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Paragon II

User Guide

Release 4.4

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To avoid potentially fatal shock hazard and possible damage to Raritan equipment:

- Do not use a 2-wire power cord in any product configuration.
- Test AC outlets at your computer and monitor for proper polarity and grounding.
- Use only with grounded outlets at both the computer and monitor. When using a backup UPS, power the computer, monitor and appliance off the supply.

Rack Mount Safety Guidelines

In Raritan products which require Rack Mounting, please follow these precautions:

- Operation temperature in a closed rack environment may be greater than room temperature. Do not exceed the rated maximum ambient temperature of the appliances.
- Ensure sufficient airflow through the rack environment.
- Mount equipment in the rack carefully to avoid uneven mechanical loading.
- Connect equipment to the supply circuit carefully to avoid overloading circuits.
- Ground all equipment properly, especially supply connections, such as power strips (other than direct connections), to the branch circuit.

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What's New in the Paragon II User Guide

The following sections have changed or information has been added to the Paragon II User Guide based on enhancements and changes to the equipment and/or user documentation.

- ***Paragon II Overview*** (on page 1)
- ***Product Features*** (on page 8)
- ***Basic Installation*** (on page 12)
- ***Installing a Paragon System with a Single Matrix Switch*** (on page 24)
- ***Installing a HubPac*** (on page 37)
- ***Messages on the ACTIVATOR User Station*** (on page 72)
- ***Installing the P2CIM-AUSB-C Driver in Windows*** (on page 74)
- ***P2-HubPac Configuration and Multiple Video*** (on page 149)
- ***P2-HubPac Upgrade Operation*** (on page 163)
- ***Specifications of Paragon II Components*** (on page 172)

Please see the Release Notes for a more detailed explanation of the changes applied to this version of Paragon II.

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How-To: Paragon Essentials

This chapter includes 10 of the most common use cases to help familiarize users quickly with practical utilization of the Paragon system. Please note that this section provides common examples, which could vary according to your actual configuration and operations.

Case 1. Setting the Network Configuration

Purpose: To set the network configuration of the Paragon switch, such as an IP address, so it can be accessed or upgraded through the network.

1. Log into the system with the administrator user name and password. The password is case-sensitive.

   default name: `admin`
   default password: `raritan`

2. Press **F5** → select **Network Setting**.
3. Configure the **Current IP** field. For example, if you want to assign 90.180.52.157 as the IP address, you do this:
   a. Highlight the first number in the **IP** field.
   b. Press **Enter** to turn the highlight color to green.
   c. Type `090` and press **Enter**. (Note that Paragon does not support the use of the keypad.)
   d. Repeat similar steps to modify remaining numbers in this field.
4. Configure remaining fields respectively, including Net Mask, Gateway IP and Port No.
5. **(Optional)** By default, Encryption is set to "Off." To change this setting:
   a. Press **Enter** to turn the highlight color to green.
   b. Press the arrow keys (↑, ↓, ←, →) to switch between options and press **Enter**.
6. **(Optional)** Configure the **Keys** field if you select "On" in the **Encryption** field.
7. Press **S** to save the changes. The system restarts itself.

See *Network Settings* (on page 108) for details.

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Case 2. Multiple Write Access to the Same Server

Purpose: To enable various users to view the same server simultaneously and to grant them equal opportunity to compete for the control/operation of the server when the keyboard/mouse activity in the server has become inactive for a preset period of time (1 second by default unless it is customized). Only one person is allowed to control/operate the server at one time.

1. Log into the system with the administrator user name and password. The password is case-sensitive.

   default name: `admin`
   default password: `raritan`

2. Press **F5** → select **System Configuration**.
3. Press the arrow keys (↑, ↓, ←, →) to highlight the **Operation Mode** field.
4. Press **Enter** to turn the highlight color to green.
5. Press the arrow keys (↑, ↓, ←, →) to select the option "PC Share" and press **Enter**.
6. Press **S** to save the changes.

See ***System Configuration*** (on page 86) for details.

Now every user can access the same server simultaneously.

Case 3. Controlling a Device's Power

Purpose: To control the power supply of specific servers, devices or even Paragon switches as long as they are connected to any power strip in the Paragon system. These devices can be turned on, turned off or power cycled as you wish.

1. Log into the system with the administrator user name and password. The password is case-sensitive.

   default name: `admin`
   default password: `raritan`

2. Associate the power outlets of the power strip with the connected devices. For example, if a router receives power from outlet No. 1 of the power strip, and both of the power strip and router are connected to the same Paragon switch. The router is named “Router-Win” in the system. Do the following to associate them.

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a. Press **F5** → select **Channel Configuration**.

b. Highlight the channel of the power strip. For example, highlight the channel No. 25 if the power strip is connected to that channel.

c. Press **G** to enter the **Outlet Configuration** screen of the power strip.

d. Change the type of outlet No. 1: press **Enter** → press the arrow key to select "CPU" → press **Enter**.

e. Associate the outlet No. 1 with the router: press the right arrow key to move the highlight → press **Enter** → highlight the router name "Router-Win" → press **Enter**.

See ***Associating a Device with a Power Outlet*** (on page 111) for details.

f. Press **S** to save the power association.

3. Now you can control the power supply to "Router-Win" by doing this:

a. Press **F2** to return to the **Selection Menu** screen.

b. Highlight the channel associated with the power strip. For example, highlight the channel No. 33 if the router "Router-Win" is connected to that channel.

c. Press **F3** to view the associated power outlet screen.

d. Highlight one or more power outlets, and choose the action you want to carry out:

Desired result	Do this
Power off the outlet(s)	Press **X** → type `yes`
Power on the outlet(s)	Press **O** (alphabetical character)
Power cycle the outlet(s)	Press **R** → type `yes`

See ***Controlling Power to an Outlet*** (on page 113) for details.

Case 4. Local Video Redirection (Forced Video)

Purpose: To locally direct a server to output its video/keyboard/mouse data to a specific user station so the user of the specified user station can be assigned to view and even work on the server.

1. Log into the system with the administrator user name and password. The password is case-sensitive.

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default name: `admin`
default password: `raritan`

2. Press arrow keys (↑, ↓) to highlight the channel of the server whose data you want to direct.
3. Press **Tab** and the message "Force switch to user port" appears on the message bar.
4. Type the port number of the desired user station. For example, if you want to direct the data to the user station connected to the user port No. 3, type **3** and press **Enter**.

   See ***Video Redirection (Forced Video)*** (on page 91) for details.

Case 5. Using Multiple Video Ports

Purpose: To have the access to a specific video port automatically trigger the video outputs of the other video ports on the same server (Paragon is designed to output a maximum of four video ports of a server).

1. Connect the four video ports of the server respectively to four channels of the same Paragon switch via four CIMs. Three of the CIMs must be P2CIM-AUSB and one could be either P2CIM-AUSB or P2CIM-APS2. For example, you may connect them to channel port No. 1, 2, 3 and 26.

   See ***Connecting CIMs to a Multi-Channel Video Server*** (on page 70) for details.

2. The Paragon administrator sets up the channel association group using Paragon Manager. Do this:
   a. Launch Paragon Manager.
   b. Connect and log into the Paragon system by doing this: choose **Session** > **Connect** → choose the Paragon switch you want to connect → type the administrator name/password → click **Login**.
   c. Create the association group consisting of channel numbers 1, 2, 3 and 26: choose **Set up** > **Multiple Video** > **New** → type necessary data → select four channels 1, 2, 3 and 26 → click **OK**.
   d. Ensure the channel triggering the video outputs of the other channels is set as the “first” channel. For example, the administrator may choose 3 in the **First Channel** field so channel No. 3 will be the channel which causes the other three channels to output their video data.

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See *Paragon Manager User Guide* on the manual CD and/or ***Channel Association for Multiple Video*** (on page 94) in this document for details.

3. Any user who wants to perform the Multiple Video function logs into the Paragon system. For example, one user uses the user station connected to the user port No. 2 to log into the system with the following user name which has no password required.

   user name: `user02`
   password: <no password>

4. Select the "first" channel of the association group in the OSUI. In this example, highlight channel number 3 and press **Enter**.
5. The other video ports of the same server connected to channel numbers 1, 2 and 26 automatically output their video data to three user stations subsequent to the one where user02 is operating, which are connected to user port No. 3, 4 and 5 respectively.
6. When user02 disconnects the channel number 3 or even logs out of the system, the three subsequent user stations are also logged off.

   See ***Concurrent Multiple Video Outputs*** (on page 69) for details.

Case 6. Restoring Settings to Factory Defaults

Purpose: To reset the Paragon switch to its factory default settings when you want to clear customized settings, such as the device name, system settings, and so on.

1. Log into the system with the administrator user name and password. The password is case-sensitive.

   default name: `admin`
   default password: `raritan`

2. Press **F5** → select **System Reset Settings**.
3. Highlight the field(s) that you want to reset, and change the setting to **Yes** by doing this: press **Enter** → press any arrow key → press **Enter**. The affected scope of different fields are described below:

Field	Settings returning to factory defaults
Device Name	The **Device ID** field in the System Configuration submenu
Network Settings	All settings in the Network Setting submenu

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Field	Settings returning to factory defaults
User Profiles	All settings of the following submenus or settings: ▪ **User Configuration** ▪ **User Station Profile** ▪ **User Profile** settings that are displayed when pressing **F4**
System Configuration	All settings in the System Configuration submenu except for the **Device ID** field
Channel Configuration	All settings or records of the active and inactive channels in the Channel Configuration submenu are cleared, but the data of active channels is rebuilt automatically after the reset

4. Now reset the selected items. Press **O** (alphabetical character) → type `yes` → press **Enter**.
5. The system will log out all of logged-in users and return the selected settings to factory defaults.

See ***System Reset*** (on page 107) for details.

Case 7. Using the Integrated Card Reader

Purpose: To pass the login authentication configured in specific servers that require the input of the data stored in an appropriate smart card. This function requires the card reader-enabled firmware and devices, including the Paragon switch with firmware 4.3 or above, P2-EUST/C and P2CIM-AUSB-C.

1. Log into Paragon utilizing a user station with an integrated card reader (P2-EUST/C).
2. Access the server where the appropriate authentication software and driver have been installed and configured properly and which is connected to the Paragon system via P2CIM-AUSB-C.
3. When you see the blank screen or a message prompting you to insert the card, insert your smart card into the card reader of the user station.
4. Depending on the configuration of the target server or authentication software, you may also need to enter a PIN.
5. After the login authentication and authorization has been completed, you can start working on the server.

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6. When you complete your work, press the hot key (default: Scroll Lock) twice quickly to trigger the On-Screen User Interface (OSUI).

   See ***Using the OSUI for Initial Configuration*** (on page 22) for details.

7. Press **Shift +F9** to disconnect the server, and then remove the card.

   See ***Using the Card Reader*** (on page 81) for details.

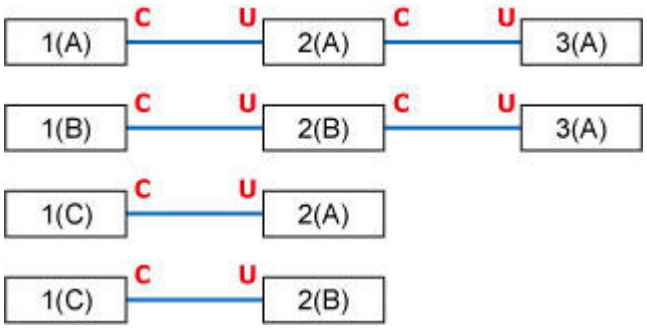
The card's authentication data is not stored in the Paragon system so you must repeat Steps 3 to 5 if you want to access the same server again.

Case 8. Creating Multiple Paths to the Same Server(s)

Purpose: To ensure that there is redundant access to specific servers. In this example, we will create four available paths for access to specific servers using the structure of multiple Base Units.

Note: A Base Unit is a "first-tier" Paragon switch.

1. Prepare six Paragon switches, such as P2-UMT1664M and/or P2-UMT832M.
2. Choose three of them as Base Units, two as the 2nd tier, and one as the 3rd tier. If these switches do not share the same firmware version, make sure the versions of lower tiers are later than those of upper tiers. For example, Base Unit is with firmware version 4.2 and 2nd Tier with version 4.0.
3. Connect all of these Paragon switches with Category 5 (Cat 5) UTP cables from the channel ports of lower tiers to user ports of upper tiers as illustrated below:



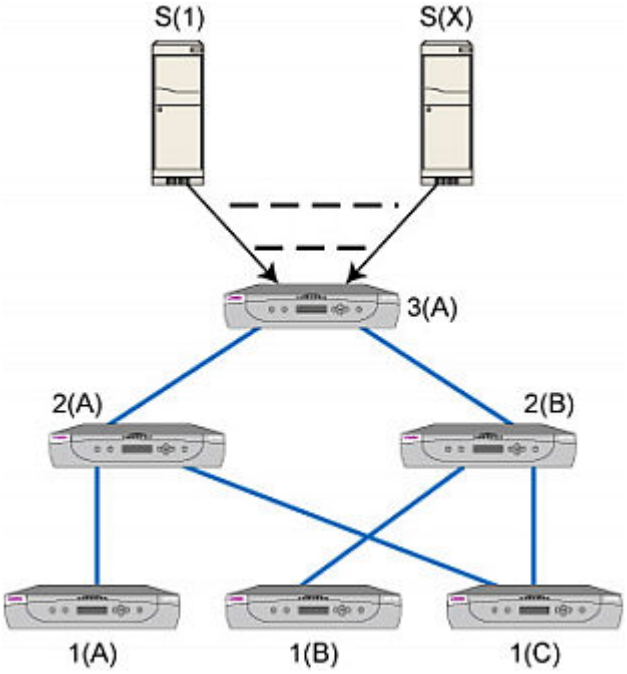
C	Channel ports
U	User ports
1(A) ~ 1(C)	Base Units (first-tier Paragon switches)

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2(A) ~ 2(B)	Second-tier Paragon switches
3(A)	Third-tier Paragon switch

See ***Tiered Configurations*** (on page 136) for details.

4. Connect servers to the "3rd Tier" Paragon switch with the Cat 5 UTP cables. The connection configuration looks like this:



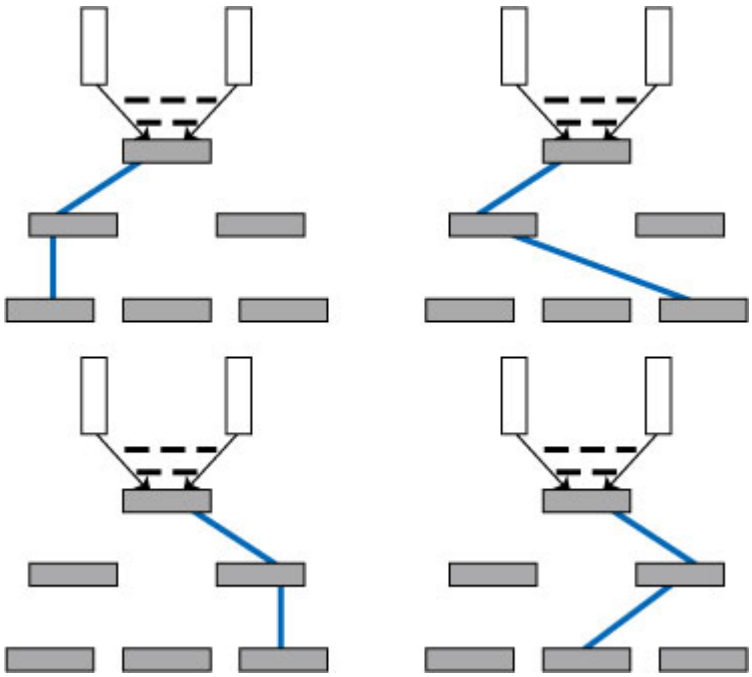
S(1) ~ S(X)	Servers
1(A) ~ 1(C)	Base Units
2(A) ~ 2(B)	Second-tier Paragon switches
3(A)	Third-tier Paragon switch

5. Connect user stations to Base Units *1(A)*, *1(B)* and *1(C)* with the Cat 5 UTP cables.
6. Connect the keyboard, mouse and monitor to each user station.

   See ***Basic Installation*** (on page 12) section for details.

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7. Now four different paths (blue solid lines as illustrated below) are available for users to access any servers connected to the "3rd Tier."



See *Configurations* (on page 135) for more details.

Case 9. Upgrading the Firmware of Paragon Switches

Purpose: To upgrade Paragon II switches and benefit from recent enhancements to the Paragon product line. (Please note the description herein refers to regular firmware upgrade and does not apply to "special" firmware upgrade which involves the boot loader or failsafe feature.)

1. Verify that the Main Switching Unit (Main Unit) is connected to the network and relevant network settings, such as the IP address, are configured properly.

   See *Case 1. Setting the Network Configuration* (on page x) for details.

2. (Optional) If there has been any Stacking Unit connected to the Main Unit, keep them attached and powered on. For example, you may upgrade one P2-UMT832M (Main Unit) and three P2-UMT832S (Stacking Units) which are connected to it altogether. Also verify the following Stacking-related settings:

   - The "Stacking Support" setting in the Main Unit is appropriate.
   - The value of the "Set Stack ID" setting in every connected Stacking Unit is unique.

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See *General Update Procedure* (on page 153) for details.

3. Download the firmware from the ***Firmware Upgrades webpage*** (http://www.raritan.com/support/firmwareupgrades) on the Raritan website.
4. Unzip the downloaded file. Among the unzipped files, there are a file named ParagonUpdate_xxx.exe and a firmware file named P2-xxx.hex (xxx represents the version). For example, the firmware file for version 4.2 is named P2-3E5.hex.
5. Double click "ParagonUpdate_xxx.exe" to execute the program.
6. Enter the information of the Main Unit in the **Paragon Update** utility. For example:
   - In the **Name** column, type `Paragon832M`
   - In the **IP address/Serial** column, type `90.180.52.157`
   - In the **Port** column, type `3000`
   - If you have assigned the Encryption keys in the Paragon system, remember to type the same encryption data in the **Encryption Key** column

   See *Paragon Manager User Guide* on the manual CD for details.
7. Ensure the checkbox before the Main Unit is selected (☑).
8. Click **Load Hex File** to select the firmware file "P2-xxx.hex". For example, choose the file "P2-3E5.hex"to upgrade to firmware version 4.2.
9. Click **Send To Paragon → Yes**. Then the utility starts to upgrade the Main Unit and every connected Stacking Unit (if any).
10. Once all of the upgrade is completed, a message appears.

Case 10. Upgrading the Firmware of User Stations

Purpose: To upgrade the user stations and benefit from recent enhancements to the Paragon product line.

1. Connect the user station to the serial port (e.g. COM 2) of a computer via an RS-232 male-to-female serial cable shipped with the user station.
2. Download the firmware from the ***Firmware Upgrades webpage*** (http://www.raritan.com/support/firmwareupgrades) on the Raritan website.

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3. Unzip the downloaded file. There are a file named ParagonUpdate_xxx.exe (xxx represents the version) and a firmware file for the user station. If using the P2-EUST, the firmware file is named EUST-xxx.hex. If using the P2-UST, the firmware file is named V5-xxx.hex (xxx represents the version).
4. Double click "ParagonUpdate_xxx.exe" to execute the program.
5. Enter the information about the user station in the **Paragon Update** utility. For example:
   - In the **Name** column, type `P2-EUST-1`
   - In the **IP address/Serial** column, select <Default Serial>
   - In the **Port** column, type `2`. This represents the serial port—COM2
6. Ensure the checkbox before the user station is selected (☑).
7. Click **Load Hex File** to select the firmware file.
8. To start the upgrade, click **Send To Paragon → Yes**.
9. Once the upgrade is completed, a message appears.

See ***General Update Procedure*** (on page 153) and *Paragon Manager User Guide* on the manual CD for details.

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Chapter 1 Introduction

Thank you for purchasing Raritan's Paragon II. The Paragon family is about breaking away from the traditional, expensive model of server management—one server, one dedicated monitor, one dedicated keyboard. Paragon enables one or more workstations to access multiple servers—even servers of different platforms.

No matter how large or small your setup, no matter how simple or how complex, Raritan is confident that there is a Paragon system just right for you.

In This Chapter

Paragon II Overview 1
Product Photos 6
Product Features 8
Package Contents 11

Paragon II Overview

The Paragon II is designed to perform heavy-duty multiple-user-to-many-server keyboard/video/mouse (KVM) matrix switching without burdening you with big, confusing hydra-headed cables. Instead, the Paragon II uses standard Category 5 (Cat 5) unshielded twisted-pair (UTP) cabling, like the type that is already installed at many sites. It can connect users with servers across as much as 1000 feet (304 m) of such cabling.

A Paragon II system consists of several components:

- **Main Switching Units** serve as Base Units and matrix switches, securely connecting users to servers.

  Note: For documentation purpose, Main Switching Units are hereafter called **Main Units** in this manual.

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- **Stacking Units** connect to Main Units and enable you to expand your system in a space-saving manner without sacrificing channels.
- **Computer-Interface Modules (CIMs)** are connected to each server.
- **User Stations** connect your keyboard, monitor, and mouse to the Main Unit and provide an intuitive On-Screen User Interface (OSUI) for accessing attached servers. Different models of user stations are explained below:
  - Standard User Station (P2-UST) provides basic user station functions as described above.
  - Enhanced User Station (P2-EUST) provides the P2-UST features, plus superior video quality with automatic skew compensation.
  - Enhanced User Station with an integrated card reader (P2-EUST/C) functions similar to a P2-EUST, and enables card authentication.
  - IP-Enabled User Stations, including P2-USTIP1 and P2-USTIP2, one- and two-worker user stations, have integrated IP access and provide KVM over IP capability for anytime, anywhere access and control of servers. Key features include a slim design and GUI for point-and-click remote access. The P2-USTIP series supports IP access, enabling one or two remote users to access Paragon II-connected servers from anywhere via a Web browser. P2-USTIP2 also supports 128-bit SSL encryption and local authentication through Paragon II, or centralized authentication when used with Raritan's CommandCenter Secure Gateway.

Main Units

There are a number of Main Units that support a wide range of configurations:

- **P2-UMT242** supports 2 users and 42 servers
- **P2-UMT442** supports 4 users and 42 servers
- **P2-UMT832M** supports 8 users and 32 servers
- **P2-UMT1664M** supports 16 users and 64 servers

CIMs

There are also several different CIMs for different types of servers (all must output VGA video):

- **P2CIM-APS2**:
  - Supports servers with IBM PS/2 type keyboard and mouse ports. It comes with automatic skew compensation (when used with P2-EUST or P2-EUST/C).

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  - Works with P2-HubPac in PC, MAC, and Sun USB configurations.
- **ZCIM-PS2** supports servers with IBM PS/2 type keyboard and mouse ports, and has an extra RJ45 port to support a "local server" installed between a user station and a Base Unit, as well as chaining of Z-CIMs for clustered access.
- **P2CIM-ASUN**:
  - Supports servers with Sun type keyboard and mouse ports. It comes with automatic skew compensation (when used with P2-EUST or P2-EUST/C).
  - Works with P2-HubPac in PC, MAC, and Sun USB configurations.
- **P2CIM-AUSB**:
  - Supports servers with USB keyboard and mouse ports. It comes with automatic skew compensation (when used with P2-EUST or P2-EUST/C).
  - Works with P2-HubPac in PC, MAC, and Sun USB configurations.
- **P2CIM-AUSB-C** provides all of the functions of P2CIM-AUSB, and enables smart card access when used with P2-EUST/C.
- **P2CIM-SER**, **P2CIM-SER-EU** and **AUATC** support servers or ASCII serial devices connected to the Paragon II system through their RS-232 serial ports.
- **P2CIM-APS2DUAL** supports servers with IBM PS/2 keyboard and mouse. This CIM doubles the number of users that have access to a particular server and provides automatic skew compensation (when used with P2-EUST or P2 EUST/C).
- **P2CIM-AUSBDUAL** supports servers with USB or Sun USB keyboard and mouse. This CIM doubles the number of users that have access to a particular server and provides automatic skew compensation (when used with P2-EUST or P2 EUST/C).
- Two CIMs support IBM BladeCenter® (blade servers), and provide automatic skew compensation (when used with P2-EUST or P2-EUST/C):
  - **P2CIM-APS2-B** for PS/2 type keyboard and mouse ports
  - **P2CIM-AUSB-B** for USB type keyboard and mouse ports

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User Stations

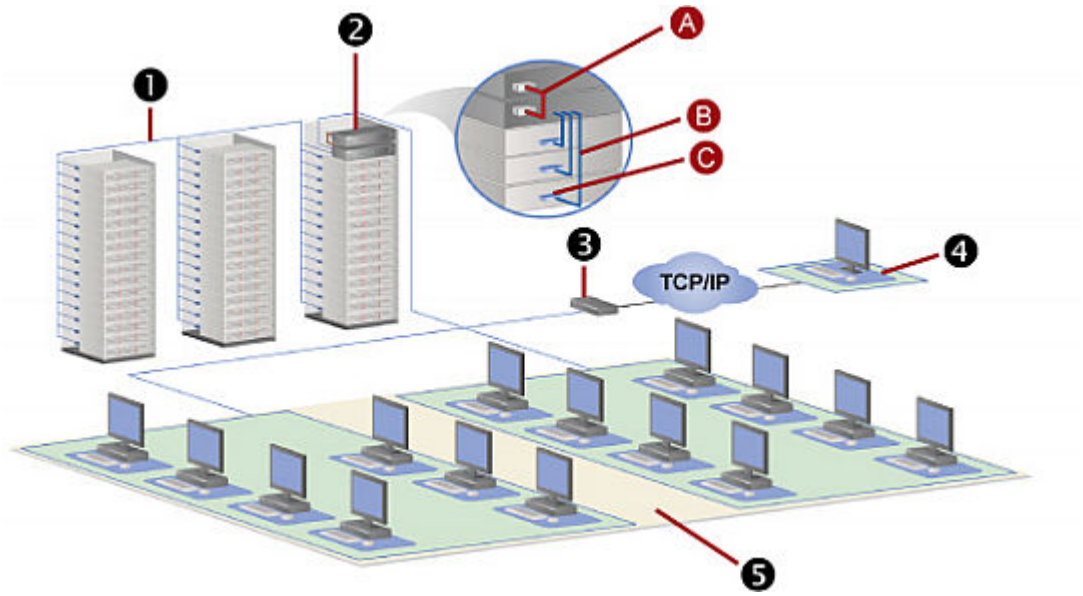
One universal user station supports PS/2, Sun, or USB keyboards and mice. If you want to connect one user station to one server across a long stretch of Cat 5 or higher cable, you can run such a cable between a "direct mode" user station and a P2CIM-APS2. Please see ***User Station Direct Mode*** (on page 178) for additional information.

Note: We recommend using a Sun keyboard if there are any Sun servers in your system; if you must use a PS/2 keyboard to control Sun servers, please see ***Extra Keyboard/Mouse Information and Settings*** (on page 200) for additional information.

Raritan's enhanced user station, P2-EUST, is a user station that functions just like Raritan's P2-UST user station. However, the P2-EUST provides enhanced control over video quality by either automatically adjusting the skew delay of each color, or allowing the user to manually adjust the video gain and skew delay on the screen, and store these preferences in the Paragon switch's database.

Another enhanced user station with an integrated card reader, P2-EUST/C, functions like P2-EUST. However, it supports USB keyboards and mice only, and provides the card reader function for smart card authentication.

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1	128 servers
2	Single base plus stacking unit **A:** Paragon II Stacking cable(s) **B:** Standard Cat 5 UTP cable **C:** Computer Interface Module (CIM)
3	IP-enabled user station
4	Remote user
5	15 user stations

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Product Photos

Paragon II Main Units: P2-UMT242, P2-UMT442, P2-UMT832M and P2-UMT1664M



Paragon II Main Unit, User Station and CIM



1	P2-UMT832M
2	P2-EUST
3	P2CIM-APS2

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P2-EUST/C (Front and Rear Sides)



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Product Features

- 2U design supports 16 users, 64 servers (model: P2-UMT1664M)
  1U design supports 8 users, 32 servers (model: P2-UMT832M)
  1U design supports 4 users, 42 servers (model: P2-UMT442)
  1U design supports 2 users, 42 servers (model: P2-UMT242)
- Expands the number of users with Raritan's P2CIM-APS2DUAL, P2CIM-AUSBDUAL, or P2-HubPac
- Locates users and servers up to 1000 feet (304 m) apart
- Supports high-resolution video—up to 1600 x 1200
- Supports up to 512 customized user profiles (with optional Memory Card)
- Adds remote access over IP or modem with Raritan's IP-Reach and UST-IP models
- Expands to 10,000 servers via multi-dimensional expansion (with optional Memory Card)
- Stacking switches provide 100% non-blocked expansion with a single cable
- Enclosed 19" rack mounts with included brackets
- Simple plug-and-play auto-configure installation
- Hot-swappable components with no impact on server operation
- Platform-specific CIMs for PS/2, Sun, USB, Sun USB, ASCII/serial devices
- Powerful, intuitive onscreen user interface for simple operation
- Flexible, multi-level security for authorized server access
- Three system operation modes—private, public, and share
- Quick access to previous or next available channels with the Up/Down Channel hot key combination
- Flash firmware upgrades with Failsafe capability via network port
- Paragon Manager, a Windows application, provides streamlined administration of Paragon II infrastructure, including adding, deleting or modifying user profiles, event logging, and database backup/restore (see Raritan's *Paragon Manager User Guide* for additional information about Paragon Manager, which is available on the "User Manuals & Quick Setup Guides" CD shipped with your Paragon product, or on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation)).
- The administrator can log out any connected user
- Turn on, off, or reboot power to any connected device

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- Network admin port
- Set power control permissions on a per-outlet basis
- Supports the use of Pinnacle FastAction keyboard (when used with P2CIM-APS2 or P2CIM-APS2DUAL)
- Supports 10-BaseT, half duplex network speed (not configurable)
- OSUI (On-Screen User Interface) support for IBM BladeCenter® servers. The following BladeCenter systems are supported:
  - BladeCenter E (also referred to as model 8677)
    - With MM model 48P7055
    - With AMM model 25R5778
  - BladeCenter H (also referred to as model 8852)
    - With AMM model 25R5778

Note: IBM has updated the BladeCenter frequently since its original release. For best results, please use P2CIM-AUSB-B firmware level 0A6 or later.

