

LynTec RPCM

Instruction Bulletin

Remote
Power
Controller
for
Mobile
Distribution



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 connect and operate the LynTec Remote Power Controller-Mobile Power Distribution Cabinet (RPCM). The controller uses remotely operated circuit breakers to control up to 42 remotely operated branch circuits. Control signals originate externally from commands received via the communications network or from dry contact inputs. Acceptable communications protocols include TCP/IP, sACN (E1.31) and DMX-512.

CONTENTS

Each RPC comes standard with the following components installed:

- RPC Controller
- Power Supply
- 400A Feed-thru Cam-Lok connectors for incoming power connections
- 200% Neutral Connections
- Main Circuit Breaker
- Nine, four digit, LED front panel displays
- Front panel LCD status display
- Neutral to ground voltage transducer

Optional equipment that may be installed:

- Capacitive buffer for brownout protection/operation.

Front Panel Overview

Figure 1-1: RPCM Front Panel Display

Figure 1–1 shows the parts of the RPCM front panel. A brief description of each part follows in Table 1–1.

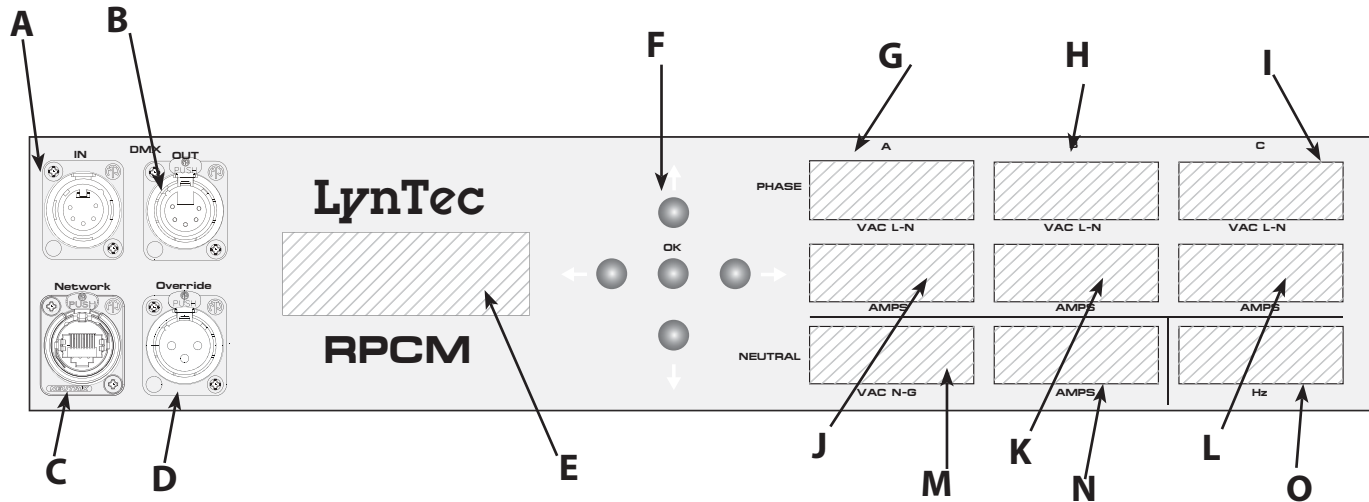


Table 1-1: Front Panel Display Components

Component	Description
A. DMX in	DMX 512 Input, isolated
B. DMX Out	DMX 512 Output, buffered, isolated.
C. Network Port	Connects the cabinet to a computer or network for initial setup or operation using the built-in web interface (RJ-45) and/or sACN.
D. Override	Dry contacts for EO and EL functions--See Chapter 4
E. LCD Screen	Screen shows RPCM information.
F. Navigation Buttons	Navigates the LCD screen menus
G. VAC L-N Phase A	Displays voltage for phase A
H. VAC L-N Phase B	Displays voltage for phase B
I. VAC L-N Phase C	Displays voltage for phase C
J. Current Phase A	Displays current in amperes for phase A
K. Current Phase B	Displays current in amperes for phase B
L. Current Phase C	Displays current in amperes for phase C
M. VAC Neutral to Ground	Displays neutral to ground voltage
N. Neutral Current	Displays current in amperes for the neutral
O. Frequency	Displays AC frequency in Hz

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.



DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- This equipment must be 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.

Chapter Three--Quick Start Guide

INTRODUCTION

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

Steps	Reference
1. Connect the RPCM to 120/208V power source	See appropriate instruction bulletins. Chapter 4--Wiring
2. Make required control and/or network connections	See appropriate instruction bulletins.
3. Connect the controller to a computer or network for panel setup.	Chapter 4--Wiring
4. Access the web page by entering the IP address or NetBIOS name into web browser.	Chapter 5--Control Setup
5. Complete the panel setup.	Chapter 5--Control Setup

Chapter 4--Wiring

To initially wire the RPCM follow these easy steps:

1. In this order, connect ground, neutral and phase feeds to rear panel.
2. Verify the presence of incoming power with indicator lights and test points on rear RPCM panel.

Emergency Shutdown Wiring:

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

1. From the fire alarm unit or latching Emergency Shutoff switch, wire the common to pin 1 and the open circuit to pin 2 (Figure 4-1).
2. When the Normally Open contacts are closed, all breakers that have been selected for E. Shutoff cycle to OFF.
3. When the contacts are released, the status indicator should extinguish and, if recovery is checked, 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.

