TECHNICAL MANUAL

RCP-MP32D
REMOTE CONTROL PANEL
WITH STATUS DISPLAY

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January, 2008

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Chapter 1 About This Manual

1.1 Documentation and Safety Overview

This manual provides instructions for the installation and operation of the RCP-MP32D Remote Control Panel built by QuStream.

It is the responsibility of all personnel involved in the installation, operation, and maintenance of the equipment to know all the applicable safety regulations for the areas they will be working in. ***Under no circumstances should any person perform any procedure or sequence in this manual if the procedural sequence will directly conflict with local Safe Practices. Local Safe Practices shall remain as the sole determining factor for performing any procedure or sequence outlined in this document.***

1.2 Warnings, Cautions, and Notes

Throughout this document, you should notice various Warnings, Cautions, and Notes. These addendum statements supply necessary information pertaining to the text or topic they address. It is imperative that audiences read and understand the statements to avoid possible loss of life, personal injury, and/or destruction/damage to the equipment. These additional statements may also provide added information that could enhance the operating characteristics of the equipment (i.e., Notes). Examples of the graphic symbol used to identify each type of statement and the nature of the statement content are shown in the following paragraphs:

Warning

	**Warning statements identify conditions or practices that can result in loss of life or permanent personal injury if the instructions contained in the statement are not complied with.**

Caution

	**Caution statements identify conditions or practices that can result in personal injury and/or damage to equipment if the instructions contained in the statement are not complied with.**

Note

	**Notes are for information purposes only. However, they may contain invaluable information important to the correct installation, operation, and/or maintenance of the equipment.**

Chapter 2 Introduction

2.1 General Description

QuStream's RCP-MP32D is a button per source, destination, or level control panel featuring direct take operation for up to eight levels of control with a visual status display. This control panel is recommended for use in switching applications where a large number of sources and destinations are required. The RCP-MP32D Control Panel has 134 configurable data keys--any of which can be configured as a source, destination, or level.

Data keys on the front of RCP-MP32D Control Panel are divided into four pages of 32 keys each. Page one provides access to data keys 1-32, Page two provides access to data keys 33-64, page three provides access data keys 65-96, and page four provides access to data keys 97-128. The Page Keys allow selection of the data key page and the active page number is displayed in the lower right area of the readout display.

There are two control push-buttons on the far right side of the control panel: PROT/LOCK Key and CLEAR/ADDR Key (Also serves as the Page 4 key). The PROT/LOCK Key enables the operator to protect or lock the selected destination. The CLEAR/ADDR Key enables the operator to clear the preset or to display the control panel's address in binary code on the top row of data key LEDs.

The RCP-MP32D Control Panel is packaged in a standard 19 inch, one rack unit (1 RU) chassis and is powered by a 7.5VDC Plug-in-the-Wall Power Supply. Communication with the system controller is via a Standard RS485 Interface.

Figure 2-1. RCP-MP32D Control Panel (Front View)

Figure 2-2. RCP-MP32D Control Panel (Rear View)

2.2 SPECIFICATIONS

GENERAL

Mounting	1RU
Push-buttons	Illuminated and Legend-able

INPUT

Communications Port	RS485

POWER

Voltage Requirements	+7.5VDC @ 800mA

MECHANICAL

Physical Dimensions	19"W X 3"D X 1.75"H 482.6mm X 76.2mm X 24.45mm

ENVIRONMENTAL

Temperature	0°C to 40°C
Humidity	20% to 90% (Non-Condensing)

Chapter 3 Installation

3.1 LOCATION AND MOUNTING

The RCP-MP32D Control Panel has been designed to fit in a standard E.I.A. 19" equipment rack and occupy one rack unit of space (1.75"). An installation area should be selected where the ambient temperature will not exceed 40°C, and where air can circulate freely. The control panel should be mounted in an area convenient to control and power connections. Sufficient space must be provided behind the equipment rack to allow for the control and power cables.

When the RCP-MP32D Control Panel is supplied as part of a system including interconnecting cables, rack layout drawings are usually provided. While strict adherence to the rack layout drawings is not required, it will ensure that the interconnection cables are the proper lengths. All mounting holes should be utilized and the hardware be securely tightened.

All interconnecting cables should be secured to the equipment racks or other supporting structures in such a way to relieve strain on the cables. Failure to provide adequate cable support may result in cables separating from connectors. If cables are to be run under elevated flooring, they should be laid out in cable racks if possible and tied to the cable racks as a guide. If cables are run along the floor, do not allow then to lay in the work area behind the racks. Stepping or tripping on the cables may result in connections being pulled free or wire breakage inside the insulation. Figure 3-1 illustrates the chassis installation.

