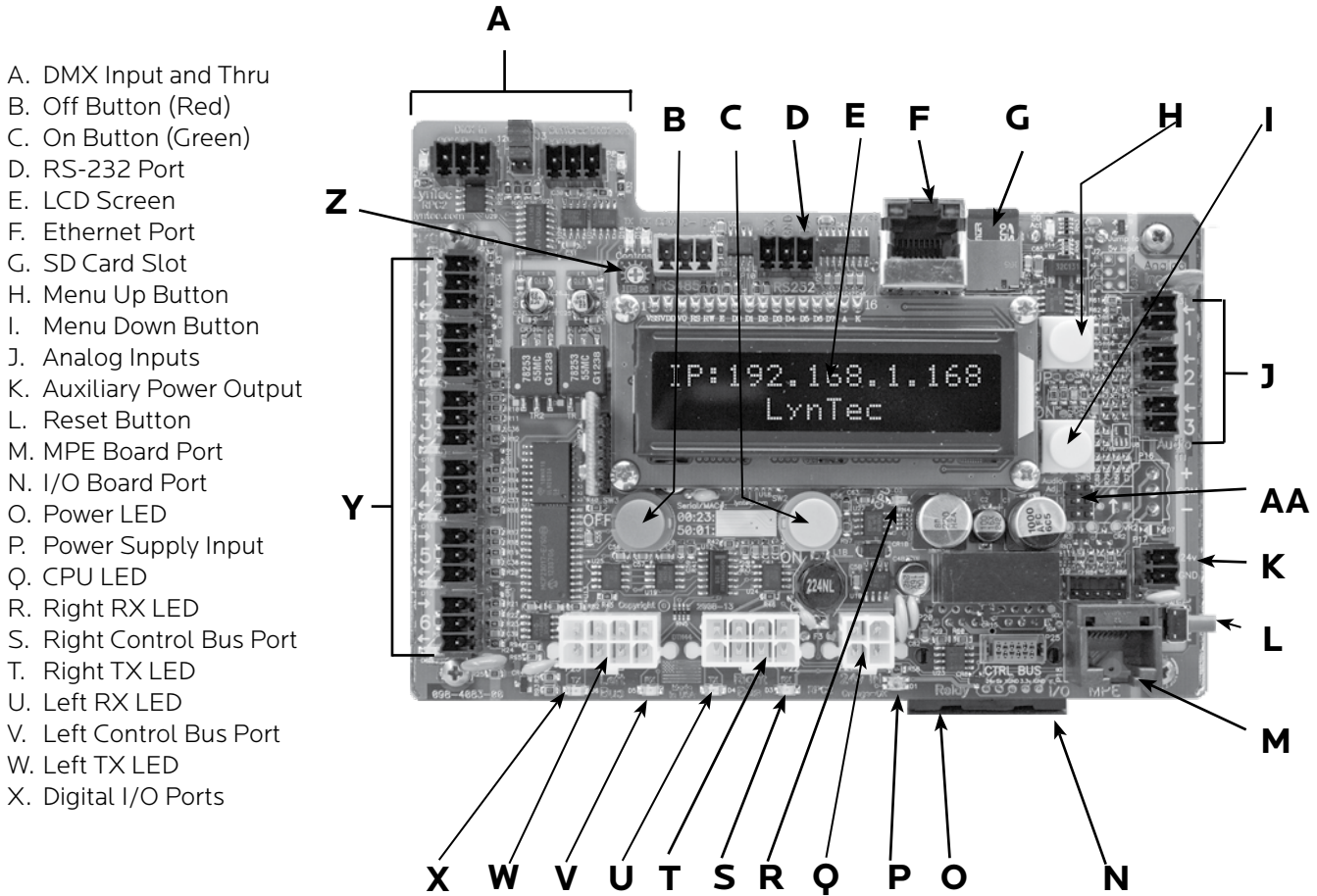
Optional additional components include:

- I/O expansion board
- I/O-R outbound relay control board
- Multi-panel expansion board (panels only)
- Current Monitoring (panels only)

**Controller Overview**

Figure 1-1 shows the parts of the RPC Controller. A brief description of each part follows in Table 1-1.

**Figure 1-1: RPC Controller**



**Table 1-1: Parts of the LCP Controller**

Component	Description
A. DMX Input and Thru	Allows the panel to be directed by a secondary DMX controller. Indicator LED signal the receipt and transmission of DMX. When DMX is enabled, DMX circuits on the control page are disabled.
B. OFF Button (red)	Turns all circuits off
C. ON Button (green)	Turns all circuits on
D. RS-232 Port	Control Port for secondary controller such as AMX or Crestron.
E. LCD Screen	Screen shows the IP address, time and setup information.
F. Ethernet Port	Connects the panel to a computer or network for initial setup or long-term operation using the built-in web interface. Port also provides sACN & Telnet communications
G. microSD Card	Card slot for microSD card for firmware updates
H. Menu Up Button (yellow)	Scrolls the screen up.
I. Menu Down Button (yellow)	Scrolls the screen down.
J. Analog Inputs	Additional analog inputs to connect voltage/current monitors or light sensors.
K. Auxiliary Power Output	Auxiliary 24V power for accessories. Maximum allowable current--200mA
L. Reset Button	Resets the controller

**Table 1-1: Parts of the RPC Controller**

Component	Description
M. MPE Port	Connects the Multi Panel Expander Board (for use with up to 3 Secondary panels)
N. I/O Board Port	Connects additional I/O boards to the controller. Up to two boards can be added for a total of 38 contact closure inputs. Or, the I/OR board may be added to provide outbound relay control
O. Relay Driver Port	Connects relay driver boards to the controller.
P. Power Led	Illuminates orange when the controller is receiving power.
Q. Power Supply Input	Connects the controller to the power supply.
R. CPU LED	CPU Heartbeat
S. Right RX LED	Flashes when the controller is receiving data from the local right control bus.
T. Right Control Bus Port	Connects the controller to the local right control bus.
U. Right TX LED	Flashes when the controller is transmitting data to the local right control bus.
V. Left RX LED	Flashes when the controller is receiving data from the local left control bus.
W. Left Control Bus Port	Connects the controller to the local left control bus.
X. Left TX LED	Flashes when the controller is transmitting data to the local left control bus.
Y. Digital I/O Ports	Contact closure input, indicator output, and 24VDC common
Z. LCD Contrast	Adjusts contrast on LCD screen (E)
AA. Default Jumper	Forces all settings back to factory default

**Figure 1-2: I/O Expander Board**

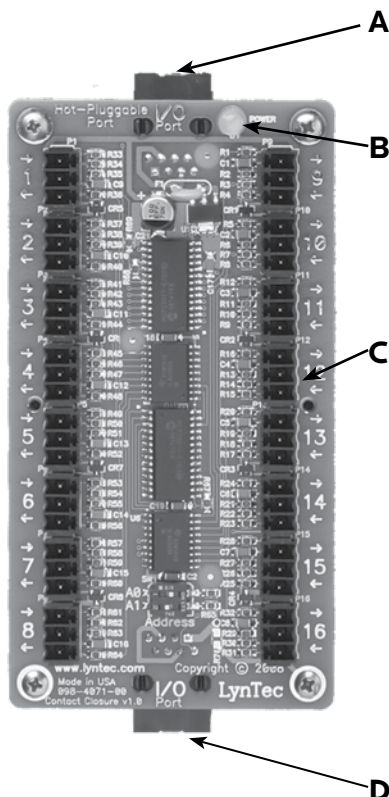


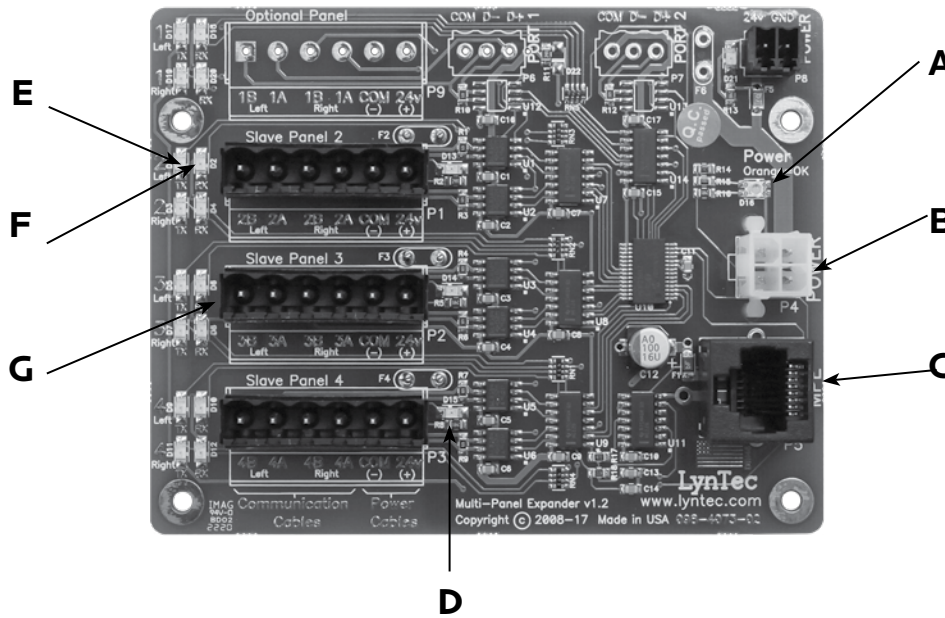
Figure 1-2 shows the parts of the I/O Board. A brief description of each part follows in Table 1-2.

**Table 1-2: Parts of the I/O Board**

Component	Description
A. I/O Control Port	Connects the board to the controller.
B. Power LED	The power LED is always on when the board is receiving power.
C. Digital I/O Headers	Allows the panel to be controlled by contact closure devices.
D. I/O Control Port Thru	Connects to an additional I/O expander board.

**Figure 1-3: Multi-Panel Expander Board**

Figure 1-3 shows the parts of the additional Multi-Panel- Expander board. A brief description of each part follows in Table 1-3.



**Table 1-3: Parts of the Multi-Panel Expander Board**

Component	Description
A. Power LED	The power LED is always orange when the board is receiving power.
B. Power Input	Provides power to control buses on panels two, three and four.
C. Control Input	Receives control signal from control board.
D. Control Bus Power Indicator (x3)	Indicates that the control buses on panel two, three or four have power.
E. Data transmission indicator (x6)	Indicates that the Multi-Panel Expander board is transmitting data to a particular control bus (example: panel 2 left).
F. Data reception indicator. (x6)	Indicates that the Multi-Panel Expander Board is receiving data from a particular control bus (example: panel 2 left)
G. Expansion Ports (x3)	Connects the MPE board to control buses on panels two, three and four.




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## Chapter Two--Safety Precautions

This chapter contains important safety precautions that must be followed before attempting to install, service, or maintain electrical equipment. Carefully read and follow the safety precautions below.

READ AND FOLLOW ALL SAFETY INSTRUCTIONS

 **DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

**This equipment must be installed and serviced only by qualified electrical personnel.**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm that power is off.
- Replace all devices, doors, and covers before turning on power to this equipment.
- Before energizing panelboard, all unused spaces must be filled with blank fillers.

**Failure to follow this instruction will result in death or serious injury.**

IMPORTANT SAFEGUARDS

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

READ AND FOLLOW ALL SAFETY INSTRUCTIONS.

1. Do not use outdoors unless the enclosure is rated for outdoor use
2. Do not mount near gas or electric heaters.
3. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
4. The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
5. Do not use this equipment for other than intended use.

SAVE THESE INSTRUCTIONS

## Chapter Three--Quick Start Guide

### INTRODUCTION

This chapter is a quick reference listing the steps necessary to install the RPC system. The steps in this chapter are provided as an installation checklist. For complete installation instructions, refer the chapter listed.

Steps	Reference
1. Install all the RPC components according to their instruction bulletins. Typical components include, but are not limited to, the following: <ul style="list-style-type: none"> <li>• circuit breakers</li> <li>• controller</li> <li>• control buses</li> <li>• power supply</li> <li>• voltage transducer</li> <li>• secondary address selectors</li> </ul>	See appropriate instruction bulletins.  <b>Chapter 4--Wiring</b>
2. Wire all RPC components according to their instruction bulletins.	See appropriate instruction bulletins.
3. Connect the controller to a computer or network for panel setup.	<b>Chapter 4--Wiring</b>
4. Access the web page by entering the IP address or NetBIOS name into web browser on the aforementioned computer.	<b>Chapter 5--Control Setup</b>
5. Complete the panel setup.	<b>Chapter 5--Control Setup</b>
6. Connect the controller to a secondary controller or add contact closures if necessary.	<b>Chapter 4--Wiring</b> <b>Chapter 5--Control Setup</b>
7. If your RPC system does not operate as expected, verify that everything is installed and programmed correctly.	<b>Appendix A--Troubleshooting</b>

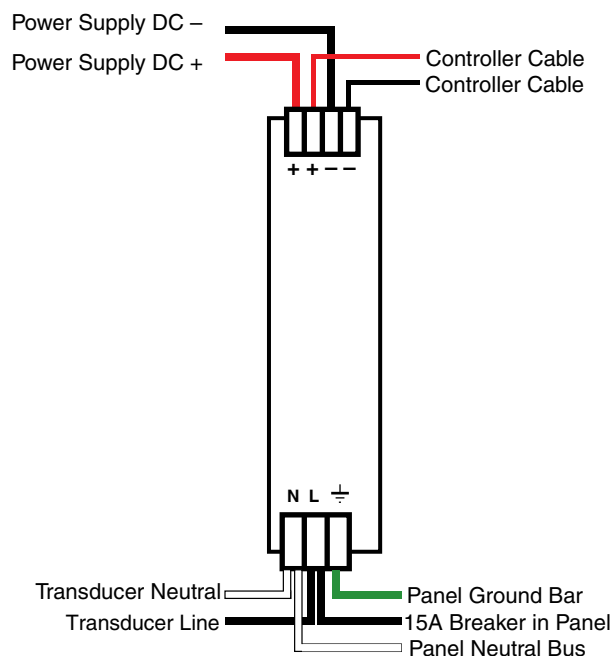
## Chapter 4--Wiring

To initially wire the RPCR connect the power breaker in your panel to the transformer in the RPCR. For additional RPCR wiring, skip to page 17.

To initially wire the RPC follow these easy steps:

1. Install and connect all main and neutral feeds as per NEC.
2. Install and connect the Isolated Technical Ground feed from the star ground of the isolation transformer or the tie point from a ground rod or building steel to the Isolated Technical Ground bar in the ITG sidecar.
3. Ensure all breakers are properly installed in the panel and that the motorized breakers are firmly plugged into the adjacent control busses.

**Figure 4-1: Power Supply**



Steps four, five and six are completed at the factory. The instructions are included as a reference only.

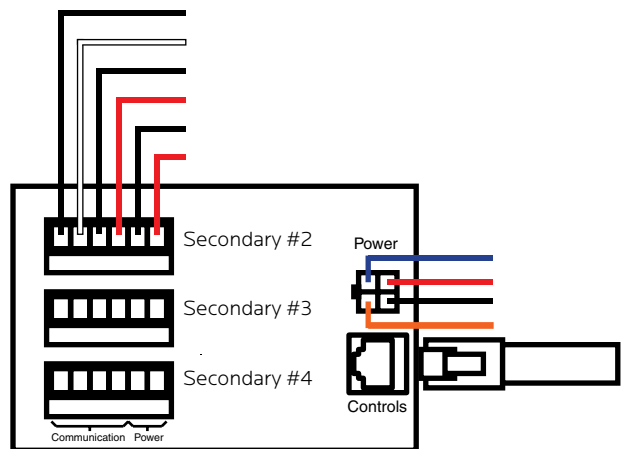
4. Connect the black 14 AWG wire from the Line terminal of the Power Supply unit (Figure 4-1--located at the top of the Isolated Technical Ground sidecar) to the 15 Amp Controller Power breaker in the panel.
5. Connect the white 14 AWG wire from the Neutral terminal of the Power Supply unit to the neutral bus located below the breakers in the panel.

6. Connect the green 14 AWG wire from the ground terminal of the Power Supply unit to the ground bar attached directly to the panel (**DO NOT attach to the isolated technical ground in the sidcar**).
7. Install and connect all load, neutral and Isolated Technical Ground feeds to circuits.
8. Ensure that all bolts and lug connections in the panel are tight. Check both sides of the main breaker, the bars connecting the busses to the main and all breaker retaining bolts.
9. Check the cable connections at the top of the breaker control busses to ensure the connectors are properly seated.
10. Replace the dead front pan and cover with door.

## ADDITIONAL CONTROL OPTIONS

Additional circuit boards may be used to add additional panels or I/O inputs.

Figure 4-2: Multi Panel Expander

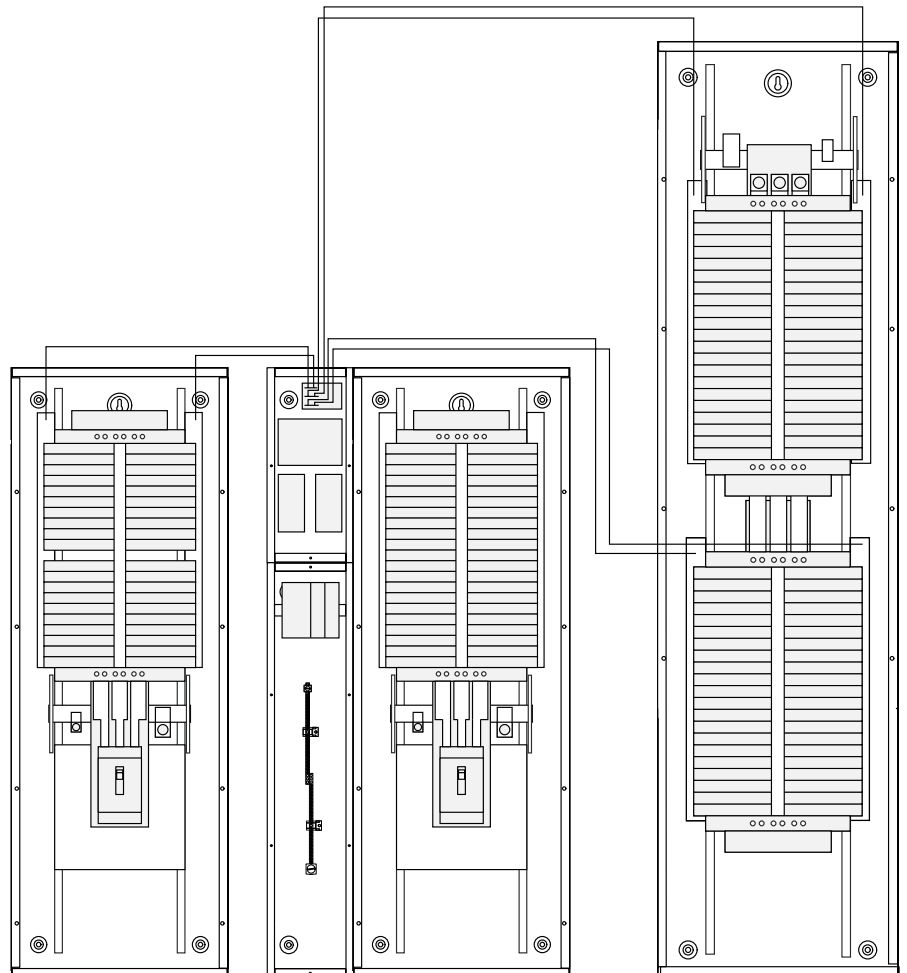


Up to to three RPS secondary panels may be added to an RPC master control panels. Each RPC controller can control a maximum of eight control bus strips. 30 and 42 circuit panels each contain two control strips, while 48, 66 and 84 circuit panels each contain 4 control bus strips. Please consult the following table table for the positions of each control bus.