Emergency Lighting Wiring:

To connect your emergency lighting system to the RPCM, follow these steps.

1. From the fire alarm unit or latching Emergency Lighting switch, wire the common to pin 1 and the open circuit to pin 3 (Figure 4-1).
2. When the Normally Open contacts are closed, all breakers that have been selected for E. Lighting cycle to ON.
3. When the contacts are released, the status indicator should extinguish and, if recovery is checked, all breakers should return to their previous state.

See Chapter 5 to configure the software for emergency lighting.

To operate Emergency Shutdown and Emergency Lighting simultaneously, tie pins 2 and 3 together.

Figure 4-1: Override connector

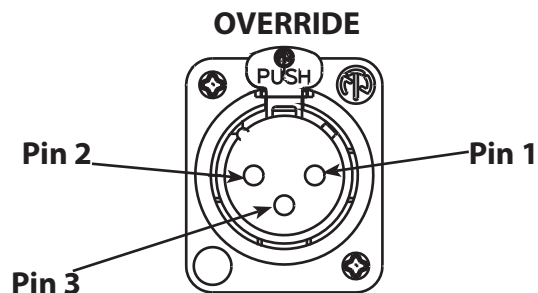
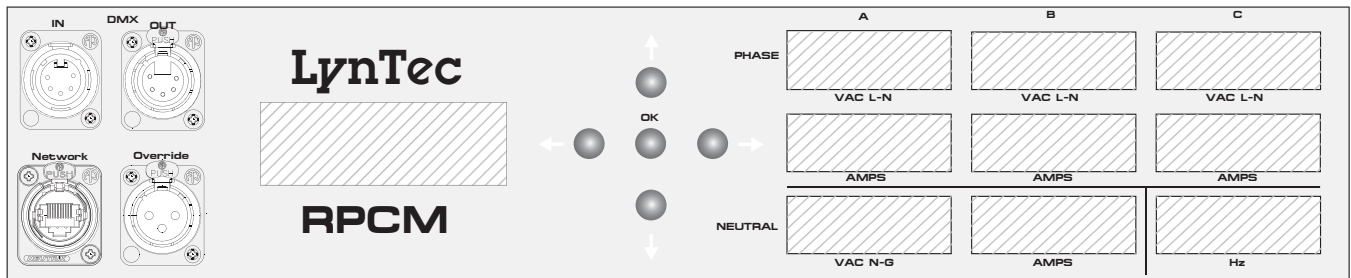


Figure 4-2: Control Wiring

**TCP/IP**

Install and connect a standard Cat. 5e cable from the facility network to the Controller Network port.

DMX

If DMX-512 is being used to control the panel, install and connect a five-pin DMX cable from the DMX source to the DMX Input.

INITIAL POWER UP PROCEDURE

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

The Controller LCD display should illuminate.

Chapter 5--Control Setup (Web Page)

OVERVIEW

There are 5 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, create schedules and assign contact closures.

SUPPORT

This page provides contact information for LynTec.

EVENT LOG

This page provides a log of 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 opens. Select "Setup" and "SetupHome" Tabs.

SETUP HOME

Figure 5-1--Setup Home

Parameters	
Enable DHCP	<input checked="" type="checkbox"/> If checked, DHCP is enabled. This module will automatically be assigned an IP, Subnet and Gateway address.
NetBIOS name	LYNTECRPC04
Email	<input checked="" type="checkbox"/> dan@lyntec.com
SMS	<input checked="" type="checkbox"/> 913-529-2233
FTP	<input type="checkbox"/> Not running
SNMP	<input type="checkbox"/> Not running
Port Type	<input type="radio"/> RS232 Baud Rate: 9600 OFF threshold: 64 (0-255) or 25 % (valid range: 0 to 190) ON threshold: 191 (0-255) or 74 % (valid range: 65 to 255) (valid range: 1 to 512)
	<input checked="" type="checkbox"/> Set 1: 1st Address 1 (default) No Action ON OFF <input checked="" type="checkbox"/> Set 2: 1st Address 51 Loss of Signal Options <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> Set 3: 1st Address 101 <input checked="" type="checkbox"/> Set 4: 1st Address 151
	<input type="radio"/> DMX512
	<input type="checkbox"/> RDM (E1.20) Remote Device Management (valid range: 1 to 63999) (1 to 112) No Action ON OFF <input checked="" type="checkbox"/> Universe 1: 1 (default) 1st Address: 1 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> Universe 2: 2 1st Address: 101 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> Universe 3: 3 1st Address: 1 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> <input checked="" type="checkbox"/> Universe 4: 4 1st Address: 201 <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/> Loss of Signal Options <input checked="" type="radio"/> <input type="radio"/> <input type="radio"/>
	<input checked="" type="radio"/> SACN (E1.31)
	<input type="checkbox"/> RDMnet (E1.33) Remote Device Management

To set the username and password for your panel, click the Setup tab. The Setup Home tab should be displayed. The default username displayed should be "admin" and the password fields should be "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.