- Supports the use of a 121-key Cortron rugged keyboard at the local site when used with the following Paragon II user station:
  - P2-EUST or P2-EUST/C with firmware version 3E46 or later
  - P2-USTIP with firmware 4.5.0.5.12 or later (local PS/2 port only)

  Both PS/2 (part number 536-0062) and USB keyboards (part number 524-0079) are supported. Those with built-in Sun keys are also supported, and the Sun power key may be used to power off the server, but not power it on.
- Supports the use of a Kensington Expert Mouse® and Turbo Mouse trackball (Model #: 64210) at the local site when used with the following Paragon II components:
  - User station: P2-UST, P2-EUST or P2-EUST/C
  - CIM: P2CIM-AUSB or P2CIM-AUSB-C with the latest CIM firmware
- Supports Multiple Video, also known as "Port-Following Switch." Multiple Video enables up to four user stations to simultaneously view the video output of a server that has multiple video outputs
- Supports video redirection to a specific user station (known as "Forced Video")
  - Local control by the administrator

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  - Remote control by the administrator and authorized users through Paragon Manager
- Supports authentication with an appropriate smart card when using the following Paragon II components:
  - P2-EUST/C
  - P2CIM-AUSB-C

Special Notes:

➢ *P2-EUST/C has been tested to support Windows and Linux operating systems. Support for Mac and Sun servers is planned for an upcoming release.*

➢ *Releases 4.2 and 4.3 are not compatible with the Paragon II System Controller (P2SC). They are considered "standalone" releases and are not supported for installation in a Raritan PCCI environment. As of release 4.3.1, Paragon II returned to compatibility with P2SC. Existing Paragon II System Controller customers may upgrade their Paragon II components to 4.3.1 or higher to benefit from recently added features and maintenance fixes. Please see the Paragon II 4.3.1 release notes for minimum firmware levels.*

For information about the supported features in PCCI, download the document titled "Supported Paragon II Features in PCCI" from Raritan's Product Documentation webpage (http://www.raritan.com/support/productdocumentation/paragon-II/*).*

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Package Contents

Each Paragon Main Unit (P2-UMT242, P2-UMT442, P2-UMT832M, or P2-UMT1664M) ships with:

- One Main Unit
- Two 20-ft. (6.1-m) Cat 5 test cables
- One Pair of Rackmount brackets and associated screws
- One 6-ft. (1.8-m) AC power cord
- RUMT-1U-LM304 Rackmount kit
- Cat 5 admin cable
- Raritan's *User Manuals & Quick Setup Guides* CD
- Quick Setup and Installation Guide

The Paragon Stacking Unit ships with:

- One Stacking Switch
- One RUMT-1U-LM304 Rackmount kit
- One 6" Stacking Cable (for use with P2-UMT832M) or two 6" Stacking Cables (for use with P2-UMT1664M)
- One AC Power Cord

The Paragon user station (P2-UST, P2-EUST or P2-EUST/C) ships with:

- One user-station Module
- One 6-ft. (1.8-m) AC power cord
- One 6-ft. (1.8-m) AC power-extension cord for the attached monitor
- One 16.4-ft. (5-m) DB9 male-to-female serial administration cable

The Paragon IP-enabled user station (P2-USTIP1/2) ships with:

- One IP-enabled user-station Module
- One 6-ft. (1.8-m) AC power cord
- One 16.4-ft. (5-m) DB9 male-to-female serial administration cable

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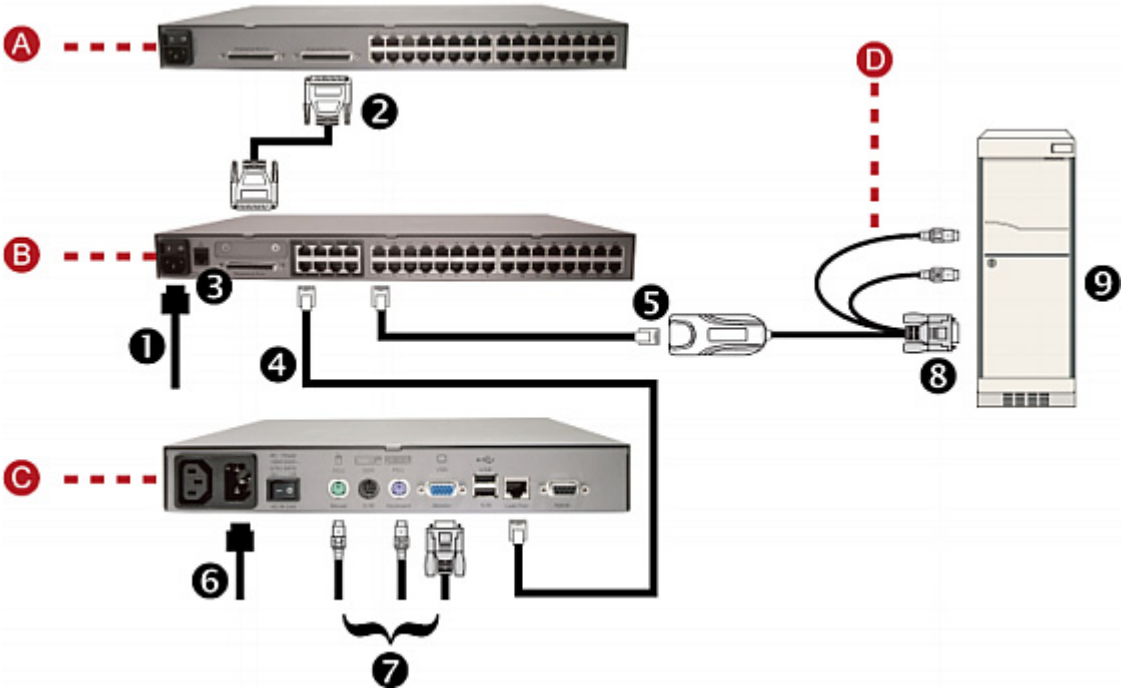
Chapter 2 Installation

The Paragon and all devices you want to attach to it must be unplugged and powered OFF prior to installation.

In This Chapter

Basic Installation 12
Paragon II Front Panel Display and Controls 16
Initial Configuration 21
Installing a Cascaded Paragon System 29
Installing a HubPac 37

Basic Installation



A	Stacking Unit (optional)
B	Main Unit
C	User Station
D	Computer Interface Module (CIM)

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Note: The above images are for illustration only and may not be the exact representation of the Paragon components you purchased.

The steps below correspond to the numbers in the above diagram.

1. Connect the power cord to the Main Unit.
2. **(Optional)** Connect a Stacking Unit if it is needed.
   a. Connect the power cord to the Stacking Unit.
   b. Connect one end of a stacking cable to the "Expansion Port Out" on the back of the Stacking Unit. Connect the other end of the cable to the "Expansion Port" on the Main Unit.

   Note: For P2-UMT1664M and P2-UMT1664S, you must use two stacking cables. For detailed instructions, see ***Installing the Paragon P2-UMT1664S Stacking Unit*** (on page 35).

   c. Power on all switching units.
   d. On the front panel of the Main Unit:
      - Press the **FUNC** button and then use the △ and ▽ buttons to select "Stacking Support." Press the **ENT** button to confirm the selection.
      - Use the △ and ▽ buttons to set the total number of Stacking Units desired (3 maximum for P2-UMT832M or 1 maximum for P2-UMT1664M). Press the **ENT** button to save the setting.
   e. On the front panel of the Stacking Unit:
      - Press the **FUNC** button and then use the △ and ▽ buttons to select "Set Stack ID." Press the **ENT** button to confirm the selection.
      - Use the △ and ▽ buttons to assign the Stacking Unit ID. (Each Stacking Unit for P2-UMT832M MUST HAVE A UNIQUE ID [1-3].) Press the **ENT** button to save the setting.
   f. Power OFF all switching units.
   g. Power ON the Stacking Unit. (This must be done before powering on the Main Unit.)
3. Power on the Main Unit.
4. Connect one end of a Cat 5 UTP cable to User Port #1 on the back of the Main Unit. Connect the other end of the cable to the "Cat5 Port" or "Paragon Port" on the back of the user station.
5. Connect a power cord to the user station and power it on.

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6. Connect a PS/2 or USB keyboard, mouse, and a VGA monitor to the user station. Power on the monitor.

   Warning! The user station does not support the use of a VGA to DVI converter. Do NOT connect the monitor to the user station through a DVI connector.

7. Connect one end of a Cat 5 UTP cable to Channel Port #1 on the back of the Main Unit (or Stacking Unit, if attached). Connect the other end of the cable to the RJ45 port on a Computer Interface Module (P2CIM).
8. Connect P2CIM to a server's keyboard, video, and mouse ports.

   Tip: If the server provides a DVI-D connector instead of a VGA port, Raritan recommends the use of a Smart View DVI (female) to VGA (female) converter (DV-101) for connecting the P2CIM and the server. Note that currently only the Smart View DVI to VGA converter has been tested and is officially supported by Raritan for use with Paragon II.

9. Power on the server.
10. Repeat steps 4 through 9 for all other servers and user stations you want to attach.

Note: Although users and servers can be located up to 1000 feet (304 m) apart, for optimal video quality, limit the cable length between the Main Unit and CIM to less than 100 feet (30.5 m). For good video quality, limit the cable length to less than 500 feet (152 m).

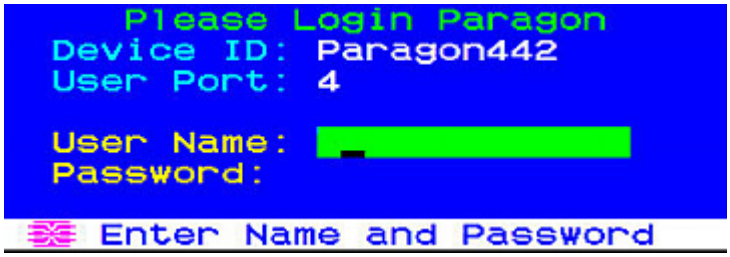
Initial Administrative Verification

To verify that an attached server can be viewed and controlled through the Paragon system:

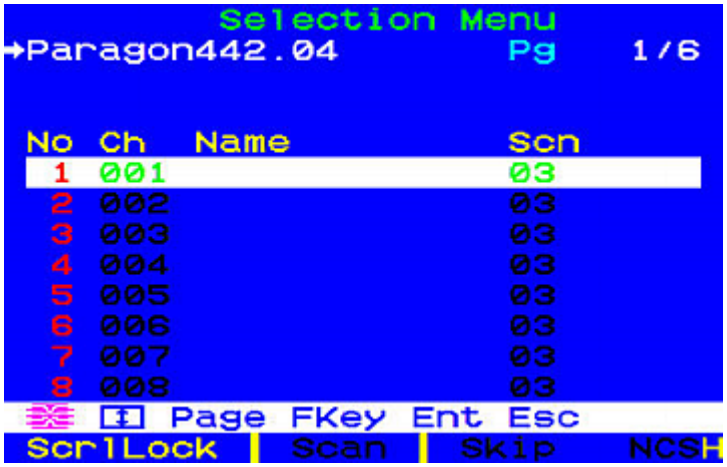
1. When you first power on the Paragon Main Unit, an attached user station, and the user station's attached monitor; the Login screen appears. Type `admin` in the **User Name** field and press **Enter**. Type `raritan` (all lowercase) in the **Password** field and press **Enter**.

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Note: The factory-default user names for regular users are **user01** through up to **user15** (depending on the model of your Main Unit), and for the administrator is **admin**. User names are not case-sensitive. By default, a password is required only for the admin user, and that password is **raritan**. Note that passwords are case-sensitive.



2. The Selection Menu of On-Screen User Interface (**OSUI**) appears. The channel ports of connected servers appear in green. At the start, there are no default names for any servers and the **Name** fields are blank, except for IBM BladeCenter chassis (if any), which has a default name shown as "IBM-Blade."

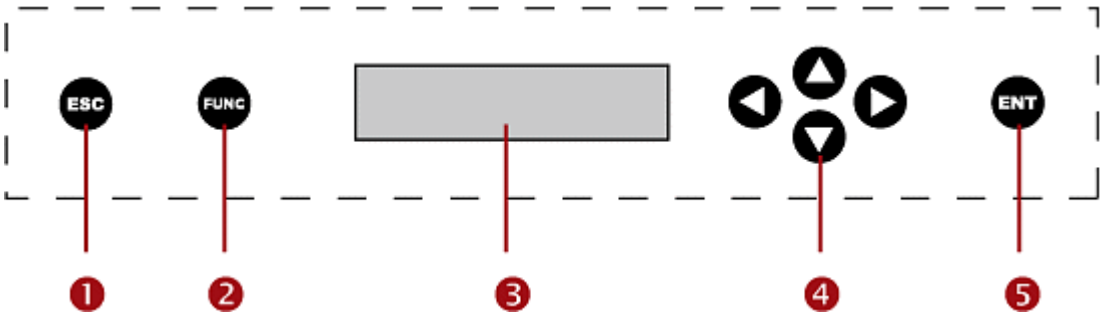


3. Press the ↑ and ↓ keys on the user station keyboard to move the highlight to one of the green server ports and press **Enter**.
4. Normal server access and operation indicates a successful connection.
5. Press the **Scroll Lock** key twice QUICKLY to activate the OSUI, and either press **F9** to log out or choose another green channel (if any) to access.

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Paragon II Front Panel Display and Controls

The control buttons and LCD display on the Paragon switch provide system management and technical support functions. For most situations, there is no need to use the front panel beyond viewing status.



Front Panel Components and Functions:

1. The **ESC** button is used for canceling displayed function and returning system to normal state.
2. The **FUNC** button is used to select various functions.
3. The LCD displays system status and indicates functions that can be selected by pressing front panel control buttons.
4. The ◁, △, ▷, and ▽ buttons are used for selecting or setting various options, depending on the function being performed.
5. The **ENT** button is used for confirming and executing selected function.

Start-Up Display

When a Paragon switch is powered ON, it performs a start-up test at the beginning. It checks each channel and user port to ensure proper operation.

Normal Display

After the start-up test, LCD panel displays two lines of messages:

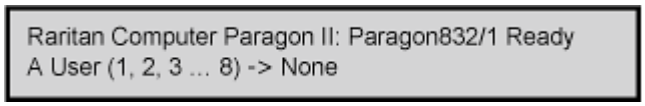
- Line 1: Running message: "Raritan Computer Paragon II: Paragon832/1 Ready"

  For a Paragon II model P2-UMT832M, "Paragon832" is the default name (this name may be changed through the OSUI's System Configuration submenu).

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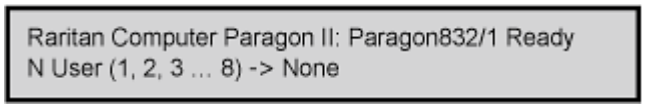
- Line 2: User port status message: "A/N User (1, 2, 3 ...) -> None"

  User port status displays a scrolling status of all user ports, one user port per second. The User's active channel, 1 through 128, is displayed after the user port number.



A=Active User # 1-8

—OR—



N=Non-Active User # 1-8

Power Up Option

If you hold down the **FUNC** button on the front panel of the Paragon switch during Power Up, the Paragon switch will clear its database and reset to factory defaults. Confirm functions by pressing the **ENT** button on the front panel.

When "Clear Database Hit Ent/ESC?" appears on the LCD, press the **ESC** button if you want to exit the screen without clearing the database. To clear the database, press the **ENT** button; "Clear All?" appears on the LCD. If you press the **ESC** button once more, the channel configuration will be cleared and will be rebuilt later by the Paragon switch. This is called a Partial Reset. However, if you press the **ENT** button, both the channel configuration and the user profile and system settings will be cleared.



Function Selection Screen

Several administrative functions can be performed on the Function Menu on the Paragon switch's front panel LCD.

Display Ver./SN
Test User UST1
Test Chan. UKVM
Test Stack Unit

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Stacking Support
Set LCD Contrast
Re-Configure
Set IP Address
Reset Unit

Selecting a Function

Press the **FUNC** button on the front panel of the Paragon switch to enter the Function Menu mode and use the △ and ▽ buttons to scroll through the Function List. Press the **ENT** button on the front panel to select one displayed function and use the instructions below for each specified function. Press the **ESC** button on the front panel at any time to return to Normal Display.



Display Ver./SN (Firmware Version and Serial Number):

Displays current version of firmware, the firmware loader, the unit's serial number, and the field programmable gate array (FPGA).



Test User UST1 (User Station):

Used by an administrator to check if user stations (UST1s) are functioning properly. Press the △ or ▽ button to change user port number. Display will read "OK", "None", or "Failed." Press **ESC** to return to normal display.

If a "Failed" condition is detected, make sure the Cat 5 UTP cable is installed properly and secured, or try using another user station (UST) to see if the user station under test has become defective.



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Test Chan. UKVM (CIM UKVM):

Used by an administrator to check if a CIM is functioning properly. Press the △ or ▽ button to change channel number. Display will read "OK", "None", or "Failed." Press **ESC** to return to normal display.

If a "Failed" condition is detected, make sure the Cat 5 UTP cable is installed properly and secured, or try using another CIM to see if the CIM under test has become defective.



Test Stack Unit:

Press the △ or ▽ button to select the corresponding Stacking Unit ID for any connected units. If there are no Stacking Units connected, the LCD will display "None." If there are Stacking Units connected, the LCD should read "OK" for each unit. Press **ESC** to return to normal display.

Stacking Support:

Press the △ or ▽ button to set the Stacking Unit ID number (0~3 for a P2-UMT832M or 0~1 for a P2-UMT1664M). The default is set to "0" (no Stacking Units connected). If you wish to add Stacking Units, this number must be equal to the number of Stacking Units connected. Press **ENT** to save the value or **ESC** to cancel and return to normal display.



Set LCD Contrast:

Modifies contrast level of front panel LCD Display. Press the △ or ▽ button to increase or decrease contrast, and press the **ESC** button to return to normal display.



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Note: LCD contrast can also be adjusted by holding the ◁ button and pressing the △ or ▽ button at any time.

Re-Configure:

Paragon II will automatically configure the system as computers or devices are added or removed. However, the system administrator can use this function to scan and re-configure the system manually. When complete, it will return to normal display.



Set IP Address:

As an administrator, you may change Paragon II's IP address directly from the front panel of the device. The Paragon II's current IP address will be displayed, along with a cursor. Use the ◁ and ▷ keys to move the cursor over digit-by-digit, and use the △ or ▽ keys to change the value of that digit. Press the **ENT** button when the new IP address has been set. Press the **ENT** button again to save changes and reboot the unit when asked to "Save Changes?" The unit will restart with the new network address.

Note: Stacking units do not have their own databases and configuration settings, and likewise, do not have their own network addresses. You cannot configure one using the front panel controls on the units.

Reset Unit (Paragon switch):

Enables restart of Paragon switch as if the switch's power is physically turned off and back on again.

With Paragon II switch firmware 2B1 and user station (UST1) firmware 2K10 or higher, either a power reset or a factory "function" reset can be performed from the front panel of the Paragon switch using shortcut button combinations (see below for details).

- Power Reset:

  Hold the △ and ▽ buttons on the front panel of the Paragon switch simultaneously for approximately three seconds. When the front panel LCD stops scrolling, release the buttons.

- Factory "Function" Reset:

  Hold the △ and ▽ buttons on the front panel of the Paragon switch simultaneously while pressing the **FUNC** button. When the front panel stops scrolling, release the △ and ▽ buttons, wait for additional three seconds, and then release the **FUNC** button.

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When "Clear Database Hit Ent/ESC?" appears on the LCD, press the **ESC** button if you want to exit the screen without clearing the database. To clear the database, press the **ENT** button; "Clear All?" appears on the LCD. If you press the **ESC** button once more, the channel configuration will be cleared and will be rebuilt later by the Paragon switch. This is called a Partial Reset. However, if you press the **ENT** button, both the channel configuration and the user profile and system settings will be cleared.

Note: Performing a reset or partial reset in a cascaded Paragon system must start from the third tier (if any) to the second tier, and finally move to the base unit (first tier).

After resetting the device, a progress indicator appears on the message bar of the OSUI to indicate the current update percentage. During the database updating, users are unable to operate the OSUI functions.



Initial Configuration

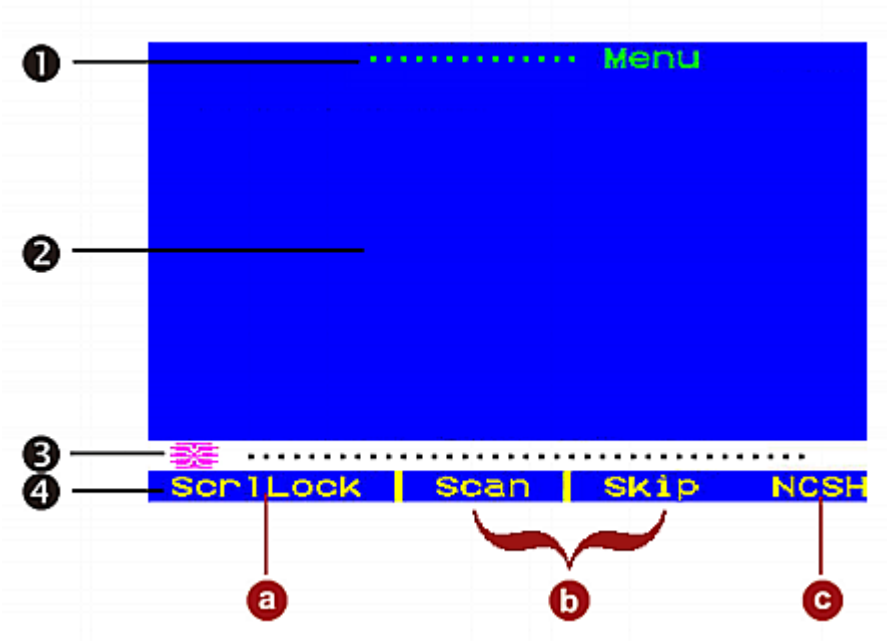
This section includes full instructions for how to install single matrix switches, cascades of multiple matrix switches, or stacking switches. Follow the simplified procedure previously outlined in ***Basic Installation*** (on page 12) to install a simple Paragon system with a single switch. See ***User Station Direct Mode*** (on page 178), to install a "direct mode" User Station-to-CIM system with no Paragon switches. See ***Paragon II and P2ZCIMs/Z-CIMs*** (on page 116) to install a Z-CIM and a local PC in your system.

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Using the OSUI for Initial Configuration

You will use the Paragon II On-Screen User Interface (OSUI) after you install the Paragon system, so here are some basics of OSUI to familiarize yourself before starting your installation. Once the user station and the attached equipment are in place and powered on, activate the OSUI by QUICKLY pressing the default hot key (**Scroll Lock**) twice on an attached keyboard. Each OSUI menu contains the following sections: a menu-title line, a menu/screen body (for text and fields), a prompt/message bar, and a status line that consists of:

- The current OSUI hotkey
- Scan/Skip function status
- NCS (**Num Lock**, **Caps Lock**, and **Scroll Lock**) status indicator
- A communication-speed indicator ("**L**" for low or "**H**" for high, which will depend on your Paragon components) showing the communication speed between the user station and Base Station.



1	Menu name
2	OSUI main screen (showing menu options and fields)
3	Message bar

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4	Status line, displays: **a.** the current OSUI hot key activator (in the illustration, the **Scroll Lock** key) **b.** Scan/Skip function status (if yellow, the function is ON; if white, the function is OFF) **c.** (N) Num Lock, (C) Caps Lock, (S) Scroll Lock, followed by Paragon II Communication Speed Indicator: (L) Low or (H) High. The speed depends on your component versions.

Use function keys **F1**, **F2**, **F3**, **F4**, **F8**, and **F12** to toggle between first-level menus. Pressing **F1** while the OSUI is onscreen can activate the Help Menu, a list of available help options.

While the OSUI is onscreen, the user-station keyboard's **Scroll Lock** LED indicator blinks.

Below is an abbreviated table of the function keys you will use when working with the OSUI:

Key	Action
F1	View the Help Menu
F2	Go to the Selection Menu for accessing channel ports
F3	View the Power Control Menu for associated Channel
F4	Go to the User Profile Menu for users to customize their settings
F5	Administrator only: Go to the Administration Menu for the administrator to manage the system settings
F6	Administrator only: Toggle the autoscan function on or off
F7	Administrator only: Toggle the autoskip function on or off
F8	View the Information Menu
F9	Log out of the system
Shift + F9	Disconnect from the currently accessed channel without logging out of the system
F10	Toggle the display of all channel ports (including inaccessible ones) on or off

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Key	Action
F11	View the Unit Status Menu for connected Raritan Remote Power Control unit (available only from Power Control Menu)
F12	Toggle the Selection Menu's sorting way: numerically by port number or alphabetically by name
Esc	Exit the current OSUI (On-Screen User Interface) screen

Installing a Paragon System with a Single Matrix Switch

If installing a single Paragon switch, keep in mind the maximum numbers of user stations and servers you can connect:

- 2 user stations and 42 servers to a P2-UMT242
- 4 user stations and 42 servers to a P2-UMT442
- 8 user stations and 32 servers to a P2-UMT832M
- 16 user stations and 64 servers to a P2-UMT1664M

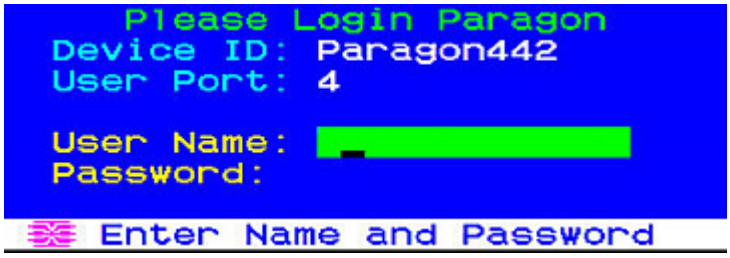
Important: All Paragon components, servers, and monitors must be turned OFF and unplugged before installation.

1. Initialize the Paragon switch.
   a. Connect the switch's included power cord from the IEC 320 inlet on its rear panel to an appropriate AC outlet.
   b. Power on the switch.
2. Connect a user station and its attached devices.
   a. Connect one end of a Cat 5 UTP cable to user port # 1 on the back of the switch. Connect the other end of the cable to the RJ45 Cat 5 port on the back of the user station.
   b. Connect the user station's included power cord from the IEC 320 inlet on its rear panel to an appropriate AC outlet.
   c. Power ON the user station. It will power up and establish communication with the Paragon switch.
   d. Connect a keyboard, a mouse, and a monitor to the user station. (To control Sun servers with a PS/2 keyboard, please see ***Extra Keyboard/Mouse Information and Settings*** (on page 200) for additional information.)
   e. Plug in and power on the monitor.

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3. Perform initial configuration of the user station.

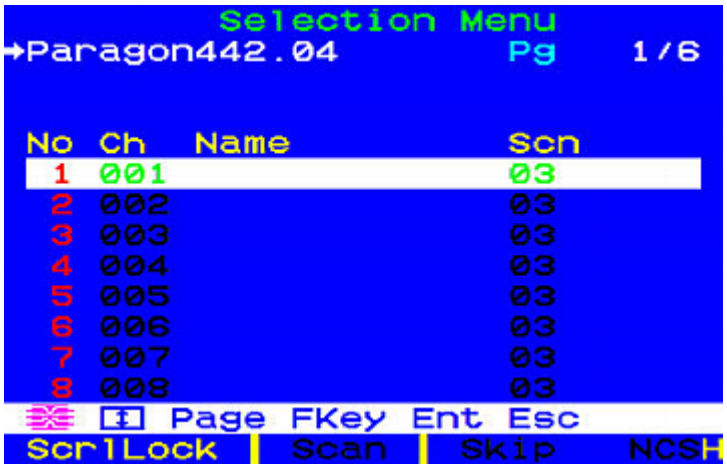
   a. The Login screen should appear on the user station's attached monitor. If the **Scroll Lock** LED on the user station's attached keyboard is blinking, the Paragon is ready to accept function key commands, which allow users to login, select servers, or administer the system.



   If the monitor instead displays a ".....No connection to Paragon....." message, the user station is not properly connected to the Paragon switch. Check for loose connections and make sure you are using good, intact Cat 5 cables.

   b. Type `admin` in the **User Name** field and press **Enter**. In the **Password** field, type the default password `raritan` (all lowercase) and press **Enter**.

   c. The OSUI's Selection Menu appears, indicating that the user station is correctly installed.



4. Repeat steps 2 and 3 for each user station you want to connect to the Paragon switch.

5. Connect a CIM and the desired server.

   a. Connect the cable strands of an appropriate CIM to the appropriate ports on a server:

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- P2CIM-APS2 (IBM PS/2 compatible servers) or P2CIM-APS2-B (IBM BladeCenter Management Module with PS/2 ports):

Plug the HD15 strand into the server's HD15 VGA video port. Plug the purple 6-pin mini-DIN keyboard strand into the server's 6-pin mini-DIN keyboard port. Plug the light green 6-pin mini-DIN strand into the server's 6-pin mini-DIN mouse port.

- P2CIM-ASUN (Sun compatible servers):

Plug the HD15 strand into the server's HD15 VGA video port. Plug the 8-pin mini-DIN strand into the server's 8-pin mini-DIN keyboard/mouse port.

- P2CIM-AUSB, P2CIM-AUSB-C, or P2CIM-AUSB-B (IBM BladeCenter Management Module with USB ports):

Plug the HD15 strand into the server's HD15 VGA video port. Plug the USB *Type A* strand into one of the server's USB *Type A* ports.

- P2CIM-APS2DUAL (IBM PS/2 compatible servers):

Connect keyboard, monitor, and mouse cables attached to the CIM to the appropriate 15-pin female video port and 6-pin mini-DIN mouse and keyboard ports on the server.

- P2CIM-SER, P2CIM-SER-EU and AUATC (serial servers, routers, and so on):

Please see ***Connecting Serial Devices to Paragon II System*** (on page 188) for installation instructions.

- P2ZCIM and Z-CIM (local single-user IBM PS/2 compatible servers):

Please see ***Paragon II and P2ZCIMs/Z-CIMs*** (on page 116) for installation instructions.

b. Plug in and power on the server. If the CIM is installed and operating properly, the CIM's green LED will start blinking: once per second while the CIM is idle, more quickly while data is transmitted in either direction.

c. Connect one end of a Cat 5 UTP cable to channel port #1 on the back of the Paragon switch. Connect the other end of the cable to the RJ45 port on the CIM.

6. Configure the CIM and the attached server.

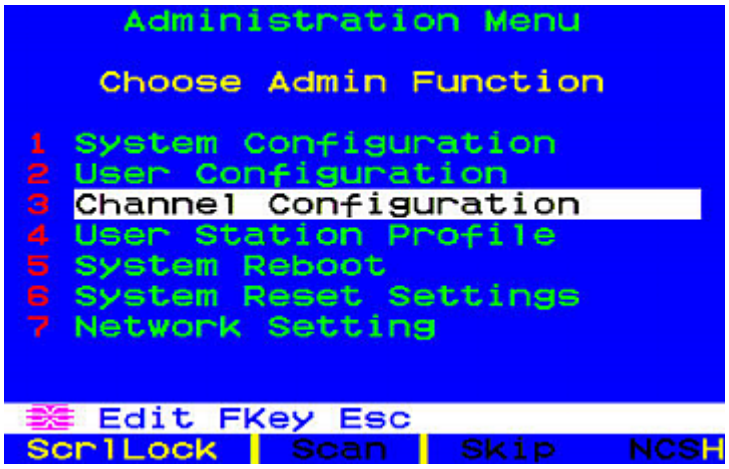
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a. The monitor attached to the user station will display the Selection Menu; with the server you just connected displayed in green. Use the ↑ and ↓ keys to move the highlight to that entry and press **Enter**. If you can access and operate the server normally, the CIM is connected successfully. Raritan recommends you give the server a meaningful system name at this time, as described in the next steps.

Note: If your video image is fuzzy (especially if you are using an LCD flat-panel monitor), you can adjust the video gain to focus the video image. If the OSUI is not displayed, activate it by pressing the Scroll Lock key twice QUICKLY, then use the + and – (plus and minus) keys on the numeric keypad to adjust the video image until it appears to be in focus. The P2-EUST and P2 EUST/C provide automatic and manual skew compensation, which will also help improve video quality. Please see ***Video Gain Adjustment and Skew Compensation in P2-EUST*** (on page 45) for additional information.