To install the RCP-MP32D Control Panel in an equipment rack take the following steps:

1. Align the control panel chassis with a slotted opening in the rack.

2. Install the bottom screws first.

3. Install the top two screws.

4. Tighten all four screws securely.

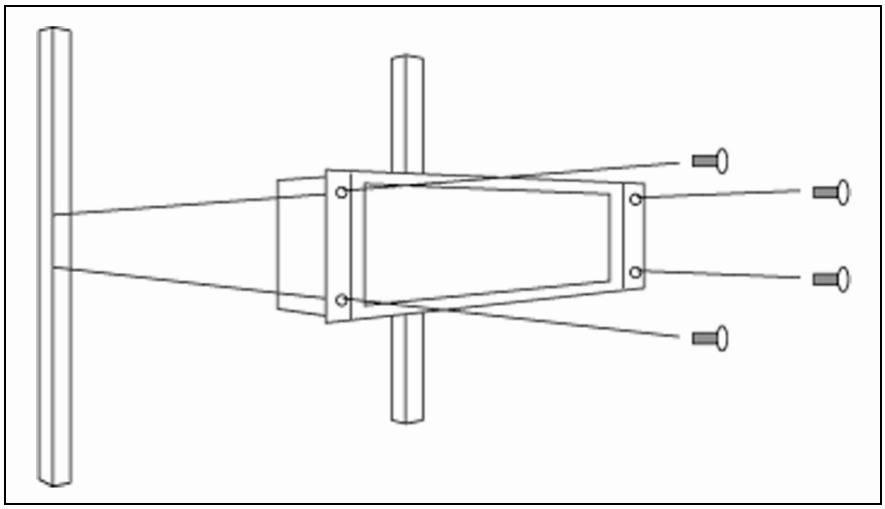


Figure 3-1. Remote Control Panel Installation

3.2 POLLING ADDRESS

For the system controller to identify a particular control panel, a specific device number or polling address must be assigned to each panel. Sequential binary numbers (1 through 1023) are used for this purpose. The appropriate binary number is entered into the control panel by setting an internal 10-position DIP switch to the selected binary number. The DIP switch is located on the Remote CPU Board and is accessible from the rear of the unit. The panel address is normally assigned and entered at the factory if the panel is purchased as part of a system and a design guide has been completed by the user. If the panel is purchased separately, the user may be required to set the panel address.

EXAMPLE: To select polling address 21, set switches 6, 8, and 10 in the "ON" or "1" position. See Figure 3-2.

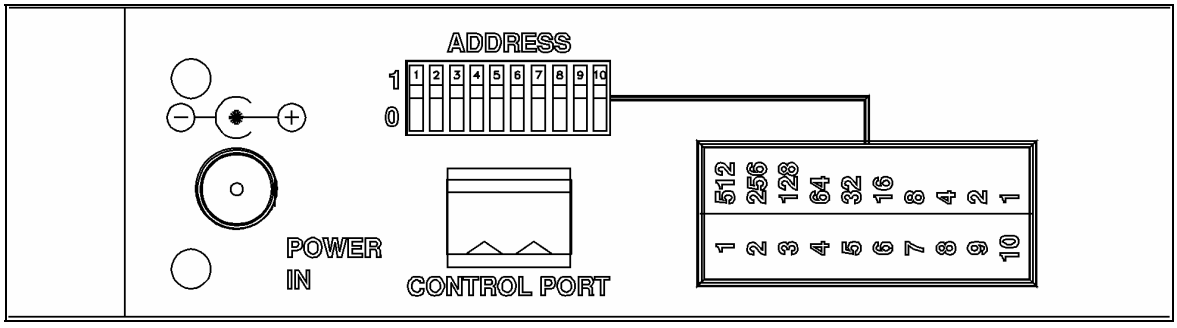


Figure 3-2. DIP Switch Location

3.3 CONTROL PANEL/CONTROLLER INTERCONNECTION

Each control panel has a single 3-pin MTA connector located on its rear panel which is utilized for system communications to and from the controller. Control panels are daisy-chained to a communications port on the rear panel of the system controller or to a communications port on the rear panel of the routing switcher containing the system controller. Use shielded twisted pair cable for all control panel communication port connections. See Figure 3-3.