Contact information for service can also be entered on this page. Under the Serial Number field, enter the name and phone number of the installing contractor (Electrician) and the system integrator (A/V Technician) for future reference. Save this information by clicking the Update Information button below the Clock Set portion of the window.

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.

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 setup is complete.

Network setup

Figure 5-2--Network Settings

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

Current Network Value		Network Settings	
This section shows the current network values.		The IP, Subnet and Gateway addresses are only used in the following situations: <ul style="list-style-type: none"> • When DHCP is disabled • When DHCP is enabled, but there is no DHCP server available on the network • For the network bootloader If DHCP is enabled and available on the network, all these values will be obtained from the DHCP server.	
IP Address:	192.168.1.68	IP Address:	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="68"/>
Subnet Mask:	255.255.255.0	Subnet Mask:	<input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="255"/> <input type="text" value="0"/>
Gateway Address:	192.168.1.254	Gateway Address:	<input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="254"/>
MAC Address:	0.35.80.0.0.1	MAC Address:	<input type="text" value="0"/> <input type="text" value="35"/> <input type="text" value="80"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="P"/>

The left hand side of the screen shows the current network values. 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
- For the network bootloader

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 and then press "Reset RPC" to apply changes.

Figure 5-3: Interface options

Parameters	
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>
NetBIOS name	<input type="text" value="LYNTECRPC04"/>
Email	<input checked="" type="checkbox"/> <input type="text" value="dan@lyntec.com"/> <input type="text"/> <input type="text"/>
SMS	<input checked="" type="checkbox"/> <input type="text" value="913-529-2233"/> <input type="text"/> <input type="text"/>
FTP	<input type="checkbox"/> <input type="text" value="Not running"/>
SNMP	<input type="checkbox"/> <input type="text" value="Not running"/>
Port Type	<input type="radio"/> RS232 Baud Rate: <input type="text" value="9600"/> OFF threshold: <input type="text" value="64"/> (0-255) or <input type="text" value="25"/> % (validrange: 0 to 190) ON threshold: <input type="text" value="191"/> (0-255) or <input type="text" value="74"/> % (validrange: 65 to 255) (valid range: 1 to 512)
	<input type="radio"/> DMX512 Loss of Signal Options: <input checked="" type="radio"/> No Action <input type="radio"/> ON <input type="radio"/> OFF
	<input checked="" type="checkbox"/> Set 1: 1st Address <input type="text" value="1"/> (default)
	<input checked="" type="checkbox"/> Set 2: 1st Address <input type="text" value="51"/>
	<input checked="" type="checkbox"/> Set 3: 1st Address <input type="text" value="101"/>
	<input checked="" type="checkbox"/> Set 4: 1st Address <input type="text" value="151"/>
	<input type="checkbox"/> RDM (E1.20) Remote Device Management (valid range: 1 to 63999) (1 to #12)
	<input checked="" type="checkbox"/> Universe 1: <input type="text" value="1"/> (default) 1st Address: <input type="text" value="1"/>
	<input checked="" type="checkbox"/> Universe 2: <input type="text" value="2"/> 1st Address: <input type="text" value="101"/>
	<input checked="" type="checkbox"/> Universe 3: <input type="text" value="3"/> 1st Address: <input type="text" value="1"/>
	<input checked="" type="checkbox"/> Universe 4: <input type="text" value="4"/> 1st Address: <input type="text" value="20"/>
	<input checked="" type="radio"/> sACN (E1.31) Loss of Signal Options: <input checked="" type="radio"/> No Action <input type="radio"/> ON <input type="radio"/> OFF
<input type="checkbox"/> RDMnet (E1.33) Remote Device Management	

NetBios Name

The NetBios name defaults to LynTecRPC. Each master panel in your system should be assigned a unique NetBios name. After names are assigned the user can access the system web page by entering the NetBios name into the web browser instead of using the IP address.

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 sACN or DMX-512 protocols.

DMX

For DMX operation use the following steps:

The RPCM 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. If you would like the RPC to automatically assign breakers to consecutive addresses. you may change that in the "Panels" tab.

Streaming ACN E1.31

For sACN operation use the following steps:

The RPCM 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. If you would like the RPC to automatically assign breakers to consecutive addresses. you may change that in the "Panels" tab.

Please note that selecting sACN/DMX control for a breaker or zone, will disable web control for that breaker/zone

Panel Setup

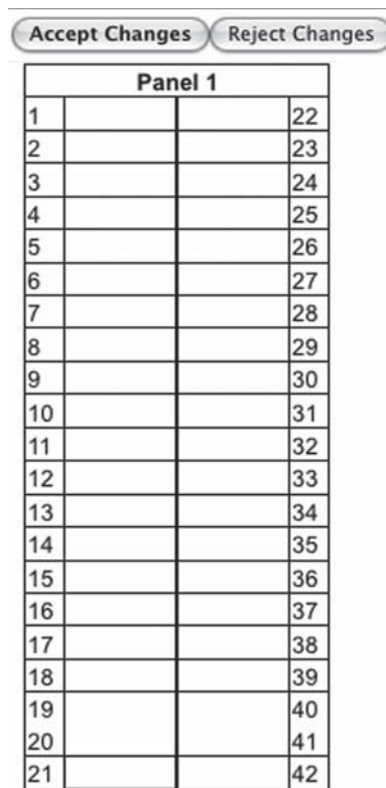
This section explains how to setup your panel and motorized breakers for remote operation. Repeat this step any time breakers are added or removed.