Table 4-1: Bus Positions

Number of Circuits	First Control Bus Set		Second Control Bus Set	
	Left Position	Right Position	Left Position	Right Position
30	Upper Left	Upper Right	NA	NA
42	Upper Left	Upper Right	NA	NA
48	Upper Left	Upper Right	Lower Left	Lower Right
65	Upper Left	Upper Right	Lower Right	Lower Left
84	Upper Left	Upper Right	Lower Left	Lower Right
30 Narrow	Lower	Upper	NA	NA
42 Narrow	Lower	Upper	NA	NA

Figure 4-3: Multi-panel setup



The first control bus set in the master panel connects directly to the RPC controller using the provided cables with 8-pin molex connectors. The second control bus set and all secondary panels, where applicable, connect to the multi-panel expander board (MPE).

To connect bus strips to the MPE you will need either one 6-conductor, 600V jacketed, 18-14 AWG tray cable or two 4-conductor, 600V jacketed, 18-14 AWG tray cables per control bus set. Each strip requires 4 conductors but the DC power conductors can be daisy chained within the panelboard. Connect control bus strips to the MPE as follows.

1. At the MPE, terminate the Left Bus B, Left Bus A, Right Bus B, Right Bus A, Common (-) and 24VDC (+) in the screw-terminal header for that control bus strip from left to right.
2. Connect the cable to the control bus strips as shown in the diagram.

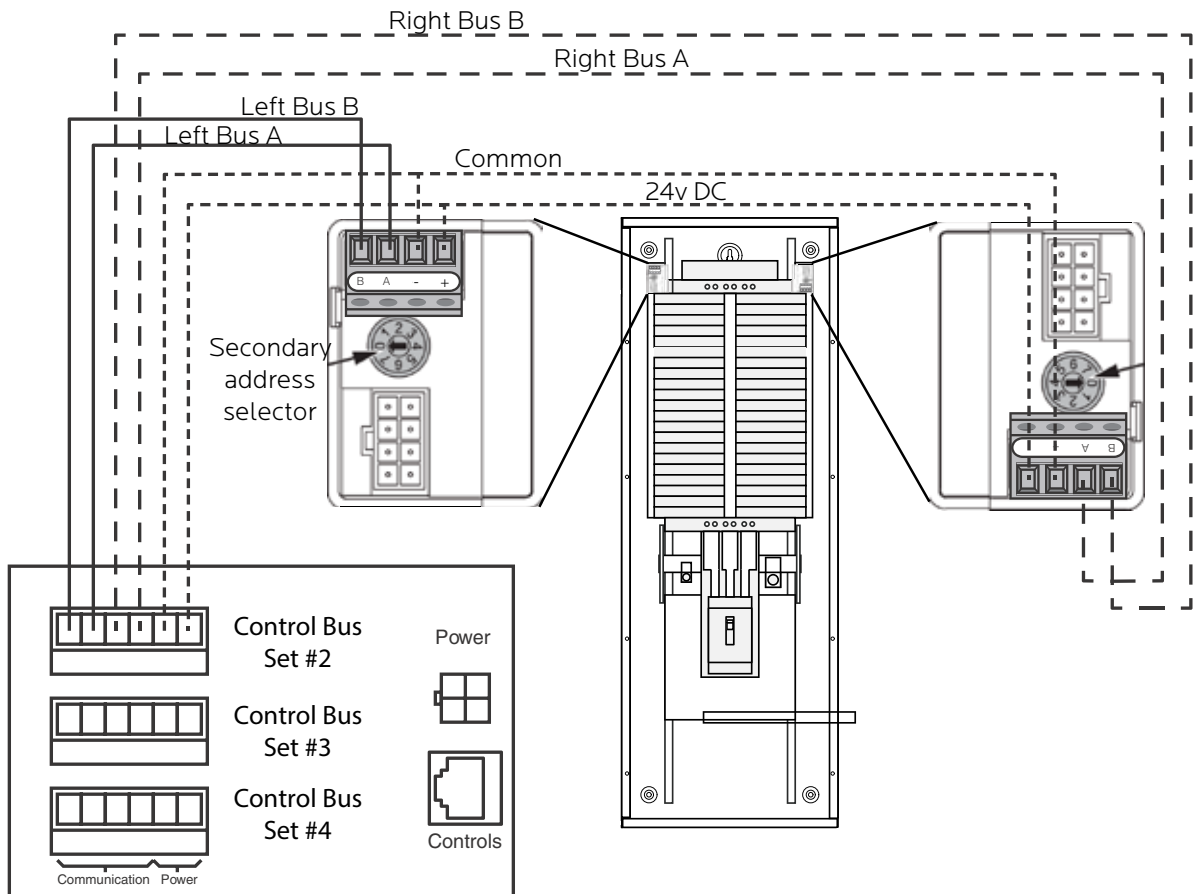
**If using one 6-conductor cable**, at each control bus set, strip the cable sheath back approximately 20 inches. Cut the conductors for Left Bus B, Left Bus A, - and + down to approximately 4 inches and terminate them in the Left Bus screw-terminal header from left to right. Terminate the remaining two conductors in the Right Bus B and Right Bus A positions of the Right Bus screw-terminal header. Cut two lengths of 18 AWG wire to install jumpers from Left Bus - and + to Right Bus - and +. Right Bus will not operate without these jumpers installed to provide 24VDC power and common.

3. Address the secondary address selectors as follows:

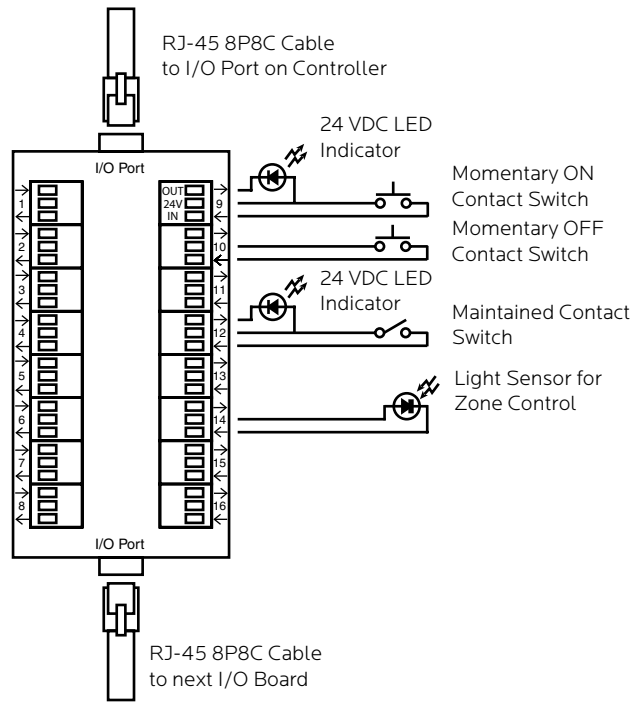
**Table 4-2: Address Selector Settings**

	<b>Left Control Bus</b>	<b>Right Control Bus</b>
<b>Bus Set #2</b>	<b>2</b>	<b>3</b>
<b>Bus Set #3</b>	<b>4</b>	<b>5</b>
<b>Bus Set #4</b>	<b>6</b>	<b>7</b>

**Figure 4-4: Secondary Address Selector Wiring**



**Figure 4-5: Digital I/O Remote Switch and Sensor Wiring**



Switches or sensors being used to control either sequenced or grouped zones are to be connected to the Digital I/O three-position spring-clamp headers. Each header can accommodate multiple input devices (switch, sensor, relay) and multiple output devices (indicator) maximum of 60mA.

The center terminal of each Digital I/O header is used as a 24VDC source. The input terminal is triggered when connected through a remote device to the 24VDC source. The output terminal activates an indicator by pulling down from 24VDC to 0VDC and creating current flow.

To assign both an On and Off function for one zone would require two input terminals and occupy two I/O headers. Six (6) Digital I/O headers are located on the left side of the Controller board. If more connections are required for multiple zone control, additional I/O Expander boards can be added. Each I/O Expander board provides an additional 16 headers for a maximum total of 38 input control sources and output indicators.



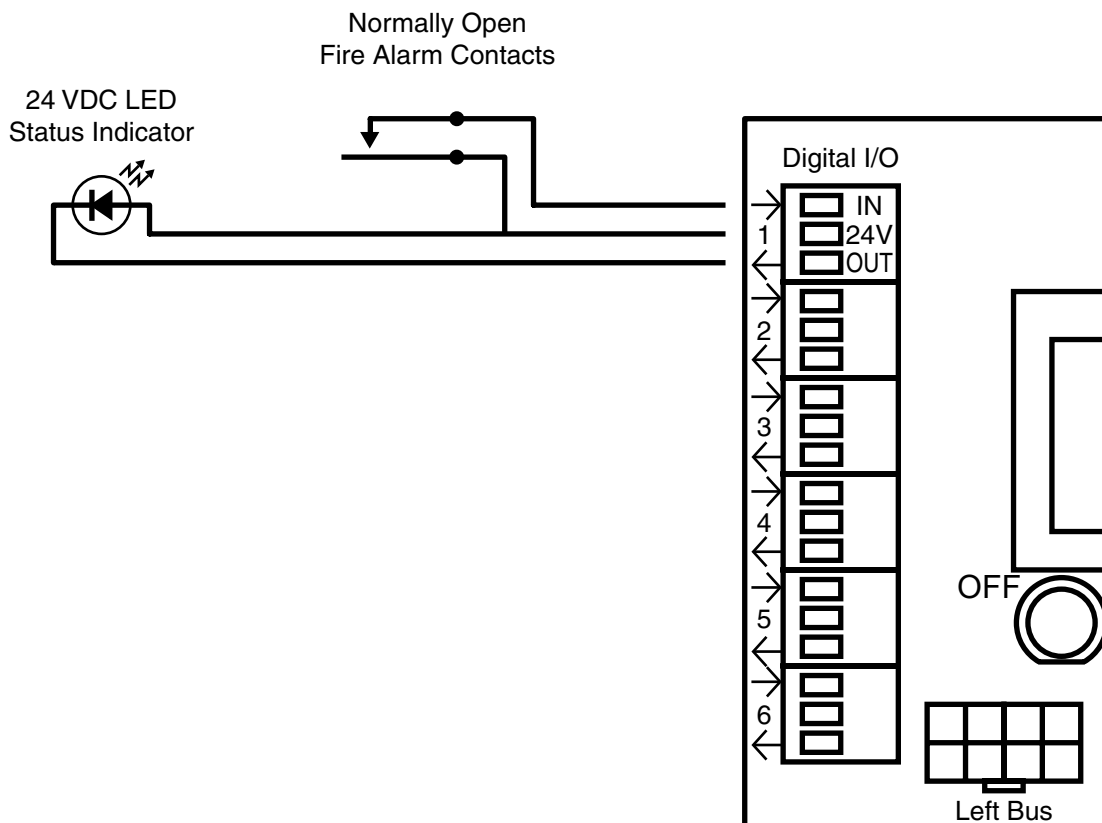
**Emergency Shutdown Wiring:**

To connect your fire alarm or emergency management system to the RPC, follow these steps.

1. From the fire alarm unit or latching Emergency Shutoff switch, wire the Normally Open (NO) contacts to the IN and 24V positions of Digital I/O Port #1 on the Controller.
2. If a remote status indicator is used, ensure that the positive terminal is wired to the 24V position and the negative terminal is wired to the OUT position of Digital I/O Port #1.
3. When the Normally Open contacts are closed, the status indicator will immediately light and all breakers that have been selected for E. Shutoff should cycle to OFF.
4. When the contacts are released, the status indicator will extinguish and all breakers that were ON when E. Shutoff was activated should return to the ON state.

See Chapter 5 to configure the software for emergency shutdown.

**Figure 4-6: Emergency shutdown wiring**



**Emergency Lighting Wiring:**

To connect your fire alarm or emergency management system to the RPC, follow these steps.

1. From the fire alarm unit or latching Emergency Lighting switch, wire the Normally Open (NO) contacts to the IN and 24V positions of Digital I/O Port #6 on the Controller.
2. If a remote status indicator is used, ensure that the positive terminal is wired to the 24V position and the negative terminal is wired to the OUT position of Digital I/O Port #6.
3. When the Normally Open contacts are closed, the status indicator will immediately light and all breakers that have been selected for E. Lighting should cycle to ON.
4. When the contacts are released, the status indicator will extinguish and all breakers that were OFF before E. Lighting was activated should return to the OFF state.

See Chapter 5 to configure the software for emergency lighting.

**Figure 4-7: Emergency Lighting Wiring**

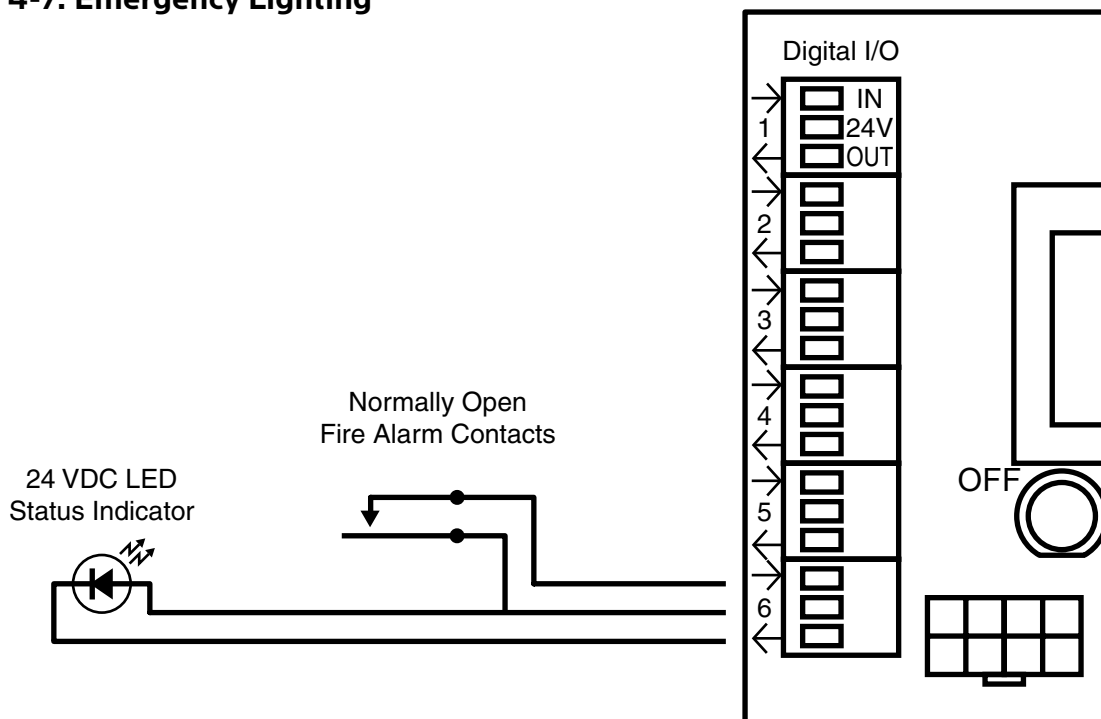
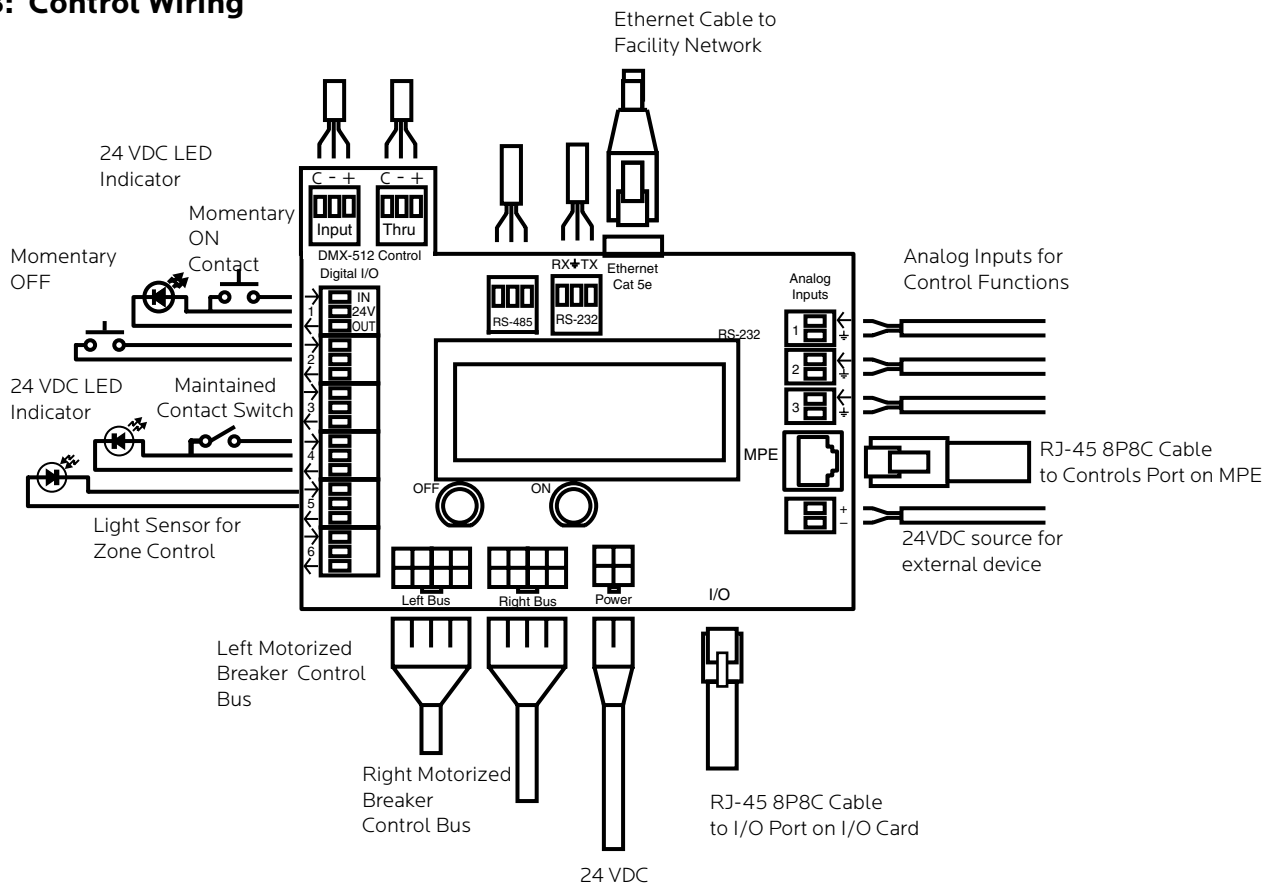


Figure 4-8: Control Wiring



**TCP/IP, sACN or Telnet**

Install and connect a standard Cat5e cable from the facility 10/100 network to the Controller's Ethernet port.