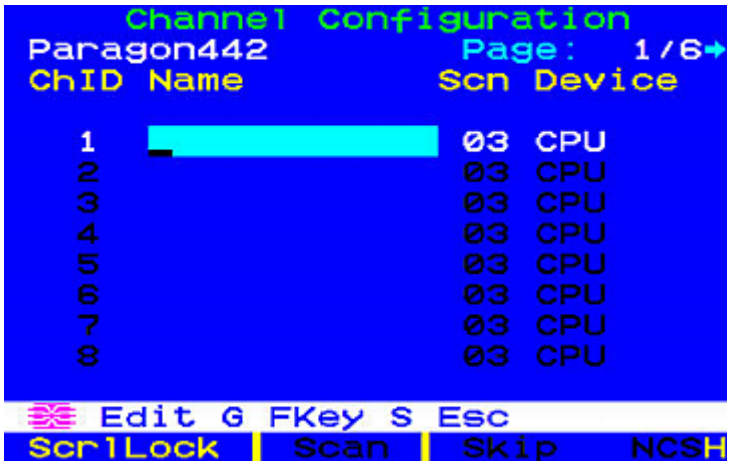
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b. Press **F5** to activate the Administration Menu. Use the ↑ and ↓ keys to move the highlight to the Channel Configuration entry and press **Enter**.



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7. The Channel Configuration submenu appears. Use the ↑ and ↓ keys or **Tab** to move the yellow highlight to the **Name** field for the channel port number where you installed the server and press **Enter**. The highlight turns light blue.



   a. Edit the name (the highlight turns green when you start typing). Press **Enter** when finished, and press **S** to save the new name.

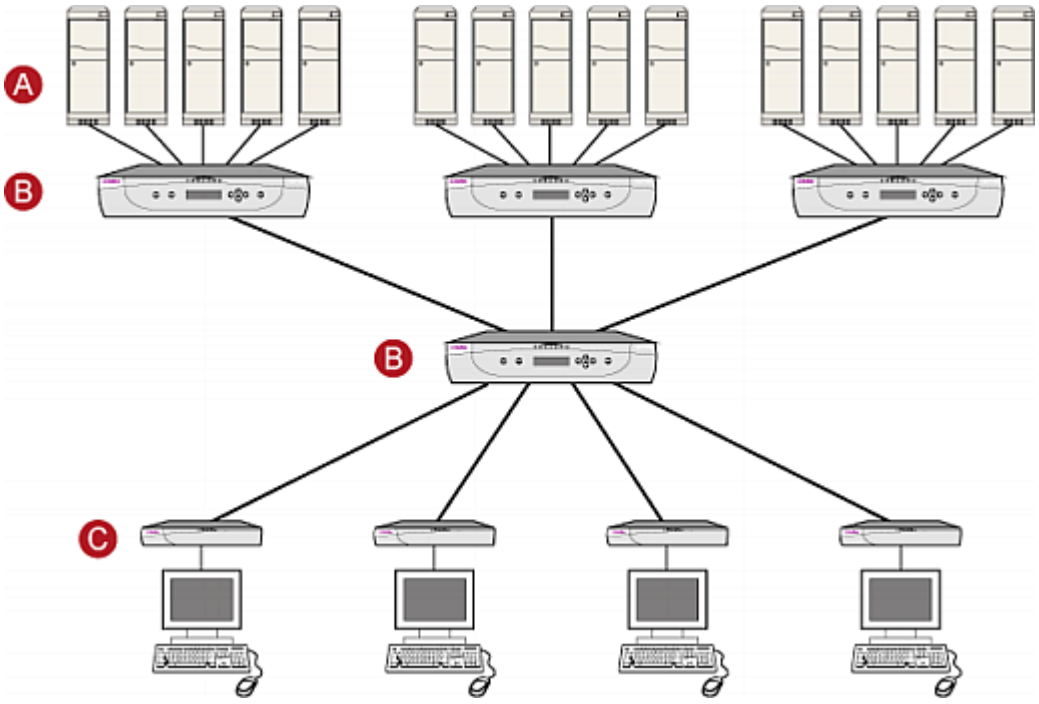
   b. Press **F2** to return to the Selection Menu. Verify that the new name appears in the Selection Menu.

8. Repeat Steps 5 and 6 for each CIM and server you want to connect to the Paragon switch's channel ports.

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Installing a Cascaded Paragon System

Paragon II's channel port capacity can be expanded by installing a cascade of Paragon matrix switches (Main Units). In a "two-tiered" cascaded system, one or more subsidiary Paragon switches are connected to the channel ports of a Base Unit ("first-tier" Paragon switch). If you fully populate a second tier, you can add a third tier by connecting additional subsidiary Paragon switches to the channel ports of Paragon switches in the second tier. Three tiers is the maximum depth of a cascaded system; only CIMs may be attached to the channel ports of Paragon switches in the third tier.



A	Servers
B	Paragon switches
C	User stations with the monitor, keyboard, and mouse attached

1. Connect one end of a Cat 5 UTP cable to user port #1 on the back of the Base Unit. (Do not attach anything to the switch's channel ports and do not plug it in or turn it on yet.)
2. Connect the other end of the cable to the RJ45 port on the back of the user station.
3. Connect a keyboard, mouse, and monitor to the user station. (Do not plug in or turn on the user stations or monitors yet.)

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4. For each subsidiary Paragon switch you want to attach directly to the Base Unit, connect Cat 5 UTP cables from consecutive channel ports on the Base Unit to the subsidiary Paragon switch's user ports.
5. If you are installing a third tier, connect Cat 5 UTP cables from consecutive channel ports on a second-tier Paragon switch to the user ports on a third-tier Paragon switch. Repeat for all other subsidiary switches in the third tier.
6. Attach CIMs and servers to the free channel ports on the third-tier Paragon switches, on the second-tier Paragon switches, and on your Base Unit. (Follow step **5** of ***Installing a Paragon System with a Single Matrix Switch*** (on page 24).)
7. Plug in and power on any THIRD-TIER Paragon switches, then the SECOND-TIER Paragon switches, and finally your Base Unit. (Follow step **1** of ***Installing a Paragon System with a Single Matrix Switch*** (on page 24).)
8. Plug in and power on your user stations and monitors. (Follow steps **2B**, **2C**, and **2E** of ***Installing a Paragon System with a Single Matrix Switch*** (on page 24).)

   The Base Unit should automatically recognize the connected subsidiary Paragon switches and update its configuration. All monitors should display the Login screen. If any monitors instead display a "....No connection to Paragon....." message, the user station which they are attached to is not properly connected to the Base Unit. Check for loose connections and make sure you are using good, intact Cat 5 cables. (See ***Specifications*** (on page 172) for UTP-cabling information.)

   Note: If your video image is fuzzy (especially if you are using an LCD flat-panel monitor), you can adjust the video gain to focus the video image. If the OSUI is not displayed at a given monitor, activate it by pressing the **Scroll Lock** key twice QUICKLY, then use + and - (plus and minus) keys on the numeric keypad to adjust the video image until it appears to be in focus. The P2-EUST and P2-EUST/C provide automatic and manual skew compensation, which will also help improve video quality. Please see ***Video Gain Adjustment and Skew Compensation in P2-EUST*** (on page 45) for additional information.

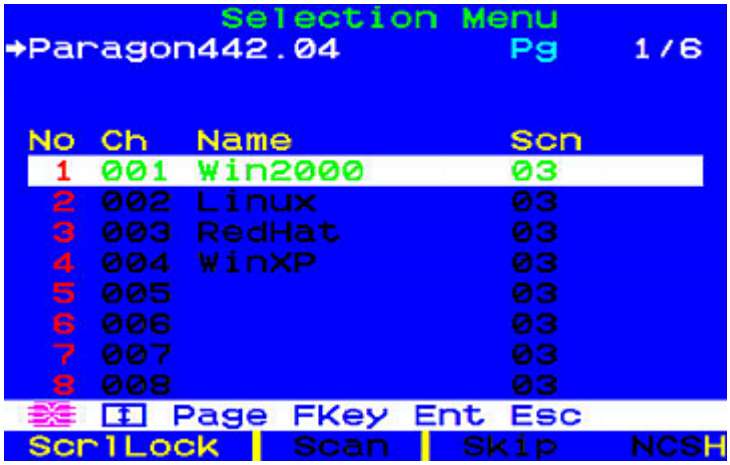
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9. Configure the channel ports in your system. (Check the **Scroll Lock** LED on one of your user-station keyboards. If it is blinking, Paragon is ready to accept the function key commands from that user station. Function key commands allow users to login, select servers, or administer the system.)

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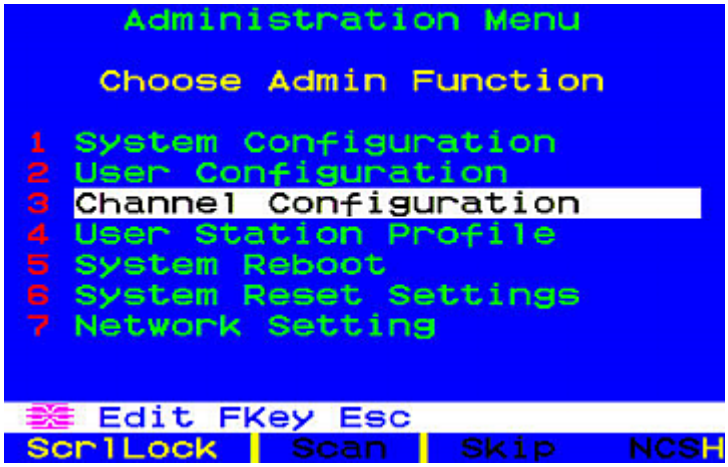
a. At the Login screen, type `admin` in the **User Name** field and press the **Enter** key. In the **Password** field, type the default password `raritan` (all lowercase) and press the **Enter** key.

b. The monitor will display the Selection Menu, indicating that the user station is correctly installed.

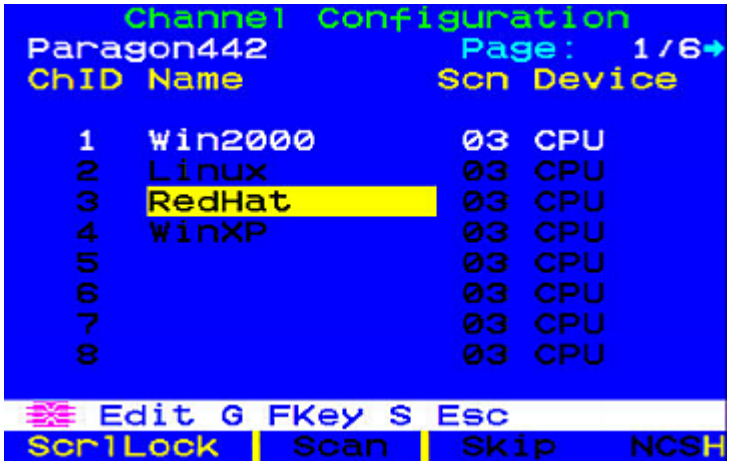


c. Press **F5** to activate the Administration Menu. Use the ↑ and ↓ keys to move the highlight to the Channel Configuration entry and press **Enter** to select it.

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d. The Channel Configuration menu appears. Use the ↑ and ↓ keys and **Page Up** and **Page Down** keys to approach channel ports to which subsidiary Paragon switches are connected. The port default device names appear in the **Name** column and the device type in the **Device** column. ("P242" for a 2 x 42 switch [P2-UMT242], "P442" for a 4 x 42 switch [P2-UMT442], "P832" for an 8 x 32 switch [P2-UMT832M], or "P1664" for a 16 x 64 switch [P2-UMT1664M].



e. Continue using the ↑ and ↓ keys and **Page Up** and **Page Down** keys to move the yellow highlight to the **Name** field for the channel port number where a subsidiary Paragon switch is installed and press **Enter**. The highlight should turn light blue.

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f. Type the name you want to assign to the subsidiary Paragon switch on this channel port (the highlight should turn green when you start typing). Press **Enter** when finished and then press **S** to save the new name. All other paths (channel ports) by which that subsidiary Paragon switch is attached to the Paragon switch above it will be given the same name automatically.

g. Press **F2** to reopen the Selection Menu; make sure that the channel port(s) of the second-tier Paragon switch are properly established. All paths to that Paragon switch should be displayed in purple.

h. Press **F5** to return to the Administration Menu. Select Channel Configuration again. Select a channel port that has been configured for the subsidiary Paragon switch you just set up. Press **G** to activate a dedicated Channel Configuration menu for the subsidiary Paragon switch.

i. Edit the names of all servers attached to this subsidiary Paragon switch. Each highlight should turn green as you start typing. Press **Enter** when finished with each name. Press **S** to save all of the new names.

j. Press **F2** to access the dedicated Selection Menu for that subsidiary Paragon switch. Verify that new names appear in green in the Selection Menu.

k. If you are configuring a second-tier subsidiary Paragon switch, and there are any third-tier Paragon switches attached to it, repeat steps **C** through **J** for a third-tier path configuration. Press **S** to save the configuration. Press **F2** to activate the Selection menu and verify that the third-tier Paragon switch is properly configured: select a channel port for the second-tier path and press **Enter**, then a channel port for the third-tier path and press **Enter**, and then a channel port for a server attached to the third-tier Paragon switch and press **Enter**. If you can properly access and operate the chosen server, the third-tier Paragon switch is properly installed.

Note: Repeat step **K** for all remaining third-tier Paragon switches (if any) attached to this second-tier Paragon switch.

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l. Press **S** to save the configuration. Press **F2** to activate the Selection menu and verify that the second-tier Paragon switch is properly configured: Select a channel port for the second-tier path and press **Enter**, then a channel port for a server attached to the second-tier Paragon switch and press **Enter**. If you can properly access and operate the chosen server, the second-tier Paragon switch is properly installed.

m. Repeat steps **C** through **L** for all remaining (if any) second-tier Paragon switches attached to the Base Unit.

n. Edit the names of any servers directly attached to the Base Unit and verify the Base Unit's configuration as described in steps **6B** through **6E** of the section ***Installing a Paragon System with a Single Matrix Switch*** (on page 24).

Important: If you rearrange a cascaded system or dismantle one and rebuild it differently later, you must recycle power to each switch in the new cascade. A soft reset allows each switch to retain all user and system profiles, and to auto-detect the current status of its channel ports and user ports. Follow the installation steps in this section to install the new cascade, but when you power on each switch (which must be done in proper tier order, from upper tier to base tier), press FUNC on the unit's front panel until "Clear Database Hit Ent/ESC?" appears on the LCD panel. Press the ENT and the ESC buttons sequentially to execute a partial reset on the database. Please see the "Reset Unit" section in *Paragon II Front Panel Display and Controls* **(on page 16) for additional information.**

Rules of Powering On a Cascaded System

When powering on existing stable configurations (that is, if you are NOT replacing or adding switches and NOT swapping the order of switches) or when you are Power Cycling a cascaded configuration, follow the sequence below:

1. First power on the third-tier switches (if a third tier exists).
2. Then power on the second-tier switches.
3. Finally power on the Paragon II base tier.

User stations can be powered on and off at any time as needed.

For configurations where switches are added, replaced, or swapped (in order), follow the sequence below:

1. First power on the third-tier switches (if a third tier exists).
2. Then power on the second-tier switches.

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3. Finally power on the Paragon II base tier.
4. Perform a partial reset of the database on the impacted switches. For example, if you swap the switches connected to the base tier, perform the partial reset on the base tier. If you swap the switches connected to the second tier, perform the partial reset from the second tier to the base tier.

Installing the Paragon P2-UMT832S Stacking Unit

1. Make sure all Paragon switches are powered OFF.
2. Connect a power cord to a Stacking Unit.
3. Connect one end of a stacking cable to "Expansion Port Out" on the back of the Stacking Unit. Connect the other end of the cable to "Expansion Port" on the Main Unit.
4. Power ON all Paragon switches.
5. On the front panel of the Main Unit:
   a. Press the **FUNC** button and use the △ and ▽ buttons to select "Stacking Support." Press the **ENT** button to confirm the selection.
   b. Select the total number of Stacking Units (3 units maximum) and press the **ENT** button.
6. On the front panel of the Stacking Unit:
   a. Press the **FUNC** button and use the △ and ▽ buttons to select "Set Stack ID." Press the **ENT** button to confirm the selection.
   b. Assign the Stacking Unit ID using the △ and ▽ buttons. (Each Stacking Unit **MUST HAVE A UNIQUE ID [1-3]**, and sequential order is not necessary).
7. Press the **ENT** button to save the ID setting.
8. Power OFF all units.
9. Power on the Stacking Unit.
10. Power on the Main Unit.

Installing the Paragon P2-UMT1664S Stacking Unit

1. Make sure all Paragon switches are powered OFF.
2. Connect a power cord to a Stacking Unit.
3. Connect the Main Unit with the Stacking Unit using two stacking cables.

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a. Connect one end of a stacking cable to "Expansion Port Out A" on the back of the Stacking Unit. Connect the other end of the cable to the lower "Expansion Port In" on the Main Unit.

b. Connect one end of the other stacking cable to “Expansion Port Out B” on the back of the other Stacking Unit. Connect the other end of the cable to the upper “Expansion Port In” on the Main Unit.

4. Power ON all Paragon switches.
5. On the front panel of the Main Unit:

   a. Press the **FUNC** button and use the △ and ▽ buttons to select "Stacking Support." Press the **ENT** button to confirm the selection.

   b. Set the total number of Stacking Units (1 unit maximum) and press the **ENT** button to save the setting.

6. On the front panel of the Stacking Unit:

   a. Press the **FUNC** button and use the △ and ▽ buttons to select "Set Stack ID." Press the **ENT** button to confirm the selection.

   b. Assign the Stacking Unit ID using the △ and ▽ buttons.

7. Press the **ENT** button to save the setting.
8. Power OFF all Paragon switches.
9. Power on the Stacking Unit.
10. Power on the Main Unit.

Important Note about Powering Off the Stacking Unit

Never power off a Stacking Unit when it is still CONNECTED to a Main Unit. Doing so will cause the channel color display on the OSUI Selection Menu to become incorrect. To power off the Stacking Unit, you must disconnect it from the Main Unit first.

If the Stacking Unit is powered off by accident when it is still connected to the Main Unit, do the following to restore the color display to normal:

1. Remove the stacking cable connected between Stacking and Main Units.
2. Power off the Main Unit.
3. Connect the stacking cable between Main and Stacking Units.
4. Power on the Stacking Unit first.
5. Then power on the Main Unit.

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Installing a HubPac

P2-HubPac is available for use with Paragon II. HubPac units allow users of different Paragon switches to access the same server(s). Each five-port cluster on a HubPac is capable of connecting a server to up to four Paragon switches.

CIM models capable of connecting to a P2-HubPac include:

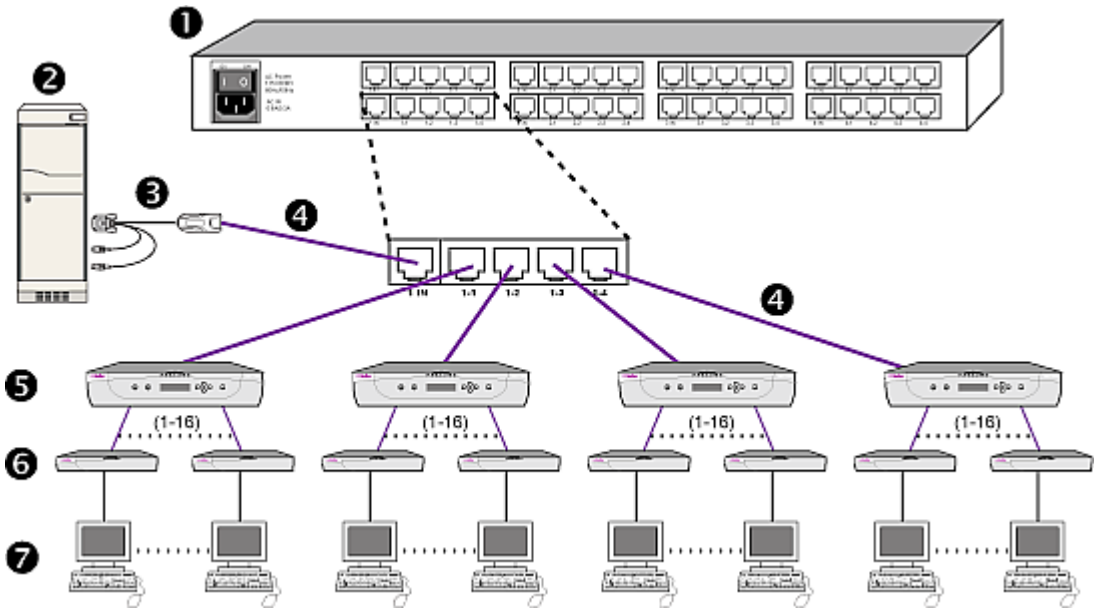
- P2CIM-APS2
- P2CIM-AUSB
- P2CIM-ASUN
- UKVMC

Installing a HubPac

Please use the basic installation instructions below to create the HubPac configuration that gives users of up to 4 Paragon switches the capability to access the same server(s).

Note: P2-HubPac does not support the card reader functionality at this time. Therefore, make sure the servers that require the card reader authentication are not connected to the P2-HubPac.

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1	HubPac
2	Server
3	CIM
4	Cat 5 cable
5	Paragon switch (the model illustrated is P2-UMT1664M)
6	User station
7	Monitor, keyboard and mouse connected to the user station

1. Power OFF each Paragon switch.

   Note: Prior to installation all Paragon switches and HubPac units must be powered OFF. Servers and user stations to be connected can be in a powered ON state.

2. Attach a server, via CIM, to the HubPac:

   Note: Up to 8 servers can be connected to one HubPac. Each 5-port cluster on the HubPac represents one server connection, with four associated HubPac switch ports. Each HubPac switch port in a cluster can be attached to a separate Paragon switch, enabling users of these attached Paragon switches to access the same server.

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a. Connect a CIM to a server—see ***Specifications*** (on page 172) for specific instructions on connecting different CIM types to a server.

b. Connect one end of a Cat 5 UTP cable to the RJ45 port on a CIM.

c. Connect the other end of cable to the RJ45 1-IN port on the back of HubPac.

d. Power ON the server.

e. Repeat the above steps to connect the remaining servers, connecting the Cat 5 UTP cable to the HubPac at the RJ45 2-IN, 3-IN, 4-IN, 5-IN, 6-IN, 7-IN, and 8-IN port for each consecutive server (2 through 8) added.

3. Connect the HubPac to each Paragon switch by repeating all of the following steps for each 5-port cluster on the HubPac:

Note: There are 8 five-port clusters on the HubPac. For each cluster the number in front of the RJ45 IN port represents the cluster number. For example, cluster 1's first RJ45 port is 1 IN, cluster 2's is 2 IN, and so on. In the instructions below, "X" represents the cluster number (1 through 8).

---

a. Connect one end of a Cat 5 UTP cable to the RJ45 X-1 port on the back of the HubPac.

b. Connect the other end of the cable to channel port # N on the back of one of the desired Paragon switches.

c. Connect one end of a Cat 5 UTP cable to the RJ45 X-2 port on the back of the HubPac.

d. Connect the other end of the cable to channel port # N on the back of the second desired Paragon switch.

e. Connect one end of a Cat 5 UTP cable to the RJ45 X-3 port on the back of the HubPac.

f. Connect the other end of the cable to channel port # N on the back of the third desired Paragon switch.

g. Connect one end of a Cat 5 UTP cable to the RJ45 X-4 port on the back of the HubPac.

h. Connect the other end of the cable to channel port # N on the back of the fourth desired Paragon switch.

4. Connect the power cord to the back of the HubPac. Power ON the HubPac.

5. Power ON each of the Paragon switches.

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A HubPac can connect to 8 servers, and allows each server to be connected to 4 different Paragon switches at once. Follow the above steps for each additional HubPac to be added.

Channel Configuration

Paragon recognizes a HubPac as an extension of a CIM, rather than as a device. As a result, each server connected to the HubPac is configured as a directly connected server would be.

1. On the Selection Menu (by channel number) each green line indicates an active channel (CIM/server). Highlight the CIM/server to be selected by using the ↑, ↓, or **Page Up**, **Page Down** keys. Press **Enter**.
2. Normal server access indicates successful connection. If necessary, manually adjust the video skew by pressing the + or - keys on the numeric keypad.
3. Enter a meaningful name for each server (channel).
   a. Press **F5** for Administration Menu.
   b. Select Channel Configuration with ↑ or ↓ keys and press **Enter**.
   c. Press ↑ or ↓ to highlight (in yellow) the **Name** field for channel ID where CIM/server was just installed. Press **Enter**. The highlight turns light blue.
   d. Edit the name (turns green when typing begins). Press **Enter** when completed.
   e. Press **S** to save the new name.
   f. Press **F2** to return to Selection Menu (by channel number). Verify that new name appears on the Selection Menu in green.
4. Repeat for each CIM/server desired.

Important: In order to perform the Multiple Video function with P2-HubPac, ensure a supported P2-HubPac configuration has been deployed. For details, see *P2-HubPac Configuration and Multiple Video* **(on page 149) in Chapter 7.**

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Chapter 3 Operation - User Functions

User functions for configuration and operation of your Paragon II system are processed through the On-Screen User Interface (OSUI). To activate the OSUI at any time, press the hot key (default: **Scroll Lock**) twice in QUICK succession.

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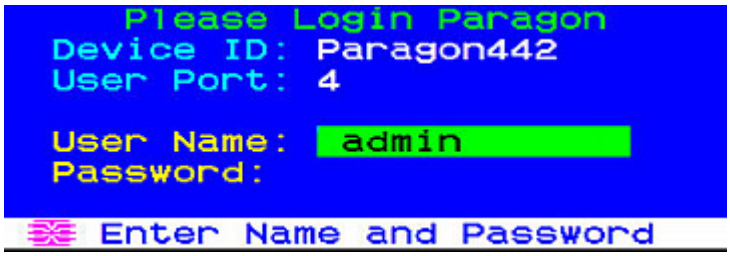
Login

Log in to Paragon II so you can access servers and other devices connected to the Paragon II system. The Login screen is automatically displayed on every user-station monitor after the single Paragon switch or Base Unit is powered on. To activate the Login screen on a user-station monitor at any other time, press the system's hot key (factory default: **Scroll Lock**) twice in QUICK succession to activate the OSUI, and then press **F9**.

Note: If a user-station monitor displays the message "...No Connection to Paragon..." instead of the Login screen, either the user station is not connected properly to the Paragon switch, the switch is powered OFF, or the switch is malfunctioning. Make sure that the cabling between the user station and the switch is intact and is securely connected at both ends. Make sure that when you turn the Paragon switch off and back on, the LEDs run through the sequence described in step **1B** of ***Installing a Paragon System with a Single Matrix Switch*** (on page 24).

The Device ID field in the login screen will initially contain the single Paragon switch or Base Unit's default device name: "Paragon II" followed by "2x42" for a P2-UMT242, "4x42" for a P2-UMT442, "8x32" for a P2-UMT832M, or "16x64" for a P2-UMT1664M. (The administrator can assign a different name.) The User Port is the number of the user port on the Paragon switch—from 1 to 16 depending on the model—to which this user station is attached.

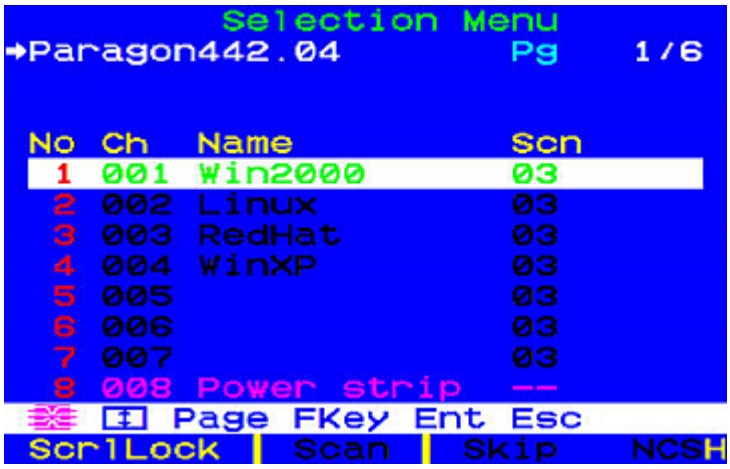
Paragon's Login screen is designed to move from corner to corner of the monitor, acting as a screen saver. **"Saver"** mode is configurable in the **System Configuration** menu, under **Login Sleep.** Please see ***System Configuration*** (on page 86) for additional information.



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➢ ***To log in at the Login screen and start operating the system***

1. Type the user name assigned to you by the system administrator. (If user names have not been assigned, use default names: **user01** through **user15**, depending on the model, for regular users and **admin** for the administrator. User names are not case-sensitive.) When finished, press **Enter**.
2. Paragon II will prompt you if a password is necessary. If so, type your password and press **Enter**. The default password for the **admin** user is **raritan** (all lowercase; passwords are case-sensitive). We recommend changing this password right away; please see the section *User Profile Customization* **(on page 62)** for additional information.
3. The Selection Menu appears. To view other menus, use the function keys as described in this section later.



Note: To log out of the Paragon II system, press **F9** while the OSUI is onscreen.

Below are the function keys used when working with the OSUI:

Key	Action
F1	View the Help Menu
F2	Go to the Selection Menu for accessing channel ports
F3	View the Power Control Menu for associated channel

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Key	Action
F4	Go to the User Profile Menu for users to customize their settings
F5	Administrator only: Go to the Administration Menu for the administrator to manage the system settings
F6	Administrator only: Toggle the autoscan function on or off
F7	Administrator only: Toggle the autoskip function on or off
F8	View the Information Menu
F9	Log out of the system
Shift + F9	Disconnect from the currently accessed channel without logging out of the system
F10	Toggle the display of all channel ports (including inaccessible ones) on or off
F11	View the Unit Status Menu for connected Raritan Remote Power Control unit (available only from Power Control Menu)
F12	Toggle the Selection Menu's sorting way: numerically by port number or alphabetically by name
Esc	Exit the current OSUI (On-Screen User Interface) screen

Video Gain and Skew Compensation

When traveling the distance from the target server to the monitor connected to a user station over different cables, Red, Green, and Blue (RGB) color signals may arrive at different times, causing color separation on your monitor; what should appear as a solid white line may instead be separated into three different colored lines: a Red, a Green, and a Blue.

Video Gain and Skew Compensation allow you to resynchronize the arrival of RGB signals by adding a time delay on any color signal (R, G, or B) that arrives at your user station sooner. After successful skew compensation, the RGB signals are resynchronized and form a solid white line once more. **Note that Skew Compensation is only available in P2-EUST and P2-EUST/C while Video Gain is available in P2-EUST, P2-EUST/C and P2-UST.**

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Video Gain Adjustment and Skew Compensation in P2-EUST

Note that "Automatic" skew compensation is only available when you use P2-EUST (or P2-EUST/C) and one of these CIMs: P2CIM-APS2, P2CIM-AUSB, P2CIM-ASUN, P2CIM-APS2DUAL, P2CIM-AUSBDUAL, P2CIM-APS2-B, P2CIM-AUSB-B or P2CIM-AUSB-C. However, "Manual" skew compensation is always available with a P2-EUST (or P2-EUST/C) regardless of the CIM type.