BREAKER SETUP

To setup breakers, follow these steps:

1. Under Setup, go to the Panels tab.
2. Confirm that all breakers are seated properly and have not shifted during transport.
3. Click the "Scan Breakers" button. Motorized breakers are represented in white, unmotorized breakers or blank spaces are represented in gray.

Figure 5-4



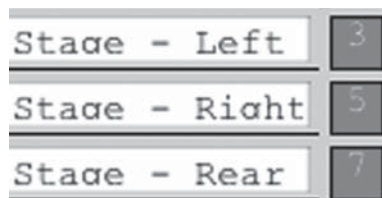
The screenshot shows a software interface for panel setup. At the top, there are two buttons: "Accept Changes" and "Reject Changes". Below them is a table titled "Panel 1". The table has 21 rows and 3 columns. The first column contains numbers 1 through 21. The second column is empty. The third column contains numbers 22 through 42. The table is currently empty, representing a blank slate for breaker configuration.

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

4. If panel configurations are correct, click "Accept Changes"

5. Assign names to the breakers. (Figure 5-5)

Figure 5-5



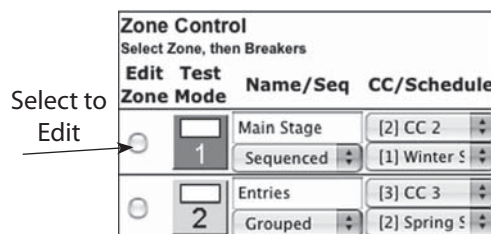
ZONE SETUP

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:

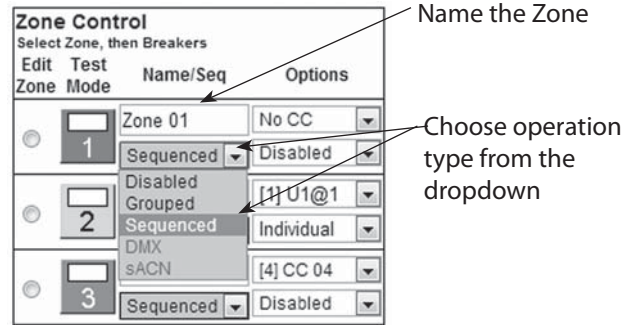
1. Choose which zone you would like to edit. (Figure 5-6)

Figure 5-6



2. Name the Zone. (Figure 5-7)
3. Choose Grouped, Sequenced, DMX or sACN operation. Note: DMX and sACN may not be used within the same RPCM (Figure 5-7)

Figure 5-7



4. If using DMX or sACN operation, select the address set (Figure 5-8) or universe (Figure 5-9) from the dropdown.

Figure 5-8

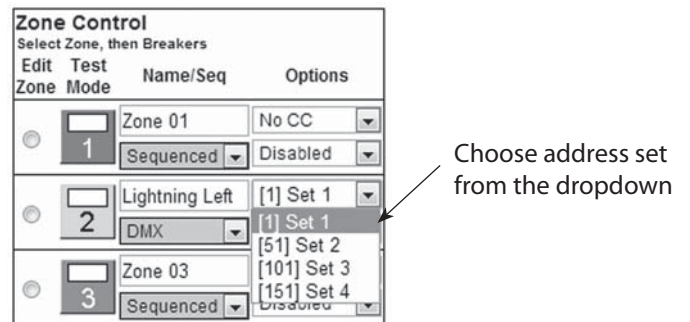
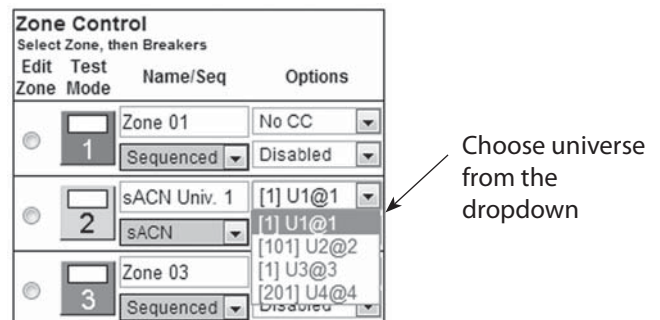


Figure 5-9



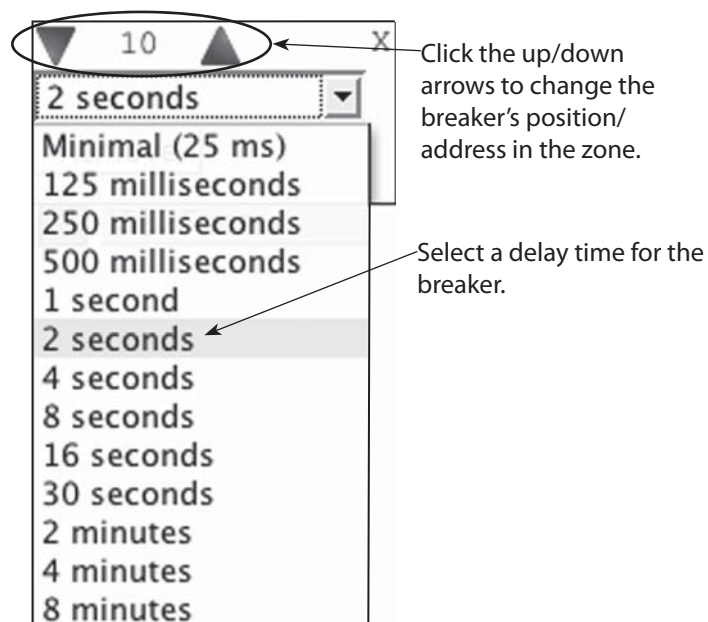
5. Select a breaker to add to the zone by clicking on the breaker you want to add. Only motorized breakers (indicated in green) may be added to zones. (Figure 5-10)