**DMX**

If DMX-512 is being used to control the panel, install and connect a shielded pair cable from the DMX source to the Controller's DMX Input three-position spring-clamp header. Terminate common, DMX- and DMX+ from left to right in the header. Follow the same wiring guide for the DMX Thru header. Both input and output are galvanic isolated.

**RS-232**

If RS-232 is being used to control the panel, install and connect a shielded pair cable from the RS-232 source to the Controller's RS-232 three-position spring-clamp header. Terminate receive, ground and transmit from left to right in the header.

**RS-485**

RS-485 connector is reserved for use with CM-H current monitoring hardware. See manual for installation and operation instructions.

## Switch Wiring Instructions

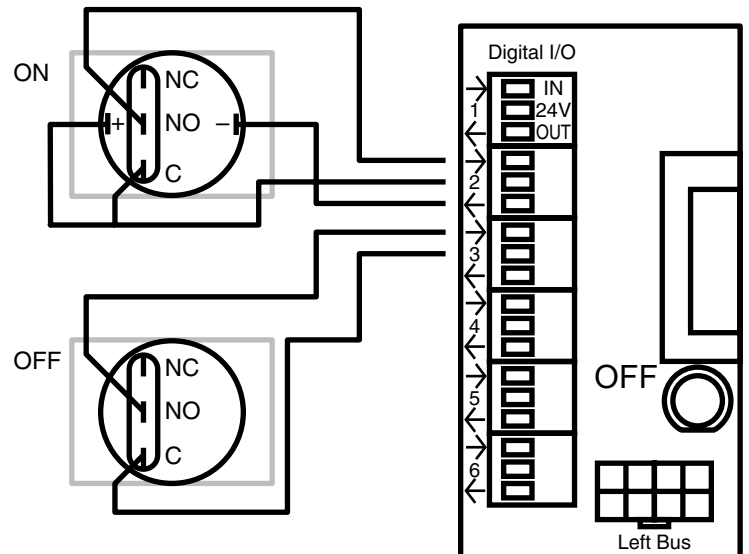
The I/O ports on your RPC controller allow for a variety of switch options.

### LynTec SS-2 Switch Set

Using a standard LynTec SS-2 Switch Set with illuminated ON switch. See Figure 4-9.

1. Wire the ON switch to Digital I/O port 1 on the left edge of the Controller board as follows:
  - i. Connect the 24VDC Common (pin 2, center terminal of the I/O port) to the C pin of the ON switch. Jumper the C pin of the ON switch to the + pin.
  - ii. Connect the Input terminal (pin 1, arrow pointing towards header) to the NO pin of the ON switch.
  - iii. Connect the Output terminal (pin 3, arrow pointing away from header) to the – pin of the ON switch.
2. Wire the OFF switch to Digital I/O port 2 on the left edge of the Controller board as follows:
  - i. Connect the 24VDC Common terminal to the C pin (pin 2) of the OFF switch.
  - ii. Connect the Input terminal (pin 1) to the NO pin of the OFF switch

**Figure 4-9:**  
**LynTec SS-2 Wiring Diagram**



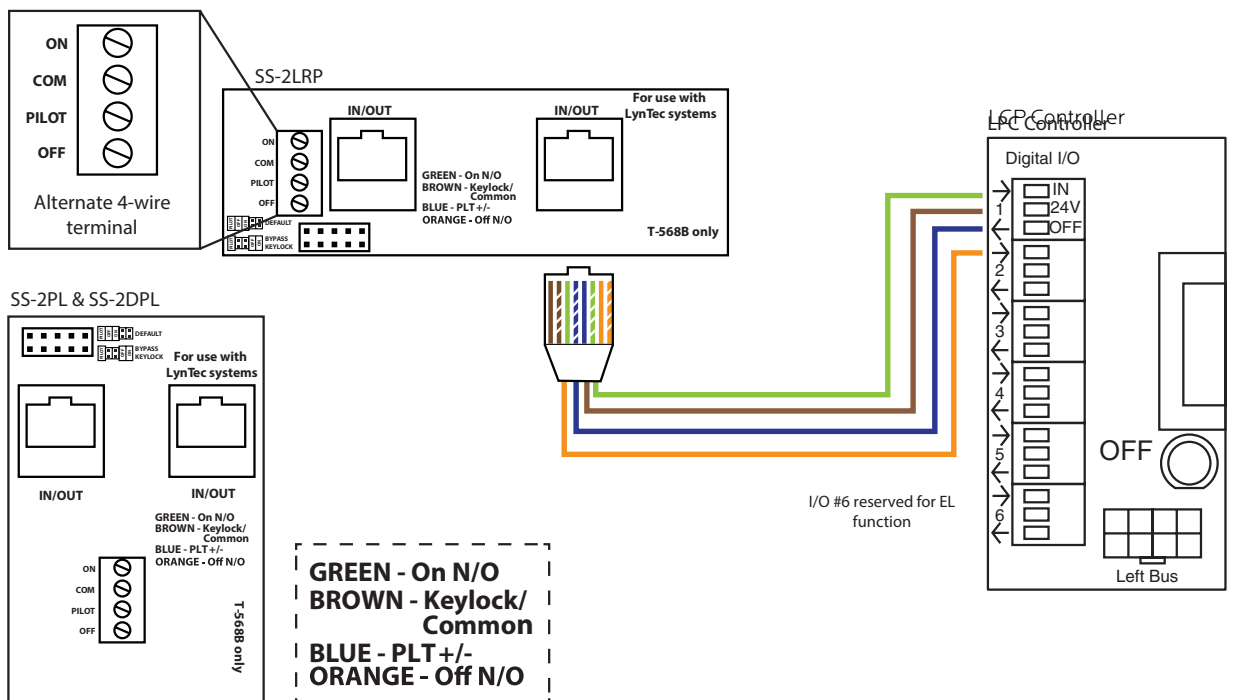
**To configure the Digital I/O port and link it to a zone see Chapter 5.**

**SS-2PL, SS-2DPL, SS-2LRP and SS-4LRP Locking Switch Sets**

Using a standard LynTec SS-2PL, SS-2DPL, SS-2LRP or SS-4LRP Switch Set with illuminated ON switch. See Figure 4-10.

1. Connect at T-568B Cat5 cable to the RJ-45 input on the back of the switch set. Alternately, you may use the provided 4- wire terminal.
2. Wire the switch set to contiguous Digital I/O ports on the left edge of the Controller board as follows:
3. Connect the green wire from the Cat5 (or the wire from the first terminal switch set terminal strip) to the input terminal (pin 1) of the first I/O port.
4. Connect the brown wire from the Cat5 (or the wire from the second terminal on the switch set) to the 24VDC terminal (pin 2) of the first I/O port.
5. Connect the blue wire (or the wire from the third terminal on the switch set) to the output terminal (pin 3) of the first I/O.
6. Connect the orange wire (or wire from the fourth terminal on the switch set) to the input terminal of the second I/O (pin 1).

**Figure 4-10**

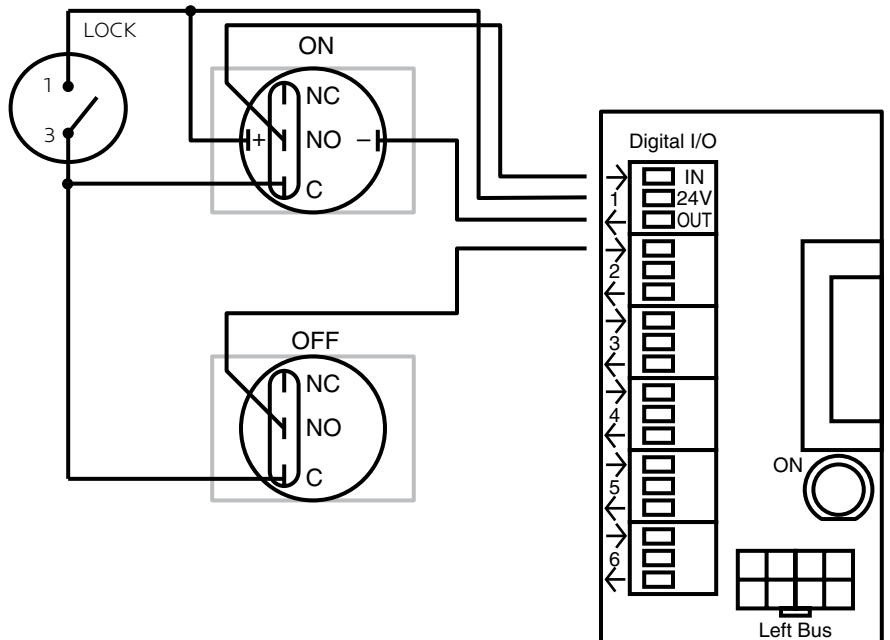


**SS-2 and KS-2L Loose Components**

Using a standard LynTec SS-2 and KS-2L with illuminated ON switch. See Figure 4-11.

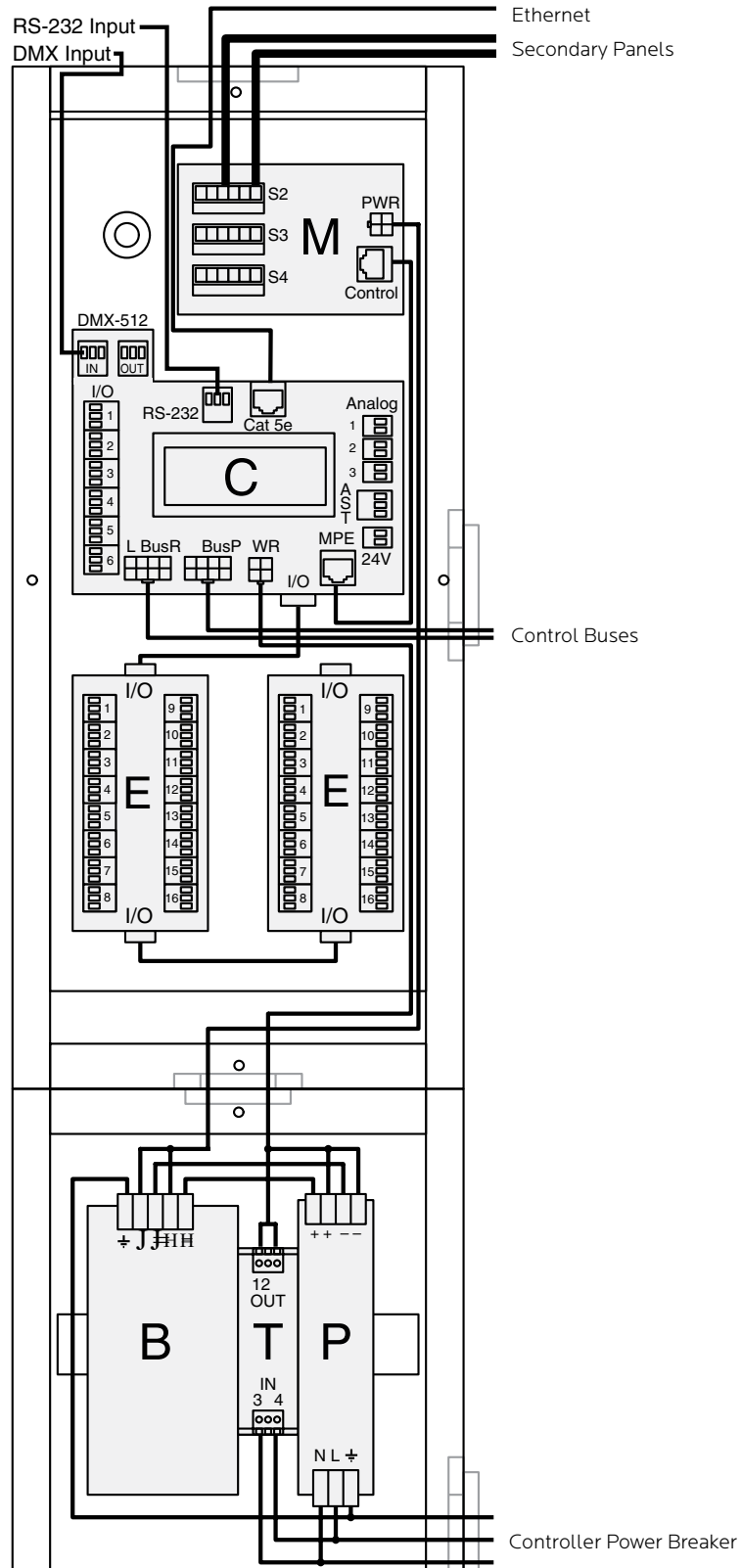
1. Solder the ON switch to Digital I/O port 1 on the left edge of the Controller board as follows:
  - i. Connect the 24VDC Common (pin 2) to the "+" pin of the ON switch.
  - ii. Connect the "+" pin on the on switch to the "1" pin on the lock.
  - iii. Connect the Input terminal (pin 1) to the NO pin of the ON switch.
  - iv. Connect the Output terminal (pin 3) to the "-" pin of the ON switch.
  - v. Connect the "C" pin on the ON switch to the "3" pin on the lock.
2. Solder the OFF switch to Digital I/O port 2 on the left edge of the Controller board as follows:
  - i. Connect the "3" pin on the lock to the "C" pin on the OFF switch.
  - ii. Connect the Input terminal (pin 1) to the NO pin of the OFF switch

**Figure 4-11**

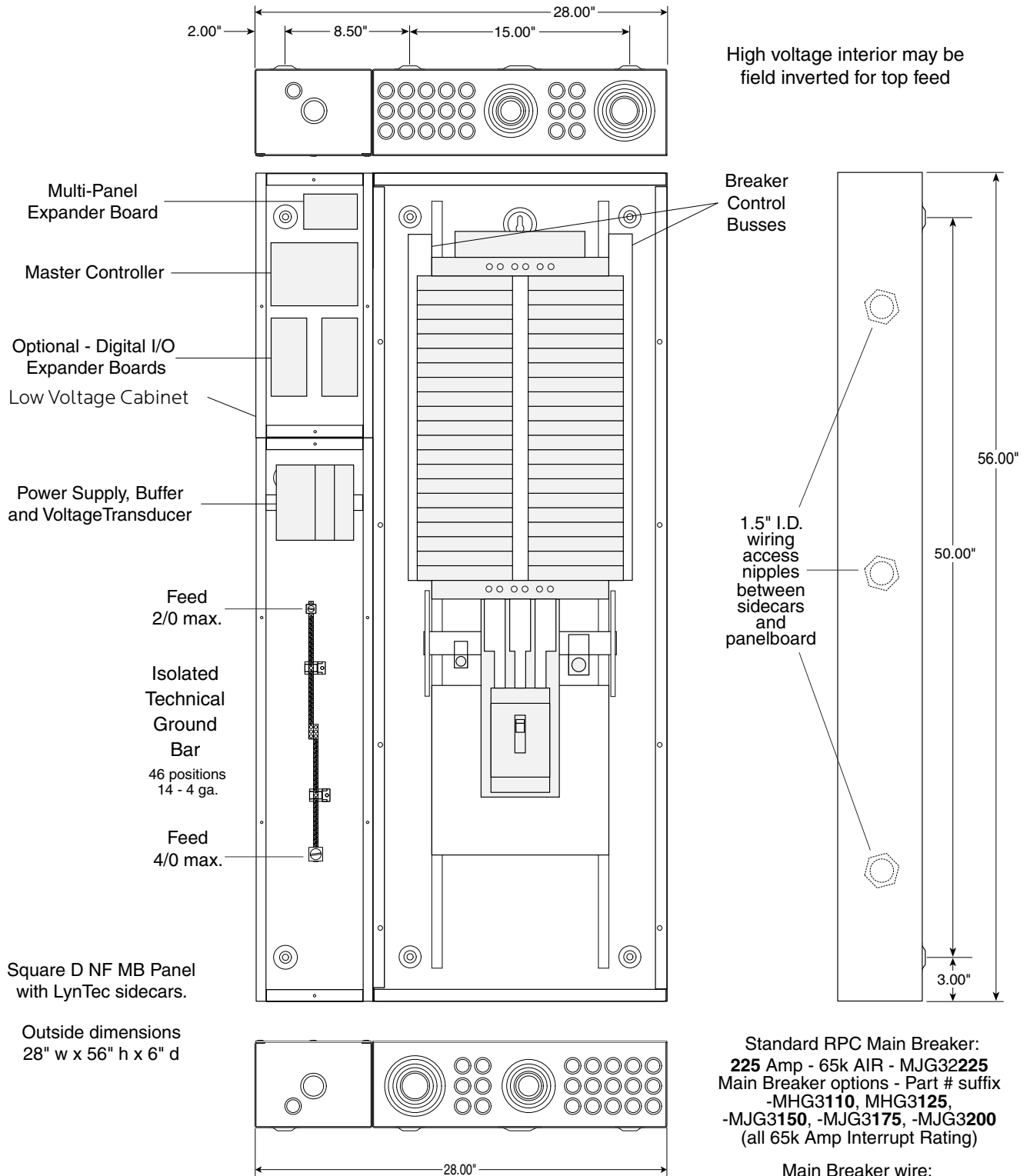


**To configure the Digital I/O port and link it to a zone see Chapter 5.**

**Figure 4-12: Complete RPC Wiring for Motorized Breaker Panels**



**Figure 4-13: RPC Mechanical Drawing**



High voltage interior may be field inverted for top feed

Breaker Control Buses

1.5" I.D. wiring access nipples between sidecars and panelboard

Square D NF MB Panel with LynTec sidecars.