Automatic skew compensation adjusts the video quality automatically based on varying cable distances and cable types. If this video quality adjustment on an active CIM using the P2-EUST (or P2-EUST/C) is unsatisfactory, you can manually adjust the video gain setting and skew delay of each color via the OSUI. Once adjusted, the gain setting and skew delay values are stored in the database of the Paragon switch that the P2-EUST (or P2-EUST/C) connects to.

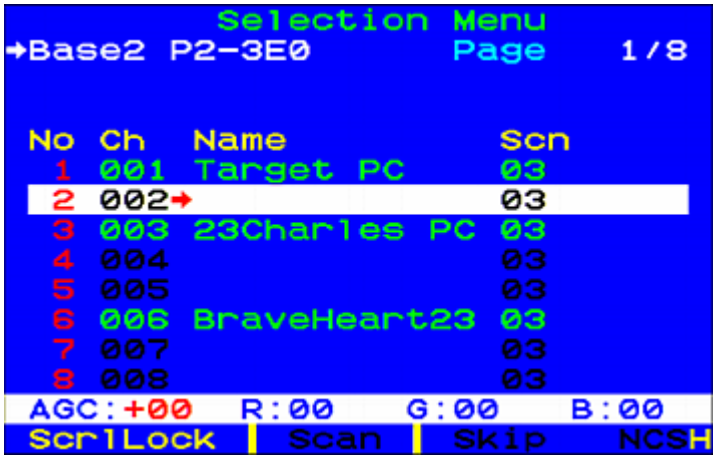
To adjust video quality on any channel, connect to the channel you wish to adjust. Press the Hot Key (default: **Scroll Lock)** twice QUICKLY to activate the Selection Menu and press the * or / keys on your numeric keypad to select one of four options: AGC, skew delay of Red, skew delay of Green, and skew delay of Blue. Press the **+** or **-** keys on your numeric keypad to increase or decrease the skew delay.

Skew compensation range is 0 to 31. The video gain changed adjustment value appears in the Message Bar; press the **+** and/or **-** keys to adjust video gain from -15 to +15 (for P2-UST) or from 0 to +6 (for P2-EUST and P2-EUST/C) until you are satisfied with the video quality.

Please note that you must connect to each channel individually to adjust that channel's video gain and skew delay.

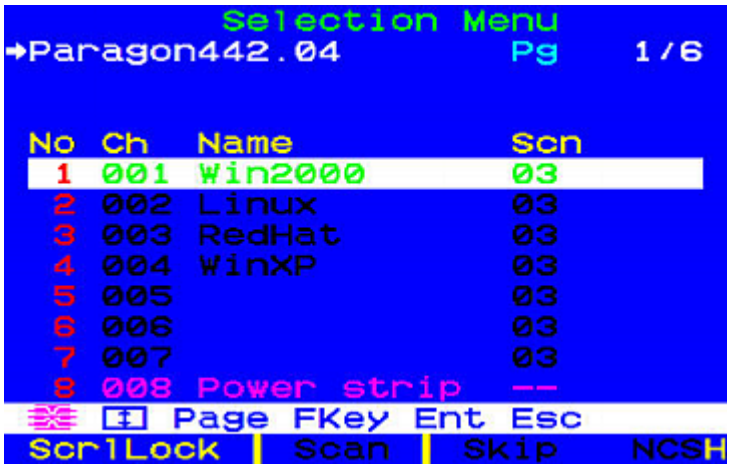
Please see ***Video Display Adjustment for P2-EUST*** (on page 99) for additional information.

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Video Gain Adjustment in P2-UST

A video-gain adjustment is available to focus the video image, which can be especially useful if you are using an LCD flat-panel monitor. To make this adjustment, activate the OSUI by pressing the hot key (default: **Scroll Lock**) twice QUICKLY, if you have not done so already**.** Use the **+** and **-** (plus- and minus-sign) keys on the keyboard's numeric keypad to adjust the video image until it appears to be in focus.



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Selecting a Server

Immediately following user login, the Selection Menu appears. Users who are already switched to a server can activate the Selection Menu by pressing the hot key (default: **Scroll Lock**) twice QUICKLY.

The Selection Menu lists devices sorted either by channel number ("Ch") or alphabetically by the name of the server or other device on that channel port ("Name"). You can toggle between these two ways of sorting by pressing **F12**. Default sorting is by channel number, but unless the system is re-initialized, the last selected sort order will be shown the next time that the Selection Menu is activated.

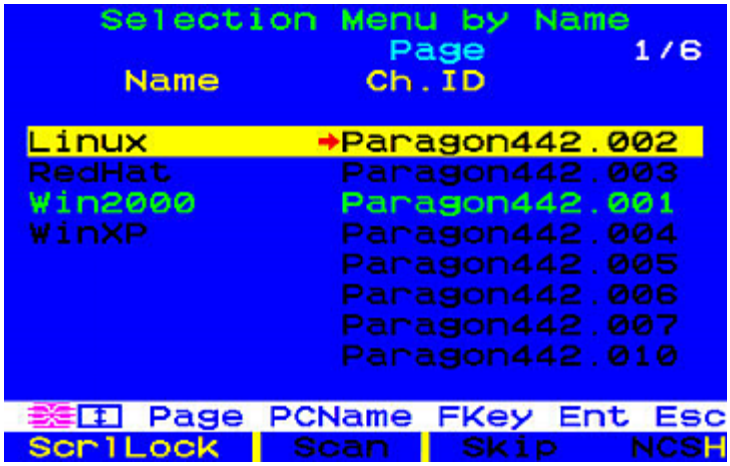
Other columns in the channel number view include "No," row number, and "Scn," the individual scan-delay time in seconds (unless the channel port has a subsidiary Paragon switch or tiered device attached to it, in which case the **Scn** column will show "--").

Selection Menu Sorted by Channel Number



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Selection Menu Sorted by Channel Name



The Selection Menu displays up to eight channel ports per page; total number of pages appears in the upper right-hand corner, for example "**Page 2/5**" indicates that you are on the second of five pages. Use the **Page Up** and **Page Down** keys on your keyboard to move between the pages. Once you have selected a server as described on the following pages, Paragon II will switch to that channel port. If "ID Display" is enabled in the User Profile configuration, a display will appear at the top of your screen to identify the chosen channel port for the number of seconds set.

➢ *To choose a server from the Selection Menu*

1. If you are not in the Selection Menu, press **F2**.
2. Press **F12** to toggle the menu to sort-order view of your choice (by channel number or alphabetically by channel name). The entry for the channel port you currently have selected (if any) will be highlighted and will have a small red arrow (➔) to the left of its channel port name.

Note: In the channel number view, the Selection Menu can display either all channel ports or only those channel ports that the current user is allowed to select (the default view). If the system administrator has set the "Display All Computers" option in the System Configuration menu to "**Yes**" (see ***System Configuration*** (on page 86)), you can press **F10** to toggle between the restricted and unrestricted views. In the unrestricted "all channel ports" view, the Paragon displays a red "S" next to the scan rate of any channel port that the user is not permitted to access.

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3. Use the ↑ and ↓ keys (and, for switching between pages, the **Page Up** and **Page Down** keys) to move the highlight bar to the channel port you want to select, and then press **Enter**. Note that although the highlight will move, the small red arrow (➔) to the left of the channel port name will remain stationary, indicating the user's currently-selected channel port, until a new selection is made.

   a. In the channel number view, once all channel ports page are assigned, you can press the desired channel port's key number (**1** through **8**) to move the highlight to that channel port instantly.

   b. In the channel name view, you can type the first few characters of the desired channel port's name to move the highlight to the first channel port whose name begins with that character sequence.

4. Press **Enter**.

If it is a server attached to the chosen channel port and you are permitted to access it, Paragon II automatically switches you to that channel port for normal server operation, and the OSUI disappears. If it is a cascaded tiered device attached to that channel port, an OSUI Selection Menu specific to that tiered device will appear; keep moving through the Selection Menu layers until you reach the server you want.

Note: To return to the main Selection Menu from any second- or third-tier device-specific Selection Menu, press the **Home** key on your keyboard once, or press the **Esc** key once or twice depending on which tier you are currently on.

Once you switch to a different channel port, you can continue switching by pressing the hot key (default: **Scroll Lock**) twice QUICKLY to activate the Selection Menu. If you want to return to your previously selected channel port without using any OSUI menus, press the "previous channel port" command key (default: **Num Lock**) twice QUICKLY.

In the Selection Menu, each channel port's availability is visually indicated by the following text colors.

Black	No device is connected or the connected device is powered OFF.
Green	Server is connected and the channel port is active and available. However, if the Paragon system is in PC Share Mode, another user may currently be accessing the server.
Red	Channel port is unavailable, currently being accessed by another user. (This happens only when the Paragon II system is in Private Mode.) A blocked Paragon switch will be in red in the Selection Menu (in order of channel number).

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Yellow	Channel port is unavailable for control (being controlled by another user), but video can be viewed. (This happens only when the Paragon system is in Public View Mode. See the paragraphs below for information about other OSUI displays that appear when the system is in Public View Mode.)
Purple	A second- or third-tier cascaded switch is connected to this channel port See ***Installing a Cascaded Paragon System*** (on page 29).
White	Channel port's current status is unknown. This should not happen if the Paragon II is operating normally.
Light Blue	Channel port is connected to a device and active, but is unavailable to access due to lack of tier path. It operates in Private mode only as 'Blocked Channels Identification'. Another possibility is the path you manually choose overlaps with another user's path partially or completely and limit your accessibility to any servers other than the server accessed by another user accordingly.

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For additional information about Private Mode, Public View Mode, and PC Share Mode, see the bulleted item **Operation Mode** under ***System Configuration*** (on page 86).

When the system is set to Public View (P-View) mode, if one user has already selected a server, another user can also select it, but the second user can only view video output, not control it or input any data with the keyboard and mouse. In this mode, other OSUI graphic elements will appear on the screen when you select various servers:

- When you select a server that someone else is already controlling, a message showing the name of the server being viewed will appear on your monitor. It cannot be removed, but will disappear after three seconds. Press **Esc** to return to the main Selection Menu.
- If another user chooses to view the video of a server you have already selected, you will see a message bearing that user's name for three seconds, twice—first when the second user begins viewing and then when the second user stops viewing.

When the system is set to Private mode, "Blocked Channels Identification" is activated automatically.

- When a blocked channel is detected, it will be displayed in light blue on the Selection Menu (whether in order of channel number or name) to distinguish from a channel that is active and available to access (in green).
- When a blocked switch is detected, it will be displayed in red on the Selection Menu (in order of channel number only) to distinguish from a switch that has available path reach (in purple).
- The 'Blocked Channel/switch Identification' is user station dependent. User login on different user stations may see different blocked channels.

Blocked Channels/Switch Identification

Definition of a blocked channel:

- Channel that is active and unoccupied by a user.
- User is unable to switch to that channel because there is no available path in the upper tier.

Definition of a blocked switch:

- All tier paths from lower tier switches to that switch are occupied.
- User is unable to switch to servers that are connected to channel ports of the switch.

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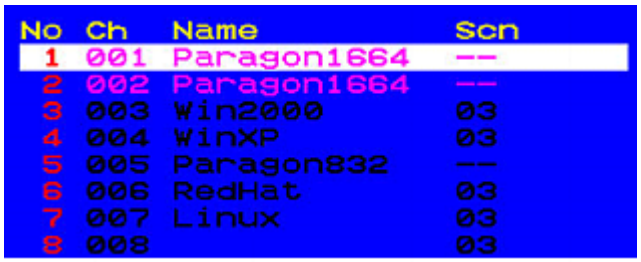
The identification of blocked channels is fully supported whether in a single-base or multiple-base regular Paragon configuration with some limitations as below.

- Blocked channel/switch identification only functions within a regular Paragon configuration (no diamond connection and triangle connection inside). There is no guarantee that it will function correctly in the diamond or triangle configuration (For additional information about these two configurations, see ***Non-Standard Tiered Configurations*** (on page 143)). However, from user's perspective, the user behavior on the light blue channel (the blocked one) is the same as that on the green channel (the active and unoccupied one).
- Blocked channel/switch identification are only activated in the Private mode. This feature will be disabled when in PC Share or P-View modes.

Manually Selecting the Access Path

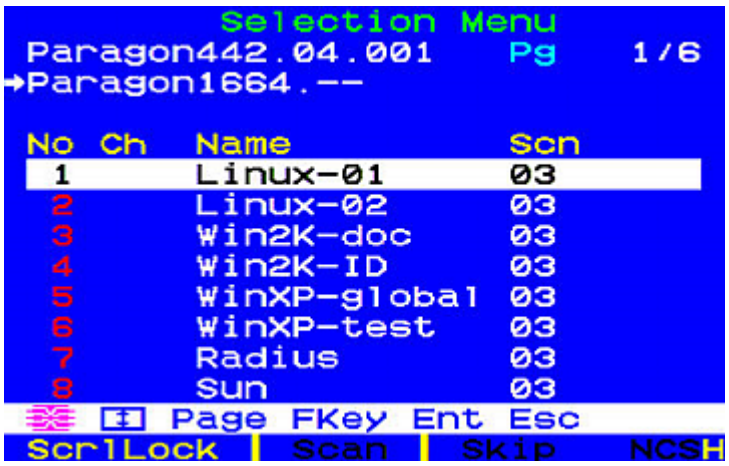
When all tiered devices in the Paragon II system are implemented with firmware version later than 3E3, you can manually choose a path to access a target server in the **channel number view**. For older Paragon I or Paragon II products to support this feature, see the note in the end of this section for more information.

1. Make sure you are in the channel number view in the Selection Menu. If not, press **F12** to toggle the view.
2. Press the ↑ and ↓ keys to highlight one of the channels in purple (available paths) or yellow (in PC share mode) which are connected to a tiered device (a tiered device is indicated with the symbol "- -" displayed in the **Scn** field).

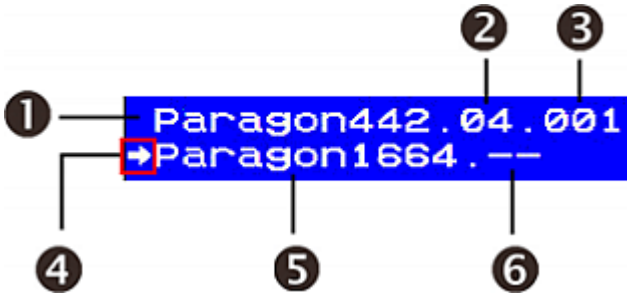


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3. Press **Enter**. Both of the chosen path information and the channel list of the selected tiered device are displayed on the screen.



The path information includes "name of the base/tiered device," "number of the selected user port" and "number of the selected channel port." If this symbol "- -" is displayed, it indicates the port number is currently unknown, and this port number will be displayed only when you access to the next channel.



1	Device name of the base unit
2	Selected user port's number
3	Selected channel port's number
4	The arrow indicates the current tier which you are on
5	Device name of the currently selected tiered device
6	The user port's number is currently unknown

4. Repeat steps 2 to 3 if you want to access the third-tier device.
5. Choose the channel port of the desired server in the specific tiered device's Selection Menu.

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Note: Manual Path Selection is automatically disabled and replaced by Automatic Path Selection when one of the following occurs:

- The desired server is accessed while the Selection Menu is sorted by channel name instead of the channel number.
- The path passes through Paragon II products with the firmware version older than 3E3. You must upgrade their firmware to support this function. See ***Firmware Upgrade*** (on page 153) for more information.
- The path passes through Paragon I products. If the Paragon I hardware version is older than HW3, it is impossible to support the Manual Path Selection function. But if the hardware version is HW3 (the HW3 unit has only one stacking port), you can upgrade its firmware to support this function. See ***Firmware Upgrade*** (on page 153) for more information.

Path Overlapping Constraint

The path you manually choose may completely or partially overlap a path having been selected by another user in the PC Share or Public View mode. In this case, Paragon either limits your server accessibility to the one accessed by the user with whom you share the path or disallows any server accessibility. To access a different server, you must choose a path not overlapping with anyone's path.

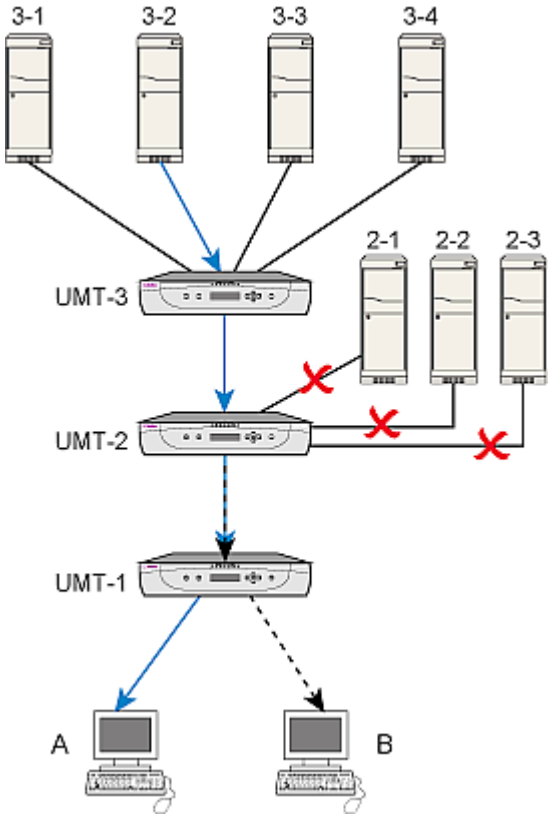
Detailed path overlapping instances are illustrated below:

Background: The "A" user manually chooses a path for accessing Server 3-2. Later on the "B" user attempts to access a server and overlaps his path partially or completely with the "A" user's path.

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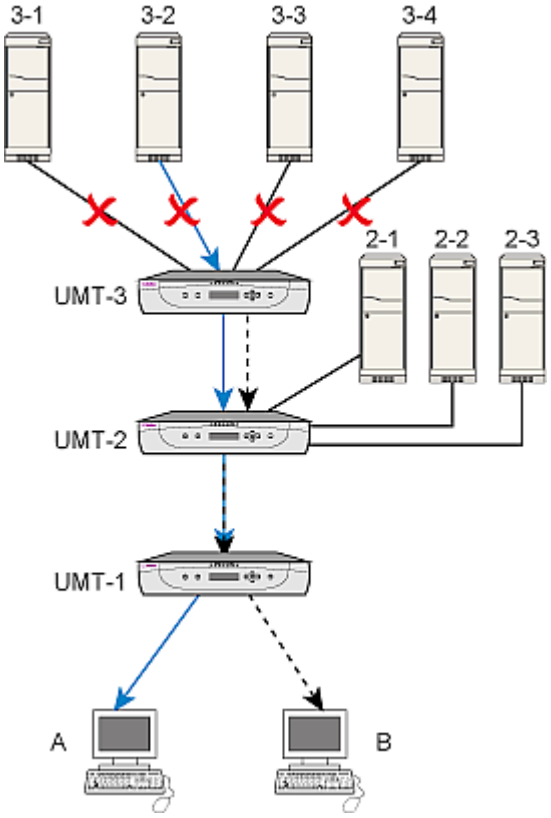
Blue solid line:	indicates the “A” user's path
Black dotted line:	indicates the “B” user's path

Instance 1: “B” user overlaps the path with “A” user's in the segment between UMT-1 and UMT-2; therefore, all servers connected to UMT-2 become inaccessible to the “B” user.



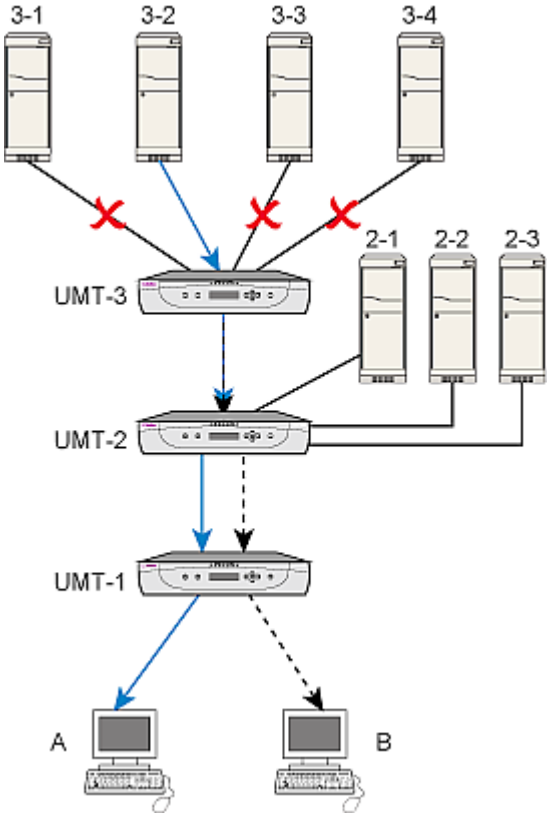
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Instance 2: "B" user overlaps the path with "A" user's in the segment between UMT-1 and UMT-2; therefore, all servers connected to UMT-3 become inaccessible to the "B" user.



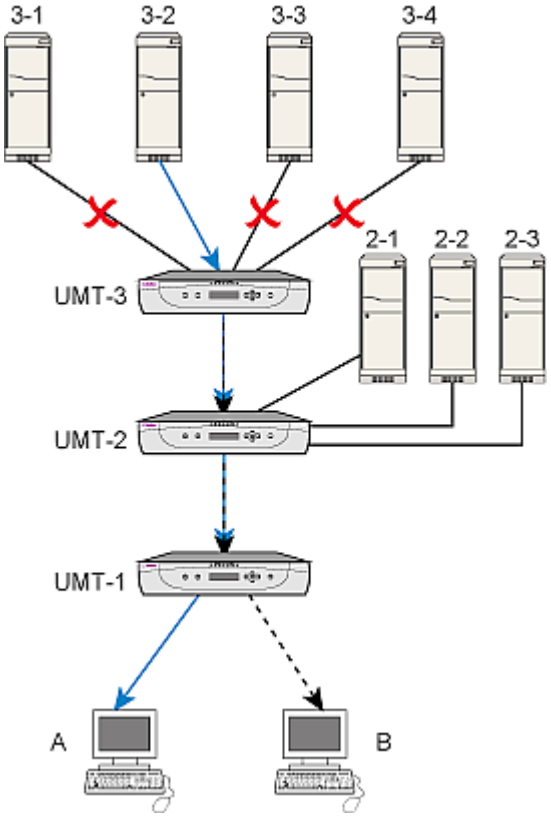
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Instance 3: "B" user overlaps the path with "A" user's in the segment between UMT-2 and UMT-3; therefore, only the server 3-2 connected to UMT-3 is accessible to the "B" user.



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Instance 4: "B" user completely overlaps the path with "A" user's; therefore, only the server 3-2 connected to UMT-3 is accessible to the "B" user.



Switching between Previous and Next Channels

There are two ways for you to switch between active channels: one is through the OSUI operation, and the other is through the "Up/Down Channel" hot key combination, which enables quick access by bypassing the OSUI. The availability of the "Up/Down Channel" function depends on two requirements as described below.

- The user station you operate must be "P2-EUST" or "P2-EUST/C" with the following firmware version.
  - P2-EUST: firmware version 3EB or later
  - P2-EUST/C: firmware version 4EB or later

  A P2-UST does not support this feature.

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- The Paragon switch to which your user station connects must be with the firmware version 3EB or later.

Note: If your Paragon switch or P2-EUST (or P2-EUST/C) is implemented with old firmware, you can upgrade the firmware to benefit from the feature. See ***Firmware Upgrade*** (on page 153) for more information.

Definition of the Previous and Next Channels

Please note that the Up/Down Channel function is performed basing on the alphanumerical sequence, that is, the sequence of channel names instead of channel numbers. After pressing the Up/Down Channel key combination, the channel you will be switched to is the one with all of the following characteristics:

- It is the next or previous channel in the alphanumerical order
- It is active
- It is available. For example, it is not being accessed by any user in the Private mode
- It is one of the channels that you have permission to access

Performing the Up/Down Channel Function

In order to use the hot key combination, follow two major steps below:

STEP 1: Set up the Up/Down Channel key
STEP 2: Change channels with the key combination

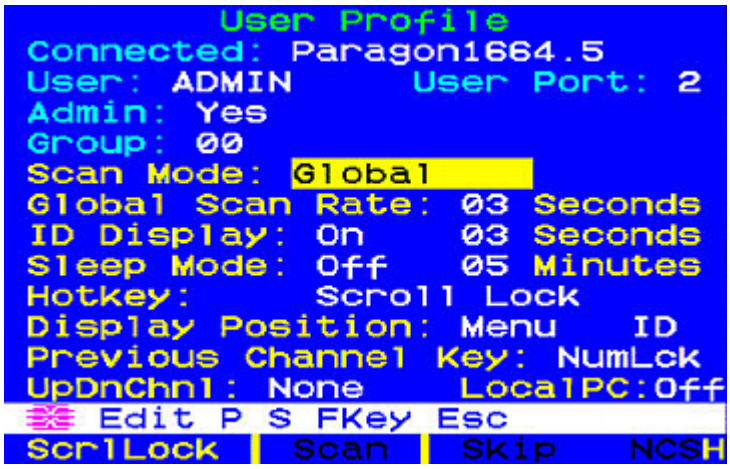
➢ *STEP 1: Set up the Up/Down Channel Key*

Prior to the use of the Up/Down Channel hot key combination, you must activate and assign the Up/Down Channel key in the User Profile menu first.

1. If the OSUI is not onscreen, activate it by pressing the hot key (default: **Scroll Lock**) twice in quick succession.

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2. Press **F4** to access the User Profile menu.



3. Press **Tab** until the **UpDnChnl** field is highlighted.



4. Press **Enter** and the highlight turns green.
5. Press the arrow keys (↑, ↓, ←, →) to switch between available options, which include **LftAlt** (Left ALT), **LShift** (Left SHIFT), **CapLck** (Caps Lock), **NumLck** (Num Lock), **ScrLck** (Scroll Lock), and **None** (function disabled). Note that those options that have been selected by the **HotKey** and **Previous Channel Key** fields are not available.
6. Press **Enter** to select the desired option and the highlight turns back to yellow.
7. Press **S** to save the changes.

➢ *STEP 2: Change Channels with the Key Combination*

When you want to view the previous channel, use the following key combination:

Press the <Up/Down Channel key> twice quickly, and then press ↑ within 1 second

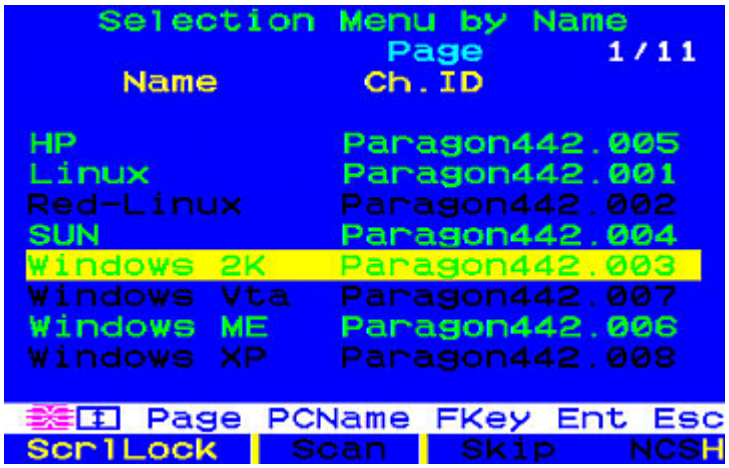
When you want to view the next channel, use this key combination:

Press the <Up/Down Channel key> twice quickly, and then press ↓ within 1 second

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For example, if you have assigned the *LEFT* **Shift** key as the Up/Down Channel key in the User Profile menu, press the *LEFT* **Shift** key twice and then press ↑ or ↓. The video of the previous or next channel is immediately displayed on the screen.

Each time the use of the Up/Down Channel key changes the Selection Menu from sorting by channel number to sorting by name on the background. Therefore, when activating the OSUI after performing the Up/Down Channel function, you see the "Selection Menu by Name" screen (see below). To return to the sorting by channel number, press **F12**.

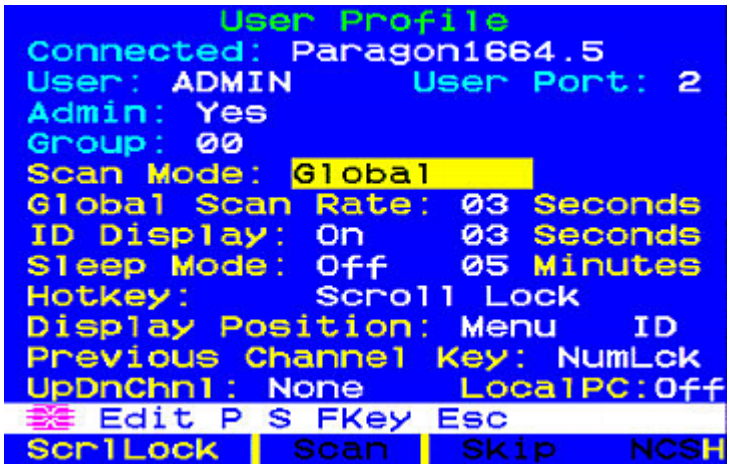


Constraint:
If you access a channel in the Public View mode, and do not gain the keyboard and mouse control, your Up/Down Channel hot key will NOT function. When this occurs, the only way to access the previous or next channel is to activate the OSUI by pressing the **Enter** key and then select the desired channel.

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User Profile Customization

Users can change their own profiles and administrators can set blank user profiles or change an individual user profile on the **User Profile** screen. To access this menu, press **F4** when the OSUI is onscreen. This menu displays Paragon II's configuration and allows you to set preferred operating parameters for individual user accounts or for a group of accounts, as the administrator, or change your profile as a logged-in user.



➢ *To view or change your user profile*

1. If the OSUI is not onscreen, activate it by pressing the hot key (default: **Scroll Lock**) twice in quick succession.
2. Press **F4** to access the User Profile menu. The topmost fields are identifiers that cannot be changed by the user:
   a. The **Connected** field displays the name and channel port ID of the currently selected device, if you are currently connected to a channel port.
   b. The **User** field displays the user name you entered at login.
   c. The **User Port** field shows which user port on the Paragon switch your user station is attached to.
   d. The **Admin** field shows whether or not you have administrator privileges.
   e. The **Group** field displays the user's group ID(s) (see *Group Settings (Access Rights)* (on page 102)).

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3. To change any of the other fields, use your keyboard keys to select the field you want to edit: Press **Tab** to move forward through the editable fields, **Shift+Tab** to move backward, the ↑ and ↓ keys to move up and down, and the ← and → keys to move left and right.

   Press **Enter** to begin editing; the highlighted area will turn green, and the message text changes to the following:



   See the next section for interpreting specific User Profile entries.

   When finished, press **Enter** to retain the changes (the highlighted area will turn yellow) or press the **Esc** key to cancel the changes. When you are going to leave the menu, (for example, if you press a function key) the prompt in the message bar will change to "**Save the changes (Y/N/ESC)**" Press **S** to save the changes to long-term memory, **Esc** to discard your changes, or **N** to discard your changes and exit the menu.

Note: When you type new numeric values, always use the number keys at the top of your keyboard, not the number keys on your keypad. Paragon does not support the keypad number keys.

User Profile Parameters and How to Change Settings

- **Scan Mode:** Indicates how Paragon II determines the length of time to pause at each channel port during autoscanning. Default setting is "**Global**." Use any of the arrow keys to toggle between these values.
  - **Global:** the system pauses at each channel port for the same length of time set in the **Global Scan Rate** field.
  - **Individual:** this indicates that the administrator has set a specific length of time for each individual channel ports (as displayed in the Selection Menu).