Figure 5-10



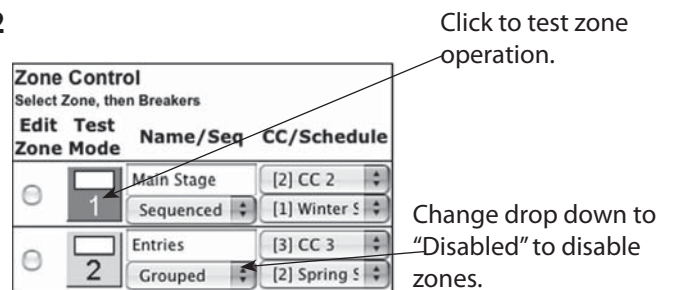
6. Select the position of the breaker in the zone. This sets the order in which they turn on and off. Or in the case of DMX or sACN, the address order. (Figure 5-11). Note: DMX and sACN zones default to individual addressing. If you choose "All Available" the entire panel or panels will change to DMX or sACN.
7. For sequenced operation, select a delay time from the dropdown. Breakers in grouped zones toggle in 25ms intervals. (Figure 5-11) Delay time is the amount of time after a breaker changes state, before the new breaker in sequence changes state.

Figure 5-11



8. Click the "Close" button when finished to save. Or, click "Remove" to remove the breaker from the zone.
9. When finished adding breakers to the zone, click the "Test Mode" (Figure 5-12) button to do a blind test (breakers will not actually toggle). Please note that delay times larger than one second are reduced to one second in Test Mode for expediency.

Figure 5-12



10. Disable zones that are not in use so they do not appear in the status and control pages (Figure 5-12).
11. Click "Save Changes" (Figure 5-13) to save zone information when finished.

Figure 5-13



GLOBAL PREFERENCES SETUP

Labeling

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

In addition to labeling breakers, each panel in your RPC system can be named (up to 16 characters) and the changes dated (Figure 5-14). For multi-panel systems, scroll down to see additional panels.

Figure 5-14

Panel:	Panel A
Date:	18-Jul-08

Numbering and addressing

The RPC system allows the user to choose top/bottom panel numbering or left/right panel numbering. (Figure 5-15) It also allows you to select the direction for addressing (DMX only).

Figure 5-15

Circuit Numbering

Left-Right

Top-Bottom

Addressing Scheme

Left-Right

Top-Bottom

Every Circuit

Installed Breakers

Global Control Preferences

The following features can be selected for additional system flexibility

Figure 5-16

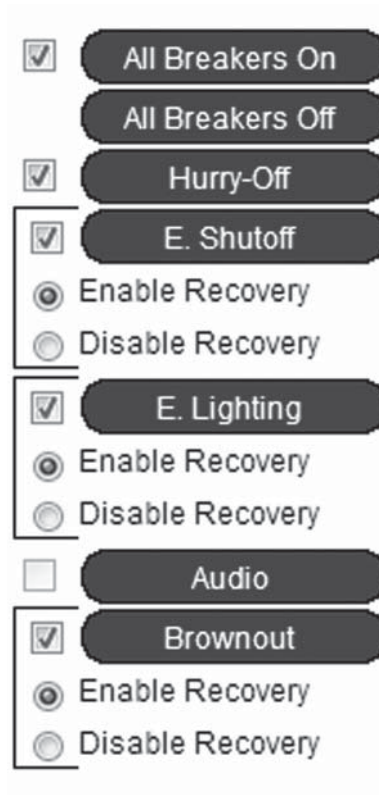
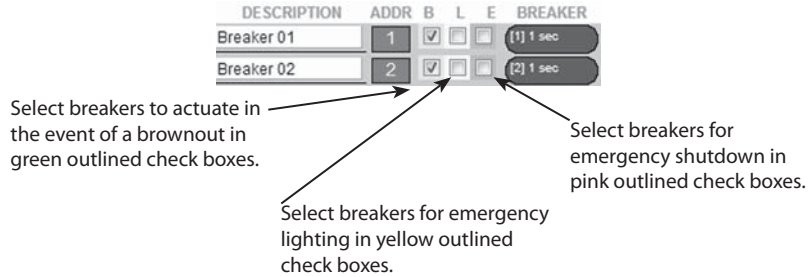


Table 5-1

All On/Off	Turns all the breakers on or off by order of zone and sequence
Hurry-Off	Turns breakers off rapidly without sequencing
Emergency Shutoff	Turns selected breakers off when external contacts or emergency management system activates
Emergency Lighting	Turns selected breakers on when external contacts or emergency management system activates
Audio	Not available for the RPCM
Brownout (optional)	Turns selected breakers off in the event of a brownout. Sequences circuits back on when voltage has stabilized for 4 seconds