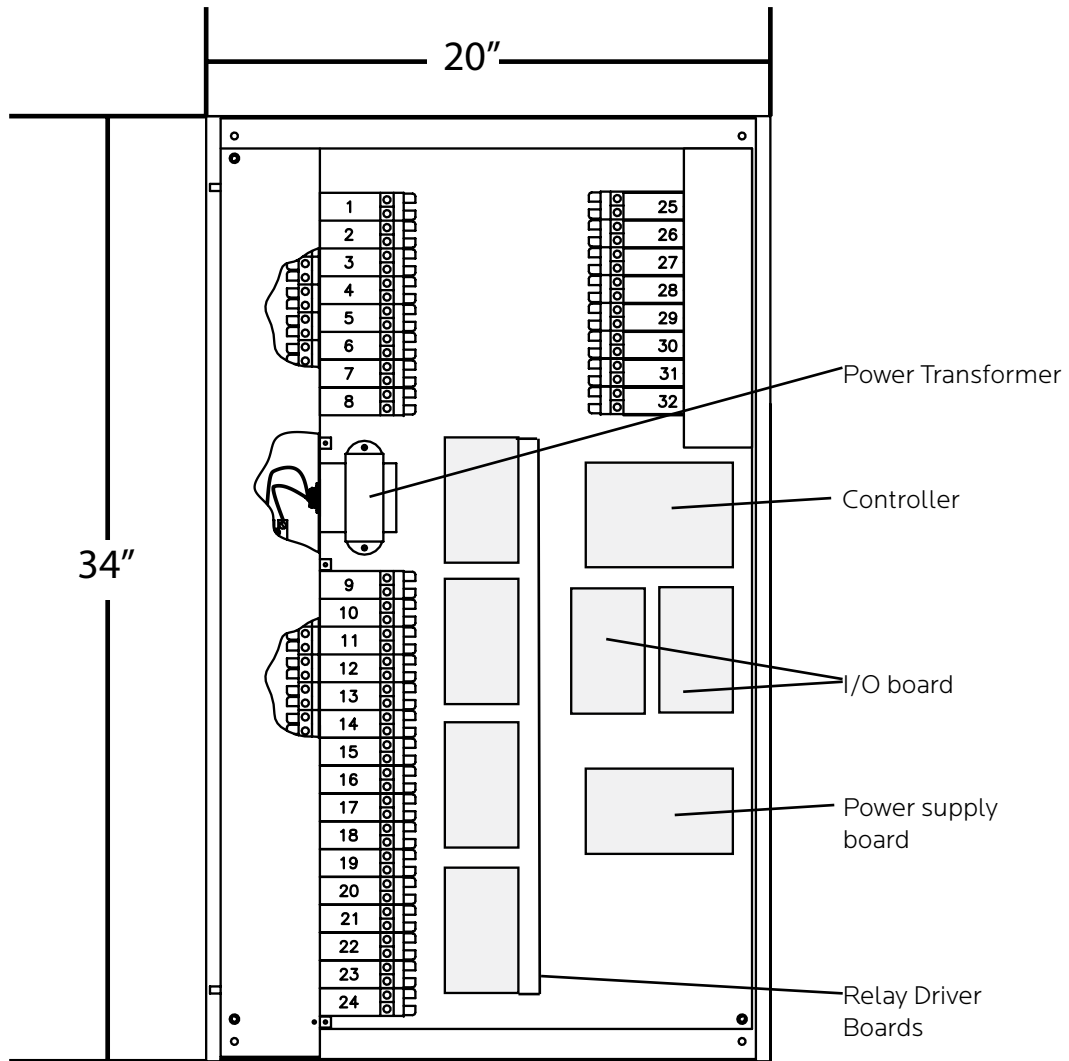
Outside dimensions  
28" w x 56" h x 6" d

Standard RPC Main Breaker:  
**225 Amp - 65k AIR - MJG32225**  
Main Breaker options - Part # suffix  
-MHG3110, MHG3125,  
-MJG3150, -MJG3175, -MJG3200  
(all 65k Amp Interrupt Rating)

Main Breaker wire:  
3/0-350 kcmil Aluminum or Copper  
200% Neutral has one feed lug that accepts two 350 kcmil wires.



Figure 4-14: RPCR-32 Mechanical Drawing



## **INITIAL POWER UP PROCEDURE**

With panel door open and breakers visible, turn on the panel main breaker and the Controller Power 15 Amp circuit breaker.

The green 'DC OK' LED should illuminate on the Power Supply and the green 'STATUS' LED on the Buffer unit should begin flashing steadily. The Buffer 'STATUS' LED will be constantly lit when the unit has been fully charged.

The Controller LCD display and orange Power LED should illuminate. If installed, the orange Power LED's on the I/O Expander boards and the orange Power LED on the MPE board will illuminate. The RPC will "beep" multiple times.

Connect a computer with an Ethernet port and open web browser program to the RPC Network connector using the provided crossover cable. Then enter the IP address for the controller.

---

## Chapter 5--Control Setup (Web Page)

### OVERVIEW

There are five main tabs on your RPC web page. This page will give you a quick overview of the pages and their functions.

### STATUS

The status page allows you to view the current status of the breakers and zones. Zones and individual breakers cannot be manipulated from this page.

### CONTROL

This page allows the user to manipulate individual breakers as well as breaker zones. "All ON/OFF" and "Hurry-Off" commands can also be triggered from this page.

### SETUP

The setup section allows you to setup and use the RPC Controller. From this section you can manipulate the network settings, assign breakers to zones, create sequences, activate emergency management features, setup the clock, change protocols, create schedules and assign contact closures.

### SUPPORT

This page provides contact information for LynTec.

### EVENT LOG

This page provides a log of simple loss of power events.

# Setup

This section will guide you through the process of setting up your RPC Controller. First enter the IP address or NetBios name into your web browser. When the RPC screen pulls up. Select “Setup” and “Setup Home” Tabs.

## SETUP HOME

Figure 5-1: Setup Home

The screenshot shows the 'Setup Home' web interface. At the top, there are navigation tabs: Status, Control, Setup, Support, Event Log, and Logout. Below these are sub-tabs: Setup Home, Network, Protocols, Panels, Schedules, and Contact Closures. The main content area is divided into several sections:

- Customer Information:** Fields for Serial Number, Job Name (Lyntec Demo), Contractor Name, Phone #, System Integrator, and another Phone #.
- Clock Set:** A note about clock updates, a 'Re-sync via NTP' button, and fields for Year (21), Month (2), Day (12), Hour (14), Min (39), Sec (13), and Day of the Week (Friday).
- Astronomical Clock:** A checked 'Enable Schedules' box, dropdowns for Country and City, and fields for City Name (NC, Charlotte), Latitude (35.0), Longitude (-81.0), Timezone (Eastern Daylight Time), and UTC Offset (-5). It also shows DST observed dates and current city details.
- Printable Pages:** Radio buttons for Network Setup, Panel Setup, and Panel Schedules (selected), with a 'Print Pages' button.
- Password Reset:** A note about root user updates, a 'User Level' dropdown (Super), and fields for Username, Password, and Repeat Password, with an 'Update Login Info' button.
- Backup RPC Configuration:** A 'Download Configuration' button.
- Restore RPC Configuration:** A 'Choose File' button, 'No file chosen' text, and a 'Restore' button.
- 1. Update Firmware:** A 'File' field, 'Choose File' button, 'No file chosen' text, and an 'Upload Firmware' button.
- 2. Update Web Page GUI:** A 'File' field, 'Choose File' button, 'No file chosen' text, and an 'Upload Web Pages' button.
- 3. Reboot RPC:** A note about GUI and firmware updates, and a 'Reboot RPC' button.

To set the username and password for your panel, click the Setup tab. The Setup Home tab should be displayed. The default username displayed is “admin” and the password fields is “pw”. Enter the desired username in the first field, password (without spaces or symbols) in the second and then retype the password again in the third field. When ready, click the Update Login Info button to save the changes to the controller’s memory. Note: Password can be any 2-8 alphanumeric characters, no symbols.

Contact information for service can also be entered on this page. Under the Customer Information field, enter the name and phone number of the installing contractor (electrician) and the system integrator (lighting technician) for future reference. Be sure to save changes.

Basic date and time information will be displayed in the Clock Set fields. Verify that the year, month and day are correct. Set the hour to the appropriate time for your time zone and verify that the minute displayed is correct. Save this information by clicking the Update Information button below the Clock Set portion of the window. Or, if connected to the internet, click “Re-sync via NTP”.

In the Astronomical Clock section, select your country from the dropdown. Then select the nearest major city. The database will automatically calculate latitude, longitude, timezone and UTC offset. The astronomical clock uses this information to calculate daily sunrise and sunset times.

Click the radio buttons for any pages to be printed out under the Printable Pages header. To print the Network Setup, Panel Setup or Panel Schedules pages at any time, ensure the desired buttons have been selected and then click the Print Pages button to the right. Please print a copy for your records after all other setup is complete. For a file versionized backup RPC configuration, use “Backup RPC” configuration. You can use this file for troubleshooting or to revert from future changes.

## Network Setup

**Figure 5-2: Network Configuration**

Figure 5-2 shows the network configuration portion of the Network setup.

Network Configuration			
Hostname	LYNTECRPC220		
Enable DHCP	<input checked="" type="checkbox"/> <i>If checked, DHCP is enabled. This module will automatically be assigned an IP, Subnet and Gateway address.</i>		
IP Address:	192.168.1.111	DNS1:	192.168.1.254
Subnet Mask:	255.255.255.0	DNS2:	0.0.0.0
Gateway Address:	192.168.1.254	MAC Address:	00:23:50:01:02:18

This screen shows the current network values. If DHCP is enabled then the fields will be grayed out. It is recommended that the user consult with the network administrator before changing these values.

The IP, Subnet and Gateway addresses are only used in the following situations:

- When DHCP is disabled
- When DHCP is enabled, but there is no DHCP server available on the network
- When the LCP provides DHCP addresses

If DHCP is enabled and available on the network, all these values will be obtained from the DHCP server.

If DHCP is disabled and a static address is used, save changes will automatically reset the RPC.

**Figure 5-3: Master/Remotes IP Configuration**

Master/Remotes IP Configuration	
Note: Any changes here will not be reflected in the panels configuration until "Scan New Circuits" is run and changes are accepted.	
<b>Master</b>	<input type="checkbox"/> Control up to 9 remote units
Remote 1:	<input type="text" value="192.168.1.201"/>
Remote 2:	<input type="text" value="192.168.1.202"/>
Remote 3:	<input type="text" value="192.168.1.203"/>
Remote 4:	<input type="text" value="192.168.1.204"/>
Remote 5:	<input type="text" value="192.168.1.205"/>
Remote 6:	<input type="text" value="192.168.1.206"/>
Remote 7:	<input type="text" value="192.168.1.207"/>
Remote 8:	<input type="text" value="192.168.1.208"/>
Remote 9:	<input type="text" value="192.168.1.209"/>

If you are using your RPC Controller to control other controllers or remote units on the same network (Whole Venue Control), check the master box. Then enter the IP addresses of the remote units that need to be controlled.

Secondary panels connected directly to the RPC do not have independent IP addresses. Only other controllers like the NPAC or remote units like the XRS and XRM units should be entered as remotes.

You will need to scan new circuits to configure and setup Whole Venue Control.

Figure 5-4: Protocol Options

Save Changes

**Protocols**

Port Type

Telnet server, port  Default at 23 (authentication required)

HTTP server, port  Default at 80 (GET commands via p2.rpc, authentication not required)

RS232 Baud Rate:  (valid range: 300 to 115200)

Shared:

OFF threshold:  (0-255) or  % (valid range: 0 to 190)

ON threshold:  (0-255) or  % (valid range: 65 to 255)

DMX512 (valid range: 1 to 512)

Set 1: 1st Address  (default) Loss of Signal Options:  No Action  ON  OFF

Set 2: 1st Address

Set 3: 1st Address

Set 4: 1st Address

RDM  (E1.20) Remote Device Management

sACN (E1.31) (valid range: 1 to 83999) (1 to 512)

Set 1: Univ  (default) 1st Address:  Loss of Signal Options & sACN Merging:  No Action  ON  OFF  No Merge  HTP  LTP

Set 2: Univ  1st Address:

Set 3: Univ  1st Address:

Set 4: Univ  1st Address:

RDMnet  (E1.33) Remote Device Management

IGMPv2  Allows RPC to receive sACN if router/switches block multicast traffic

## Port Type

The port type section is used to select the preferred communication protocol. The controller defaults to Ethernet (TCP/IP) for setup but can be controlled in conjunction with Telnet, RS-232, sACN or DMX-512 protocols.

## RS-232

For RS-232 operation use the following steps:

Select a baud rate in the dropdown box from 300 to 115,200 Baud. The default is 115200. The data structure is set at 8 Data bits, 1 Stop bit and No Parity bit (8,1,N).

## Telnet

Authenticate with the same username and password. The command structure is the same as RS-232

## DMX

For DMX operation use the following steps:

Set the ON and OFF thresholds in either the 0-255 range or the percentage range.

The LCP allows up to four different sets of DMX starting addresses within a single universe.

In the first set, enter the first individual breaker address. All motorized breakers need to be assigned addresses manually. Do this by clicking on each breaker in the order you would like them to be addressed. If you need to skip an address or group of addresses, simply create a new zone and enter the desired starting address. If you would like the LCP to automatically assign all breakers to consecutive addresses or assign a single address to a zone, you may change that in the "Panels" tab in the Zone Control options.

## Streaming ACN E1.31

For sACN operation use the following steps:

Set the ON and OFF thresholds in either the 0-255 range or the percentage range.

The LCP allows up to four different universes with sACN operation.

First, assign a number to the universe.

In the first set, enter the first individual breaker address. All motorized breakers need to be assigned addresses manually. Do this by clicking on each breaker in the order you would like them to be addressed. If you need to skip an address or group of addresses, simply create a new zone and enter the desired starting address. If you would like the LCP to automatically assign all breakers to consecutive addresses or assign a single address to a zone, you may change that in the "Panels" tab in the Zone Control options.

Please note that selecting sACN/DMX control for a zone will disable web browser or contact closure control for that breaker. Although, breaker/zone status may still be monitored by web browser or smartphone.



DMX and sACN are exclusive and cannot be used on the same controller at the same time. Either can be used to control breakers in zones while other zones are controlled by RS-232/Telnet IP commands or contact closures.

IGMP is available if your router/switch blocks multicast traffic.

Priority HTP/LTP is available for two sources in each set.

## Panel Setup

This section explains how to setup your panel and motorized breakers for remote operation.

### BREAKER SETUP

To setup breakers, follow these steps:

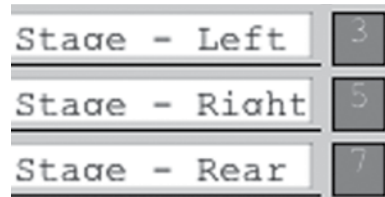
1. Under Setup, go to the Panels tab.
2. Breakers are generally installed at the factory and have been scanned during testing. If breakers have been changed, added or deleted, click the "Scan New Circuits" button. Motorized breakers are represented in white, unmotorized breakers or blank spaces are represented in gray. If the control buses in your panel are inverted, you may need to select the "top-feed" option.

Figure: 5-5

Panel 1		Panel 2		Panel 3		Panel 4	
1	22	1	22	1	22	1	
2	23	2	23	2	23	2	
3	24	3	24	3	24	3	
4	25	4	25	4	25	4	
5	26	5	26	5	26	5	
6	27	6	27	6	27	6	
7	28	7	28	7	28	7	
8	29	8	29	8	29	8	
9	30	9	30	9	30	9	
10	31	10	31	10	31	10	
11	32	11	32	11	32	11	
12	33	12	33	12	33	12	
13	34	13	34	13	34	13	
14	35	14	35	14	35	14	
15	36	15	36	15	36	15	
16	37	16	37	16	37	16	
17	38	17	38	17	38	17	
18	39	18	39	18	39	18	
19	40	19	40	19	40	19	
20	41	20	41	20	41	20	
21	42	21	42	21	42	21	

3. If panel configurations are correct, click “Accept Changes”; if not, reject and try again.
4. Assign names to the breakers (Figure 5-6).

**Figure: 5-6**

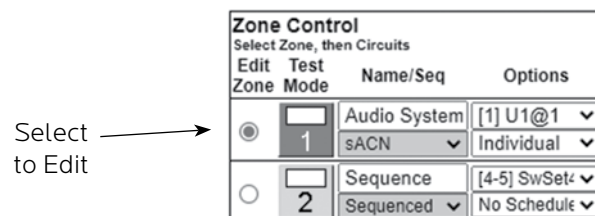


## ZONE SETUP

Breakers can be controlled individually or arranged into zones. Breakers in zones can be toggled at 25 ms intervals (Grouped Operation), at variable intervals (Sequenced Operation), or via DMX or sACN.

To setup a Zone follow these steps:

**Figure 5-7**



1. Choose which zone you would like to edit (Figure 5-7).
2. Name the Zone (Figure 5-8).
3. Choose Grouped, Sequenced, DMX or sACN operation. Note: DMX and sACN may not be used within the same LCP (Figure 5-8).
4. If using DMX or sACN operation, select the address set (Figure 5-9) from the dropdown.