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- **Global Scan Rate:** If **Scan Mode** is set to "**Global**," this parameter determines the length of time that the system pauses at each channel port while scanning. Using leading zeroes if necessary, type in a two-digit number of seconds from 01 to 24, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **03**.
- **ID Display:** The ID Display is a small window that can appear onscreen to display the name and ID of each channel port as you switch between them or scan them. Edit the two fields to determine how the system will show you this window:
  - Possible values in the first field are "**On**" (ID Display is shown, the default value) and "**Off**" (ID Display isn't shown). Use any of the arrow keys to toggle between these values.
  - If the ID Display is set to "**On**," the number in the second field, **Seconds**, indicates how many seconds it will remain onscreen. Using leading zeroes if necessary, type a two-digit number of seconds from 01 to 24, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. If you type a number greater than 24, the second field will be filled with a "- -", indicating that the ID Display will be shown at all times. The default setting is **03**. If the ID Display is set to "**Off**," the number in this field will have no effect.
- **Sleep Mode:** A power-saving mode that is activated once a user logs in. Sleep mode acts as a screensaver if the user station is idle (no keyboard or mouse activity) for a specified amount of time. Sleep mode is user-specific; whatever mode a user sets applies to only that user once logged in. Edit this field and the **Minutes** field that follows to determine how the system handles sleep mode. Possible values are **Saver**, **Green**, and **Off**. Use the ↑ and ↓ keys to toggle between these values.
  - **Saver:** The OSUI, with or without background, is a "floater" and appears regularly in random locations on the screen.
  - **Green:** The monitor goes blank.
  - **Off:** Sleep Mode is disabled and the screen displays normal video indefinitely.
  - If Sleep Mode is set to **Saver** or **Green**, in the **Minutes** field, type the number of minutes of inactivity before **Sleep Mode** is triggered. Using leading zeroes if necessary, type a two-digit number of minutes from 01 to 99, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **05**. If Sleep Mode is set to "**Off**," the number in this field will have no effect.

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- **Hotkey:** The keyboard key that, when pressed twice quickly, activates the OSUI. The alternatives are **Scroll Lock** (the default), **Caps Lock**, **Num Lock**, the LEFT **ALT** key, and the *LEFT* **SHIFT** key. Use any of the arrow keys to switch between the choices. You cannot select the key currently being used as the Previous Channel Key (see below).
- **Display Position:** This position indicates where the OSUI menus and ID Display appear on your monitor. Move the highlight to "Menu" (for the OSUI) or "ID" (for the ID Display) and press **Enter** to highlight it, then use the ↑, ↓, ←, and → keys to move the chosen window as desired. When finished, press **Enter** to save the change.
- **Previous Channel Key:** The keyboard key that, when pressed twice quickly, causes Paragon II to return to the previously selected channel port (provided that that channel port is still available) without going through the OSUI. The alternatives are the *LEFT* **ALT** key, the *LEFT* **SHIFT** key, **Caps Lock**, **Num Lock** (the default), **Scroll Lock**, and **None** (no Previous Channel Key; function disabled). Use any of the arrow keys to switch between the choices, but you cannot select the key currently being used as the Hotkey (see above).
- **UpDnChnl:** The keyboard key that, when pressed twice quickly and followed by the ↑ or ↓ key within one second, causes Paragon II to switch to the previous or next channel port (provided that that channel port is still available) *without* going through the OSUI. The alternatives are the *LEFT* **ALT** key, the *LEFT* **SHIFT** key, **Caps Lock**, **Num Lock**, **Scroll Lock**, and **None** (function disabled; the default). Use any of the arrow keys to switch between the choices, but you cannot select the key currently being used as the Hotkey or Previous Channel Key (see above). For more information, see ***Switching between Previous and Next Channels*** (on page 58) earlier in this chapter.
- **Local PC:** Use any of the arrow keys to toggle Local PC Mode **On** or **Off** (the default) for the attached user station. Turn PC Mode "**On**" only if you have used a Z-CIM to attach a local PC between the user station and the Paragon switch.

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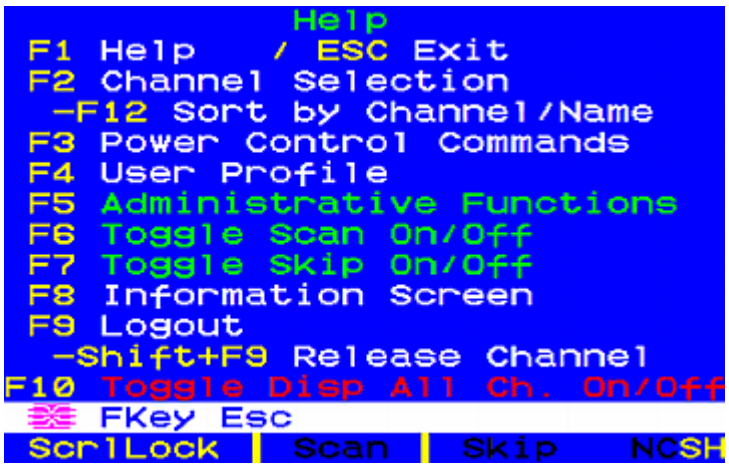
➢ ***To change or delete your password***

You can delete a password (if "Require Password" is set to "No"), or change it while the User Profile Menu is onscreen by pressing **P**. Type your old password at the first prompt. Type a new password up to eight characters at the next prompt, and press **Enter**. To delete your password, press **Enter** without typing anything in the field. Confirm the new password by typing it again at the third prompt; then either press **Enter** to save the new password or **Esc** to abort the change and continue using the old password.

Note: Be careful when you change your password. If you forget or lose it, the administrator has no way of recovering or erasing it; your account will have to be deleted and recreated.

Help Menu

When the OSUI is open, activate the Help Menu by pressing **F1**. This menu displays a list of function keys and their functions.



Keyboard-Controlled OSUI Functions

Use the following function keys to access Paragon's OSUI functions:

Press...	When you want to...
F1	View the Help Menu
F2	Access the Selection Menu in order to view or select channel ports, or view group IDs or scan rates

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Press...	When you want to...
F3	Access Power Control Menu for associated channel
F4	Access the User Profile Menu in order to view and change user-specific operating parameters
F5	Administrator only: View the Administration Menu
F6	Administrator only: Toggle autoscan on or off
F7	Administrator only: Toggle autoskip on or off
F8	View the Information Menu to see the version numbers of the Paragon II's firmware and hardware, the number of accessible Paragon switches, the total number of accessible servers, and so on.
F9	Log out of the Paragon system (logs user out and invokes the login screen)
Shift + F9	If any OSUI screen is displayed; disconnect yourself from the active channel port without logging out
F10	If the administrator has set "Display All Computers" to "Yes" and the Selection Menu is sorted by channel port ID, toggle the display of all channel ports (including inaccessible ones) on or off
F11	Unit Status Menu for connected Raritan Remote Power Control unit (available only from Power Control Menu)
F12	If you are at the Selection Menu: Toggle the Selection Menu between sorting the channel port entries by name or by channel port ID
Esc	Exit the current OSUI screen (returns user to the Selection Menu, or to the login screen when no channel port is selected)

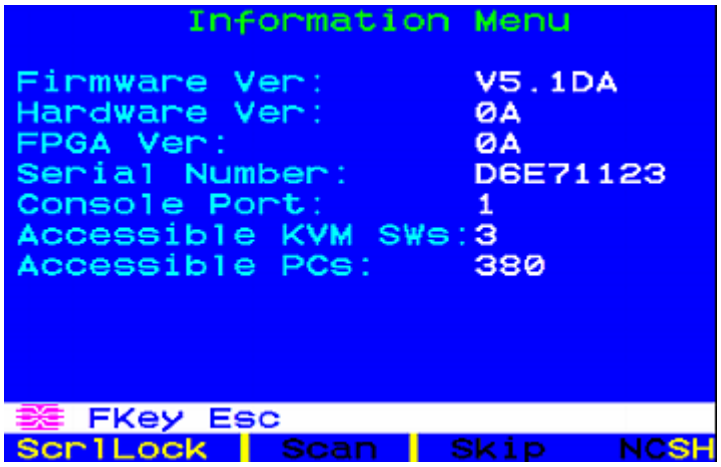
Notes:

- If a user is not the administrator (the **Admin** account) but has administrator privileges, functions **F6** and **F7** are displayed in red in the Help Menu, indicating that these functions are not available to them.
- If a system administrator has set Display All Computers to "**No**," then **F10** is displayed in red in the Help Menu for all users, indicating that this function is not available (even for administrators).
- We recommend that you use a Sun keyboard if there are any Sun servers in your system. (If you want to control Sun servers with a PS/2 keyboard, see ***Extra Keyboard/Mouse Information and Settings*** (on page 200)).

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Information Menu

When the OSUI is onscreen, activate the Information Menu by pressing **F8**. This menu displays the "vital statistics" of the user station that you are using, including its firmware, hardware, and FPGA revisions, serial number, which console port (user port) and port number on the Paragon switch attached to it, and the number of KVM switches and PCs (servers) that can be accessed through it.



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Concurrent Multiple Video Outputs

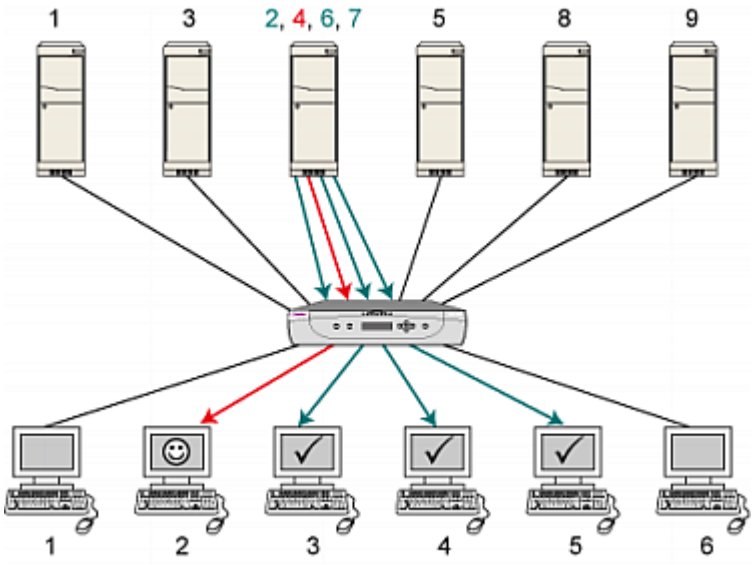
You can access one single channel and thus activate the video outputs of another or several channels at the same time. That is, when a channel is selected in the Selection Menu, the other pre-configured channel(s) automatically output video data to subsequent user stations. This function is called "Multiple Video" or "Port-Following Switch." It is especially useful if you have a multi-channel video server, or intend to set up a TV wall in the Paragon II system.

Performing this function requires the channel association to be configured in Paragon Manager. Only the administrator is allowed to set up the channel association. If the desired association has not been configured, contact your Paragon II system administrator.

Illustration Example

Four channels (numbers 2, 4, 6 and 7) of Paragon II system are connected to the same server which has four video ports. The Paragon administrator has configured these four channels as an association group in Paragon Manager, and **Channel 4 is set as the "first" channel in the association setting**.

In this example, you use the user station attached to the user port #2 to access the "first" channel—**Channel 4**. When you do this, channels 2, 6 and 7 will automatically output their video data to user stations subsequent to your user station, which are 3, 4 and 5.



☺	The user station you operate to activate the Multiple Video function

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✓	The user stations that receive the Multiple Video outputs

Note: Depending on your purpose, the associated channels can also be connected to different servers and output the video data accordingly.

Naming Convention for Multiple Video

For documentation purpose, the following name conventions will be used to describe the Multiple Video function:

Name	Meaning
ACTIVATOR channel	The **"first"** channel in the channel association setting. Access to this channel causes the other channels of this association group to output their data.
FOLLOWER channel	The channel(s) other than the ACTIVATOR channel in the association setting. These channels automatically output their data once the ACTIVATOR channel is accessed.
ACTIVATOR user station (or user port)	The user station (or user port) that you use to access an ACTIVATOR channel of an association group.
FOLLOWER user station (or user port)	The user station (or user port) that receives the data outputs of the FOLLOWER channels after the Multiple Video function is activated. FOLLOWER user stations (or user ports) are subsequent to the ACTIVATOR user station (or user port).

Connecting CIMs to a Multi-Channel Video Server

A multi-channel video server is a server with multiple video ports. When you connect CIMs to this kind of server for multiple video outputs, make sure that each CIM gets its power from the server's PS/2 keyboard or USB port. Usually a server provides one PS/2 keyboard port only. Therefore, you must use P2CIM-AUSB for additional CIMs to gain power from available USB ports on the same server.

1. Fully connect one CIM to the server's ports, be it P2CIM-APS2 or P2CIM-AUSB.
   - P2CIM-APS2: Connected to the server's video, keyboard and mouse ports.
   - P2CIM-AUSB: Connected to the server's video and USB ports.

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Note: This CIM must be set as the ACTIVATOR channel so please note down its channel number.

2. Connect other P2CIM-AUSB to the remaining video and USB ports of the server. Make sure each CIM is connected to one USB port. If there are not enough USB ports on the server, connect their USB connectors to a USB hub's USB ports for power supply.
3. Connect these CIMs to the channel ports of the desired Paragon switch using the Cat 5 cables.

Operation Rules

This section describes the general concept for operating the Multiple Video function, including the activation and termination of the Multiple Video mode.

Activation of the Multiple Video Mode

- Only access to the ACTIVATOR channel can trigger the function.
- The sequence of the ACTIVATOR and FOLLOWER user ports is consecutive. For example, with the precondition of four associated channels, if the ACTIVATOR user port is No. 3, the FOLLOWER user ports start from the next number, which are 4, 5, and 6.
- The function is forced regardless of the login status or the permissions of the logged-in users on the FOLLOWER user stations.
- This function can be remotely triggered through Raritan's IP-Reach (if any).

Note: Accessing the ACTIVATOR channel with the Forced Video command CANNOT trigger the Multiple Video function. The associated channels will not output their data automatically.

Termination of the Multiple Video Mode

The hot key for triggering the OSUI is disabled on the FOLLOWER user stations. Therefore, choose one method below to make the user station(s) exit the Multiple Video mode.

- On the ACTIVATOR user station, press the hot key (default: **Scroll Lock**) twice quickly to trigger the OSUI, and do one of the following. Both of the ACTIVATOR and FOLLOWER user stations will then exit the mode.
  - Press **Shift+F9** to disconnect the ACTIVATOR channel
  - Press **F9** to log out of the system
  - Choose another channel in the Selection Menu

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- Directly power cycle the desired user station(s), be it an ACTIVATOR or FOLLOWER user station.

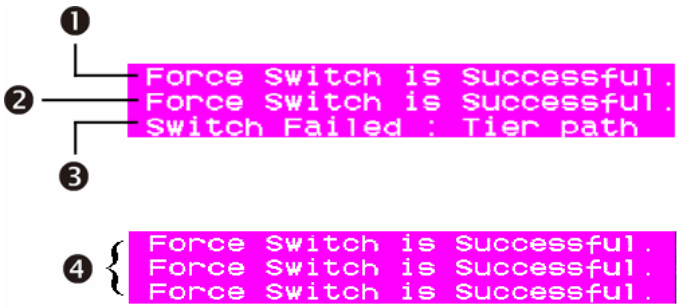
Note: If the user station is P2-USTIP, it automatically enters the remote mode when quitting the Multiple Video mode. Press **Ctrl+Alt+Delete** on the P2-USTIP if you want to return to the local mode.

Limitation

The function is not applicable to those channels which share only one path via the tiered device, such as P2ZCIM, P2CIM-APS2-B or P2CIM-AUSB-B (for IBM BladeCenter servers).

Messages on the ACTIVATOR User Station

The success and/or failure of data outputs of the FOLLOWER channel(s) will be displayed on the screen of the ACTIVATOR user station (see the example images below).



1	The 1st FOLLOWER channel successfully outputs its data
2	The 2nd FOLLOWER channel successfully outputs its data
3	The 3rd FOLLOWER channel CANNOT successfully output its data
4	Every FOLLOWER channel successfully outputs its data

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The failure of data output can be caused by one of the following reasons:

- Blockage to the FOLLOWER channel port(s). For example, other user(s) may be accessing one or more of the FOLLOWER channels in Private mode and thus block the access.
- Mouse/keyboard activity is detected on the FOLLOWER user station(s) when the Multiple Video command is issued. Paragon will NOT execute Multiple Video in order to protect that server's operation.
- The FOLLOWER user station is P2-USTIP which enters the remote mode (no OSUI displayed). This message will be displayed on the screen.

```
User port is in Remote Mode.
```

- The FOLLOWER user station is set to Local PC mode.
- The FOLLOWER user station is P2-EUST/C which detects the insertion of the smart card. This message will be displayed on the screen.

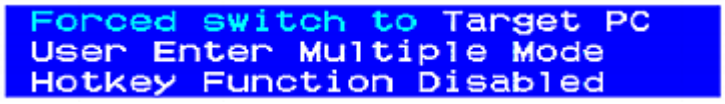
```
User is in Card Reader Mode.
```

- There are not enough FOLLOWER user stations subsequent to the ACTIVATOR user station. This message will be displayed on the screen.

```
User Station is not available
```

Messages on the FOLLOWER User Stations

When the Multiple Video command is issued, a message similar to the following will be displayed on the FOLLOWER user stations. Any keyboard output on these user stations is invalid while in the Multiple Video mode.



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Using P2-USTIP for Multiple Video Outputs

P2-USTIP has two operation modes: remote and local modes. Only local mode supports the Multiple Video function.

In the remote mode (no OSUI displayed):

P2-USTIP CANNOT function as either the ACTIVATOR or FOLLOWER user station in this mode. If a remote user accesses an ACTIVATOR channel via P2-USTIP, the Multiple Video function is NOT triggered at all.

In the local mode (OSUI displayed):

This is the only mode in which Multiple Video functions. Enter the local mode by pressing **Ctrl+Alt+Delete**. Then P2-USTIP can act as either the ACTIVATOR or FOLLOWER user station.

Authentication with a Smart Card

With the use of the P2-EUST/C user station and the P2CIM-AUSB-C computer interface module, Paragon II enables you to control access to servers that require user authentication with an appropriate smart card. Therefore, data security is further enhanced by only permitting users who pass appropriate login credentials to a target server to view and manage the server's data. Note that the integrated card reader is used when accessing target servers, but not when accessing Paragon II. The method of accessing Paragon II is unchanged.

Installing the P2CIM-AUSB-C Driver in Windows

The target server must be running the proper driver in order to communicate with the card reader. If the operating system of your server is Windows 2000, 2003, XP or Vista, it has the capability to auto-detect and install the proper driver. Depending on the operating system, the driver installation procedure may vary a little.

1. Connect the target server to the network.
2. Plug the P2CIM-AUSB-C into the server's USB port. The *Found New Hardware Wizard* dialog appears.

   If the wizard does not appear automatically, do this:

   a. Choose **Start**.

   b. Right-click **My Computer**, and then choose **Manage** from the shortcut menu. The *Computer Management* window opens.

   c. Click **Device Manager** on the left pane.

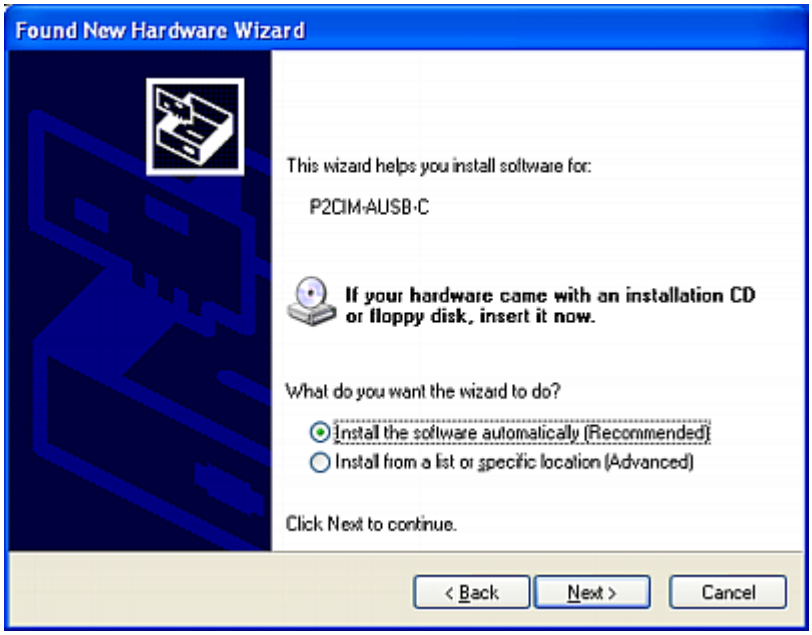
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d. Right-click **Smart card readers** on the right pane, and then choose **Scan for hardware changes** from the shortcut menu.

3. Select "Yes, this time only" and click **Next**.

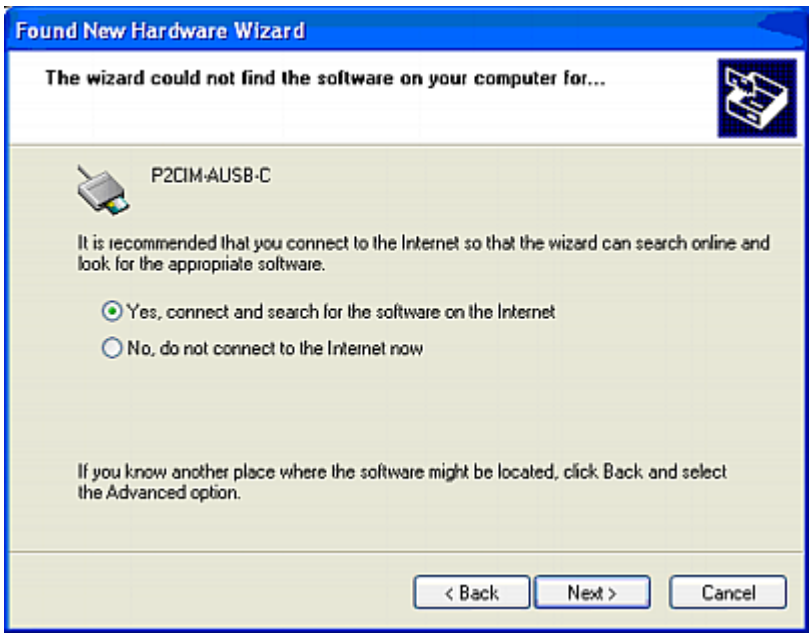


4. Select "Install the software automatically (Recommended)" and click **Next**.



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5. (Optional) If this dialog appears, select "Yes, connect and search for the software on the Internet" and click **Next**.



6. Click **Finish** when the installation is complete.



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Note: If one of the following scenarios occurs, you can obtain the Windows driver by downloading the P2-EUST/C update from Raritan's ***Firmware Upgrades webpage*** (http://www.raritan.com/support/firmwareupgrades/paragonii):

- If your target server cannot be connected to the Internet, connect a PC to the Internet to download the driver, and then install the driver on the target server.
- If the driver cannot be found or does not install properly with the *Found New Hardware Wizard*, download the driver and assign the driver's location during the installation.

Contact Raritan Technical Support for assistance when necessary.

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Requisites for Card Reader Functionality

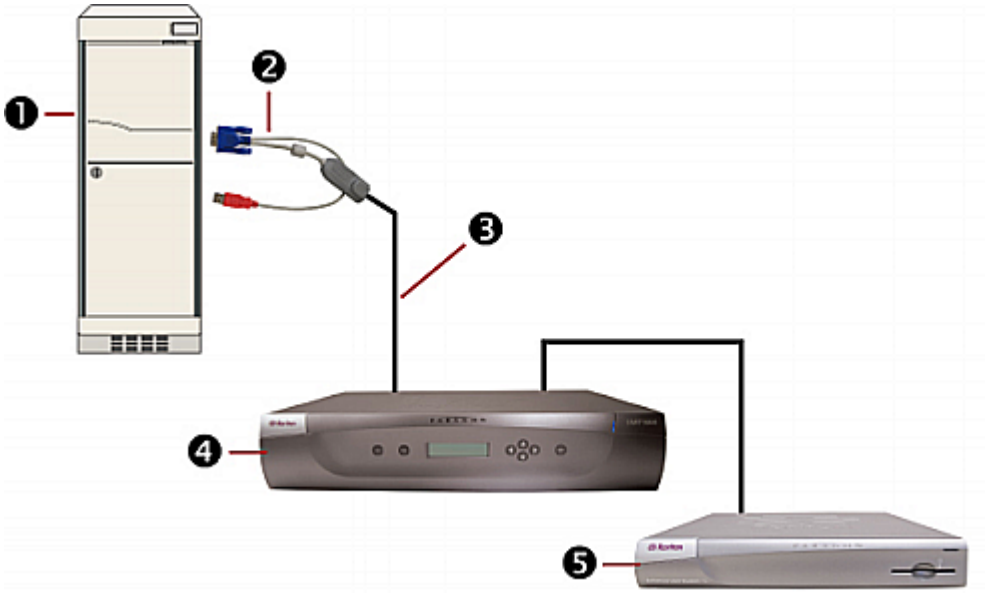
In order to enable the card reader functionality, the following Paragon II components must be included in the path you choose to access a specific server.

- **Reader-enabled user station**: P2-EUST/C
- **Reader-enabled CIM**: P2CIM-AUSB-C
- **Reader-enabled firmware**: Paragon II switch (including the Main Unit and, if any, the Stacking Unit) with firmware version 4.3 or later

To utilize the integrated card reader, client authentication software must have been installed and configured properly in the target servers. The Paragon II card reader supports the PC/SC specification, enabling communication between cards and authentication middleware. It also conforms to the ISO7816 standard for the card-to-reader interface. Specifically, the reader supports ISO7816 Class A and AB smart cards.

Note: Raritan does not provide the client authentication software. If you encounter any problems regarding the authentication messages, please consult the user documentation shipped with the authentication software or contact your system administrator.

The connection pattern in the chosen path will look like the figure below.



1	Server
2	P2CIM-AUSB-C
3	Cat 5 cable

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4	Paragon II switch (firmware version 4.3 or later)
5	P2-EUST/C

Warning!! The maximum cable length between the reader-enabled CIM and the Paragon switch to which it is directly connected CANNOT exceed 500 feet (152 m). A cable longer than 500 feet may result in the card's data loss during the transmission.

If the path runs through the second- or even third-tier Paragon switches, the firmware version of these upper tiers must also be 4.3 or later. Otherwise, the card reader function in the path will not be enabled. For information on connecting user stations, CIMs, servers and Paragon switches, see ***Basic Installation*** (on page 12).

Notes:

➢ A Paragon Main Unit is not used when in Direct Mode. In Direct Mode, only P2-EUST/C and P2CIM-AUSB-C are required to activate the card reader functionality. See ***User Station Direct Mode*** (on page 178) for more details.

➢ P2-HubPac does not support the card reader functionality at this time. Therefore, make sure the servers that require the card reader authentication are not connected to the Paragon switch via P2-HubPac.

Features of P2-EUST/C

This device is an enhanced user station with a built-in card reader.

Its functions are similar to those of P2-EUST and can work with Paragon II that has been upgraded to version 4.3 or later. The internal card reader allows users to insert their smart cards when prompted by the authentication software installed in the servers, and deliver the necessary authentication data to the server. The P2-EUST/C is compatible with all CIMs that are compatible with the standard P2-EUST. This allows for use of the P2-EUST/C in environments that also include servers that do not require the card authentication.

Comparison between P2-EUST/C and P2-EUST

Components / Functions	P2-EUST/C	P2-EUST
USB Keyboard/Mouse Support	✓	✓
PS/2 Keyboard/Mouse Support		✓
Sun Keyboard/Mouse Support		✓
Automatic Skew Compensation	✓	✓

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Components / Functions	P2-EUST/C	P2-EUST
Internal Card Reader	✓	



1	LED
2	Card reader slot

LED Status

LED Color	Status
Blue (Solid)	The user station is powered on without any card inserted
Blue (Blink)	Only keyboard/mouse signals are being transmitted to the Paragon switch or when the keyboard/mouse activity is detected
Green (Solid)	A card is inserted into the card reader slot when the user station is powered on
Green (Blink)	Only the card's data is being transmitted to the Paragon switch
Green and Blue (Blink alternatively)	Both of the card's data and keyboard/mouse signals are being transmitted to the Paragon switch

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Note: An external USB card reader is not supported at this time.

Features of P2CIM-AUSB-C

This device is a USB CIM and is required when using a smart card.

Its functions are similar to those of P2CIM-AUSB and can work with Paragon II that has been upgraded to version 4.3 or later.

Paragon II 4.3 or Later Firmware Version

As long as the card reader function is intended in the Paragon II system, you must ensure the firmware version of the Paragon switch (or switches) in the chosen path is 4.3 or later. Otherwise, the card reader function is not available even though both of the reader-enabled user station and CIM are present in the path.

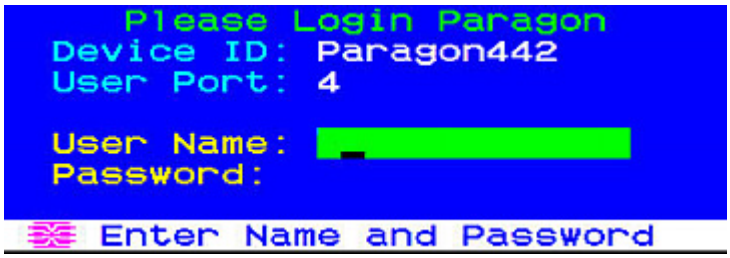
To upgrade the firmware version of existing Paragon switches to 4.3 or later, including Paragon I HW3 and Paragon II, see ***Firmware Upgrade*** (on page 153) for additional information.

Using the Card Reader

Once all required reader-enabled components are installed in the Paragon system, and the proper driver and authentication software have been configured in the servers, the card reader authentication is ready for use.

Note that when you connect the P2-EUST/C user station to the Paragon Base Unit with 4.3 or later firmware version, the whole system comprising the Base Unit and its tiers enters the Private Mode regardless of the original **Operation Mode** setting. This is to ensure that only the user that has validated his or her credentials may view the server's video output.

1. Using the P2-EUST/C, verify that the user station is connected to a keyboard/mouse/VGA monitor, and is powered on. See ***Basic Installation*** (on page 12) for more details.
2. Log in to the Paragon system by typing a valid user name and password and then pressing **Enter**. See ***Login*** (on page 42) for more details.



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3. After logging into the system, the Selection Menu appears on the screen.
4. Press ↑, ↓, ← or → to move the highlight to the desired server which is connected to the reader-enabled CIM (P2CIM-AUSB-C).
5. Press **Enter** to access the server. See *Selecting a Server* (on page 47) for more details.
6. If the client authentication software has been configured properly, either a blank screen or a message prompting you to insert the card appears. The message varies depending on the configuration of your authentication software.
7. Insert your card into the card reader slot on the user station. The LED of the user station turns green.

   Note: The Paragon II integrated smart card reader may not recognize the insertion of a smart card when there is conflict with an external card reader, including keyboards that consist of a built-in smart card reader. When there is conflict with an external reader, the LED on the user station (which normally turns from blue to green when a card is inserted) will not react to the insertion of the card.