Selecting breakers for Emergency Shutdown, Emergency Lighting or Brownout

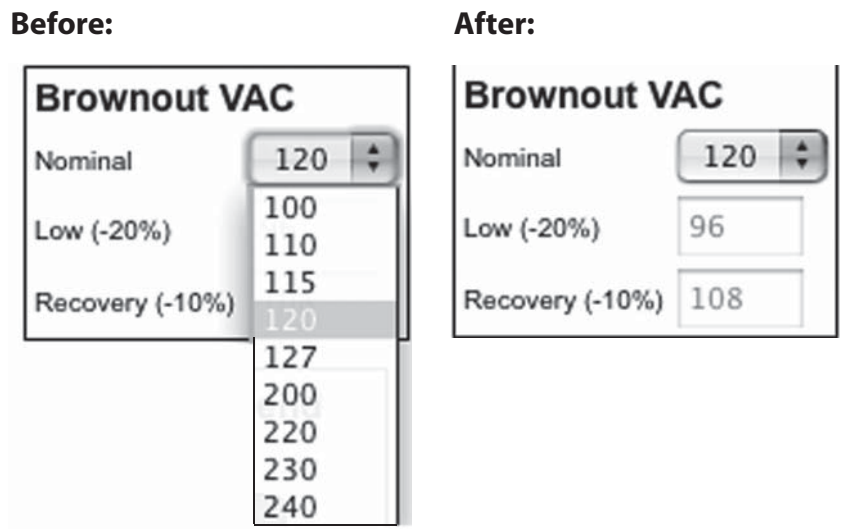
Figure 5-17



Select breakers to actuate in the event of a brownout 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.

Brownout Thresholds (optional)

Figure 5-18



If the brownout 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 applicable for DMX or sACN).

1. Enable Schedules in Setup Home tab
2. Rename each schedule as desired
3. Assign weekday (M-F) on and off times by clicking on time and off time buttons, using pull-down menu and clicking the pick button to select.
4. Assign weekend (S-S) on and off times by clicking on time and off time buttons, using pull-down menu and clicking the pick button to select.
5. Enable each schedule by clicking the checkbox for that line.
6. Click the Save Changes button at the top of the page to save

Figure 5-19

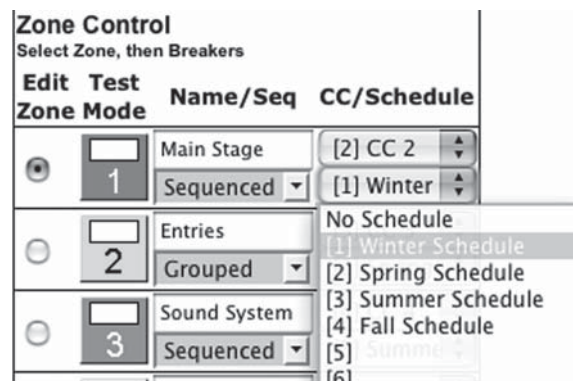
Schedule Name	Enabled	Monday - Friday		Weekend	
		On Time	Off Time	On Time	Off Time
Winter Schedule	<input checked="" type="checkbox"/>	On Time: 10:15 am	Off Time: 5:15 pm	On Time: 10:00 am	Off Time: 3:15 pm
Spring Schedule	<input checked="" type="checkbox"/>	On Time: 10:15 am	Off Time: 5:15 pm	On Time: 10:00 am	Off Time: 3:15 pm
Summer Schedule	<input checked="" type="checkbox"/>	On Time: 10:15 am	Off Time: 5:15 pm	On Time: 10:00 am	Off Time: 3:15 pm
Fall Schedule	<input checked="" type="checkbox"/>	On Time: 10:15 am	Off Time: 5:15 pm	On Time: 10:00 am	Off Time: 3:15 pm

Assigning Schedules to Zones

To assign a schedule to a zone in the "Panel" screen:

1. Select the desired zone from the drop down box.
2. Save changes.

Figure 5-20



Chapter Six: Operating your RPCM

Figure 6-1

LynTec Remote Power Controller (RPC-2)
LynTec Test Job
Hardware Version: 2.3
Firmware/Web Version: 2.40

Logic Core(3.3v): 3.36 v
Peripherals(5.0v): 5.1 v
Cap Buffer(24.0v): 24.4 v
Monitored VAC: 116.3 VAC

Time: 12/6/2013 15:01:50
Master panel: 82°F / 28.3°C
Network: Connected
Storage: 36%

Schedule: Disabled
DMX512: Disabled
sACN: Enabled
AC Monitoring: Enabled

Status Control Setup Support Event Log Logout

Panel: Panel A
Date: 1-Jan-14

Global Controls

- All Breakers On
- All Breakers Off
- Hurry-Off
- Current Power
- Energy pf

Status

- E. Shutoff
- Brownout
- E. Lighting

Breaker Legend

- Status Only
 - ON
 - OFF
 - TRIPPED
 - MANUAL ON
 - FAILURE
- Controllable
 - ON
 - OFF
- Panel Numbering
- Breaker Address
- High/Low Latching Alarm
- High/Low Non-Latching Alarm
- Normal
- Zero