Figure 5-8

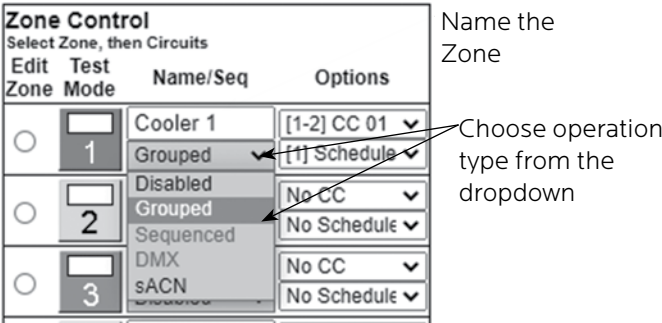
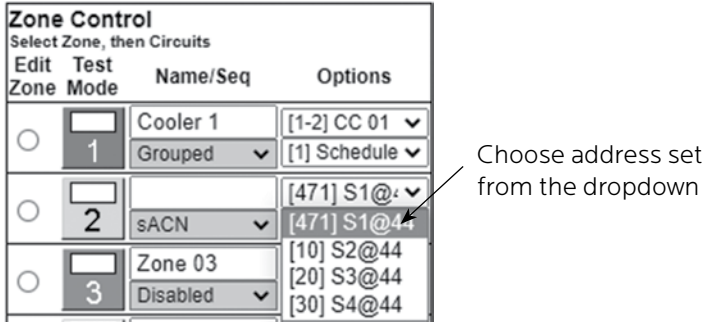
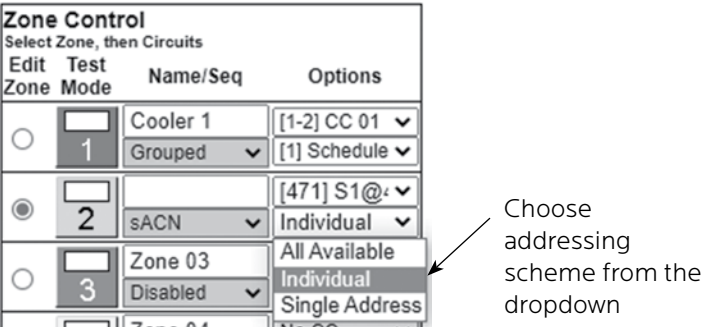


Figure 5-9



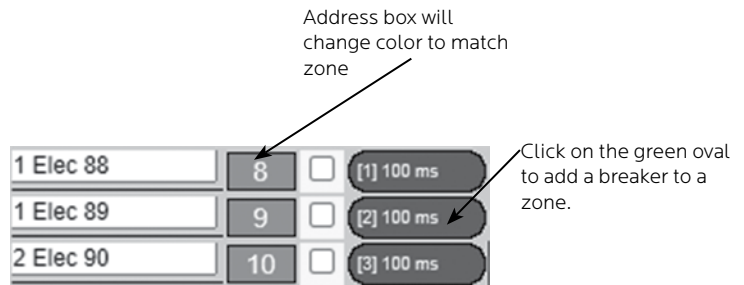
- 5. Select whether you want each circuit to be addressed individually or whether the zone should have a single DMX or sACN address (Figure 5-10).

Figure 5-10



6. Select a breaker to add to the zone by clicking on the breaker you want to add. Only motorized breakers (indicated in green) may be added to zones (Figure 5-11).

**Figure 5-11**



7. Optionally, use the arrows to select the position of the breaker in the zone. This sets the order in which they turn on and off. Or in the case of DMX or sACN, the address order. Note: DMX and sACN zones default to individual addressing. If you choose "All Available" the entire panel or panels will change to DMX or sACN.
8. For sequenced operation, select a delay time from the dropdown. Breakers in grouped zones toggle in 25ms intervals. (Figure 5-12) Delay time is the amount of time after a breaker changes state, before the new breaker in sequence changes state. Two custom delay times of up to 999 seconds are available.
9. Add additional consecutive breakers or click the "Close" button when finished to save. Or, click "Remove" to remove the breaker from the zone.
10. When finished adding breakers to the zone, click the "Test Mode" (Figure 5-13) button to do a blind test (breakers will not actually toggle).
11. Disable zones that are not in use so they do not appear in the status and control pages
12. Click "Save Changes" (Figure 5-14) to save zone information when finished.

Figure 5-12

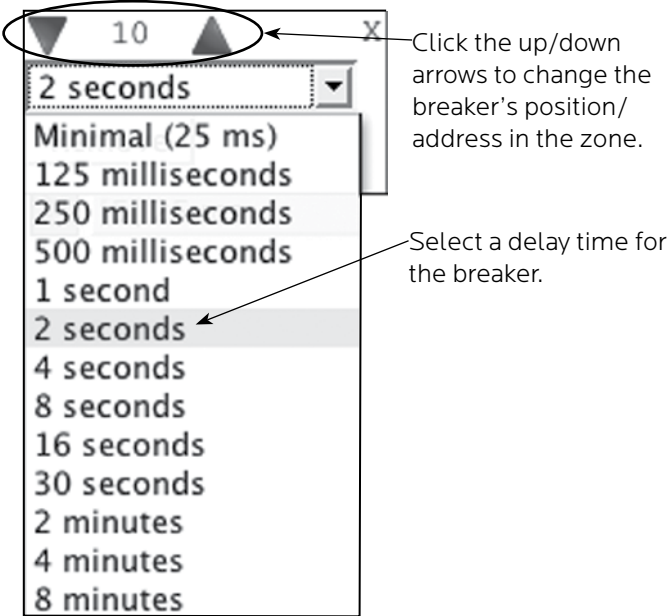


Figure 5-13

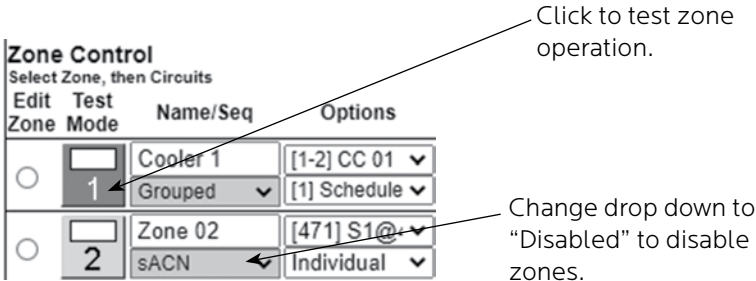


Figure 5-14



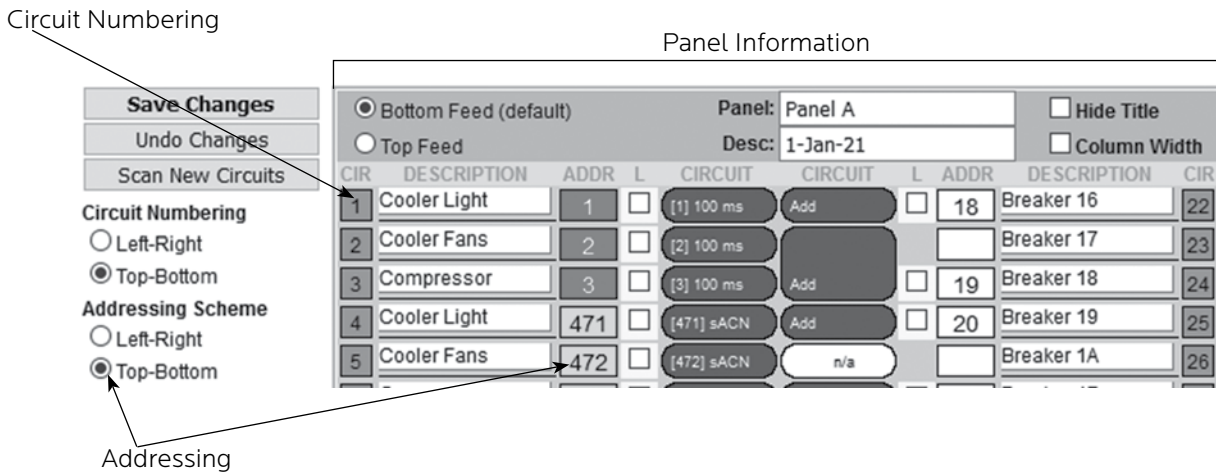
## GLOBAL PREFERENCES SETUP

This section guides you through the setup process for the many features and preferences in your RPC system.

### Labeling

In addition to labeling breakers, each panel in your RPC system can be named (up to 16 characters) and a short description can be added (Figure 5-15). For multi-panel systems, scroll down to see additional panels.

**Figure 5-15**



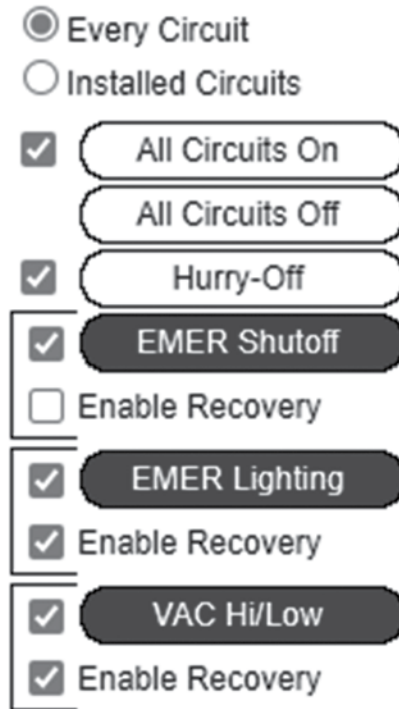
### Numbering and Addressing

The RPC system allows the user to choose top-bottom or left-right panel numbering (Figure 5-15). It also allows you to select the direction for addressing and whether to address every circuit or just installed circuits. Note: narrow profile panels are always “Top-Bottom”; the top bus depicted on the left and the bottom on the right.

**Global Control Preferences**

The following features can be selected for additional system flexibility

**Figure 5-16**

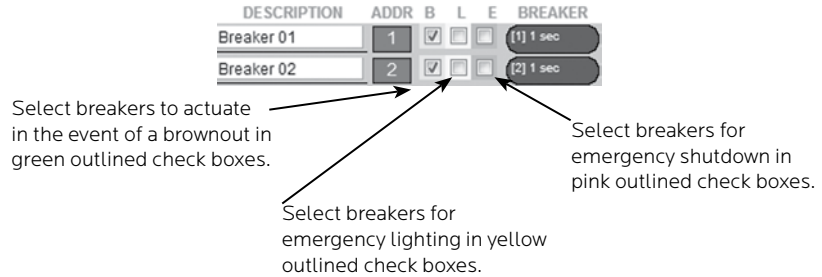


**Table 5-1**

All Breakers On/Off	Turns all the breakers (both zone and unassigned breakers) on or off by order of zone and sequence.
Hurry-Off	Turns breakers off rapidly without sequencing
E. Shutoff	Turns selected breakers off when external contacts or emergency management system activates (uses I/O CC#1)
E. Lighting	Turns selected breakers on when external contacts or emergency management system activates (uses I/O CC#6)
VAC Hi/Lo	Turns selected breakers off in the event of a over or undervoltage scenario. Sequences circuits back on when voltage has stablized for 4 seconds (optional on RPCR)

### Selecting breakers for Emergency Shutdown, Emergency Lighting or Brownout

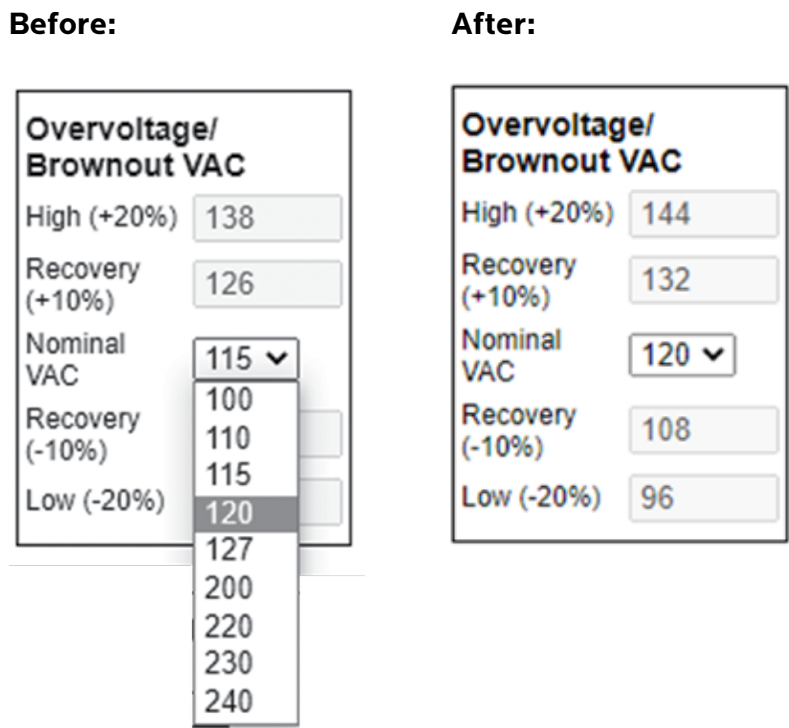
Figure 5-17



Select breakers to actuate in the event of a brownout or overvoltage by checking the green box next to the breaker. Select breakers to turn on in the event of a fire or other emergency by checking the yellow box next to the breaker. Select breakers to turn off in the event of a fire or other emergency by checking the red box next to the breaker. The status of unchecked breakers will remain unaffected.

### VAC Hi/Low Thresholds (optional)

Figure 5-18



If the Hi/Low VAC feature has been selected, the nominal AC Voltage should be set for proper operation. Click the pull down menu in the brownout VAC box and select the nominal operation voltage for the panel (100-240 VAC) The brownout thresholds will automatically adjust for shutoff at nominal -20% and recovery at nominal -10%..



### Schedule Setup

Follow these steps to set a schedule (not compatible with DMX or sACN).

1. Check “Enable Schedules” in Setup Home tab
2. Rename each schedule as desired
3. Assign day on and off times by clicking on time and off time buttons, using the pull-down menu and clicking the “pick” button to select (Figure 5-19). If using sunrise or sunset, the time will be chosen by the astronomical clock based on the selected city. A secondary offset time in increments of ±0.5 hours is optional.
4. Enable each schedule by clicking the checkbox for that line. This will make the schedules visible in the zone dropdown (“Panels” tab).
5. Click the Save Changes button at the top of the page to save updated schedules.

Figure 5-19

		Setup Home	Network	Protocols	Panels	Schedules	Contact Closures								
		Save Changes													
Schedule Name	Repeat	Sunday	En	Monday	En	Tuesday	En	Wednesday	En	Thursday	En	Friday	En	Saturday	En
Schedule 01	<input checked="" type="checkbox"/>	On: 8:00 am	<input checked="" type="checkbox"/>	On: 8:00 am	<input checked="" type="checkbox"/>	On: S.Rise 0h	<input checked="" type="checkbox"/>	On: S.Rise 0h	<input checked="" type="checkbox"/>	On: S.Rise 0h	<input checked="" type="checkbox"/>	On: S.Rise 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input type="checkbox"/>
<input checked="" type="checkbox"/> Enable		Off: 4:30 pm	<input checked="" type="checkbox"/>	Sunrise	0 h	Pick		Off: S.Set 0h	<input checked="" type="checkbox"/>	Off: S.Set 0h	<input checked="" type="checkbox"/>	Off: S.Set 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input type="checkbox"/>
Schedule 02	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>
<input type="checkbox"/> Enable		Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>
Schedule 03	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>	On: S.Set 0h	<input checked="" type="checkbox"/>
<input type="checkbox"/> Enable		Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>	Off: S.Rise 0h	<input checked="" type="checkbox"/>

### Assigning Schedules to Zones

To assign a schedule to a zone in the “Panels” tab:

1. Select the desired schedule from the dropdown box (Figure 5-20).
2. Save changes.

Figure 5-20

Zone Control			
Select Zone, then Circuits			
Edit Zone	Test Mode	Name/Seq	Options
<input type="radio"/>	1	Cooler 1 Grouped	[1-2] CC 01 [1] Schedule
<input type="radio"/>	2	Zone 02 sACN	No Schedule [1] Schedule 01 [2] Schedule 02
<input type="radio"/>	3	Zone 03 Grouped	[3] Schedule 03 [4] Schedule 04

### Contact Closure Setup

Configure the Digital I/O port and link it to a zone as follows:

1. Rename each contact closure as desired
2. Select contact closure action type
3. Save Changes

Note: CC Module 1 and CC Module 2 will be displayed if optional I/O Expander Boards are installed.

Figure 5-21

Save Changes			
Onboard			
	Name	Action	Merge
11	CC 01	Momentary N.O. ▼	U <span style="font-size: small;">← Unmerge</span>
22	CC 02	Momentary N.O. ▼	M
33	CC 03	Momentary N.O. ▼	M <span style="font-size: small;">← Merge</span>
44	CC 04	Maintain N.C. ▼	M
55	CC 05	Momentary Toggle ▼	
66	Emergency Lighting	Maintain N.O. ▼	

### Assigning Contact Closures to Zones

To assign a contact closure to a zone in the “Panels” tab:

1. Select the desired zone from the dropdown box.
2. Save changes.

Figure 5-22

Zone Control			
Select Zone, then Circuits			
Edit	Test	Name/Seq	Options
Zone	Mode		
<input type="radio"/>	1	Cooler 1 Grouped ▼	[1-2] CC 01 ▼ No CC [1-2] CC 01 ▲
<input type="radio"/>	2	Zone 02 sACN ▼	[3] CC 03 [4] CC 04

## Individual Momentary Contact ON and OFF Pushbuttons

Using a standard LynTec SS-2 Switch Set with illuminated ON switch or two illuminated pushbuttons:

Configure the Digital I/O port and link it to a zone as follows:

1. Follow the previous instructions for naming the contact closure and setting closure type.
2. Click the M button at the right side of the first of the two ports used (Figure 5-21). The name box and M button in the second port should turn gray and the Action selections should default to Momentary NO (normally open).
3. Ensure that both of the Action selections for both ports are set to Momentary NO.
4. Enter a name in the text field of the CC used that is indicative of the zone it will control.
5. Click the "Save Changes" button at the top of the Onboard I/O box.
6. Follow the previous instructions for assigning a contact closure to a zone. The two ports will be in brackets
7. Click the Save Changes button in the upper left corner of the Panels page.

Verify proper operation of your Switch Set:

1. Press the ON switch. Breakers in the selected zone should immediately begin actuating.
2. The ON indicator should flash steadily until all of the breakers are in the on state.
3. When the zone has completed, the ON indicator should remain constantly lit (if the indicator is blinking fast, one or more breakers may be tripped).
4. Press the OFF switch. Breakers in the selected zone should immediately begin actuating.
5. The ON indicator should flash steadily until all of the breakers are in the off state.
6. When the zone has completed, the ON indicator should remain constantly dark. Note: When using two illuminate pushbuttons the OFF indicator will remain constantly lit when the zone has completed. (OFF indicator will extinguish immediately when ON is pressed again.)

I/OR Setup

The I/OR board combines the input function of the I/O board with output devices (either low-voltage SPDT relays or high-current transistors) to control external devices.