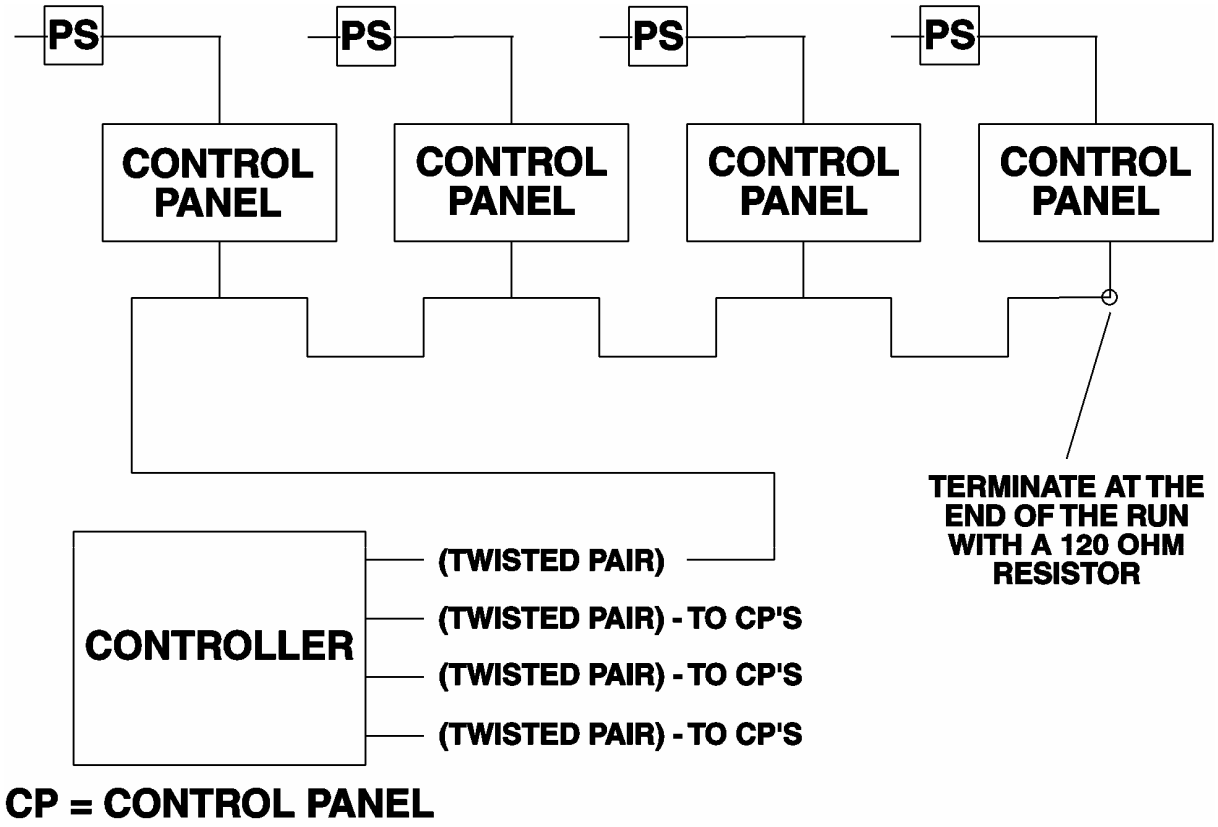


Figure 3-3. Typical Control Panel Interconnection

3.4 WIRING THE CONTROL PANEL CONNECTOR

Should an additional panel be added to your system, it will be necessary to wire the connector using shielded twisted pair cable and a 3-pin MTA connector using the following instructions. See Figure 3-4.

1. Remove approximately 1.5" of insulation from each of the two cables.
2. Remove approximately 0.5" of insulation from the black and red wires.
3. Twist together and insert the two black wire into position one. Crimp down using a screwdriver.
4. Twist together and insert the two shield wires into position two. Crimp down using a screwdriver.
5. Twist together and insert the two red wires into position three. Crimp down using a screwdriver.