CIR	ADDR	Amp		Amp	ADDR	CIR		
1	Breaker 01	1	0.0	MANUAL ON	ON	2	Breaker 16	2
3	Breaker 02	2	0.0	TRIPPED	OFF	5	Breaker 17	4
5	Breaker 03	3	0.0	ON	OFF	6	Breaker 18	6
7	Breaker 04	4	0.0	ON	OFF	8	Breaker 19	8
9	Breaker 05	5	0.0	OFF	OFF	10	Breaker 1A	10
11	Breaker 06	6	0.0	OFF	ON	12	Breaker 1B	12
13	Breaker 07	7	0.0	OFF	OFF	14	Breaker 1C	14
15	Breaker 08	8	0.0	ON	OFF	101	Breaker 1D	16
17	Breaker 09	9	0.0	ON	ON	102	Breaker 1E	18
19	Breaker 0A	10	0.0	ON	OFF	103	Breaker 1F	20
21	Breaker 0B	11	0.0	ON	OFF	200	Breaker 20	22
23	Breaker 0C	12	0.0	ON	OFF	201	Breaker 21	24
25	Breaker 0D	13	0.0	ON	OFF	202	Breaker 22	26
27	Breaker 0E	14	0.0	ON	ON	203	Breaker 23	28
29	Breaker 0F	15	0.0	ON	OFF	204	Breaker 24	30
31	Breaker 10	16	0.0	ON	ON	205	Breaker 25	32
33	Breaker 11	17	0.0	ON	ON	206	Breaker 26	34
35	Breaker 12	18	0.0	ON	OFF	207	Breaker 27	36
37	Breaker 13	19	0.0	ON	NON/EMPTY	0.0	Breaker 28	38
39	Breaker 14	20	0.0	ON	NON/EMPTY	0.0	Breaker 29	40
41	Breaker 15	21	0.0	ON	NON/EMPTY	0.0	LynTec Power	42

Zone Control

- Zone 01: OFF 0.0 A.
- sACN Univ. 1: EN 0.0 A.
- Zone 03: OFF 0.0 A.
- sACN Univ. 2: EN 0.0 A.
- Zone 05: ON 0.0 A.
- sACN Univ. 4: EN 0.0 A.
- Zone 07: ON 0.0 A.
- sACN Univ. 3: EN 0.0 A.

TOTAL

Energy	10.27	KWh
Power	0.0	KW
pf	0.00	
frequency	59.9	Hz

AVERAGE

Current	0.0	A
Neutral	0.0	A
L-L	213.0	Vac
L-N	123.0	Vac

Phase-Phase Voltage

A	212.1	Vac
B	214.3	Vac
C	212.7	Vac

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 DMX addresses entered in the NETWORK page (see page 16).

TCP/IP commands are in Appendix A.

Appendix A--TCP/IP Protocol

TCP/IP PROTOCOL

TCP/IP communications and control via a third party control system is facilitated by the use of the HTTP GET command.

Example of GET command:

GET /p2.rpc?IPB002=1

Three modes of control are:

Breaker control = "B" Zone control = "Z" Event Control = "E"

Breaker Control = B

Refer to LynTec RPC browser set-up for breaker numbering

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 167 breakers (4 panel system) is possible.

Zone Control = Z

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

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.

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

Verification Scheme:

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

```
GET /p2.rpc
```

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"

Status returns for Breakers:	Status returns for Zones and Events:
0 = OFF	0 = OFF
1 = ON	1 = ON
2 = Breaker Tripped	2 = Processing
3 = Failure	
4 = Manual On	
5 = Empty	

Appendix B--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
Front Panel LCD and status indicators do not illuminate.	Power supply is not energized.	Verify that the power supply's LED status indicators are ON. Make sure the 15A breaker that provides power to the power supply is 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.	Make sure the 15A breaker that provides power to the power supply is on.
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.
	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 Chapter 4--Wiring 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 Chapter 5--Control Setup for more information on how to add or delete a circuit breaker in a zone.

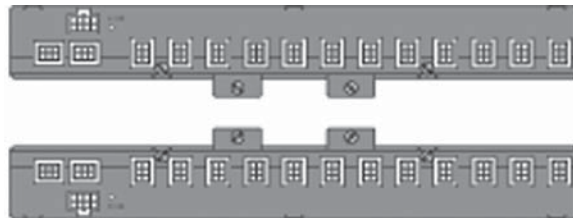
Appendix C--RPC System Components

The LynTec system consists of control buses, a panelboard, remotely operated circuit breakers, a power supply, an optional buffer, a transducer and a controller.

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.