In the contact closure setup page the first eight contacts in the I/OR Module are standard I/O ports. Configure the digital I/O ports and link it to a zone as described on the previous page.

The remaining contacts (under the heading “Trigger Controls” are the outputs (relays, transistors, or a combination of both)

Configure the Trigger Controls as follows:

1. Rename each contact closure as desired
2. If desired, merge a pair of outputs. Merged outputs act as a pair of momentary normally open pulsed outputs (for example, the merged outputs would mimic the SS-2 switch set when controlling a PDS-10). Unmerged outputs act as individual maintained normally open toggle switches.
3. If outputs are merged, select a pulse rate length of 50ms-500ms from the dropdown. The PDS-10 requires 100ms, but some contactors may require a longer pulse length.
4. Save Changes

Figure 5-23

Save Changes			
Onboard			
	Name	Action	Merge
11	CC 01	Momentary N.O.	U
22	CC 02	Momentary N.O.	M
33	CC 03	Momentary N.O.	M
44	CC 04	Maintain N.C.	M
55	CC 05	Momentary Toggle	
66	Emergency Lighting	Maintain N.O.	

IOR Module #1			
	Name	Action	Merge
77	CC 07	Momentary Toggle	M
88	CC 08	Momentary Toggle	M
99	CC 09	Momentary Toggle	M
100	CC 0A	Momentary Toggle	M
111	CC 0B	Momentary Toggle	M
122	CC 0C	Momentary Toggle	M
133	CC 0D	Momentary Toggle	M
144	CC 0E	Momentary Toggle	
Trigger Controls			
155	CC 0F	Maintain N.O.	M
166	CC 10	Maintain N.O.	M
177	CC 11	Maintain N.O.	M
188	CC 12	Maintain N.O.	M
199	CC 13	Maintain N.O.	M
200	CC 14	Maintain N.O.	M
211	CC 15	Maintain N.O.	M
222	CC 16	Maintain N.O.	

IOR Module #2			
	Name	Action	Merge
233	CC 17	Momentary Toggle	M
244	CC 18	Momentary Toggle	M
255	CC 19	Momentary Toggle	M
266	CC 1A	Momentary Toggle	M
277	CC 1B	Momentary Toggle	M
288	CC 1C	Momentary Toggle	M
299	CC 1D	Momentary Toggle	M
300	CC 1E	Momentary Toggle	
Trigger Controls			
311	CC 1F	Momentary 100mS	U
322	CC 20	Momentary 250mS	M
333	CC 21	Momentary 100mS	U
344	CC 22	Momentary 250mS	M
355	CC 23	Momentary 100mS	U
366	CC 24	Momentary 250mS	M
377	CC 25	Momentary 100mS	U
388	CC 26	Momentary 250mS	M

### Email Alert Setup

Follow these steps to set an email alert

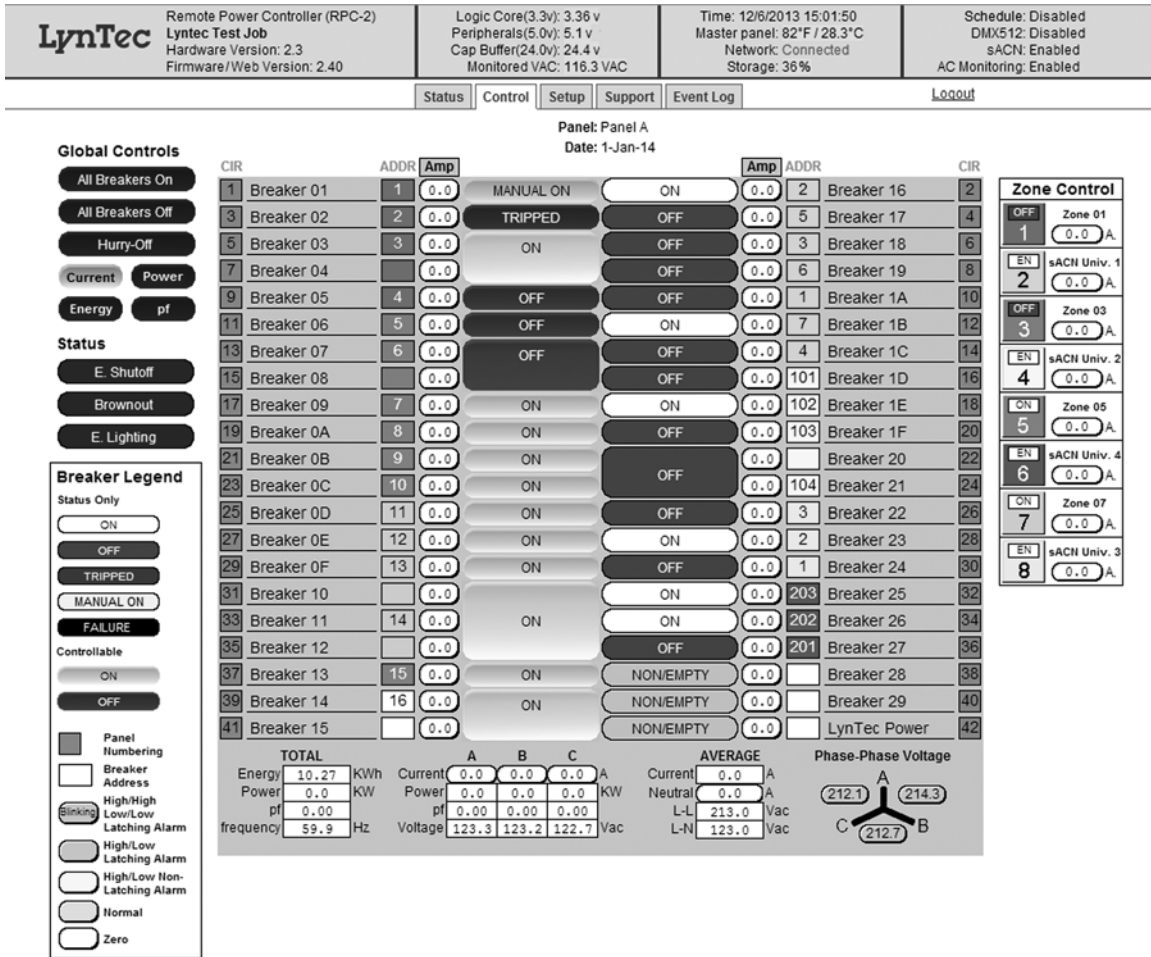
- 1. Go to Setup Network tab.
- 2. Enter email addresses.
- 3. Select alert types (tripped breaker, BO/EO/EL, On Recovery and/or Temperature).
- 4. If using Temperature alerts, enter the temperature threshold.

Figure 5-24

Email Alerts							
Enter the alert contact email where alert messages should be sent							
	Enter email address(es)	Breaker Trip	BO/EO/EL	On Recovery	Temp	Current Monitoring Only:	
Alert Contact 1:	<input type="text" value="dan@lyntec.com"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alert Contact 2:	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alert Contact 3:	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alert Contact 4:	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Alert Contact 5:	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Repeats:	<input type="radio"/> Hourly <input type="radio"/> Daily <input type="radio"/> Weekly				>150 °F	>15 A	<85 V
Ends:	<input type="radio"/> Never <input checked="" type="radio"/> After <input type="text" value="2"/> Emails						
<small>If your firewall settings prevents alert messages from being sent by the embedded SMTP server, or if your ISP blocks SMTP port 25, enter a remote SMTP server that alert email messages can be routed through. Some SMTP servers will reject non-fully qualified hostnames, so you may need to change the hostname on this device to FQDN format, e.e. use myhost.domain.com instead of myhost.</small>							
SMTP server:	<input type="text" value="mail.lyntec.com"/>			Port:	<input type="text" value="25"/>		
	<input type="checkbox"/> Use SSL (usually port 465)						
User:	<input type="text" value="rpc_v2@lyntec.com"/>			Optional			
Password:	<input type="text" value="dan321"/>			Optional			
Message:	<input type="text" value="Alert message from RPC Panel"/>						
	<input type="button" value="Send Test Message"/>						

# Chapter Six--Operating Your RPC

Figure 6-1



### Using the built-in web page

To operate the RPC using the built in web page, select the control tab from the top of the page. Once on the CONTROL page, simply click each breaker for individual control. Or, click a zone for zone control. “All Breakers ON” and “All breakers OFF” commands can also be executed from this page.

### Using a secondary controller

For DMX and sACN follow the manufacturer’s instructions using the addresses entered in the “Protocols” tab (see page 31).

RS-232 and TCP/IP schemes are in Appendix B (page 53).

# Appendix A--RPC Quick Start Guides

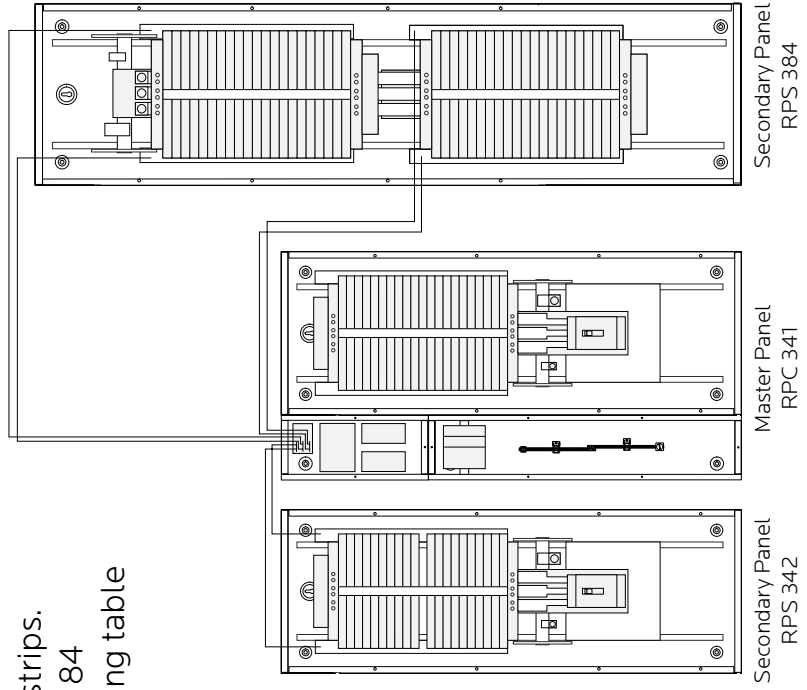
## RPC to RPS Wiring Instructions

# RPC THE INDUSTRY'S MOST COMPLETE SELF-CONTAINED ELECTRICAL CONTROL PANEL SERIES PANELS

## MASTER/SECONDARY QUICK START GUIDE

A quick guide to connecting RPS secondary panels to the RPC master panel. Up to to three RPS secondary panels may be added to an RPC master control panels. Each RPC controller can control a maximum of eight control bus strips. 30 and 42 circuit panels each contain two control strips, while 48, 66 and 84 circuit panels each contain 4 control bus strips. Please consult the following table for the positions of each control bus.

Number of Circuits	First Control Bus Set		Second Control Bus Set	
	Left Position	Right Position	Left Position	Right Position
30	Upper Left	Upper Right	NA	NA
42	Upper Left	Upper Right	NA	NA
48	Upper Left	Upper Right	Lower Left	Lower Right
65	Upper Left	Upper Right	Lower Right	Lower Left
84	Upper Left	Upper Right	Lower Left	Lower Right
30 Narrow	Lower	Upper	NA	NA
42 Narrow	Lower	Upper	NA	NA



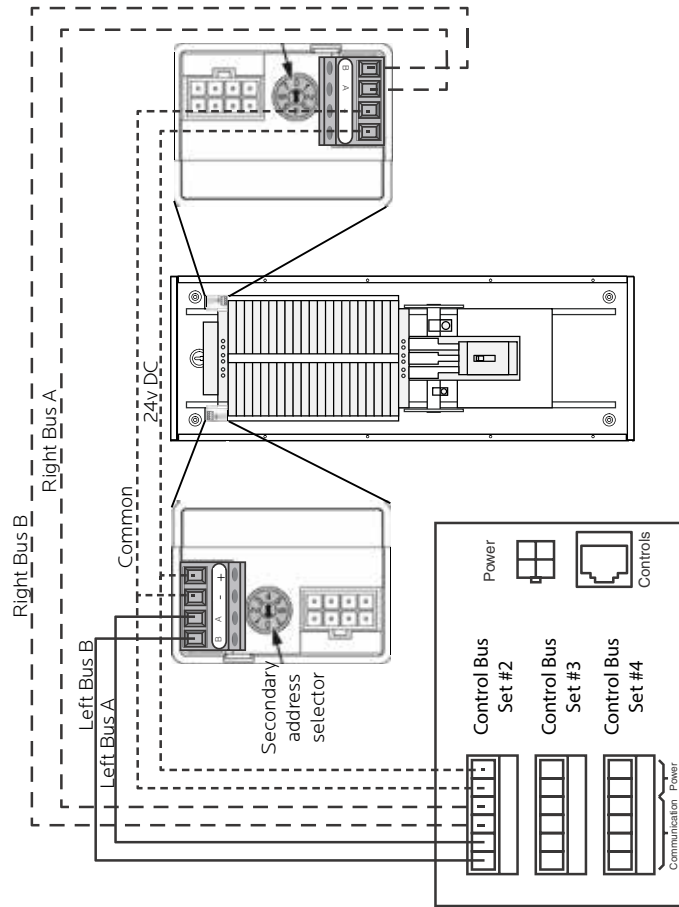
The first control bus set in the master panel connects directly to the RPC controller using the provided cables with 8-pin molex connectors. The second control bus set and all secondary panels, where applicable, connect to the multi-panel expander board (MPE). To connect bus strips to the MPE you will need either one 6-conductor, 600V jacketed, 18-14 AWG tray cable or two 4-conductor, 600V jacketed, 18-14 AWG tray cables per control bus set. Each strip requires 4 conductors but the DC power conductors can be daisy chained within the panelboard. Connect control bus strips to the MPE as follows.

1. At the MPE, terminate the Left Bus B, Left Bus A, Right Bus B, Right Bus A, Common (-) and 24VDC (+) in the screw-terminal header for that control bus strip from left to right.
2. Connect the cable to the control bus strips as shown in the diagram.

**If using one 6-conductor cable**, at each control bus set, strip the cable sheath back approximately 20 inches. Cut the conductors for Left Bus B, Left Bus A, - and + down to approximately 4 inches and terminate them in the Left Bus screw-terminal header from left to right. Terminate the remaining two conductors in the Right Bus B and Right Bus A positions of the Right Bus screw-terminal header. Cut two lengths of 18 AWG wire to install jumpers from Left Bus - and + to Right Bus - and +. Right Bus will not operate without these jumpers installed to provide 24VDC power and common.

3. Address the secondary address selectors as follows:

Bus Set #	Left Control Bus	Right Control Bus
Bus Set #2	2	3
Bus Set #3	4	5
Bus Set #4	6	7





## RPC Quickstart Guide

# RPC

THE INDUSTRY'S MOST COMPLETE SELF-CONTAINED  
ELECTRICAL CONTROL PANEL

## SERIES PANELS

### QUICK START GUIDE

This guide is a quick reference listing the steps necessary to install the RPC system. The steps in this guide are provided as an installation checklist. For complete installation instructions, refer to the instruction manual.

- 1) Make sure that the panel(s) have been wired by a certified electrician and that there is power to the panel(s).
- 2) Confirm that RPC panel and any secondary panels are connected to the controller as indicated in the "RPC Master/Secondary Quick Start Guide" bulletin.
- 3) Confirm that the electrician has connected the 15A breaker in the master panel to the power supply in the lower sidecar (Figure 1). When the 15A breaker is connected and switched on, orange power LEDs will be lit (Figure2).
- 4) Connect a computer to the control board using a CAT5 crossover cable  
OR connect the RPC to your network.

If connecting via a crossover cable:

If directly connected to the RPC with a computer configured for DHCP, APIPA protocol automatically assigns an address in the 169.254.x.x range. Check the LCD or push the top yellow button twice to see the assigned IP address to use in a web browser.

If connecting via a network:

Connect the RPC to the network via the Ethernet port. Push the upper yellow button twice or until the IP address appears on the LCD screen.

Figure 1

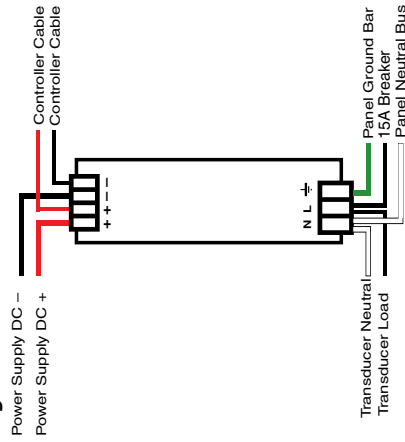
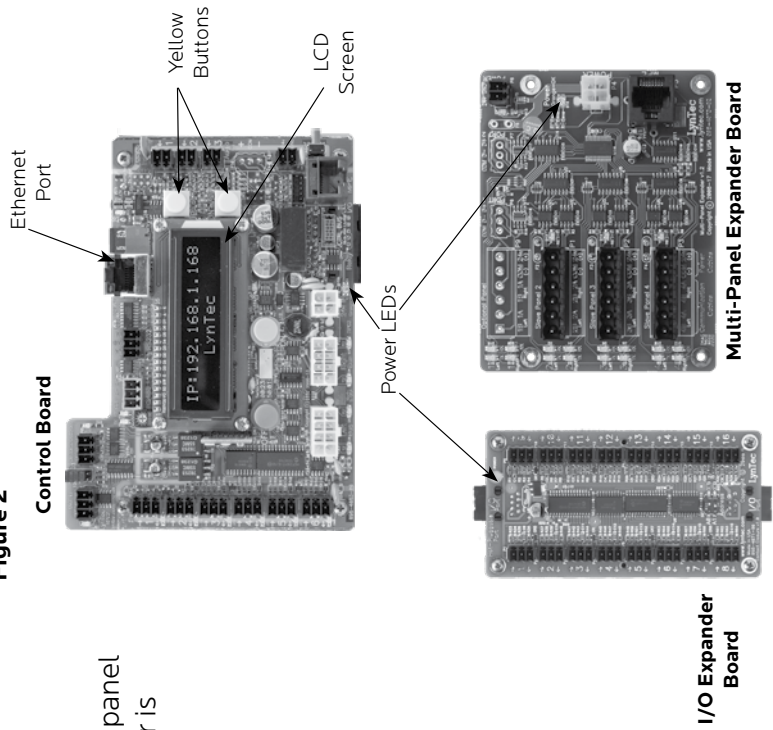


Figure 2



5) Open a web browser and access the status page via the IP address of the RPC. (ex. http://192.168.1.250)

The default username is "admin" and the initial password is "pw".