8. The card reader reads the data of the card and transmits the data to the server. Follow the server's onscreen instructions, if any, to complete the login authentication process.
   For more information on completing the authentication process, see the user documentation provided with your system's authentication software or contact your system administrator.

   IMPORTANT: Whenever the card reader is reading and transmitting the data (indicated by the green blinking LED), do NOT do anything that interrupts the transmission, such as the removal of the card or CIM, turning off the Paragon switch or server, and so on. Doing this may cause abnormal function and require you to restart all of the devices in order to return to normal operation.

   The Paragon system does not allow you to switch to any server during the transmission of the card's data. When attempting to do so, the system displays the message below on the OSUI.



9. Once you pass the authentication process, you are allowed to view and manage the server.

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10. When finishing your server task, press the hot key (default: **Scroll Lock**) twice quickly to trigger the OSUI.
11. Depending on what you want to do next, either keep the card inserted or remove it.

Desired action	Do this
To access another server which is attached with the reader-enabled CIM and requires the use of the smart card as well	Keep the card inserted and press **F2** to choose another server
To log out of the system	Remove the card and press **F9**
To access another server which is attached with a NON-reader-enabled CIM	Remove the card and press **F2** to choose another server

Note: Paragon does not automatically disconnect you from the server upon the removal of the card, but the server may respond to this based on the configuration of the authentication software and thus deny your access and management of the server.

The design of the reader-enabled user station allows you to insert the card even before the server is accessed or before the user station is powered on. The user station is always capable of informing the accessed server of the card's existence as long as it is physically inserted in the card reader.

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Chapter 4 Operation - Administrator Functions

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The Administration Menu

Administrators can use the Administration Menu to set security classes, maintain user names and privileges, and manage the system configuration, including controlling user access to Paragon II and all connected devices.

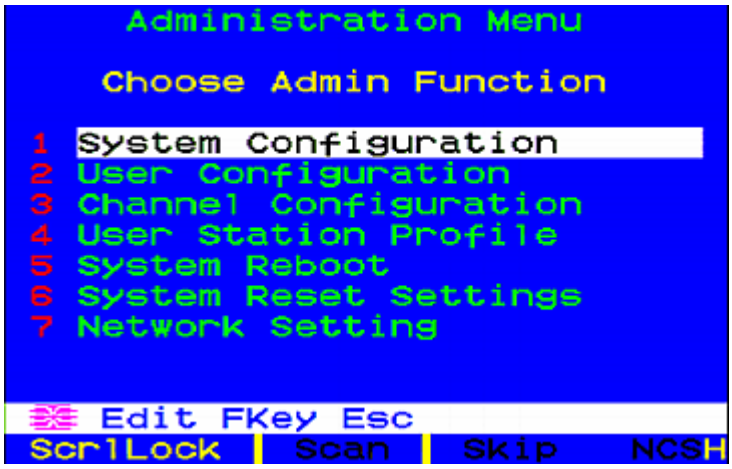
Note: Administrative user IDs assigned to group 00 have complete access to all of the Administration Menu's submenus. Other administrative users have limited access and cannot select the System Configuration, User Configuration and Network Setting submenus.

➢ ***To reach any of the Administration Menu's submenus:***

1. Log in using the **admin** user name (or your own user name if you have administrator privileges). The default password for the admin account is **raritan**, all lowercase, but we recommend this password be changed as soon as Paragon II is initially installed (see ***User Profile Parameters and How to Change Settings*** (on page 63) for additional information). After login, the Selection Menu appears.

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2. Press **F5**. The Administration Menu appears.



3. Press any keyboard number from 1 through 7, or use the ↑ and ↓ keys to move the highlight to your desired option (submenu), and press **Enter**.

Guidelines for System Configuration

- Only one user should attempt to modify/update the system's Administration Menu at one time (especially the User Configuration and Channel Configuration submenus).
- Z-CIMs should be added one at a time to a Z-CIM chain. The administrator should read from message bar that the database has been completely updated before adding a new Z-CIM.
- If updating the system is necessary at Installation, make certain all users have logged out.
- When naming or renaming a CIM, switch to that CIM to activate it and to ensure the new name is stored or updated in the Paragon switch's database.
- When powering on existing stable configurations (that is, if you are NOT replacing or adding switches and NOT swapping the order of switches) or when you are Power Cycling a cascaded configuration, follow the sequence below:

  1. First power on the third-tier switches (if a third tier exists).
  2. Then power on the second-tier switches.
  3. Finally power on the Paragon II base tier.

  User stations can be powered on and off at any time as needed.

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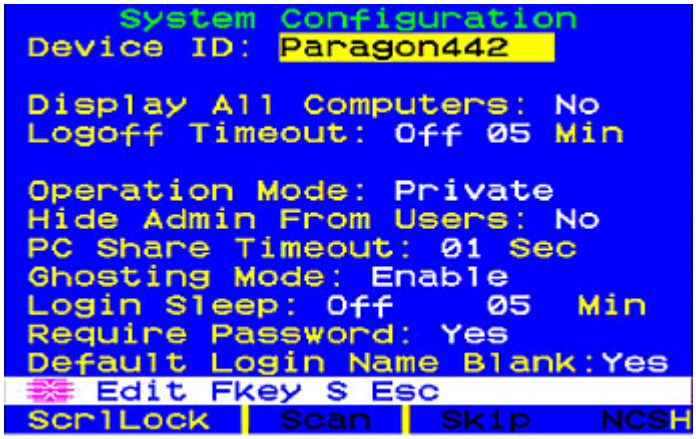
For configurations where switches are added, replaced, or swapped (in order), follow the sequence below:

1. First power on the third-tier switches (if a third tier exists).
2. Then power on the second-tier switches.
3. Finally power on the Paragon II base tier.
4. Perform a partial reset of the database on the impacted switches. For example, if you swap the switches connected to the base tier, perform the partial reset on the base tier. If you swap the switches connected to the second tier, perform the partial reset from the second tier to the base tier.

System Configuration

To set certain global parameters, select option 1, **System Configuration**, from the Administration Menu and press **Enter**.

1. Press the ↓ or **Tab** key to move the highlight forward, or the ↑ or **Shift + Tab** to move the highlight backward to a desired field. Press **Enter** to edit the field. The highlighted area will turn green. Some fields have character or numeric values you can type; others have values you can toggle between with the arrow keys. When editing is complete, either press **Enter** followed by **S** to save your changes, or press **Esc** to abort the changes and continue using the previous settings.



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- **Device ID:** Type the desired name for the single Paragon switch or Base Unit. It is important for Paragon switches in a "cascaded system with multiple matrix switches" to have distinctive names, so that users can tell them apart. (The system will assign each switch the default name "Paragon <user ports><channel ports>": each P2-UMT242 will be named "Paragon 242, each P2-UMT442 "Paragon 442," and so on.)
- **Display All Computers:** This option can be "**Yes**" or "**No**" to respectively allow or disallow users from viewing channel port listings for all connected devices through the OSUI, even if the user doesn't have the security privileges to access them. The factory-default setting is **No**.
- **Logoff Timeout:** If enabled, after the amount of time in minutes that a user station can remain inactive (no keyboard or mouse activity), the logged-in user at that station is logged out of the Paragon II system.

  Possible values in the first field are "**On**" (Logoff Timeout is enabled) and "**Off**" (Logoff Timeout is disabled – the default value). Use the ↑ and ↓ keys to toggle between these values.

  If **Logoff Timeout** is set to "**On**," the number in the second field is the number of minutes of inactivity that must elapse before the timeout is triggered and the user is logged out. Using leading zeroes if necessary, type a two-digit number of minutes from 01 to 99, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **05**. If **Logoff Timeout** is set to "**Off**," the number in this field will have no effect.
- **Operation Mode:** Any of the three ways in which the Paragon system handles requests from multiple users for access to the same channel port. Use the ↑ and ↓ keys to switch between the choices:

  Private: A server or other device on a specific channel port can be accessed exclusively by only one user at a time. No other users can see or control that device until its controlling user selects a different channel port.

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Public View (P-View): While one user is accessing a server or other device on a specific channel port, other users can select that channel port and view the video output from that device, but only the first user will have keyboard and mouse control. When the first user disconnects or selects a different channel port, the waiting user who is first to type or move his/her mouse is given keyboard and mouse control. Status messages showing users' identities appear on video-sharing users' monitors when Public View mode is in effect.

PC Share: A server or other device on a specific channel port can be selected and controlled by more than one user, but only one user has keyboard and mouse control at any one time. If the PC share timeout is enabled and the user in control is idle (no keyboard or mouse activity) for the duration of the timeout, the waiting user who is first to type or move his/her mouse is given keyboard and mouse control of the PC.

- **Hide Admin From Users:** When Operation Mode is set to "**Public View**," the user in control of a server is normally notified when other users start and stop viewing the channel port's video. However, when Hide Admin From Users is set to "**Yes**," administrators can view other users' video without activating this viewing-notification message. Use ↑ and ↓ to toggle between "**Yes**" and "**No**." The default setting is **No**.
- **PC Share Timeout:** If Operation Mode is set to "**PC Share**" and more than one user has selected a server, the first user to type or use his/her mouse will have control of the server. However, another user can gain control of the server if the first user's keyboard and mouse remain idle for the length of this timeout. Using leading zeroes if necessary, type a two-digit number of seconds from 01 to 99, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **01**.

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- **Ghosting Mode:** In a Paragon system, when a CIM (attached to a server) or tiered device is removed from the system or powered off (manually or accidentally), a record of the CIM or CIMs connected to that device is reserved in the Paragon system. The target (or port) name continues to appear in black text on the OSUI of local user ports, and also appears with inactive status in other Raritan clients that operate with Paragon II, such as Paragon Manager, RRC/MPC, P2SC, and CC. If Ghosting is set to **Enable**, when an active CIM is removed from one channel port and connected to another channel port ('hot-swapped'), you will see two identical CIM entries on the OSUI of Paragon Clients: one in green text (active) and another in black text (inactive). The inactive CIM is known as a 'ghost' CIM. To remove records of the inactive CIMs after they are hot-plugged into a different port, select **Disable**. The default Ghosting Mode setting is **Enable**.
- **Login Sleep:** This is a power-saving mode that is activated when the Login screen is onscreen. **Login Sleep** acts as a screen saver if the user station is idle (no keyboard or mouse activity) for a specified amount of time. When an administrator sets this mode, it applies to a Paragon switch and its attached configuration; individual users can change this mode in the **Login Sleep** field of their **User Profile** screens. Edit this field and the **Minutes** field that follows to determine how the system handles sleep mode. Possible values are **Saver**, **Green**, and **Off**. Use the ↑ and ↓ keys to toggle between these values.

  Saver: The login screen or the OSUI are "floaters" and appear regularly in random locations on the screen.

  Green: The monitor goes blank.

  Off: Login Sleep is disabled and the screen displays normal video indefinitely.

  If **Login Sleep** is set to **Saver** or **Green**, in the **Minutes** field, type the number of minutes of inactivity before **Login Sleep** is triggered. Using leading zeroes if necessary, type a two-digit number of minutes from 01 to 99, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **05**. If **Login Sleep** is set to "**Off**," the number in this field has no effect.

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- **Require Password:** Determines whether a user can specify a blank password, that is, delete any existing password and have no password at all. Use the ↑ and ↓ keys to toggle between "**No**" (users may delete their existing passwords) and "**Yes**" (the default setting; starting with the first time they change their password, users must always specify a password). Newly created users always start with no password, and must assign one to themselves during initial setup.
- **Default Login Name Blank:** Determines whether the User Name field in the Login screen will be blank, or if the field will contain the default user name (the first available "**userxy**" name, where "xy" is a two-digit number with leading zeroes—"user01," "user02," and so on). Use the ↑ and ↓ keys to toggle between "**Yes**" (the field is blank – the default value) and "**No**" (field contains the user name).

2. When you are finished, either press **Enter** followed by the letter **S** to save your changes, or press **Esc** to abort the changes and continue using the previous settings.

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Video Redirection (Forced Video)

You can have any server send its video/keyboard/mouse data to any user station other than yours. This function is called "Forced Video" and it can be performed using either OSUI or Paragon Manager.

As an administrator, you can authorize specific normal users to perform this function. Both of the authorization and operation of these users can only be done through Paragon Manager. In addition, with Paragon Manager, you can remotely perform the Forced Video function. See *Paragon Manager User Guide* for additional information. This user guide is available on the **"**User Manuals & Quick Setup Guides**"** CD and on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation).

Those who have the permission to perform Forced Video include:

- Administrator—the **Admin** account (by default)
- Users with administrator privileges (by default)
- Users who are authorized to perform the Forced Video function; however, these users must operate the function through Paragon Manager only instead of OSUI

Illustration Example

You are operating on the user station "A" as shown in the diagram below. Now you can issue the Forced Video command to direct one server to output its data to one of the user stations connected to the same Paragon II switch as your user station. It is impossible to direct the server to output its data to user stations connected to a Paragon switch other than the Base Unit—UMT-1, such as user station "E" or "F."

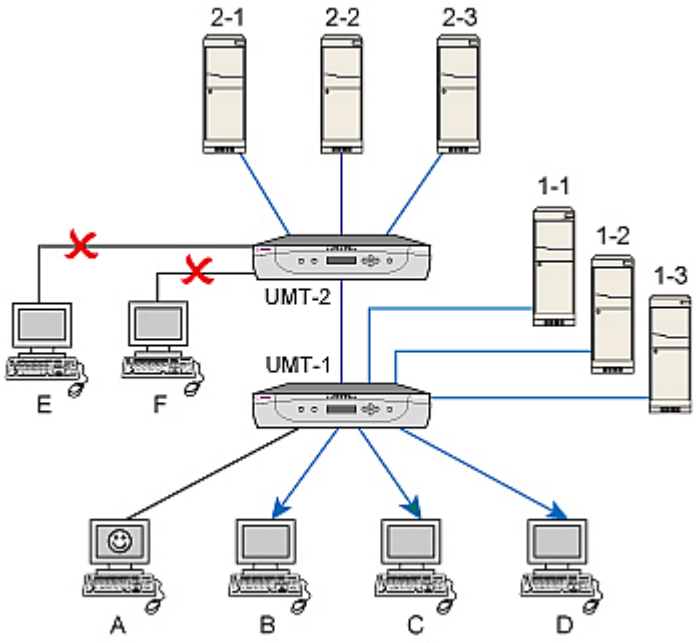
The permitted data direction is shown below:

- Data transmitted from one of the base-tier servers **(from 1-1 to 1-3)** TO one of the user stations connected to UMT-1 **(B to D)**

  —OR—

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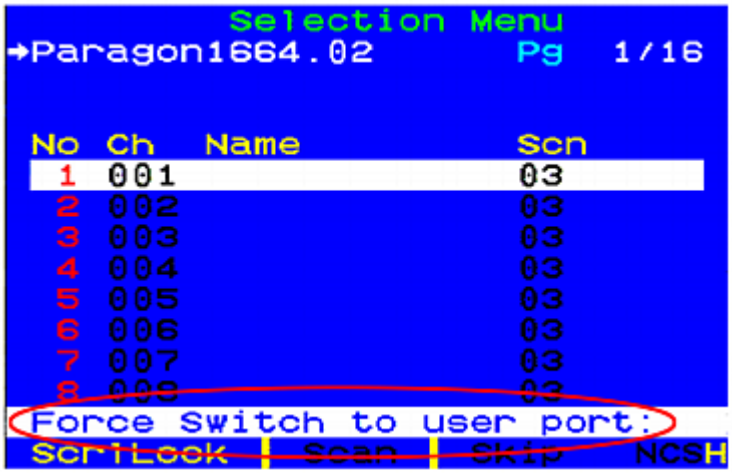
- Data transmitted from one of the upper-tier servers **(from 2-1 to 2-3)** TO one of the user stations connected to UMT-1 **(B to D)**



☺	The user station you operate to issue the Forced Video command

Operating Forced Video Using OSUI

1. At the Selection Menu, press the ↑ and ↓ keys to highlight the channel number of the server whose video/keyboard/mouse data output you want to redirect.
2. Press **Tab**, and the OSUI message bar displays a switch message.



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3. Type the two-digit number of the user port to which the data output is redirected.
4. Press **Enter** to have the data output to the assigned user port or press **Esc** to cancel.

The Forced Video function is always performed regardless of the login status or the permissions of that logged-in user on the assigned user station. If it is performed successfully, the following message appears on the screen of the administrator.



Possible Failure Causes

Several scenarios will lead to the failure of the function:

- There is blockage to the selected channel because it has been accessed by another user.
- Mouse/keyboard activity is detected on the assigned user station when the Forced Video command is issued. Paragon will NOT execute Forced Video in order to protect the server operation.
- Multiple Video (Port-Following Switch) function is being applied to the assigned user station.
- The user station is set to Local PC mode.
- No available path between the server and the user station.
- The assigned user port is not attached to any user station.

When the failure occurs, a failure message appears on the screen of the administrator.

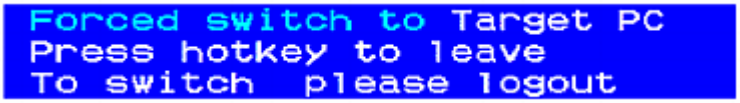
Operating Forced Video Using Paragon Manager

You can also use Paragon Manager in a remote PC to redirect the video/keyboard/mouse output. For more information, see *Paragon Manager User Guide*. This user guide is available on the "User Manuals & Quick Setup Guides" CD and on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation).

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User Station Receiving Forced Video

When the Forced Video command is issued, a message similar to the following appears on the user station which receives the forced video output.



➢ ***To exit the Forced Video mode:***

1. Press the hot key (default: **Scroll Lock**) twice quickly, this message appears.



2. Press **F9** to log out of the system.

Note: Pressing **Esc** will return you to the current forced video mode.

Channel Association for Multiple Video

"Multiple Video" (or called Port-Following Switch) enables up to four user stations to simultaneously receive the video output of a server that has multiple video ports.

In order to perform this function, the administrator must configure channel port association in Paragon Manager. See *Paragon Manager User Guide* for more information. This user guide is available on the "User Manuals & Quick Setup Guides" CD, or on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation).

Note: Depending on your purpose, the associated channels can also be connected to different servers and output the video data accordingly.

The association setup can only be done by those listed below, but any normal user can perform the Multiple Video function once the association setup is finished.

- Administrator (the **Admin** account)
- Users with administrative privileges

For more information on this operation, see ***Concurrent Multiple Video Outputs*** (on page 69).

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Channel Association Guidelines

This section describes the general concept for associating channels.

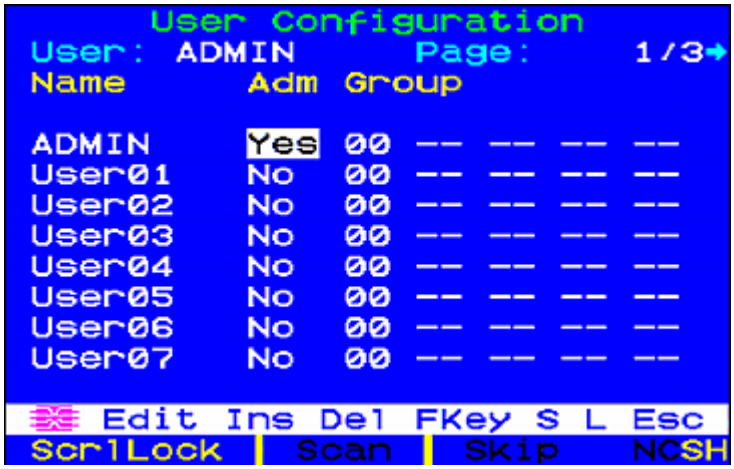
- This function applies to both **Paragon II** Main and Stacking Units.
- Channel ports of the same association group are all on the same Paragon II Main Unit (either with or without any Stacking Units connected).
- Set the channel intended to activate other channels as the "first" channel in the association setting.
- Association of two or four channel ports is permitted for most Paragon II models except P2-UMT242, which comes with two user ports only.
- The sequence of associated channels can be random.
- Each channel port belongs to one association group only.
- Only channel ports connected to servers are available for association.
- Up to 256 association groups are allowed per Paragon II system.

Limitations:

The Multiple Video function is not applicable to those channels which share only one path via the tiered device, such as P2ZCIM, P2CIM-APS2-B or P2CIM-AUSB-B (for IBM BladeCenter servers).

User Configuration

To view the current connection status for each user and to add, delete, and edit user names and security rights, select option 2, **User Configuration,** from the Administration menu.



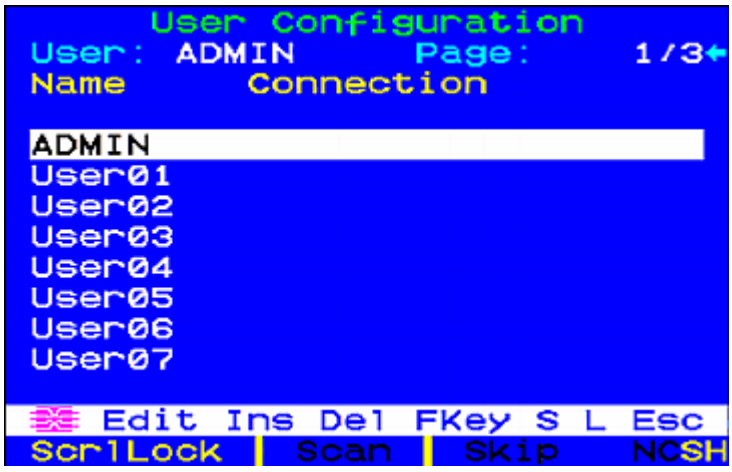
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This menu displays one user's information in each row. There are two panels of this menu—left and right panels, as indicated by the right-pointing arrow (➔) at the top of the menu. The fields and columns in the left panel of this menu include:

- **User:** Your user name. This field cannot be edited.
- **Name:** The user names assigned to all user accounts. Except for the special user name "**admin**," these user names can be edited: You can type new names up to eight alphanumeric characters long (not case-sensitive).
- **Group:** The ID numbers of the security groups to which users are assigned.
- **Adm:** Indicates whether any given user has administrator privileges. You can use the ↑ and ↓ keys to toggle between "**Yes**" and "**No**" (the default setting).

Use the arrow keys, **Tab**, **Shift + Tab**, **Page Up**, and **Page Down** to move within this menu and its submenus. Press **Enter** to edit a highlighted field; it will turn green. When you finish editing a field, press **Enter** to save the changes or press **Esc** to abort changes.

Press **Tab** or the → key to move through the fields to the right panel of the menu and display users' connection information. The **Connection** column displays which channel port (if any) each active user is currently connected to.



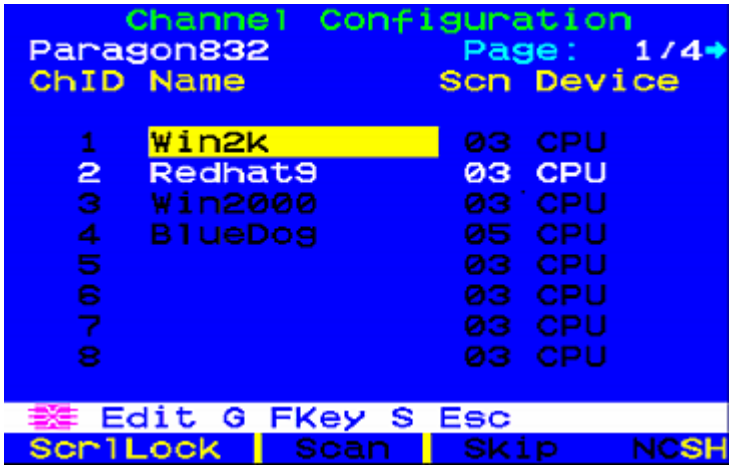
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You can also perform three other functions at this menu:

- Add a new user by pressing the **Insert** key. A new default user name will be added in the end of the existing list (for example, if users "user01" through "user25" already exist and a new one is added, its default name will be "user26"); you can edit the name as desired. The maximum number of users is 127 (512 with an added memory card).
- Delete a user by moving the highlight to a user name and pressing **Delete**. Paragon II will ask for confirmation; if you respond by pressing **Y**, that user account will be deleted from the system.
- A user with administrator privileges can log out another connected user by highlighting a user name and pressing **L**. That user name will then be disconnected from the Paragon system.

Channel Configuration

To edit or initialize a P2CIM, change the device name, individual scan rate, device type, and group IDs associated with each server or device, select option 3, **Channel Configuration,** from the Administration Menu. When you save Channel Configuration changes, Paragon II will update each affected P2CIM as necessary.



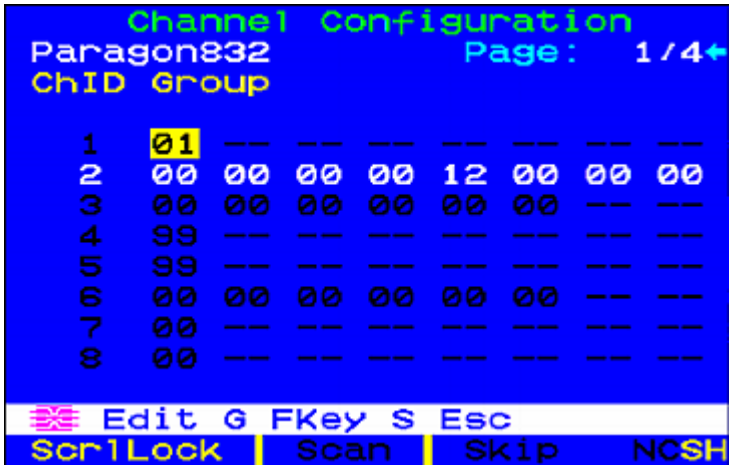
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This menu displays one channel port's information in each row. If the Paragon system detects a powered device on that channel port, it will display the text in that row in green; otherwise, it will display it in black. Again, there are two panels in this menu—left and right panels, indicated by the right-pointing arrow (➔) at the top of the menu. The fields and columns on the left panel of this menu:

- **ChID:** The channel port's number.
- **Name:** The name of the device attached to that channel port. Device names are case-sensitive and may be up to twelve alphanumeric characters long. As shown with channel port #1 in and elsewhere, you may leave a device name blank if you wish, but we do not recommend this.
- **Scn:** Displays the device's individual scan rate (the length of time that the system pauses while scanning that channel port for those users who set their Scan Mode to "Individual" rather than "Global"). Using leading zeroes if necessary, type a two-digit number of seconds from 01 to 24, or use the ↑ and ↓ keys to increase and decrease the current value by 1 respectively. The default setting is **03**.

Use the arrow keys, **Tab**, **Shift + Tab**, **Page Up**, and **Page Down** to move within this menu and its submenus. Press **Enter** to edit a highlighted field; it will turn green. When you finish editing a field, press **Enter** followed by **S** to save the changes, or press **Esc** to abort them.

While the cursor is in the **Device** column, press **Tab** or ➔ key to move to the right panel of this menu and display device group information: The **Group** columns display which groups (if any) the device has been assigned to.

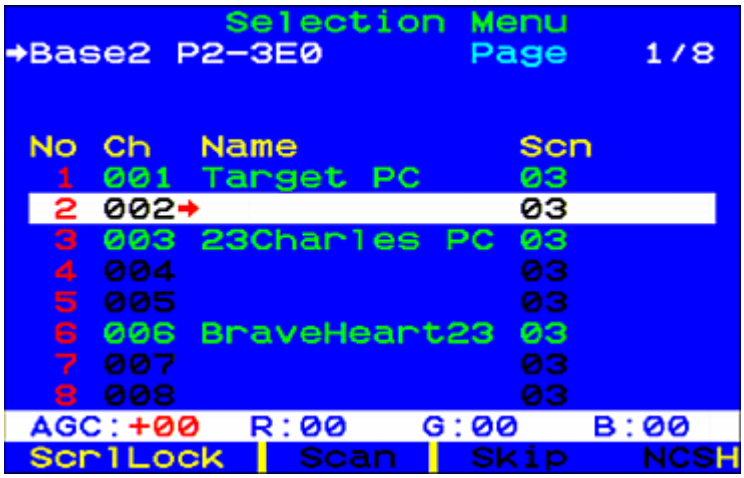


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Video Display Adjustment for P2-EUST

The P2-EUST and P2-EUST/C have additional capabilities for allowing adjustment of your video display. Specify skew levels for Automatic Gain Control (AGC), Red (R), Green (G), and Blue (B) to improve video quality.

After switching to a channel from P2-EUST or P2-EUST/C, press the hot key twice quickly to activate the OSUI. The Selection menu will be displayed with a RED arrow (➜) on the left side of the name of the server you are accessing. Press the * (asterisk) key to view the skew delay settings, which appear in the bar at the base of the menu. See *Video Gain Adjustment and Skew Compensation in P2-EUST* (on page 45) for additional information.



Use the numeric keypad for the following operations:

➢ ***To select the value to change (when selected, the value appears in red):***

- Press / (forward slash) to move cursor to the left.
- Press * (asterisk) to move curser to the right.

➢ ***To change values:***

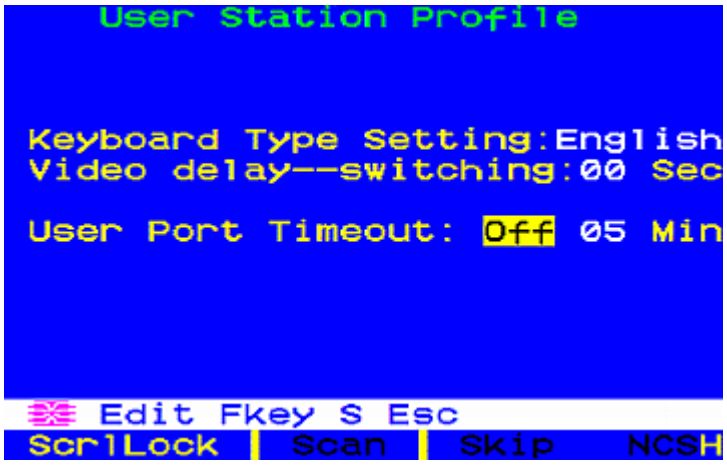
- Press + (plus sign) to increase the value.
- Press - (hyphen or minus sign) to decrease the value.

Once you have specified video values and the video quality is acceptable, the values will be stored on your system until you change them again.

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User Station Profile

To activate the User Station Profile and set the global keyboard type and video delay, select option 4, **User Station Profile,** from the Administration Menu.



Keyboard Type

The OSUI supports three types of keyboard mappings: Select either "English"—the default is **U.S. English**—"French," or "German." If you are using a non-English keyboard, you must temporarily attach an English-language keyboard to change the keyboard type.

To set the keyboard type, use arrow keys to move the highlight to the **Keyboard Type Setting** field, press **Enter** to turn the highlight green, use any of the arrow keys to toggle the field to the correct keyboard type, and press **Enter** again to select it.

Press **S** to save your changes, or press **Esc** and then **N** to exit without saving changes. You can now attach the keyboard type you selected.

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Video Delay

If channel switching or autoscanning takes too long to sync up on Paragon II, especially when your servers are set with different resolutions, it may create a displaying issue with your monitor. At this time, set a video delay for channel port switching at your user station.

If you set the video delay to any number of seconds greater than zero, Paragon II will wait until a video signal is constant for that number of seconds before passing it through to the monitor.