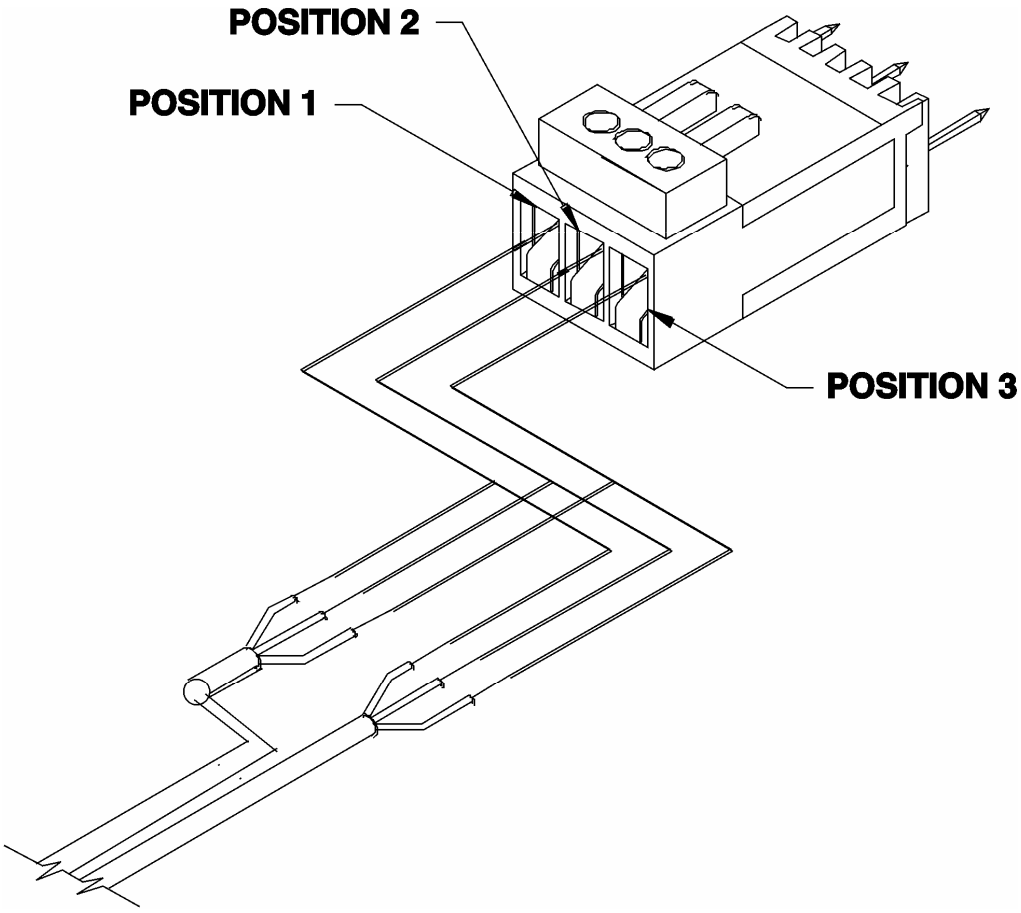


Figure 3-4. Wiring the Control Panel Connector

3.5 TERMINATING CABLE RUNS

Each cable run should be terminated with a 120 ohm, 1/4 watt 5% resistor. The cable is terminated internally at the controller. See Figure 3-5.

1. Un-crimp the black and red leads in positions one and three.
2. Insert the resistor leads into positions one and three along with the black and red leads.
3. Crimp down using a screwdriver.
4. The shield wire remains in position two.

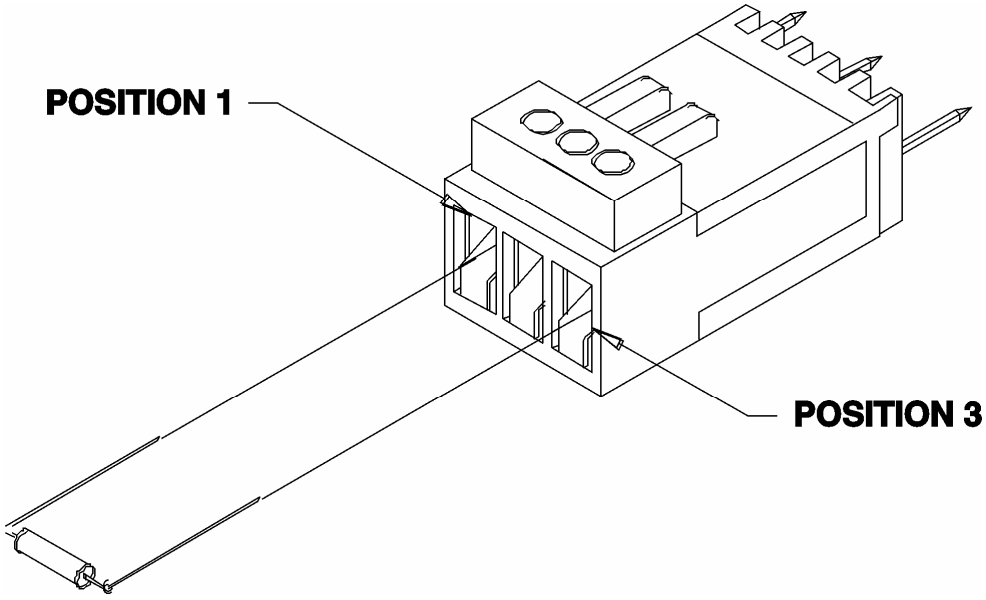


Figure 3-5. Terminating Cable Runs

3.6 POWER CONNECTIONS

Power for the RCP-MP32D Control Panel is supplied an external 7.5 VDC, 800 mA power supply.