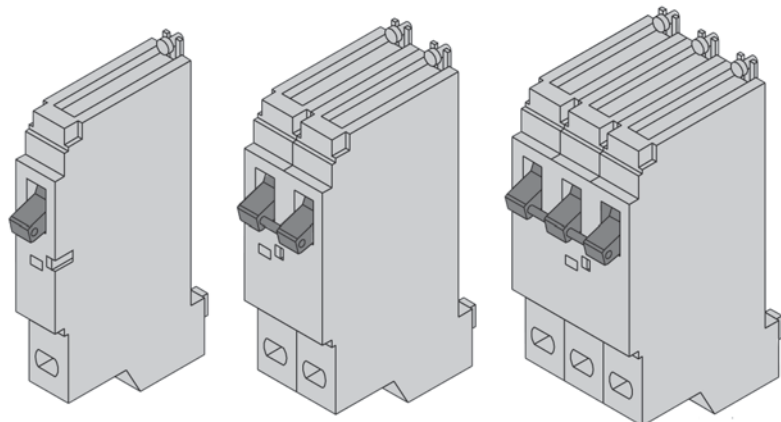
Figure C-1



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 C-2



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 C-3**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 C-4**Transducer**

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

Figure C-5

Control Module

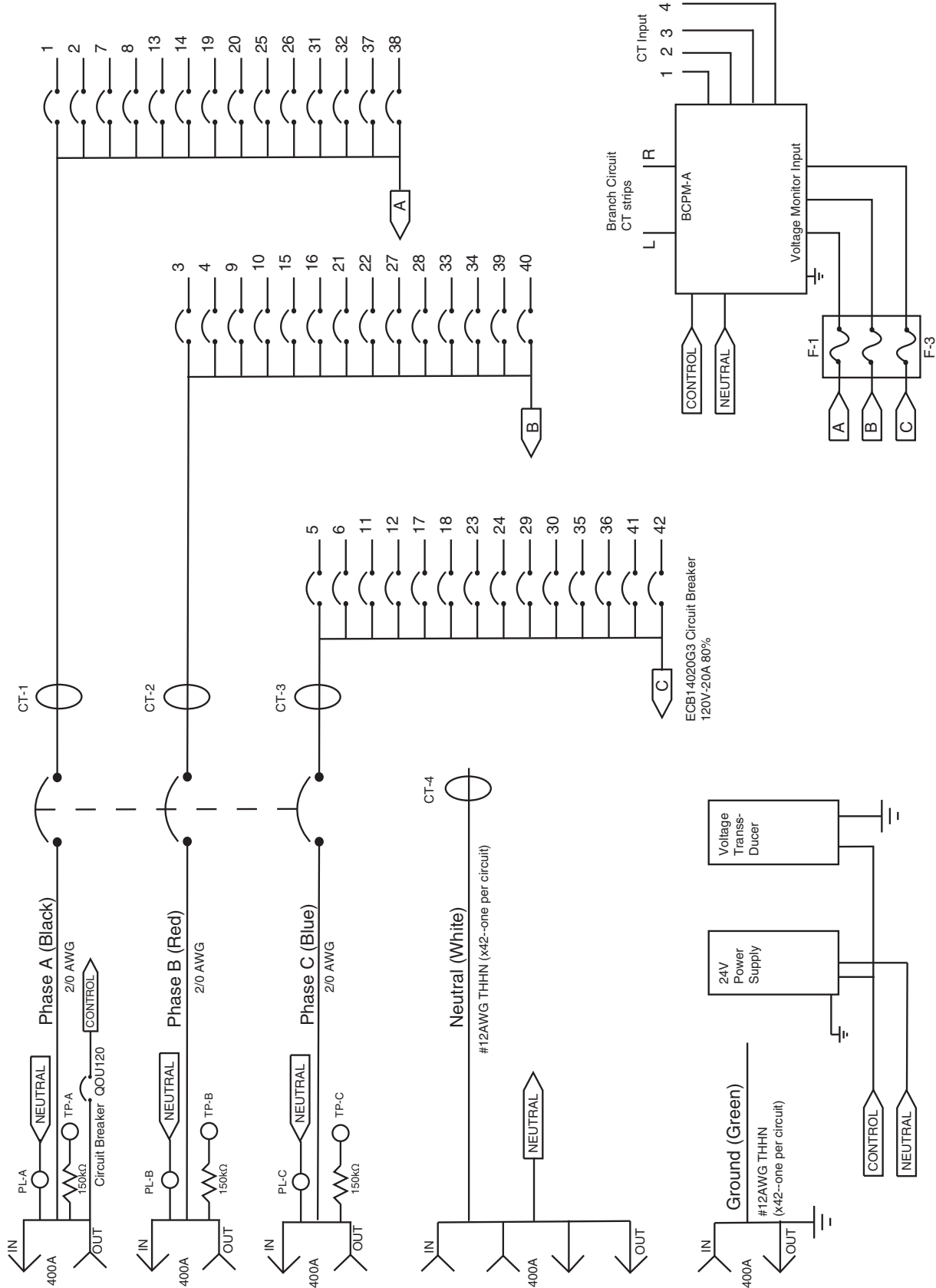
The RPC Control Module provides control logic for the operation of a RPC system. The controller uses remotely operated circuit breakers to control up to 42 remotely operated branch circuits. The built in web server allows for easy setup and operation. Also, it provides input channels for connecting external dry-contact control devices.

Specifications

Auxiliary Power Supply	24 Vdc (200mA maximum Current)
Communication Interface	RJ-45 (8P8C) TCP/IP/sACN/Web Server/100 Base TX DMX in/thru 5-wire
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 = >2 years
Memory Retention	Program: > 20 years
Standards	UL1640 CSA 2.22-10
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 2.22-10 and UL1640	

Appendix D--RPC System Diagrams and Schematics

RPCM Schematic



RPCM BLOCK DIAGRAM