To set video delay, use any of the arrow keys to move the highlight to the **Video delay--switching** field, press **Enter** to turn the highlight green, type the desired two-digit delay from 00 to 30 seconds (or use the ↑ and ↓ keys to increase or decrease the value by 1), and press **Enter** again to select it.

Press **S** to save the changes, or press **Esc** and then **N** to exit without saving changes. The changes are applied only to your user station (the station at which the change was made).

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User Port Timeout

Similar to the **Logoff Timeout** field in the System Configuration submenu (see ***System Configuration*** (on page 86) for more details), this field also sets up the amount of time in minutes the user station can remain inactive (no keyboard and mouse activity) before the logged-in user at this user station is logged out of the Paragon II system. The difference between these two is the **Logoff Timeout** field controls all user stations of the system, and the **User Port Timeout** field controls only the one you are operating.

To turn on the function, use any arrow key to move the highlight to the **User Port Timeout** field, press **Enter** to turn the highlight green, use any arrow key to toggle the field to "On," and press **Enter** again to select it.

To specify the amount of inactive time preferred, press ➔ to highlight the next field, press **Enter** to turn the highlight green, type the desired two-digit number from 01 to 99 minutes (or use the ↑ and ↓ keys to increase or decrease the value by 1), and press **Enter** again to select it.

Press **S** to save the changes, or press **Esc** and then **N** to exit without saving changes. The changes are applied only to the user port at which the changes were made. Note that the timeout setting is not assigned to the user station. The setting is assigned to the user port. Any user station can be connected to the port and will be "timed out" based on the setting.

Note: If you turn on both of the **Logoff Timeout** and **User Port Timeout** functions at the same time, only the **User Port Timeout** function is applied to the user station(s) where the **User Port Timeout** is enabled. However, the **Logoff Timeout** setting is applied back once you turn off the **User Port Timeout** function at the user station(s).

Group Settings (Access Rights)

To assign access rights to users and security levels to servers in a Paragon system, assign users to user groups with defined rights and servers to channel port groups with defined accessibility. Each group can contain multiple users or servers. By default, all users start out assigned to user group 00 and all servers start out assigned to channel port group 00. You can create groups numbered from 00 to 99 for both users and servers; each user can belong to a maximum of five user groups and each server can belong to a maximum of eight channel port groups.

Note: Cascade channel ports cannot be assigned to groups.

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	User groups:	Computer groups:
Available Group IDs for Assignment	00 -- 99	00 -- 99
Maximum Number of Group IDs available	5	8

Users and computers communicate according to the following Group ID access rules:

Group ID for users:	Can access computers with group IDs:
00	00 through 99 (all computers)
For IDs 01 through 09:	
0x through 0x	00, 0x; and x0, x1, x2, x3, x4, x5, x6, x7, x8, and x9
For example:	
05	*00, 05; and 50, 51, 52, 53, 54, 55, 56, 57, 58, and 59*
For IDs 10 through 99:	
x0 through x9	00, 0x, and exact same computer ID# as the user's ID#
For example:	
98	*00, 09 and 98*

Group ID for computers:	Can be accessed by users with group IDs:
00	00 through 99 (all users)
For IDs 01 through 09:	
0x through 0x	00, 0x; and x0, x1, x2, x3, x4, x5, x6, x7, x8, and x9
For example:	
08	*00, 08; and 80, 81, 82, 83, 84, 85, 86, 87, 88, and 89*
For IDs 10 through 99:	
x0 through x9	00, 0x, and exact same computer ID# as the user's ID#
For example:	
12	*00, 01, and 12*

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These user groups...	...can access these channel port groups:
00	00 through 99 (all servers)
0x (01 through 09)	00, 0x, and x0 through x9
For example:	
01 can access 00, 01, and 10 through 19	
02 can access 00, 02, and 20 through 29	
xy (10 through 99)	00, 0x, and xy
For example:	
10 can access 00, 01, and 10	
23 can access 00, 02, and 23	
97 can access 00, 09, and 97	
These channel port groups...	**...can be accessed by these user groups:**
00	00 through 99 (all users)
0x (01 through 09)	00, 0x, and x0 through x9
For example:	
01 can be accessed by 00, 01, and 10 through 19	
02 can be accessed by 00, 02, and 20 through 29	
xy (10 through 99)	00, 0x, and xy
For example:	
10 can be accessed by 00, 01, and 10	
45 can be accessed by 00, 04, and 45	
86 can be accessed by 00, 08, and 86	

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Recommendations

Systems Requiring High Security:

We recommend assigning IDs of **10 through 99** to computers requiring high protection. This will make them less accessible than computers with IDs of **00 or 01 through 09.**

Main System Administrator and Assistant Administrators:

Although any user may be assigned administrator privileges, we recommend the user ID "**00**" for the Main System Administrator, and user IDs **01 through 09** for Assistant Administrators. These IDs provide a broader scope of access.

Correspondingly, we recommend that those servers that all users will need to access, such as application or document servers, be assigned to channel port group **00**, and that servers needing the most security protection be assigned to channel port groups from **10 to 99**.

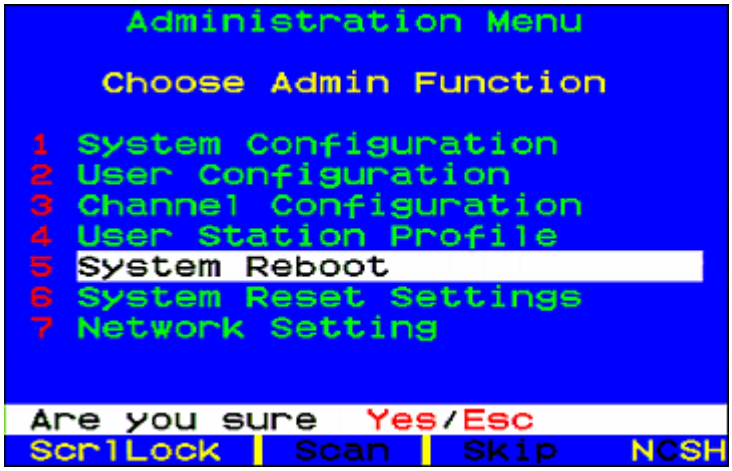
System Reboot and System Reset

System Reboot and System Reset commands affect your entire Paragon configuration, that is, if you perform a System Reset on your Base Unit, the 3rd-tier switch (or switches) will reset, then the 2nd-tier switch (or switches) will reset, and finally the Base Unit will reset. Each switch sends a Ready-to-Reset report to Paragon clients (P2SC, Paragon Manager, UST-IP, and so on) as an event log.

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System Reboot

To reboot your Paragon II from the OSUI, select option 5, **System Reboot**, from the Administration Menu, and press **Enter**.

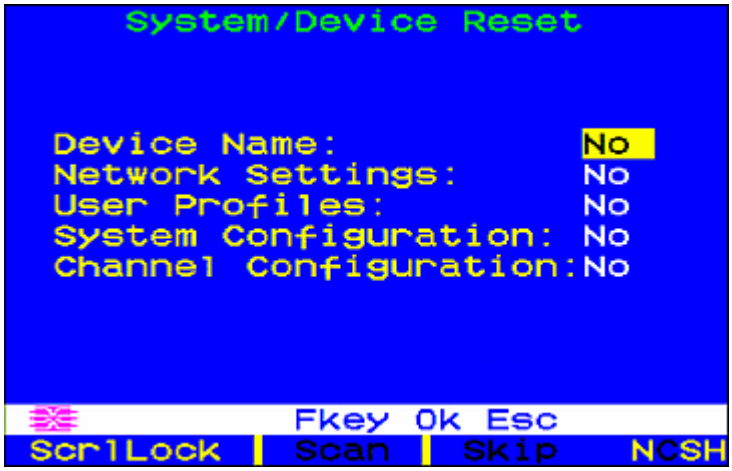


A message in the message bar asks you to confirm the System Reboot command. You must type `Y-E-S`, the complete word 'Yes,' and press **Enter** to confirm, or press **Esc** to cancel. A "Reset" message screen appears and remains onscreen while your system reboots. If you have multiple tiers, the reboot will take slightly longer than if you are rebooting only a single Paragon switch.

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System Reset

To reset the Device Name, Network Settings, User Profiles, System Configuration, and Channel Configuration, returning them to the original factory default values, without having to physically go to each switch to reset it, select option 6**, System Reset Settings,** from the Administration Menu. You can reset one, several, or all system settings in any combination.



1. On the System/Device Reset menu, press ↑, ↓, or **Tab** to move to the field you want to reset.
2. Press **Enter**, and then press the arrow keys to toggle between **Yes** and **No.** When finished, press **Enter**.
3. When finished, press the letter **O** on your keyboard.
4. A message in the message bar asks you to confirm the System Reset command. You must type `Y-E-S`, the complete word 'Yes,' and press **Enter** to confirm, or press **Esc** to cancel.
5. The Paragon switch logs out all local users, disconnects all connections, and then sends a Ready-to-Reset report to all Paragon clients. A progress indicator appears on the message bar to indicate the current update percentage. During the database update, users are unable to operate the OSUI functions.

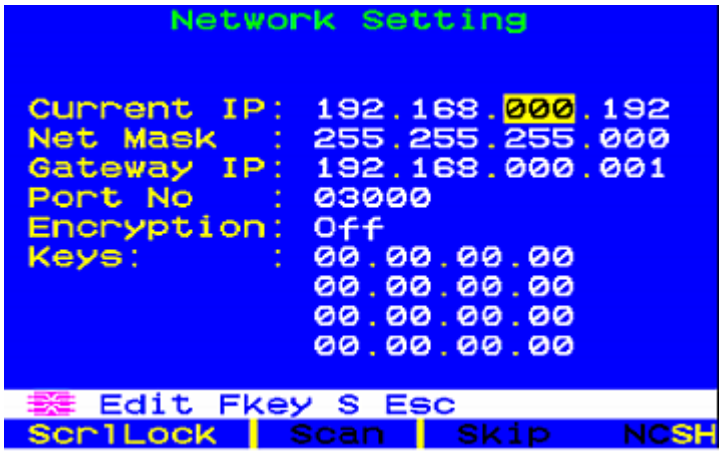


After the reset is complete, the Paragon clients can log in again.

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Network Settings

To configure Paragon II's network settings from the OSUI, select option 7, **Network Settings,** from the Administration Menu.



- **Current IP:** This field allows administrators to configure the Paragon II's address on the network. Use the arrow keys to scroll over to each byte and change the IP as needed. The default IP address is **192.168.0.192**.
- **Net Mask:** The net mask for the Paragon switch is set at a default value of **255.255.255.0**. Reset this as necessary.
- **Gateway IP:** This default is set to **192.168.0.1**. Reconfigure as needed.
- **Port No**: Default is 3000.
- **Encryption:** If you enable Encryption for the network port, communications between the Paragon switch and Paragon Manager clients run from a PC are encrypted with a 128-bit key. Default setting is **Off**.

Note: The Ethernet port on the Paragon II is hard coded (not configurable) and supports only 10-BaseT/Half duplex.

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- **Keys** (16-field encryption key)**:** These fields are designed to contain the hexadecimal encryption key used in encrypting network traffic. Only a valid hexadecimal number will be accepted in these fields. Default value of each field is set to **00**.

After saving the changes, the Paragon II will automatically reboot with the new network settings.

When building a tiered system of Paragon switches, each Paragon II switch should be connected to the network with a unique IP address. In such a system, changing the network settings through a user station will change the network settings of the Paragon II switch that user station is physically connected to. For example, a P2-UST connected to the base tier of a system will change the IP address only of that Base Unit, while a P2-UST connected to a third tier Paragon II will change the IP address of that particular third-tier unit.

It is essential to put all matrix switches in a Paragon II system on the network, as firmware upgrades are pushed across the system through TCP/IP.

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Autoscan and Autoskip

As an administrator, you can press **F6** to turn autoscanning on and off. When autoscanning is turned on and you press **Esc** to leave the OSUI screen, Paragon sequentially and automatically switches from one channel port to the next, displaying each channel port's video for the duration of the user's global scan rate or the channel port's individual scan rate (see ***User Profile Customization*** (on page 62)), starting over at port 1 when it reaches the last channel port.

In a cascaded system, when the scan reaches a channel port to which a subsidiary Paragon switch is attached, it "drops down" to the subsidiary's channel ports and scans them before resuming with the higher-level channel ports.

To stay on a given channel port while Paragon is switching between channels one by one due to autocanning, you must turn off autoscanning. Press the hot key (default: **Scroll Lock**) twice quickly to trigger the OSUI when the desired channel is displayed and press **F6** to turn off the function. The word "Scan" at the bottom of the OSUI will appear in black when autoscan is off or yellow when autoscan is on.

In Paragon II's default setting, autoscanning will display all channel ports (including vacant ones, which are not connected to any devices), except those occupied by servers that the user has no rights to access, that is, the servers that are not in one of the user's permitted groups—see the section ***Group Settings (Access Rights)*** (on page 102). To allow a user to see servers that he or she cannot otherwise access, an administrator must set "Display All Computers" to "Yes" (see the section ***System Configuration*** (on page 86)). To force the system to skip over vacant channel ports, an administrator must turn on autoskipping.

After logging into Paragon II, administrators can press **F7** to turn autoskipping on and off. When autoskipping is on, Paragon will automatically skip vacant channel ports during autoscanning or when a user tries to switch to such a port manually. The word "Skip" at the bottom of the OSUI will appear in black when autoskip is off or yellow when autoskip is on.

Power Management

An administrator can control power to connected devices directly via the Paragon II OSUI. To use the power management features of Paragon II, you will need Raritan's Remote Power Control Unit in one of the four models, depending on your needs:

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Product family	Number of outlets	Rack space	Corresponding device option in the OSUI
PCR8/8A series	8	1U rack mount	PCR8
PCS12/12A series	12	0U vertical mount	PCS12
PCS20/20A series	20	0U vertical mount	PCS20
PCR20/20A series*	20	2U rack mount	PCS20

* The corresponding device type for model PCR20/20A series in the Paragon OSUI is the "PCS20" option.

A special Raritan Power CIM (P2CIM-PWR) is available for use with this kind of power strip. Attach this CIM to the RJ45 port on the Power Strip, and then connect the power strip into an AC source. Connect the CIM to one of the channel ports on a Paragon switch.

Configuring and Naming the Power Strip

Activate the Paragon II OSUI by logging into the system or pressing the hot key (default: **Scroll Lock**) twice quickly. The new Power Strip should appear in the appropriate channel port with the name PCR8, PCS12, or PCS20, depending on the model type. The Power Strip will be treated exactly like a tiered device.

1. Press **F5** to activate the Administration Menu.
2. Select option 3, "Channel Configuration," and press **Enter**.
3. Select the Power Strip's channel port, and edit the name of the Power Strip. The appropriate model type should already be selected in the **Device** column.
4. Press **S** to save the changes.
5. If you want to configure the individual power outlets on the Power Strip, press **G** to enter the "Outlet Configuration" Menu.
6. When finishing the configuration, press **S** to save the changes.

Associating a Device with a Power Outlet

Since Paragon II cannot detect which type of device is connected to which power outlet, associations of devices with individual power outlets must be done manually.

1. Press **F5** to activate the "Administration Menu."
2. Select option 3, "**Channel Configuration**," and press **Enter**.

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3. Highlight the connected Power Strip and press **G** to enter the "Outlet Configuration" Menu. The physical outlet number corresponds to the number in the "Ch. ID" column.
4. In the "Type" column, highlight an outlet and press **Enter** to configure the device type:
   - **PWR:** This is the default association type and refers to devices not connected to the Paragon II system (a router or a monitor).
   - **CPU:** Select this type for all devices connected to the Paragon II system (including "non-server" devices such as Paragon switches).
5. Press ➔ to highlight the name field. Then press **Enter** to configure the name of a device associated with that outlet.
   - If the type is set to **PWR**, users will be able to change the name of the device as desired.
   - If the type is set to **CPU**, the OSUI will request you to save changes ("Y/N/ESC"), and then displays a "Select Powered Device" menu. This is an alphabetized list of all devices connected to the Paragon II system, allowing the user to indicate which device is powered by the newly configured outlet. Highlight the desired device and press **Enter**.
6. The selected device (if any) will be automatically associated with that power outlet. The outlet name will be the name of the selected server. Press **S** to save the configuration.
7. Press ➔ to scroll to the next page of the configuration menu for setting security groups for a power outlet. See ***Group Settings (Access Rights)*** (on page 102) for more information on setting access rights. This allows administrators to limit who is authorized to control power to various devices. The default setting for each group on that outlet is "- -", which means no accessibility to any user other than the **Admin** user. Note, once a group ID setting is changed, it can never return to the original "- -" state.

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Controlling Power to an Outlet

The addition of a Power Strip to the Paragon II system allows administrators to control the power to devices in two ways:

Control Power from the Channel/Server Selection Menu

Normal Paragon II operation involves browsing the list of servers in the OSUI and pressing **Enter** to switch to that server. By pressing **F3** instead of **Enter** when a server is highlighted, Paragon II will check that server for Power Strip outlet associations:

- If Paragon II does not detect any associations with that server, a message indicating "No Outlets / Access Denied" appears, and the action is cancelled.
- If the server has associated power outlets, but the user is not authorized to control those outlets, a "No Outlets / Access Denied" message appears and the action is cancelled.
- If Paragon II detects that this server is associated with at least one power outlet, it will switch to that server. The OSUI will remain onscreen, displaying a list of power outlets associated with the specific server. This allows users to see the server before power is cycled to it.

  Four choices are offered in this menu: Power Off (X), Power On (O), Recycle Power (R), and Select All (A).

  - If the server is powered OFF, pressing **O** will power ON the outlet instantly.
  - If the server is powered ON, pressing **X** or **R** will activate a confirmation dialog "Are you sure (yes/no)?" As a safeguard, type the whole word `yes`, to confirm cutting power to the server. Typing in `y` only, or any word other than `yes` will be taken as a "no" response.
  - In the case of a server associated with multiple outlets, such as a server with dual power supplies, pressing **A** will highlight all of the associated outlets, allowing them to be turned on, off, or recycled simultaneously.

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Control Power from the Outlet Selection Menu

A connected Power Strip is treated as a tiered device. The Power Strip, therefore, has its own device menu consisting of "ports" for each power outlet with which power can be controlled on a per-outlet basis.

- Navigate the Paragon II OSUI Selection Menu, select the Raritan Power Strip and press **Enter**. You will now be at the "Outlet Selection" menu.
- A list of outlets (up to 8 per page) will appear. Outlets in green are switched ON; outlets in black are switched OFF.
- Press **X**, **O**, or **R** to turn off, turn on, or recycle power to the outlet respectively. Type `yes` to confirm turning off the power if you select **X** or **R**.

Get Power Strip Unit Status from the Outlet Selection Menu

At any time while navigating the "Outlet Selection" Menu, pressing **F11** will provide a status screen showing certain parameters of the connected power strip. These parameters vary depending on the model of the power strip, and they may include:

- Average power
- True RMS Current
- True RMS Voltage
- Internal Temperature
- Apparent Power
- Maximum Detected
- Outlet Circuit Breaker

Note: Unlike second-tier channel ports, the power outlet "channel ports" will not appear in the list of channels when the OSUI is sorted by the channel name.

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Paragon II Network Port

Paragon II has a network port and is designed as a network-aware device. This network port is used to communicate with Paragon Manager administrative software, packaged with the Paragon switch (see *Paragon Manager User Guide* for additional information; this user guide is available on the "User Manuals & Quick Setup Guides" CD, or on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation)).

Note: The Ethernet port on the Paragon II switch is hard coded (not configurable) and supports 10-BaseT/Half duplex only.

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Chapter 5 Paragon II and P2ZCIMs/Z-CIMs

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Introduction

Many CIMs, including Paragon II Z-CIMs (P2ZCIMs) and Z-CIMs (UKVMSPD and UKVMSC), enable access and control of multiple servers from a Paragon user station, occupying only one channel port on your Paragon switch. P2ZCIMs or Z-CIMs are set up in a chain-like server-to-server arrangement, with each P2ZCIM or Z-CIM connected to the keyboard, video, and mouse ports of each server and linked with standard Cat 5 UTP cables. Through this chained cabling, they transmit keyboard, video, and mouse signals to the system. You can access and control any server connected in the chain via the OSUI and new servers can be added at any time without interrupting server operation.

Paragon II operates using P2ZCIMs and Z-CIMs (UKVMSPD and UKVMSC). Although all these CIMs are installed the same way, certain CIMs will not function if used in the same chain as other CIMs.

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P2ZCIMs

- For use with the Paragon II switch
- Can be used on Paragon I unit whose hardware version is HW3 (running Paragon II code)
- Support PS2 (P2ZCIM-PS2), USB (P2ZCIM-USB) and Sun (P2ZCIM-SUN) interfaces
- Support up to 42 units in any mixed arrangement on a Cat 5 chain
- Span up to 1,000 feet (304 m.) from the user station to the last P2ZCIM on a Cat 5 chain
- Cannot be mixed on a Cat 5 chain with Z-CIM (UKVMSPD or UKVMSC)
- P2ZCIM-USB can be used for either Sun USB and PC USB (controlled by a toggle switch on the back of the unit)
- "L" models (e.g., P2ZCIM-PS2L) are available, which feature longer cables 36" (91 cm) for use with cable management arms

Note: The easiest way to determine if the hardware version of your Paragon I unit is HW3 is to check the number of its stacking ports on the rear side. If there is only one stacking port, the hardware version is HW3.

Z-CIMs (UKVMSPD and UKVMSC)

- For use with Paragon I and Paragon II switches
- Support PS2 interface only
- Support up to 42 units on a single Cat 5 chain
- Span up to 1,000 feet (304 m.) from the user station to the last Z-CIM on a Cat 5 chain
- Cannot be mixed on a Cat 5 chain with P2ZCIMs
- UKVMSC Z-CIM features local KVM ports

Note: UKVMSPD is supported with Paragon II, but is no longer available for purchase.

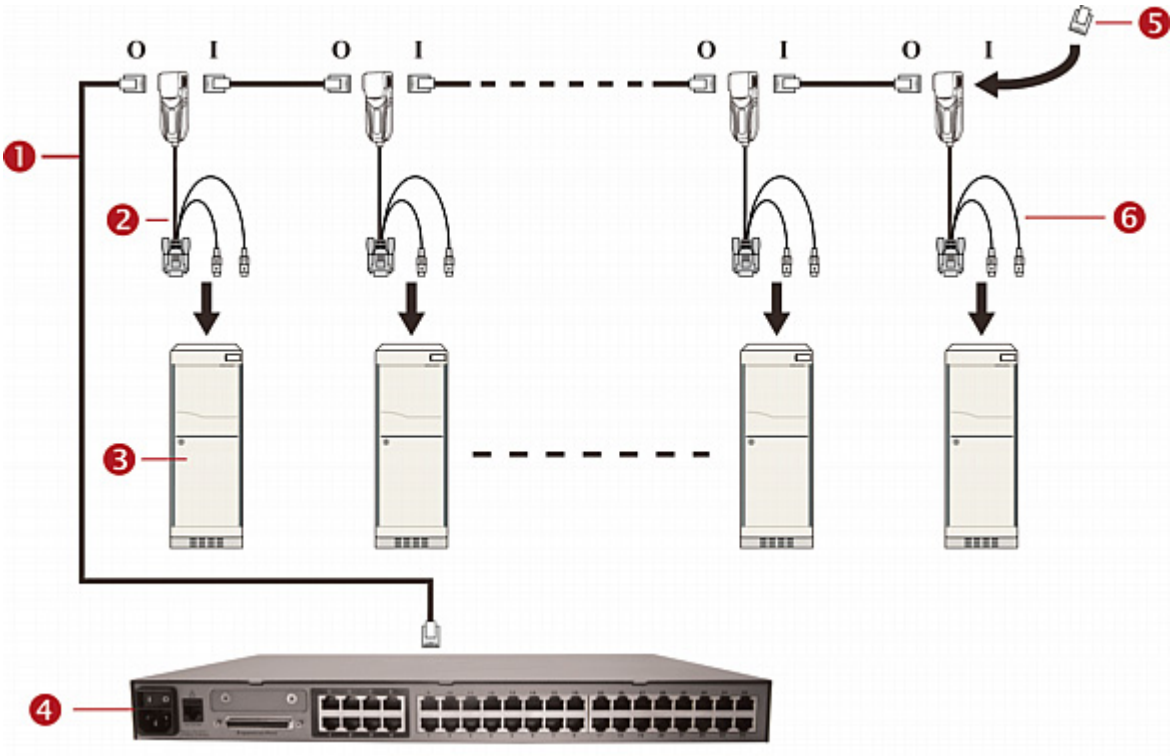
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Paragon II and P2ZCIMs

P2ZCIM installation requires that each server be assigned a channel name as it is added to the P2ZCIM chain. Server channels are organized alphanumerically by the assigned names or the default names of P2ZCIMs—their serial numbers, rather than in the order of their placement within the P2ZCIM chain. We recommend that users assign channel names before connecting all servers to eliminate any difficulty in locating the respective channel for each server. When naming or renaming a P2ZCIM, switch to that P2ZCIM to activate it, thereby ensuring that its new name is updated in the Paragon switch's database.

Connecting P2ZCIMs as Tiers

The following diagram shows the final setup when connecting P2ZCIMs as a tier. Up to 42 P2ZCIMs can be connected in one single chain.



1	Cat 5 cable
2	P2ZCIM
3	Server

I	Input
O	Output

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4	Paragon switch (the model shown in the illustration is P2-UMT832M)
5	P2ZCIM terminator (required for the last P2ZCIM in the chain)
6	"The last" P2ZCIM in the chain

All Paragon II components must be powered ON prior to P2ZCIM tier installation. All servers in the P2ZCIM chain must be powered OFF prior to installation.

When following the installation and configuration instructions below, sort the Selection Menu by channel number, not by name. Display the Selection Menu by pressing the **F2** key on your keyboard and change the sorting method by pressing the **F12** key.

➢ *To connect a P2ZCIM as a tier*

1. Connect a Cat 5 UTP cable to the channel port on the Paragon II switch reserved for the P2ZCIM chain.
2. Connect the other end of this Cat 5 UTP cable to the UTP OUT (O) port on a P2ZCIM, which will be the first P2ZCIM in the chain.
3. Connect a server to the first P2ZCIM.
   a. Connect the 6-pin mini-DIN keyboard and mouse and HD15 video connectors on the P2ZCIM to the server's keyboard, mouse, and video ports.
   b. Place the P2ZCIM Terminator in the P2ZCIM's UTP IN (I) port.
   c. Power ON the server.

➢ *To perform P2ZCIM channel configuration*

1. At a user-station Login screen, type `admin` in the **User Name** field and press **Enter**.
2. Type the default password `raritan` or your new password, if already changed, in the **Password** field and press **Enter**.
3. Press **F5** to go to the Administration Menu and select the Channel Configuration submenu.
4. Use the ↑ and ↓ or the **Page Up** and **Page Down** keys to highlight the Paragon II channel where the P2ZCIM was just added.
5. Ensure that the **Device** field reads **P2-ZCIM** for a P2ZCIM.
6. If **P2-ZCIM** does not appear in the **Device** field:
   a. Press **Tab** until the **Device** field is highlighted and then press **Enter**—the highlight will turn light blue.

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b. Use the ↑ and ↓ keys to change device type to **P2-ZCIM** and press **Enter**—the light blue highlight will return to yellow.

c. Press **S** to save the change, or press **Esc** to exit without saving.

7. If a more descriptive name is desired:

   a. Hold the **Shift** key and press **Tab** to go back to the **Name** field, and then press **Enter**—the highlight will turn light blue.

   b. Edit the default name and press **Enter**—the highlight will turn green as you begin to type.

   c. Press **S** to save the change, or press **Esc** to exit without saving.

8. Press **F2** to go to the Selection Menu, select the tiered P2ZCIM device, and press **Enter** to validate that the second-tier P2ZCIM is properly configured.

➢ *To name the server channel on the Tiered Selection menu of P2ZCIM*

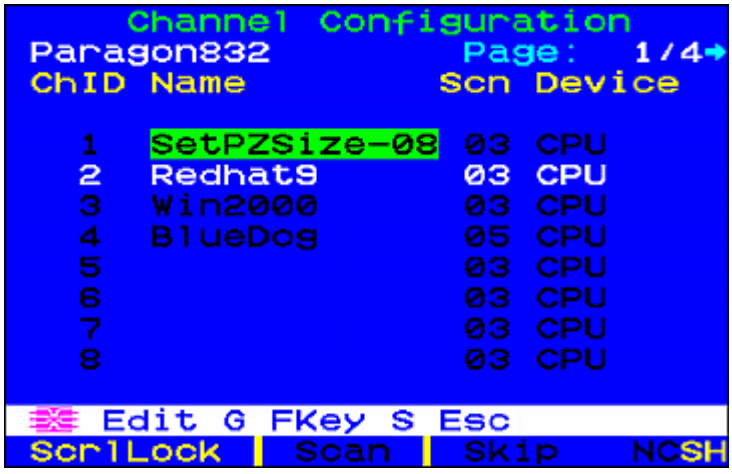
1. When the OSUI is onscreen, press **F5** to go to the Administration Menu.
2. Select the Channel Configuration submenu, and press **Enter**.
3. Select the P2ZCIM device channel.
4. Press **G** to bring up a Channel Configuration submenu for the CIM chain.
5. Use the ↑ and ↓ keys to highlight the **Name** field of the server just connected via P2ZCIM. The channel will display in black and the highlight will turn yellow when it is selected.
6. Press **Enter**—the highlight will turn light blue.
7. Type the desired computer name—the highlight will turn green as you begin to type.
8. Press **Enter**—the highlight will turn yellow.
9. Press **S** to save the new name.
10. Press **F2** to return to the Selection Menu. Go to the Z-CIM channel to verify both of the name change and the server operation are OK.

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➢ *To resize the P2ZCIM Chain*

The size limit for a P2ZCIM chain is 42 units. If you never resize the chain, it displays 42 channels (that is, 6 pages) no matter how many P2ZCIMs are actually added in the chain. After resizing, only the number of channels you specify will be shown on the OSUI screen. Resizing the P2ZCIM chain does not change the name of the chain. It changes only the size. Next time when you add new P2ZCIMs to the chain, remember to resize it again so the new P2ZCIMs can be displayed in the OSUI.

1. At a user-station Login screen, type `admin` in the **User Name** field and press **Enter**.
2. Type `raritan` or your new password in the **Password** field and press **Enter**.
3. If the Selection Menu is not sorted by the channel number, press **F12** to toggle the sorting.
4. Press the **F5** key.
5. Select the Channel Configuration submenu and press **Enter**.
6. Use the ↑ and ↓ or the **Page Up** and **Page Down** keys to select the P2ZCIM chain you wish to resize.
7. Press Enter and type `SetPZSize-NN` (NN represents the two-digit number for the size of your chain, from 01-42).