Remove the power supply from the box it was shipped in and check to insure that no damage has occurred in shipping. Verify that the power supply is rated for the proper AC voltage (i.e. 115 VAC or 230 VAC) before connection to the AC line voltage. The power connector can now be plugged into the **POWER IN** connector on the rear of the control panel. The power supply will immediately power the unit upon connection to the AC line voltage. See Figure 3-6.

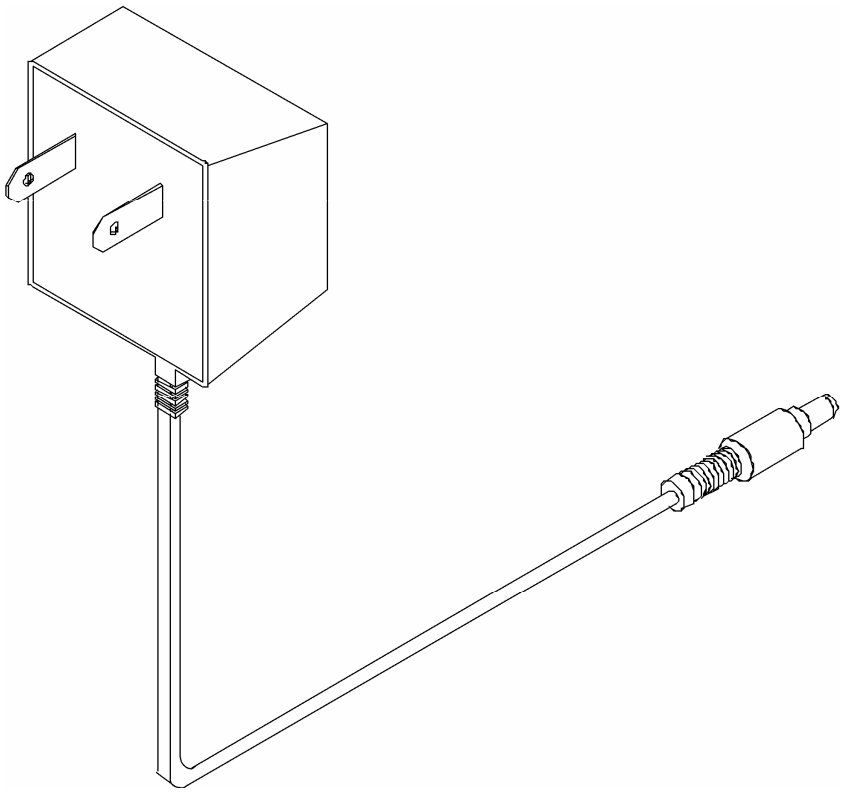


Figure 3-6. Typical Control Panel Power Supply

3.7 SWITCH CAP ASSEMBLY

Legends on the front panel pushbuttons of the RCP-MP32D Control Panel may be changed as needed. If it becomes necessary, due to configurations changes, to change the switch labels (legends) take the following steps to disassemble the switch cover to gain access to the switch legend while referring to Figure 3-7:

1. Using a small straight-edge screwdriver, carefully pry the sides of the clear legend cap (first the right side and then the left side if necessary) until the legend cap is freed from the switch base.
2. Once the legend cap is freed from the switch base, gently tap the clear legend cap to remove the legend retaining cap and the legend.

Once the legend is replaced, the following steps to reassemble the switch while referring to Figure 3-7:

1. Place the new legend into the clear cap with its right and left sides aligned with the right and left sides of the clear cap (the sides with the retaining tabs).
2. Once the new legend is correctly placed into the clear cap, insert the legend retaining cap into the clear cap.

3. Once the legend and the legend retaining are inserted into the clear cap, align the right and left sides (the sides with the tabs) with the right and left sides of the switch base.

4. When the clear cap is properly aligned with the switch base, press the clear cap onto the switch base until it snaps into place.