If desired, set your username and password on the "Setup Home" page under the "Setup" tab.

Setup Home		Status	Control	Setup	Support	Event Log	Logout	
Network		Protocols	Panels	Schedules	Contact Closures	Printable Pages		
<b>Customer Information</b>		Serial Number	RPC Server	Print Pages		Network Setup		
Job Name	Contractor	Contractor Name	Contractor	Panel Setup		Panel Schedules		
Phone #	Phone #1	System Integrator	Sys Integrator	Panel Schedules		Panel Schedules		
Phone #	Phone #2	<b>Clock Set</b>		Password Reset				
Note: NTP requires internet for autosync on Sundays.		Note: Only changed clock values will be updated.		Note: If the root username or password updated successful, you will be prompted for login information before the webpage will reload.				
Year (00-99)	21	Month (0-12)	01 (Enter '0' to resync via NTP)	User Level	Super	Username		
Day (1-31)	13	Hour (0-23)	15	Password		Repeat Password		
Min (0-59)	52	Sec (0-59)	49	Day of the Week	Friday	Update Login Info		
<b>Astronomical Clock</b>		Enable Schedules (see tab)		1. Update Firmware				
Country	Select Country	City	Select City	File	Choose File	No file chosen	Upload Firmware	
City Name	KS, Lenexa	Latitude	33.8	2. Update Web Page GUI				
Longitude	-118.3	Timezone	America/Los_Angeles	File	Choose File	No file chosen	Upload Web Pages	
UTC Offset	-6	DST Observed	<input checked="" type="checkbox"/> 2nd Sun/Mar... 1st Sun/Nov	3. Reboot RPC				
Current City	KS, Lenexa	Sunrise (SR)	8:34 a.m.	Note: New GUI and new firmware do not take affect until the RPC has been rebooted. Some updates may reset network to default.				
Sunset (SS)	7:40 p.m.	Save/Refresh Astro Clock		Reboot RPC				

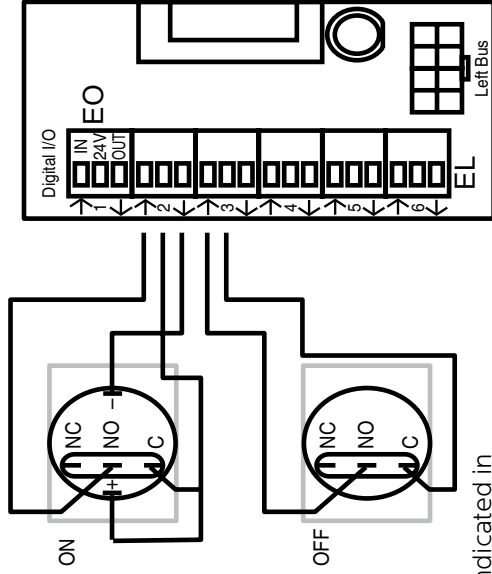
6) Complete the RPC setup by following the steps in Chapter 5.

# RPC THE INDUSTRY'S MOST COMPLETE SELF-CONTAINED ELECTRICAL CONTROL PANEL SERIES PANELS

## CONTACT CLOSURE SETUP QUICK START GUIDE

Using a standard LynTec SS-2 Switch Set with illuminated ON switch.

(For other types of switches, consult chapter 4 of the instruction bulletin for wiring diagrams.)



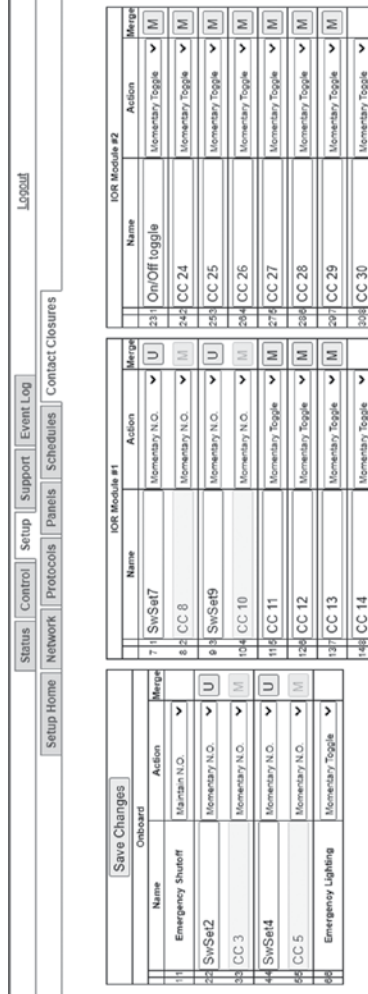
Note: Ports 1 & 6 are reserved for emergency functions

### RPC Contact Closure Wiring Instructions

- 1) Complete all steps in the "RPC Quick Start Guide"
- 2) Confirm that RPC panel and any secondary panels are connected to the controller as indicated in the "RPC Master/Secondary Quick Start Guide" bulletin.
- 3) Wire the ON switch to a digital I/O port on the left edge of the Controller board as follows:
  - A. Connect the 24VDC Common (center terminal of the I/O port) to the C pin of the ON switch.
  - B. Connect the Input terminal (arrow pointing towards header) to the NO pin of the ON switch.
  - C. Connect the Output terminal (arrow pointing away from header) to the - pin of the ON switch.
  - D. Connect a jumper between the C pin and the + pin of the ON switch.
- 4) Wire the OFF switch to the next consecutive digital I/O port on the left edge of the Controller board as follows:
  - A. Connect the 24VDC Common terminal to the C pin of the OFF switch.
  - B. Connect the Input terminal to the NO pin of the OFF switch
- 5) On the RPC web page, go to the contact closure page. (Setup → Contact Closures)

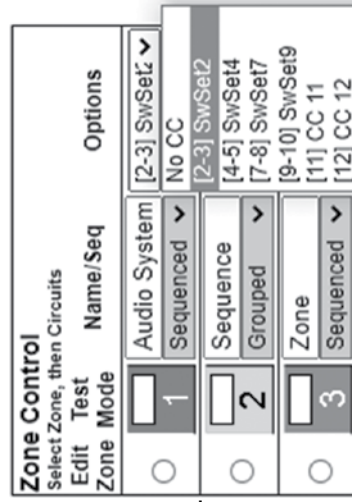
**6)** Configure the digital I/O port:

- A. Rename each contact closure as desired
- B. Click the M (merge) button at the right side of the first of the two ports used. The name box and M button in the second port should turn gray and the Action selections should default to Momentary NO (normally open).
- C. Ensure that both of the Action selections for both ports are set to Momentary NO.
- D. Click the “Save Changes” button at the top if the Onboard I/O box.



**7)** Assign the contact closure to a zone in the “Panel” (SETUP⇒PANELS) screen:

- A. In the ZONE CONTROL box under “CC/Schedule”, choose which contact closure to assign to any zone using the drop down box.
- B. Enable the zone by selecting Sequenced or Grouped operation under “Name/Seq”.
- C. Save changes.



**8)** Verify proper operation of your Switch Set:

- A. Press the ON switch. Breakers in the selected zone should immediately begin actuating.
  - B. The ON indicator should flash steadily until all of the breakers are in the on state.
  - C. When the zone has completed, the ON indicator should remain constantly lit.
  - D. Press the OFF switch. Breakers in the selected zone should immediately begin actuating.
  - E. The ON indicator should flash steadily until all of the breakers are in the off state.
  - F. When the zone has completed, the ON indicator should remain constantly dark.
- Note: When using two illuminate pushbuttons the OFF indicator will remain constantly lit when the zone has completed. (OFF indicator will extinguish immediately when ON is pressed again.)

## Appendix B--RS-232, Telnet and TCP/IP Protocols

### RS-232/TELNET PROTOCOL

Note: Telnet port = 23. Send Telnet commands to LCP using port 23 (e.g. 192.168.1.250:23)

**Table B-1: Command Codes**

Command	Decimal	Hexidecimal
Start Byte	176	0xB0
Activate breakers	180	0xB4
Deactivate breakers	181	0xB5
Request all breakers status	183	0xB6
Activate zones	183	0xB7
Deactivate zones	184	0xB8
Request zones status	185	0xB9
Event ON	186	0xBA
Event OFF	187	0xBB
Event status	188	0xBC
Request breakers status	189	0xBD
Request bus status	190	0xBE
Breaker status identifier	200	0xC8
Zone status identifier	201	0xC9
Event status identifier	202	0xCA
Emergency override identifier	203	0xCB
Checksum identifier	204	0xCC
Checksum digits	205-214	0xCD - 0xD6
Stop byte	240	0xF0

### Addressing Scheme

#### Breaker address:

1 byte. Numbers 1 through 168 (0x01 – 0xA8) are assigned to populated breakers in sequential order

Zone number: 1 byte (1-12)

### Breaker Related Commands

#### Activate breakers

*0xB0, 0xB4, breaker\_address\_1, ..., breaker\_address\_m, 0xF0*

breaker\_address\_1, ..., breaker\_address\_m: addresses of breakers to be activated  $m \leq 168$

**Deactivate breakers**

*0xB0, 0xB5, breaker\_address\_1, ..., breaker\_address\_n, 0xF0*

breaker\_address\_1, ..., breaker\_address\_n: addresses of breakers to be deactivated  $n \leq 168$

**Activate/deactivate breakers**

*0xB0, 0xB5, breaker\_address\_1, ..., breaker\_address\_m, 0xB6, breaker\_address\_1, ..., breaker\_address\_n, 0xF0*

breaker\_address\_1, ..., breaker\_address\_m: addresses of breakers to be activated

breaker\_address\_1, ..., breaker\_address\_n: addresses of breakers to be deactivated  $m+n \leq 168$

**Request all breakers status**

*0xB0, 0xB6, 0xF0*

**Request breakers status**

*0xB0, 0xBD, breaker\_address\_i, breaker\_address\_j, ..., breaker\_address\_n, 0xF0*

breaker\_address\_1, ..., breaker\_address\_n: addresses of breakers, status of which is requested

**Request bus status**

*0xB0, 0xBE, bus, 0xF0*

bus=0-7: number of bus, status of which is requested

**Reply to activate/deactivate breakers command: status of updated breakers**

*0xB0, 0xC8, breaker\_address\_i, breaker\_status\_i, breaker\_address\_j, breaker\_status\_j, ..., breaker\_address\_n, breaker\_status\_n, 0xF0*

breaker\_address\_i, breaker\_status\_i, breaker\_address\_j, breaker\_status\_j, ..., breaker\_address\_n, breaker\_status\_n:

Addresses and status of breakers updated by the command reply is generated for

**Reply to request breakers status command:**

Same format as “Request Bus Status”; contains addresses and status of the breakers specified in the request command

**Reply to request all breakers status command: status of all breakers**

*0xB0, 0xB6, byte\_1, ..., byte\_84, 0xF0*

byte\_i: bits 7-4: status of breaker # 2i, bits 3-0: status of breaker # 2i-1, i=1-84

**Reply to request bus status command: status of all breakers of the requested bus**

*0xB0, 0xBE, byte\_1, ..., byte\_11, 0xF0*

byte\_i format is identical to 3.9, except i=1-11

**Breaker status description (4 bits) (3,5 &6 panels only)**

Value	1	2	3	4	5	6
Status	Off	On	Tripped	Faulty	Empty	Manual On

**Table B-2: Breaker Status**

**Zone Related Commands**

**Activate zone**

*0xB0, 0xB7, zone\_number\_1, ..., zone\_number\_m, 0xF0*

zone\_number\_1, ... zone\_number\_m: numbers of zones to be activated m<=12

**Deactivate zone**

*0xB0, 0xB8, zone\_number\_1, ..., zone\_number\_n, 0xF0*

zone\_number\_1, ... zone\_number\_n: numbers of zones to be deactivated n<=12

**Activate/deactivate zone**

*0xB0, 0xB7, zone\_number\_1, ... zone\_number\_m, 0xB8, zone\_number\_1, ..., zone\_number\_n, 0xF0*

zone\_number\_1, ... zone\_number\_m: numbers of zones to be activated

zone\_number\_1, ... zone\_number\_n: numbers of zones to be deactivated m+n<=12

**Request zones status**

*0xB0, 0xB9, 0xF0*

**Reply to activate/deactivate zone command: status of updated zones**

*0xB0, 0xC9, zone\_address\_i, zone\_status\_i, zone\_address\_j, zone\_status\_j, ..., zone\_address\_n, zone\_status\_n, 0xF0*

zone\_address\_i, zone\_status\_i, zone\_address\_j, zone\_status\_j, ..., zone\_address\_n, zone\_status\_n: addresses and status of zones updated by the command reply is generated for

**Reply to request zone status command: status of all 12 zones**

*0x40, 0xB9, byte\_1, byte\_2, byte\_3, 0x80*

byte\_i: bits 7-6: status of zone # 4i, bits 5-4: status of zone 4i-1, bits 3-2: status of zone 4i-2, bits 1-0: status of zone 4i-3, i=1-3

**Zone status description (2 bits)**

<b>Value</b>	1	2	3
<b>Status</b>	Off	On	Sequencing

**Table B-3: Zone Status**

**Event Related Commands**

**Event ON**

*0xB0, 0xBA, event\_number\_1, ..., event\_number\_m, 0xF0*

event\_number\_1, ... event\_number\_m: numbers of events to be turned on

m<=2

**Event OFF**

*0xB0, 0xBB, event\_number\_1, ..., event\_number\_n, 0xF0*

event\_number\_1, ... event\_number\_n: numbers of events to be turned off

n<=2

**Event ON/OFF**

*0xB0, 0xBA, event\_number\_1, ... event\_number\_m, 0xBB, event\_number\_1, ..., event\_number\_n, 0xF0*

event\_number\_1, ... event\_number\_m: numbers of events to be activated

event\_number\_1, ... event\_number\_n: numbers of events to be deactivated

m+n<=2



**Request event status**

*0xB0, 0xBC, 0xF0*

**Reply to activate/deactivate event command: status of updated events**

*0xB0, 0xCA, event\_address\_i, event\_status\_i, < event\_address\_j, event\_status\_j>, 0xF0*

event\_address\_i, event\_status\_i, < event\_address\_j, event\_status\_j>: addresses and status of events updated by the command reply is generated for

**Reply to request event status command: status of all 2 events**

*0xB0, 0xBC, status\_byte, 0xF0*

status\_byte: bits 3-2: status of event #2, bits 1-0: status of event #1

**Event status description (1 bit)**

Value	1	2	3
Status	Off	On	Processing

**Table B-4: Event Status**

**Device Discovery**

**Beacon request**

*"AMX\r"*

**Beacon**

*"AMXB<-SDKClass=Utility><-Make=Lyntec><-Model=RPC><-Revision=1.1.4>\r"*

(rev changed from 1.1.3; 1.1.3 supported old protocol)

**Emergency override response to breaker, zone, or event on/off command**

If system is in Emergency Override mode, it replies to breaker, zone or event on/off command with emergency override response

*0xB0, 0xCB, 0xF0*

## Checksum

Checksum is optional. It is calculated as a sum of all bytes of the message starting with start byte and ending with checksum identifier. Checksum is transmitted as a sequence of 3 bytes, where 1st byte is (hundreds+0xCD), 2nd byte is (tens+0xCD) and 3rd byte is (units+0xCD). For example, checksum=137 will be transmitted as:

*0xCE, 0xD0, 0xD4*

## Code Examples (Hercules, PuTTY, TCP Test Tool 3.0) using Telnet

The following examples turn on zone #3:

Hercules SETUP Utility using TCP Client:

```
admin$0d$0a(SEND)
pw$0d$0a(SEND)
b0b703f0$0d$0a(SEND)
```

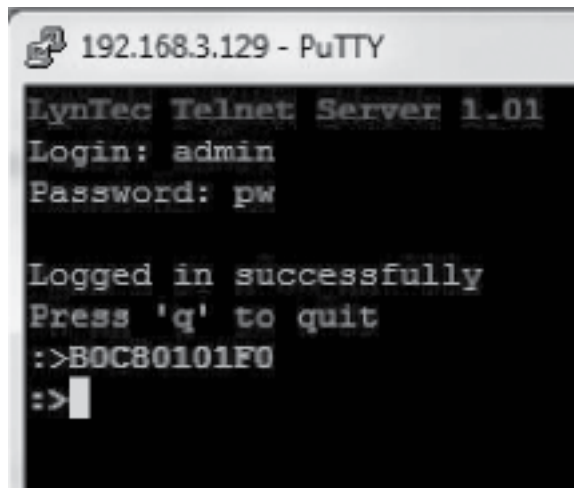
PuTTY using Telnet connection type (Figure B-1):

```
admin<ENTER>
pw<ENTER>
b0b703f0<ENTER>
```

TCP Test Tool 3.0 using Client:

```
admin[CR][LF](SEND), or ^M(SEND)
pw[CR][LF](SEND)
b0b703f0[CR][LF](SEND)
```

**Figure B-1: Sample PuTTY session**



---

## TCP/IP PROTOCOL

TCP/IP communications and control via a third party control system is facilitated by the use of the HTTP GET command. Use “&” to string multiple commands together

Example of GET command:

```
GET /p2.rpc?IPB002=1
```

```
GET /p2.rpc?IPB002=0&IPB004=1
```

Three modes of control are:

Breaker control = “B”, Zone control = “Z”, Event Control = “E”

### Breaker Control = B

Refer to LynTec LCP browser set-up for breaker addressing.

```
GET /p2.rpc?IPB002=1
```

This control string will turn breaker #2 on.

```
GET /p2.rpc?IPB002=0
```

This control string will turn breaker #2 off.

Control of up to 168 breakers (4 panel system) is possible.

### Zone Control = Z

Configure your zones (breaker groups) using the LynTec LCP browser set-up when connected to the LynTec LCP panel.

```
GET /p2.rpc?IPZ002=1
```

This control string will turn zone #2 on.

```
GET /p2.rpc?IPZ002=0
```

This control string will turn zone #2 off.

### Events Control = E

Events include:

Event 1 = “All Breakers ON”

Event 2 = “All Breakers OFF”

Event 3 = “Hurry OFF” zips all breakers off fast.