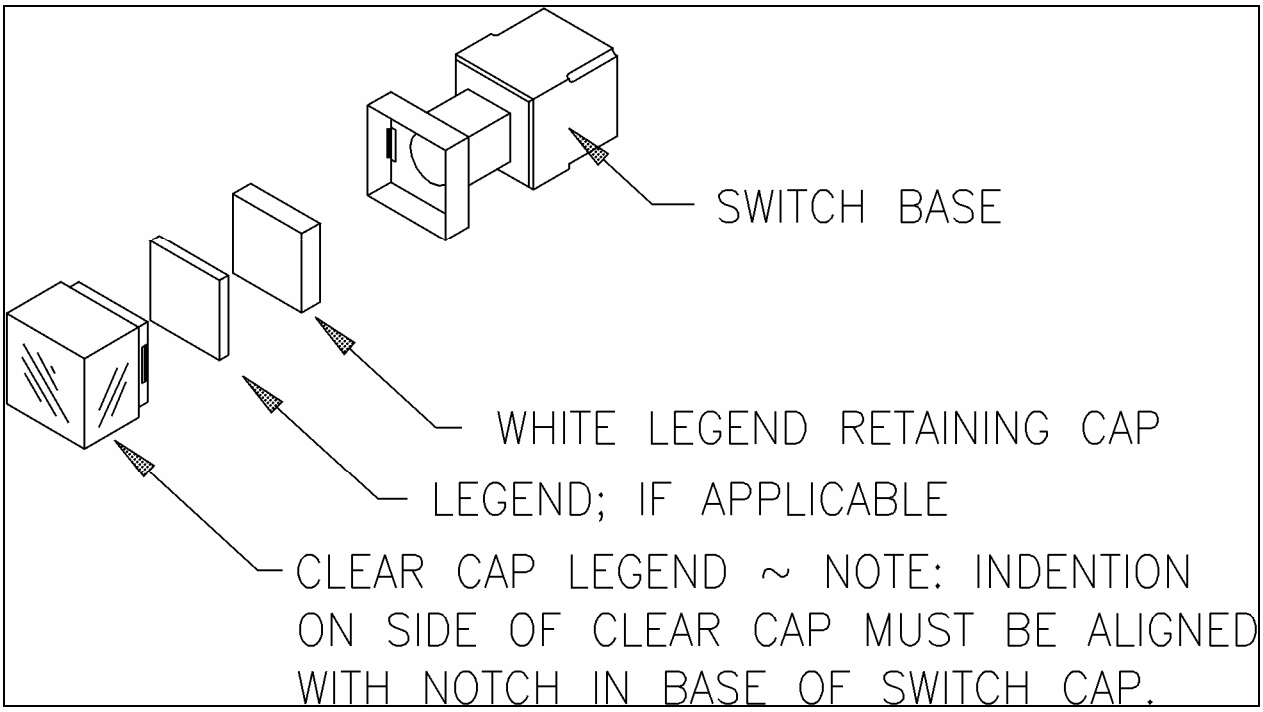


Figure 3-7. Switch Cap Assembly

Chapter 4 Operation

4.1 INTRODUCTION

The RCP-MP32D Control Panel is designed to be controlled by the 3500 or PERC2000 System Controller. Operation of the RCP-MP32D Control Panel requires that it be configured by the system controller utilizing the configuration graphical user interface (GUI). *Refer to the Operations Section of the Win3500 Control System Manual or the PERC 2000 Technical Manual for configuration instructions.*

All RCP-MP32D Control Panels in a routing switcher system are custom configured at the factory prior to shipment. The information needed to configure the control panels comes from the System Design Guide filled out by the customer. However, if the system configuration changes, the RCP-MP32D Control Panels can be re-configured on site using the control system configuration software.

4.2 BREAKAWAY OPERATION

Breakaway allows you to select a source on a specific level to be taken to a destination on that level. Breakaways can be accomplished in the Direct Take Mode.

To Make a Breakaway Switch:	**Results:**
Depress Data Key associated with level(s) you wish to breakaway.	Data Key(s) selected light to show level selection(s). Data Key whose associated input matches the current status on the selected level(s) will be illuminated.
Depress the Data Key associated with the input you desire on the level(s) selected.	The destination controlled by the panel will be switched to the input assigned to the Data Key pressed for each level selected.
To Return to Follow Operation:	**Results:**
Depress Data Key(s) associated with active levels.	Data Key LEDs are extinguished and associated levels are no longer selected for breakway operation.
	In Follow Operation the Data Key whose source matches the current status is illuminated.

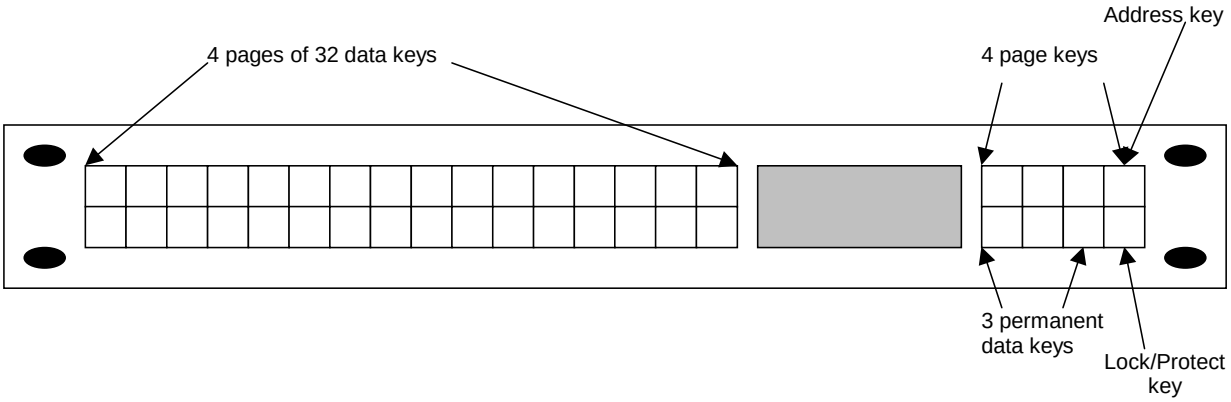
4.3 DISPLAY

DEST	SOURCE
LEVEL	PAGE

Each RCP-MP32D control panel is equipped with a 2x20 character display that shows the destination being controlled by panel (referred to as the panel's current destination) shows switch status for the destination, and displays the breakaway mode of the panel. It also shows the current page of the data keys on the left hand side of the panel.

4.4 KEY TYPES

RCP-MP32D control panels are equipped with 40 pushbuttons configured with 32 data keys on the left, 4 page keys on the top right, 3 permanent data keys on the bottom right, and the lock/protect function key.



The 32 data keys on the left are user configurable in 4 pages so that the user can have access to 128 total functional data keys. Data keys can be configured to represent a router source, destination, or level of control, or may be left unconfigured.

Pages are accessible by pressing one of the 4 page keys on the right side of the panel. When a page key is lit, it indicates the page that is currently active. If none of the data keys on a page are configured, then the page is not accessible.

In addition to the 4 pages of data keys, there are 3 permanent data keys located on the right side of the panel - these keys are always accessible no matter what the state of the page keys.
Each data key performs the following functions:

- Source Key – Pressing a source key takes an immediate switch on the panel's current destination.
- Destination Key – Pressing a destination key changes the panel's current destination. The new destination and its current status are displayed in the panel's display. Pressing the lock/protect button or any source key acts on this destination.

- Level Key – The level keys activate or deactivate the level of control associated with the key. (Active levels cause their associated level button to be lit.) One or more level keys can be active at any one time. Activating levels allows the user to take breakaway switches. Pressing a source key causes a switch to be taken on all the active levels. If no level keys are active, than the panel switches all levels that it has access to i.e. a follow mode of operation. .

In addition to the data and page keys, there are two other function keys. These are:

- Lock/Protect key – Pressing the Lock/Protect key for less than 1 second causes the panel's current destination to be "protected". (Only the user who "protected " the destination can switch it.) A Lock/Protect key is lit solid to indicate the destination is protected.
  Pressing the Lock/Protect for approximately 2 seconds puts the current destination into lock. (No one can switch the destination until the lock is cleared.) The Lock/Protect key flashes to indicate the destination is locked.

If the destination is locked or protected, pressing the lock/protect key for less than 1 second will clear the lock/protect if the panel has sufficient lock priority. (See the 3500Pro manual for complete details on lock priorities.)

- Address Key – The page 4 button is also associated with the panel display address feature. Holding the Page 4/Address button for more than 2 seconds causes the panel display to show the panel's address. Releasing the button causes the display to revert to its standard mode of operation.

4.5 DATA KEY TALLY

The panel data keys are lit to indicate the current status of the panel's current destination.

DESTINATION KEY TALLY

If the destination being controlled by the panel matches the destination assigned to a destination data key, the destination data key's LED will be illuminated.

SOURCE KEY TALLY (FOLLOW MODE)

LED Illuminated Solid (not blinking)

The current destination's status matches the source assigned to the data key for all levels.

LED Blinking

The current status matches the source assigned to the data key for the default status level. However, there is another level whose status does not match the key's source.

No LED Illuminated

The current status does not match the source assigned to any data key on the default status level or the assigned key is on a page other than what is being viewed.

SOURCE KEY TALLY (BREAKAWAY STATUS)

LED Illuminated Solid (not blinking)

The current status matches the source assigned to the data key for all the selected levels

LED Blinking

The current status matches the source assigned to the data key for the highest priority level selected (level 1 is the highest priority level) but does not match for at least one other selected levels.