Event 4 = “EO” Emergency override (status only)

Event 5 = “Audio Timer” (NA) (status only)

Event 6 = “BO” Brown-Out (status only)

Event 7 = “DMX/sACN”

Event 8 = “EL” Emergency Lighting

*GET /p2.rpc?IPE001=1*

This control string will turn event #1 on.

*GET /p2.rpc?IPE001=0*

This control string will turn event #1 off.

**Verification Scheme**

Verification Scheme:

The following GET command will return the current status of all breakers, zones and events in the LCP system.

*GET /p2.rpc*

Your custom software will need to parse for necessary information. The system will return the following:

*breakers=10110111111111111111*  
*zones=111111111011*  
*events=1000000*

The above return is displaying the status of a 20 circuit breakers system in which all are presently ON, with the exceptions of breaker #2 and breaker #5, which are OFF.

The above return is also showing the status of 12 zones, all are ON with the exception of zone #10, which is OFF.

The events return is showing that event #1 is active = "All Breakers ON"

**Table B-5: Verification Status**

<b>Status returns for Breakers:</b>	<b>Status returns for Zones and Events:</b>
0 = OFF	0 = OFF
1 = ON	1 = ON
2 = Breaker Tripped (panels only)	2 = Processing
3 = Failure	
4 = Manual On (panels only)	
5 = Empty	

---

**Code Examples (Crestron, QSC, Hercules, PuTTY, TCP Test Tool 3.0) using TCP/IP**

The following examples turn on zone #3 (all SPACES are necessary):

Crestron command string:

If RPC at 192.168.12.180, append " HTTP/1.1\nHost: 192.168.12.180\n\n" in the delimiter:

```
GET /p2.rpc?IPZ003=1 HTTP/1.1\nHost: 192.168.12.180\n\n
```

QSC command string:

```
GET /p2.rpc?IPZ003=1 \r\n\r\n
```

Hercules SETUP Utility (HW-group.com) using TCP Client:

```
GET /p2.rpc?IPZ003=1 $0d$0a$0d$0a(SEND)
```

PuTTY using Raw connection type:

```
GET /p2.rpc?IPZ003=1 <ENTER><ENTER>
```

TCP Test Tool 3.0 (SimpleComTools.com) using Client:

```
GET /p2.rpc?IPZ003=1 <ENTER><ENTER>(SEND), or  
^M^M(SEND), Hex mode shows "20 0D 0A 0D 0A" at the  
end
```

**Table B-6: Decimal to Hex Conversions**


Serial and Telnet commands require hex addresses

Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex	Decimal	Hex
1	01	36	24	71	47	106	6A	141	8D	176	B0
2	02	37	25	72	48	107	6B	142	8E	177	B1
3	03	38	26	73	49	108	6C	143	8F	178	B2
4	04	39	27	74	4A	109	6D	144	90	179	B3
5	05	40	28	75	4B	110	6E	145	91	180	B4
6	06	41	29	76	4C	111	6F	146	92	181	B5
7	07	42	2A	77	4D	112	70	147	93	182	B6
8	08	43	2B	78	4E	113	71	148	94	183	B7
9	09	44	2C	79	4F	114	72	149	95	184	B8
10	0A	45	2D	80	50	115	73	150	96	185	B9
11	0B	46	2E	81	51	116	74	151	97	186	BA
12	0C	47	2F	82	52	117	75	152	98	187	BB
13	0D	48	30	83	53	118	76	153	99	188	BC
14	0E	49	31	84	54	119	77	154	9A	189	BD
15	0F	50	32	85	55	120	78	155	9B	190	BE
16	10	51	33	86	56	121	79	156	9C	191	BF
17	11	52	34	87	57	122	7A	157	9D	192	C0
18	12	53	35	88	58	123	7B	158	9E	193	C1
19	13	54	36	89	59	124	7C	159	9F	194	C2
20	14	55	37	90	5A	125	7D	160	A0	195	C3
21	15	56	38	91	5B	126	7E	161	A1	196	C4
22	16	57	39	92	5C	127	7F	162	A2	197	C5
23	17	58	3A	93	5D	128	80	163	A3	198	C6
24	18	59	3B	94	5E	129	81	164	A4	199	C7
25	19	60	3C	95	5F	130	82	165	A5	200	C8
26	1A	61	3D	96	60	131	83	166	A6	201	C9
27	1B	62	3E	97	61	132	84	167	A7	202	CA
28	1C	63	3F	98	62	133	85	168	A8	203	CB
29	1D	64	40	99	63	134	86	169	A9	204	CC
30	1E	65	41	100	64	135	87	170	AA	205	CD
31	1F	66	42	101	65	136	88	171	AB	206	CE
32	20	67	43	102	66	137	89	172	AC	207	CF
33	21	68	44	103	67	138	8A	173	AD	208	D0
34	22	69	45	104	68	139	8B	174	AE	209	D1
35	23	70	46	105	69	140	8C	175	AF	210	D2

# Appendix C--Troubleshooting

## TROUBLESHOOTING THE CONTROLLER

Use the following table if you need to troubleshoot the RPC controller.



# DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

**This equipment must be installed and serviced only by qualified electrical personnel.**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- Carefully inspect the work area for tools and objects that may have been left inside the equipment.
- Use caution while removing or installing panels so that they do not extend into the energized bus; avoid handling the panels, which could cause personal injury.

**Failure to follow this instruction will result in death or serious injury.**

**Table C-1: RPC Controller Troubleshooting**

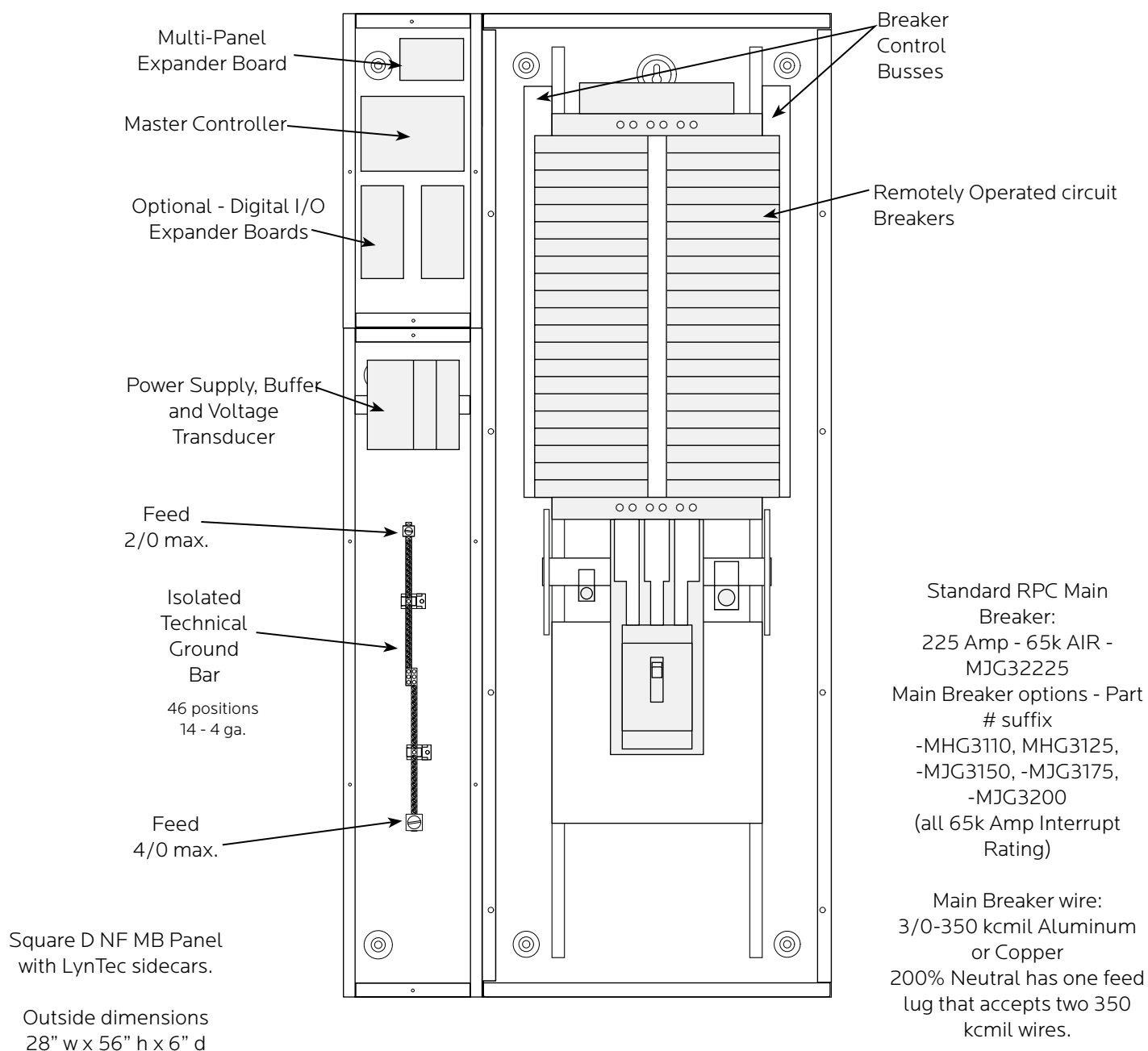
Condition	Possible Causes	Solutions
Controller's CPU LED is not blinking, Power LED is not orange, or MPE's Power LED is not orange (red may indicate a short circuit)	Power supply is not energized.	Verify that the power supply's LED status indicators are ON. Also, verify that the power supply line terminal is secured. Refer to the Power Supply instruction bulletin for installation and safety information.
	Controller is not receiving power from the power supply.	Call LynTec 800-724-4047
	The power supply is not operating.	Verify that the power supply is wired correctly and CL1 and CL2 lights are illuminated. See <b>Chapter 4</b> .
Motorized circuit breaker does not respond to input change or does not respond as desired.	Controller or power supply is not powered or operating properly.	Verify that both the controller and power supply are energized by observing that all power LEDs are illuminated. Verify that the controller is operating by observing that the CPU LED is blinking.
	Breakers have been moved.	Scan new circuits.
	Circuit breaker handle is OFF.	Turn circuit breaker handle to ON.
	Circuit breaker is tripped.	Reset the circuit breaker by turning it OFF and then back ON.
	Circuit breaker Manual mode is engaged.	Restore the circuit breaker to Auto mode by engaging the white button located on the face of the circuit breaker.
	Input is not connected or wired properly.	Verify that the input wiring is properly connected. Wiring specifics depend on the type of external switching device being used. Refer to <b>Chapter 4--Wiring</b> for more information.
	Circuit breaker is not included in zone, or an incorrect circuit breaker is included in zone.	To test all circuit breakers assigned to a zone, first verify that all circuit breakers are in Auto mode. Enter the Setup page and verify that the breaker is assigned to the correct zone. If the circuit breakers are not responding as desired, refer to <b>Chapter 5--Control Setup</b> for more information on how to add or delete a circuit breaker in a zone.
	Sub-net wiring error.	Circuit breakers in Secondary panels must have properly wired sub-net communications and power. Refer to <b>Chapter 5--Control Setup</b> , as well as instruction bulletins for the control bus, power supply, and Secondary address selector, for more information.
Scan New Circuits is non-responsive.	Sub-net addressing error.	Each Secondary panel must have a unique address. Verify that no two Secondary address selectors have the same address setting and that no Secondary address selector is set to zero, unless the power supply and controller are remotely mounted with no control bus attached. Refer to the Secondary Address Selector instruction bulletin for more information.
	Multi-pole breaker spanning control buses.	In panels where control buses meet end to end (e.g. RPC 365, Narrow Profile Panelboards), multi-pole breakers may not span more than one control bus. Move the multi-pole breaker so that the entire breaker is positioned on a single control bus.



## Appendix D--RPC System Components

The LynTec system consists of control buses, a panelboard, remotely operated circuit breakers, a power supply, a buffer, a transducer and a controller. Optional expansion boards are available to add up to three additional panels or 16 or 32 additional I/O outputs. Figure B-1 identifies main components which are described in this appendix.

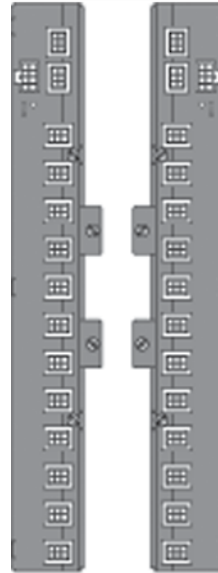
Figure D-1



### Control Bus

The control buses provide control and data monitoring for remotely operated circuit breakers and are connected to the power supply and controller. Installed control buses will not interfere with the installation of standard circuit breakers into the panelboard.

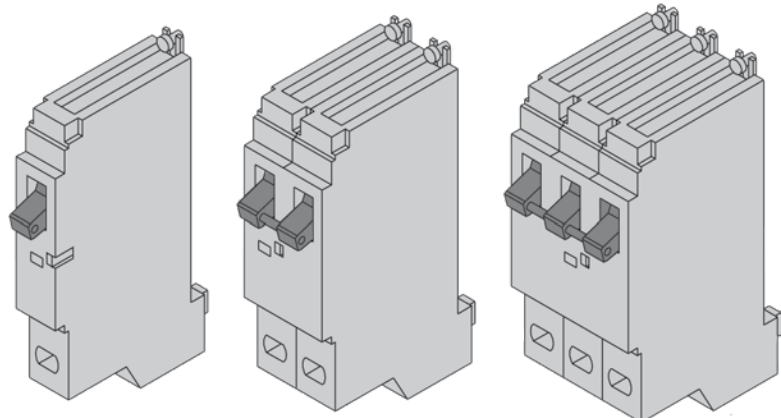
Figure D-2



### Remotely Operated Circuit Breakers

Remotely Operated Circuit Breakers provide the same overcurrent protection as standard circuit breakers, and have an integral operator that can remotely switch the circuit breaker ON and OFF. The circuit breaker works with the RPC controller, power supply, and control buses to provide a remote power switching system in a panelboard.

Figure D-3



Part Numbers:  
MBR-15  
MBR-20  
MBR-30

Part Numbers:  
MBR-215  
MBR-220  
MBR-230

Part Numbers:  
MBR-315  
MBR-320  
MBR-330

## Power Supply

The Power Supply connects to a 15A non-motorized breaker and provides 24VDC, 3A power to the RPC controller.

**Figure D-4**



## Buffer

The buffer stores DC power and discharges it during a brownout or power loss condition to turn off selected breakers (up to four panels). This is a capacitive buffer and is lead and acid free.

**Figure D-5**



## Transducer

The transducer converts incoming AC line voltage to a varying DC output, allowing the RPC to monitor line voltage.

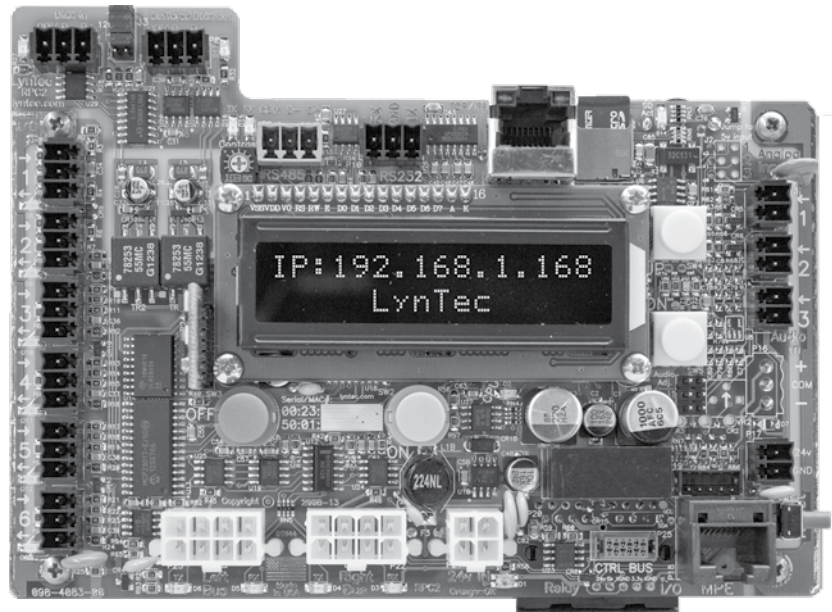
**Figure D-6**



## Controller

The RPC Controller provides control logic for the operation of a RPC system. The controller uses remotely operated circuit breakers to control up to 167 remotely operated branch circuits. The built in web server allows for easy setup and operation. Also, it provides input channels for connecting external dry-contact control devices.

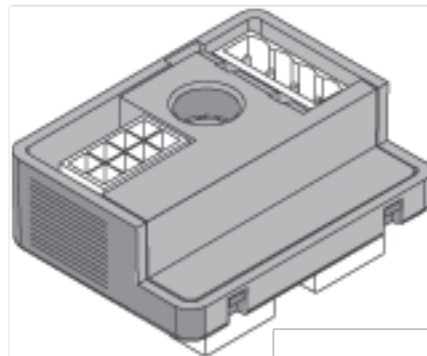
Figure D-7



## Secondary Address Selector

The secondary address selector is used to set an address for a control bus on a secondary panelboard.

Figure D-8



## Appendix E-- Specifications

Inputs	Six (6) independently configurable digital inputs/outputs
Input Types	Maintained N.O. Maintained N.C. Momentary N.O. Momentary N.C. Momentary toggle Three (3) analog inputs 0-5 or 0-10VDC Thirty-two (32) I/O ports on optional expander boards
Status Output	24 Vdc (60mA maximum load per individual output) Indicator output on each I/O port
Auxiliary Power Supply	24 Vdc (200mA maximum Current)
Communication Interface	10/100 Base-T, Ethernet/Web Server DMX in/thru 3-wire RS-232 3-wire
DMX Isolation	Galvanic isolated at 1500VDC
Circuit breaker delay	0.025 sec to 8 min (selectable)
Environmental Standards	Operating Temperature: -5°C to +65°C (internal panelboard temperature) Storage Temperature: -20°C to 85°C Operating Humidity: 5% to 95%
Time Clock	Operation during absence of power = >8 years
Memory Retention	Program: > 20 years
Standards	UL 508A CSA C22.2-14
ESD Immunity	IEC 1000, Level 4
RF Susceptibility	IEC 1000, Level 3
Electrical Fast Transient Susceptibility	IEC 1000, Level 3
Electrical Surge Suceptibility--power line	IEC 1000, Level 4
Electrical Surge Suceptibility--data line	IEC 1000, Level 3
FCC--Part 15, Class A	
ETL Tested to: CU 22.2-14 and UL508A	