No LED Illuminated

The current status does not match the source assigned to any data key on the highest priority level selected (level 1 is the highest priority level).

LEVEL KEY TALLY

When the panel is in a follow mode of operation i.e. it controls all levels to which it is assigned, none of the level keys are lit.

If the panel is in breakaway mode, the keys associated with the currently active breakaway levels are lit.

Chapter 5 Panel Configuration

The following are the fields that need to be configured in the System Controller Configuration Editor. A more complete description of these fields is included in the Technical Manual for the System Controller.

5.1 PANEL NAME

Any eight alphanumeric characters. Currently used only by the controller configuration program to provide a user-friendly method of referring to each control panel.

5.2 PANEL ADDRESS

Decimal number from 1 to 1023 that is used to distinguish each panel on the panel communications bus. Address must match the dip switch setting on the rear of the panel.

5.3 REQUESTOR CODE

Decimal number from 1 to 65535 that is used to distinguish the ownership of locks and protects. For example, if two or more panels are assigned the same requestor code and one of the control panels locks or protects a destination the other control panels with the same assigned requestor code and an equal or higher lock priority code may unlock or unprotect the destination.

The assignment of the same requestor code to two or more control panels allows all of the panels with same requestor code assigned to take switches on a protected destination if the destination was protected by one of the panels.

5.4 LOCK PRIORITY

Lock priorities are used when a panel attempts to set or clear a destination protect or lock. Only the panel which set a protect or lock or a panel of higher priority can un-protect or unlock a destination once it is locked. Lock priorities range from 0 (master) to 255. The default setting is master.

5.5 STATUS LEVEL

Level to be statused when the panel is in the Follow Mode.

5.6 STATUS METHOD

Indicates the algorithm used to determine panel tally in a follow mode of operation.

The **DEF** method uses the status level for all tally determination.

The **GRP** method uses the default status level unless the level is not defined on the panel's current destination. In this case, it searches for a valid level to determine status.

5.7 DESTINATION

The panel's current destination when it comes out of power up or is reset.

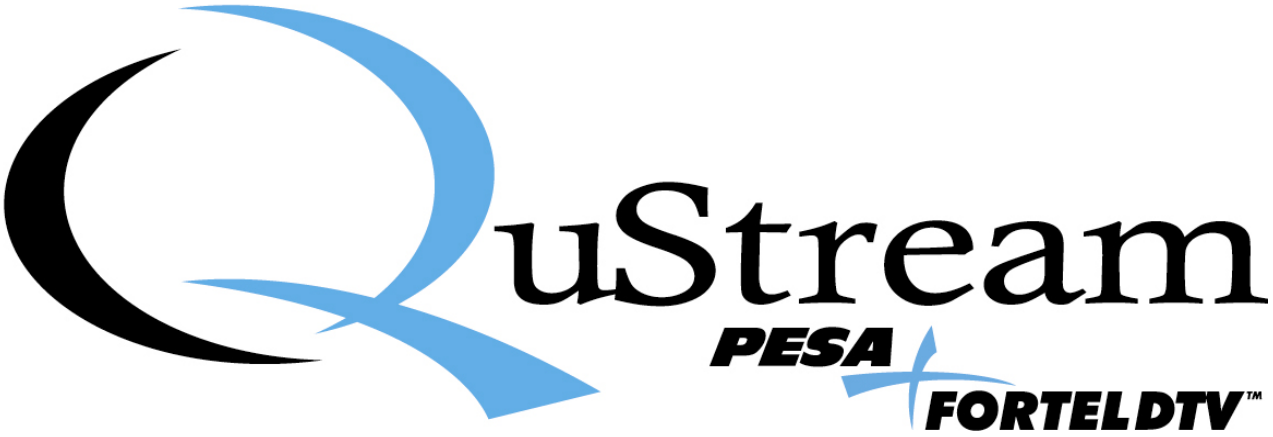
5.8 LEVELS OF CONTROL LIST

List of levels to be controlled by the panel. Any level not assigned in the Levels of Control List will not be accessible or affected by panel operations.

5.9 DATA KEY LIST

List containing the assignment of all data keys as configured by the user. The 131 Data Keys of the RCP-MP3D Control Panel can be configured as source, destination, or level keys as follows:

- 1-32 – Page 1 Data keys
- 33-64 – Page 2 Data keys
- 65-96 – Page 3 Data keys
- 97-128 – Page 4 Data keys
- 129-131 – 3 Permanent Data keys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