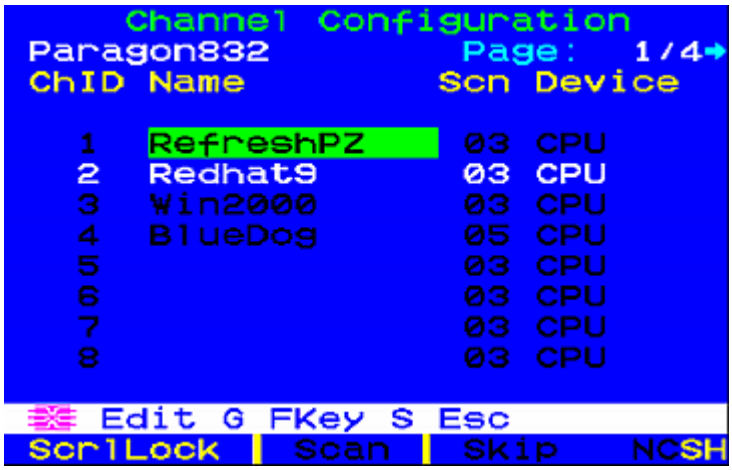
8. Press **Enter**.
9. Press **S** to save the new chain size.
10. Press **F2** to go to the Selection Menu and verify that the chain size has changed.

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➢ *To refresh a P2ZCIM chain*

The Refresh command resets the Communication Addresses of each P2ZCIM by reassigning all Communication Addresses sequentially. All active P2ZCIM channels will be rearranged so they are placed together in the former part of the channel list.

1. At a user-station Login screen, type `admin` in the **User Name** field and press **Enter**.
2. Type `raritan` or your new password in the **Password** field and press **Enter**.
3. If the Selection Menu is not sorted by the channel number, press **F12** to toggle the sorting.
4. Press the **F5** key.
5. Select the Channel Configuration submenu and press **Enter**.
6. Use the ↑ and ↓ or the **Page Up** and **Page Down** keys to select the P2ZCIM chain you wish to refresh.
7. Press **Enter** and type `RefreshPZ`.



8. Press **Enter** again.
9. Press **S** to refresh the chain.
10. Press **F2** to go to the Selection Menu and verify that channel order of the chain has been refreshed.

Important: Please follow the guideline here to ensure that there is enough power to support all P2ZCIMs in a chain.

For Paragon I UMT242, 442, 832 and 1664 with hardware III and Paragon II firmware, and Paragon II switches, in chains up to 20

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individual P2ZCIM units at least one P2ZCIM must be powered ON; in P2ZCIM chains from 21 to 42 P2ZCIM units, at least 15 P2ZCIMs must be powered ON.

P2ZCIM LED Status

The LED on each P2ZCIM indicates its operational state:

- If the LED blinks rapidly: P2ZCIM does not have a confirmed Communication Address.
- If the LED is primarily off and blinks on every two (2) seconds: P2ZCIM has a confirmed Communication Address but is not switched to that Address.
- If the LED is on and blinks on/off rapidly when there is keyboard/mouse traffic: CIM has a confirmed Communication Address and is switched to that Address.

  Note: The P2ZCIM will blink from time to time even if there is no keyboard/mouse traffic; this demonstrates that the P2ZCIM is operating normally and not locked.

- If the LED is blinking on and off but at a regulated, moderate speed (that is, every half second): that P2ZCIM is acting as Manager of the chain.

Paragon II and Z-CIMs

Z-CIM installation requires that servers are assigned names when added to the Z-CIM chain. The default name of any Z-CIM is its serial number, which is not meaningful to you. In order to name the Z-CIM, it must be connected to a server that is powered on and to the Paragon switch to get status and name assignment.

To organize and track Z-CIMs and the servers to which they are connected, we recommend one of two methods:

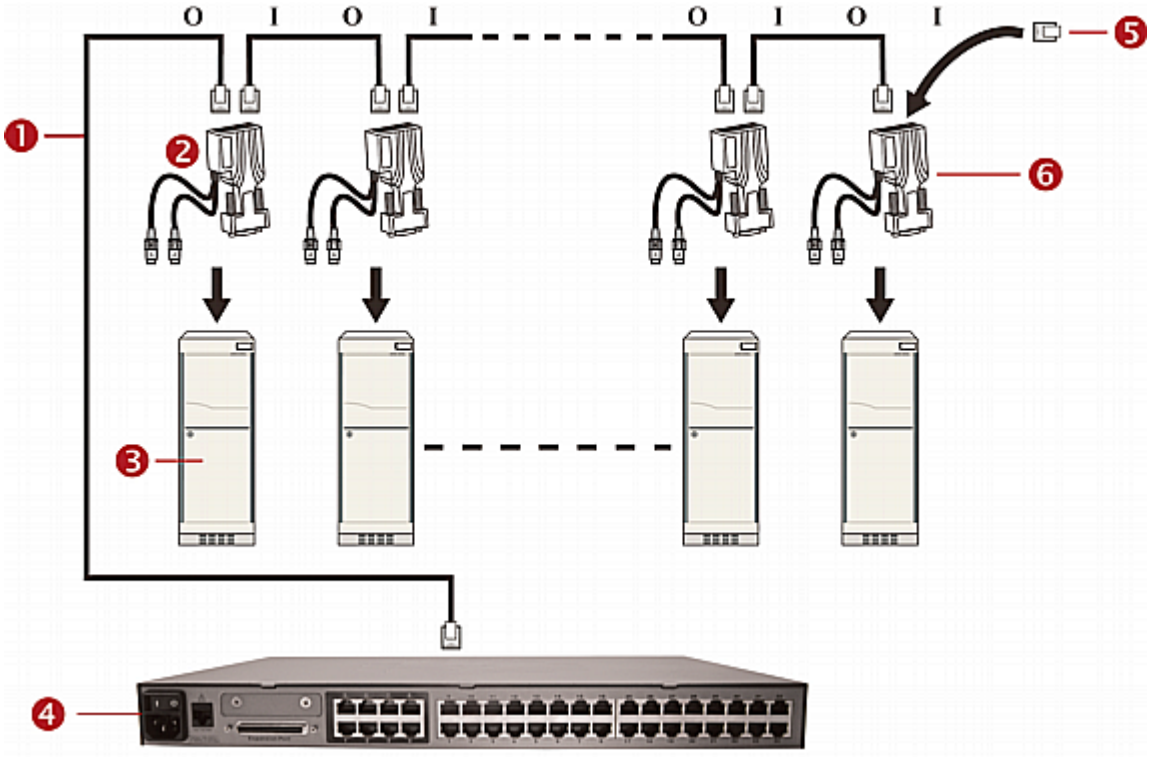
- Record the serial numbers of the Z-CIMs connected to each server, and then name all Z-CIMs at one time after the chain is complete.
- First complete the chain and then power on the Z-CIM one at a time, checking the serial number on the Z-CIM as it is connected, and assigning the proper name to the proper server Z-CIM.

When naming or renaming a Z-CIM, switch to that Z-CIM to activate it, thereby ensuring that its new name is updated in the Paragon switch's database.

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Connecting Z-CIMs as Tiers

The following diagram shows setup guidelines for connecting Z-Series Z4200U Z-CIMs (UKVMSPD or UKVMSC). Up to 42 Z-CIMs can be connected in one single chain.



1	Cat 5 cable
2	Z-CIM (UKVMSPD or UKVMSC)
3	Server
4	Paragon switch (the model shown in the illustration is P2-UMT832M)
5	Z-CIM terminator (required for the last Z-CIM in the chain)
6	"The last" Z-CIM in the chain

I	Input
O	Output

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All Paragon II components must be powered ON prior to Z-CIM tier installation. All servers and components in the Z-CIM chain must be powered OFF prior to installation.

When following the installation and configuration instructions below, sort the Selection Menu by channel number, not by name. Display the menu by pressing the **F2** key on your keyboard and change the sorting method by pressing the **F12** key.

➢ *To connect a Z-CIM as a tier*

1. Connect a Cat 5 UTP cable to the channel port on the Paragon II switch reserved for the Z-CIM chain.
2. Connect the other end of this Cat 5 UTP cable to the UTP OUT port on a Z-CIM, which will be the first Z-CIM in the chain.
3. Connect a server to the first Z-CIM.
   a. Connect the 6-pin mini-DIN keyboard and mouse and HD15 video connectors on the CIM to server's keyboard, mouse, and video ports.
   b. Place the CIM Terminator in the CIM's UTP IN port.
   c. Power ON the server.

➢ *To perform Z-CIM channel configuration*

1. At a user-station Login screen, type `admin` in the **User Name** field and press **Enter**.
2. Type the default password `raritan` or your new password, if already changed, in the **Password** field and press **Enter**.
3. Press **F5** to go to the Administration Menu and select the Channel Configuration submenu.
4. Use the ↑ and ↓ or the **Page Up** and **Page Down** keys to highlight the Paragon II channel where the Z-CIM was just added.
5. Ensure that the **Device** field reads "ZSeries" for a Z-CIM.
6. If ZSeries does not appear in the **Device** field:
   a. Press **Tab** until the **Device** field is highlighted and then press **Enter**—the highlight will turn light blue.
   b. Use the ↑ and ↓ keys to change device type to ZSeries and press **Enter**—the light blue highlight will return to yellow.
   c. Press **S** to save the change, or press **Esc** to exit without saving.
7. If a more descriptive name is desired:

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a. Hold the **Shift** key and press **Tab** to go back to the **Name** field, and then press **Enter**—the highlight will turn light blue.

b. Edit the default name and press **Enter**—the highlight will turn green as you begin to type.

c. Press **S** to save the change, or press **Esc** to exit without saving.

8. Press **F2** to go to the Selection Menu, select the tiered Z-CIM device, and press **Enter** to validate that the second-tier Z-CIM is properly configured.

➢ *To name the server channel on the Tiered Selection Menu of Z-CIM*

1. When the OSUI is on screen, press **F5** to go to the Administration Menu.
2. Select the Channel Configuration submenu, and press **Enter**.
3. Select the Z-CIM device channel.
4. Press **G** to bring up a Channel Configuration submenu for the CIM chain.
5. Use the ↑ and ↓ keys to highlight the **Name** field of the server just connected via Z-CIM. The channel will display in black and the highlight will turn yellow when it is selected.
6. Press **Enter**—the highlight will turn light blue.
7. Type the desired server name—the highlight will turn green as you begin to type.
8. Press **Enter**—the highlight will turn yellow.
9. Press **S** to save the new name.
10. Press **F2** to return to the Selection Menu, and verify that the server name on the Z-CIM chain is changed successfully, and the server operation is normal.

➢ *To attach a new Z-CIM to the existing Z-CIM chain*

1. Remove the Z-CIM Terminator from the UTP IN port of the last Z-CIM in the chain and set aside.
2. Connect a Cat 5 UTP cable to UTP IN port on the last Z-CIM in the chain.
3. Connect the other end of this Cat 5 UTP cable to the UTP OUT port on the next Z-CIM/server currently being added to the chain.
4. Place the Z-CIM Terminator in the added Z-CIM's UTP IN port.

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5. Power ON the server.
6. (Optional) Connect a local user console to the UKVMSC Z-CIM.
7. Name the newly added server by repeating the steps described in the previous section—**To name the server channel on the Tiered Selection Menu of Z-CIM**.
8. Press **F2** to return to the Selection Menu. Go to the Z-CIM channel to verify both of the name change and the server operation are OK.

Repeat the steps in the above sections for each server to be added to the chain. Name and test each server as it is added. Follow the steps below to add the rest of the Z-CIM chain of servers.

- Insert a new Z-CIM in the chain
- Name the server channel on the tiered Selection Menu of Z-CIM

Important: Please follow these guidelines to ensure that there is enough power to support all Z-CIMs in a chain.

For Paragon I UMT242, 442, 832 and 1664 with hardware III and Paragon II firmware, and Paragon II switches, in chains up to 20 individual Z-CIM units at least one Z-CIM must be powered ON; in Z-CIMs chains from 21 to 42 Z-CIM units, at least 15 Z-CIMs must be powered ON.

At least 75% of UKVMSPD Z-CIMs in the chain must be powered ON in order for the chain to be recognized by the Paragon switch.

Using a UKVMSPD Z-CIM with a Local PC

To grant specific access to a local PC from a certain user station and to access the Paragon system servers also, insert a UKVMSPD dual-access CIM between a user station and a Base Unit.

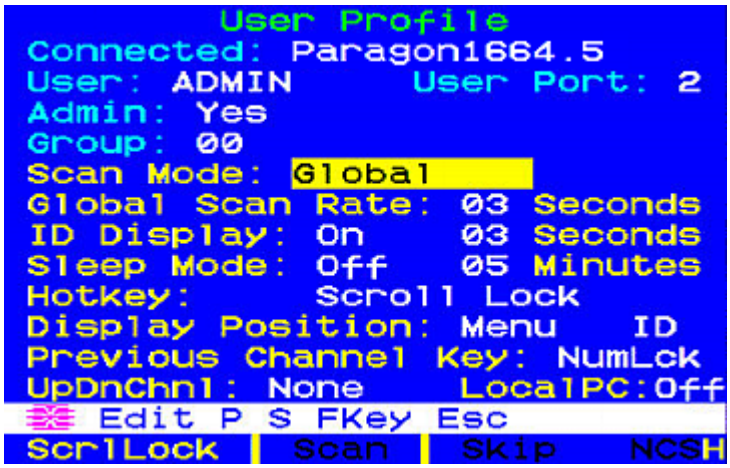
1. If you have not already done so, install your Paragon system as described in ***Installation*** (on page 12).
2. Disconnect the cable that connects the user station to the Base Unit from the Base Unit's user port.
3. Connect the free end of this cable to the UKVMSPD RJ45 port labeled "UTP OUT."
4. Connect another Cat 5 cable from the UKVMSPD RJ45 port labeled "UTP IN" to the Base Unit's user port (where you just disconnected the other cable).

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5. Plug the UKVMSPD HD15 strand into the HD15 VGA video port of the server you want to access. Plug the purple 6-pin mini-DIN keyboard strand into the server's 6-pin mini-DIN keyboard port. Plug the light green 6-pin mini-DIN strand into the server's 6-pin mini-DIN mouse port.
6. Plug in and power ON the server. If the UKVMSPD is installed and operating properly, the UKVMSPD green LED will start blinking (once per second when the UKVMSPD is idle, more quickly while data passes in either direction).

Once this installation is finished, activate Local PC Mode on the user station:

1. Log in at the attached user station.
2. Press the hot key (default: **Scroll Lock**) twice rapidly to activate the OSUI.
3. Press **F4** to activate the User Profile menu.



4. Use **Tab** or the ↑ and ↓ keys to move the highlight to the **Local PC** field.
5. Press **Enter**. The **Local PC** field will turn green.
6. Use the ↑ and ↓ to toggle the value of the field to "On."
7. Press **Enter**. The highlight will turn yellow.
8. Press **S** to save the change. If you do not wish to save changes, press the **Esc** key to abort the changes.

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Once Local PC Mode is turned on, you can access the dedicated local PC server from this user station by pressing the **Home** key twice rapidly while viewing the OSUI. The user station will immediately switch you to the local PC. To return to the Paragon system and its switched servers, activate the OSUI by pressing the hot key twice (default: **Scroll Lock**), and access any of the listed servers from the Selection Menu.

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Chapter 6 Managing IBM BladeCenter Servers

Paragon II provides access to the blade servers installed in one IBM BladeCenter® chassis via a single CIM plugged into the chassis' Management Module (MM) or Advanced Management Module (AMM). The CIM specific to IBM BladeCenter is either P2CIM-APS2-B for PS/2 keyboard and mouse, or P2CIM-AUSB-B for USB keyboard and mouse.

The following BladeCenter systems are supported:

- BladeCenter E (also referred to as model 8677)
  - With MM model 48P7055
  - With AMM model 25R5778
- BladeCenter H (also referred to as model 8852)
  - With AMM model 25R5778

IBM has updated the BladeCenter frequently since its original release. For best results, please use P2CIM-AUSB-B firmware level 0A6 or later.

Paragon treats one IBM BladeCenter chassis as one tiered device similar to the Z-CIM chain. However, Paragon II does not detect and display the real-time blade server status in the OSUI as it does to the Z-CIM chain. **You must issue a refresh command** for the following scenarios:

- When connecting the IBM BladeCenter to the Paragon system for the first time
- When there are changes made to BladeCenter's hardware configuration, such as unplugging, plugging or swapping any blade server(s), or powering off any blade server(s)

The refresh command updates the OSUI channel information of blade servers to reflect current blade server status.

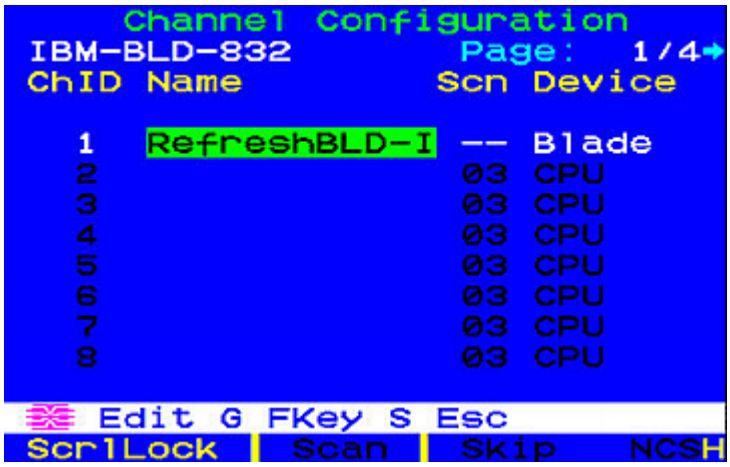
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Renaming a BladeCenter Chassis 132
Renaming a Blade Server 133

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Refreshing Channel Status

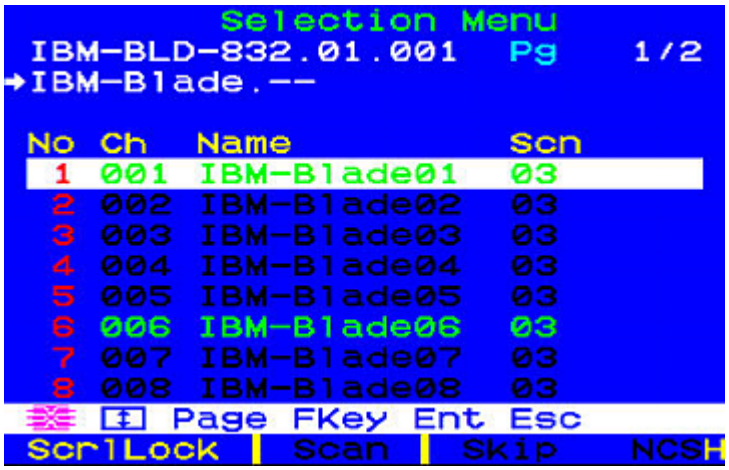
1. Log in to the Paragon system as an administrator. Type `admin` in the **User Name** field, press **Enter**, and type the password (default: `raritan`, all lowercase) in the **Password** field.
2. Make sure the Selection Menu is sorted by the channel number. If not, press **F12** to toggle the sorting.
3. Press **F5** to enter the Administration Menu.
4. Select the Channel Configuration submenu, and press **Enter**.
5. Use the ↑ and ↓ or the **Page Up** and **Page Down** keys to select the channel port to which the IBM BladeCenter is connected, and press **Enter**.
6. Type `RefreshBLD-I`. Please note this is a *case-sensitive* command.



7. Press **Enter**.
8. Press **S** to refresh the BladeCenter channel status. It takes 2 to 4 minutes to complete refreshing, depending on your blade servers' installation status.

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9. Press **F2** to go to the Selection Menu and verify that blade server status has been updated. Green channels indicate that there is a blade server installed and it is powered on; black channels indicate that either there is no blade server installed or the installed blade server is powered off.



If any user is accessing a blade server while the refresh command is issued by the administrator, two results are possible:

- If the keyboard/mouse activity has been idle for more than 200ms, the user(s) will be disconnected and the refresh command is executed.
- Otherwise, the refresh command is NOT executed and the message "BladeServer is occupied" will be displayed in the message bar.

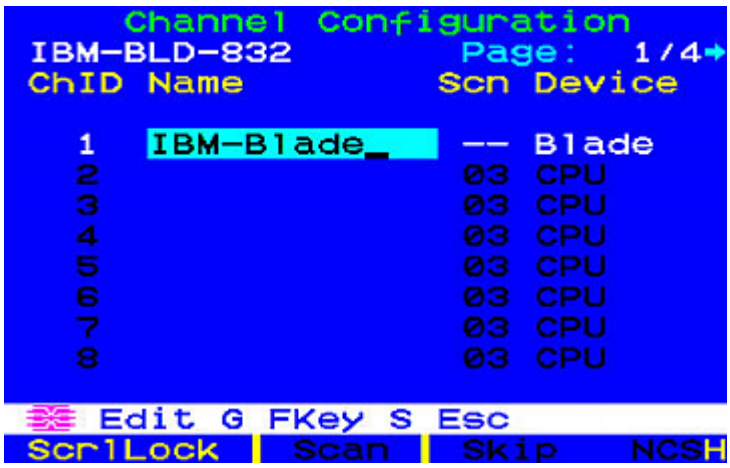
Renaming a BladeCenter Chassis

By default, IBM BladeCenter is named "IBM-Blade" in the Selection Menu of Paragon system.

1. When the OSUI is onscreen, press **F5** to go to the Administration Menu.
2. Select the Channel Configuration submenu, and press **Enter**.

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3. Select the IBM BladeCenter's channel and press **Enter**. The highlight turns light blue.



4. Type the desired server name—the highlight will turn green as you begin to type.
5. Press **Enter**—the highlight will turn yellow.
6. Press **S** to save the new name.
7. Press **F2** to verify the new name in the Selection Menu.

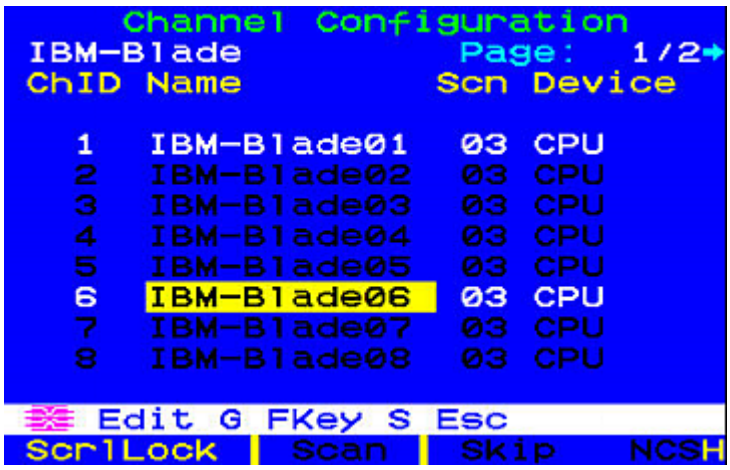
Renaming a Blade Server

By default, each of IBM BladeCenter server is named "IBM-Blade01," "IBM-Blade02," and so on.

1. When the OSUI is onscreen, press **F5** to go to the Administration Menu.
2. Select the Channel Configuration submenu, and press **Enter**.
3. Select the IBM BladeCenter's channel.
4. Press **G** to bring up a Channel Configuration menu for the IBM BladeCenter servers.

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5. Use the ↑ and ↓ keys to highlight the **Name** field of any server whose name you want to edit.



6. Press **Enter**—the highlight will turn light blue.
7. Type the desired server name—the highlight will turn green as you begin to type.
8. Press **Enter**—the highlight will turn yellow.
9. Repeat steps 5 through 8 if you want to edit other servers' names.
10. Press **S** to save the new name(s).
11. Press **F2** to go to the Selection Menu and verify whether the server names are changed.

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Chapter 7 Configurations

The aim of the Main Units (such as P2-UMT1664"**M**") and Stacking Units (such as P2-UMT1664"**S**") is to allow users to build the Paragon system to include additional channel ports and the tiers up to three levels, so that more users and channels can be configured to control more servers. The system does not need to be over-redundant in accessibility, but administrators should consider the configurations illustrated in this chapter. In more complex stacked Paragon setups, there are important guidelines about legal and illegal device configurations that must be followed to ensure functionality.

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Principles of Re-Connection 135
Tiered Configurations 136
Stacked Configurations 139
Non-Standard Tiered Configurations 143
Loop-Back Configuration 148
P2-HubPac Configuration and Multiple Video 149

Principles of Re-Connection

When a change is made to a connected tiered device, we recommended that power to **all** devices is recycled, if possible. This includes the device where the connection is changed directly, as well as all devices below it in the system architecture.

The sequence of power recycling should start from the HIGHEST tiered device and end with the Base Unit (first-tier Paragon switch). For example, in a "Single Base" configuration (only one Paragon switch as the Base Unit), if a connection change is made at a device on the third tier, the sequence of power recycling should be as follows:

- The third-tier device with the changed connection
- The second-tier device connected to the third-tier device
- The Base Unit

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Tiered Configurations

Standard Tiered Configurations

Common Guidelines for Tiering Configuration

- Only Paragon I with hardware version HW3 (running Paragon II code) or Paragon II Main Unit can serve as Base Units (first tier).
- The version of Base Unit(s), both hardware and firmware, must always be later than or at least equal to the version of other tiered devices.
- A maximum of three tiers, including the Base Unit, is permitted.
- Devices that are not Paragon switches but come with two or more channel ports, such as Raritan MasterConsole, CompuSwitch, Z-CIM, or P2ZCIM, are treated as *tiered devices*. These devices cannot act as Base Units in a Paragon II system and can be connected only to a Base Unit or to a second-tier Paragon switch.

Note: The easiest way to determine if the hardware version of your Paragon I unit is HW3 is to check the number of its stacking ports on the rear side. If there is only one stacking port, the hardware version is HW3.

Guidelines for Single Base Configuration

A single base configuration could be two-tier or three-tier configuration. It is composed of one Paragon Main Unit, serving as the Base Unit, and second-tier or even third-tier device(s).

Initialization

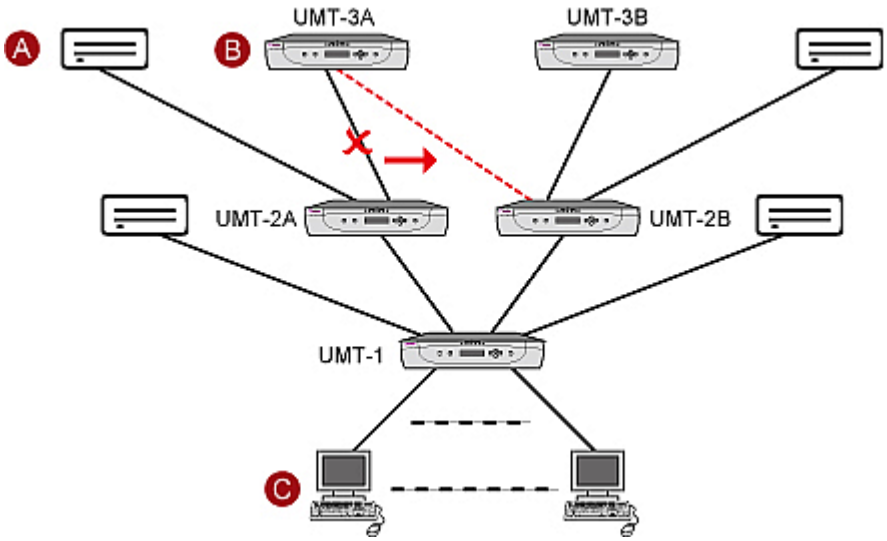
- After all devices have been connected, power on the devices from UPPER tier to lower tier. For example, power on the second-tier device(s) first and then the Base Unit in a two-tier configuration.
- After initialization, each tiered device has an updated database.

Guidelines for changing connections of tiered devices:
Example A: Relocating a higher-tier device (refer to dotted line)

1. Disconnect some or all of the user ports on the third-tier unit (UMT-3A) that connect to the channel ports of the second-tier unit (UMT-2A) and re-connect the user ports to the channel ports of another second-tier unit (UMT-2B).
2. Recycle the power of all impacted devices. This is recommended to build a clean database for Paragon switches. Sequence of recycling power is from the HIGHEST tier (third tier) to the Base Unit. In our example: UMT-3A → UMT-2A → UMT-2B → UMT-1.

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The operation is the same for tiered devices that are not Paragon switches.



A	Tiered devices that are not Paragon switches
B	Paragon switches (UMT-x)
C	User stations

Guidelines for Multiple Base Configuration

A multiple base configuration could be two-tier or three-tier configuration. It is composed of more than one Paragon Main Unit, serving as Base Units, and second-tier or even third-tier devices.

Initialization

- After all devices have been connected, power on the devices from UPPER tier to lower tier. For example, power on the second-tier device(s) first and then the Base Units in a two-tier configuration.
- After initialization, each tiered device has an updated database.

Guidelines for changing connections of tiered devices:

Example A: Relocating a third-tier device with multiple second-tier connections (refer to red line in the diagram):

1. Disconnect some or all of the user ports on an third-tier unit (UMT-3A) that connect to the channel ports of second-tier units (UMT-2A and UMT-2C) and re-connect the user ports to the channel ports of another second-tier unit (UMT-2B).

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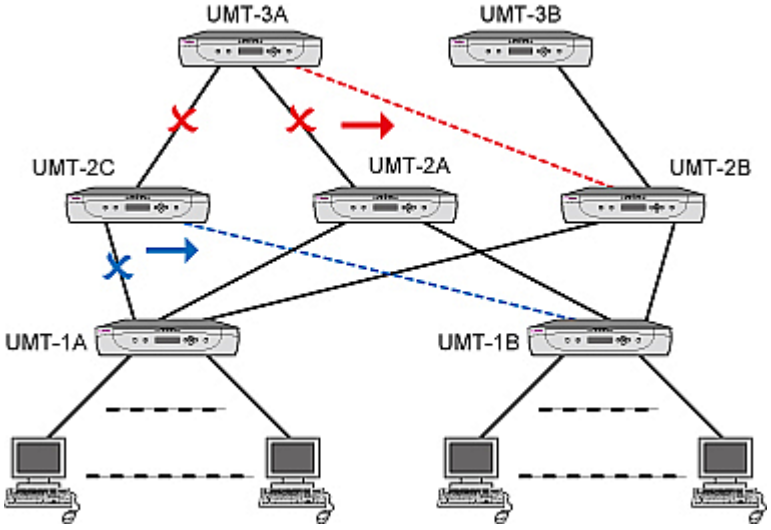
2. Recycle the power of all impacted devices. This is recommended to build a clean database for Paragon switches. Sequence of recycling power is from the HIGHEST tier (third tier) to the Base Unit. In our example: UMT-3A → UMT-2A → UMT-2B → UMT-2C → UMT- 1A → UMT-1B.

Example B: Relocating a second-tier device with multiple base connections (refer to blue line in the diagram):

1. Disconnect some or all of the user ports on a tiered device (UMT-2C) that connect to the channel ports of a Base Unit (UMT-1A) and re-connect those user ports to another Base Unit (UMT-1B).
2. Recycle the power of impacted devices. This is recommended to build a clean database for Paragon switches. Sequence of recycling power is from the HIGHEST tier (second tier) to the Base Unit. In our example: UMT-2C → UMT-1A → UMT-1B.

The operation is the same for tiered devices that are not Paragon switches.

Red color	Example A
Blue color	Example B



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Stacked Configurations

Definition of Stacked Configuration:

- The Paragon II Stacking Unit expands the number of available channel ports in a single switching unit. It does not add user ports.
  - P2-UMT1664S has four 68-pin expansion ports. Two are input ports and two are output ports. P2-UMT832S has only one 68-pin expansion input port and one output port.
- The Paragon II Main Unit comes with both of user ports and channel ports. It has a database to store information such as system configuration, user profiles, channel configuration, and so on.
  - P2-UMT1664M has two 68-pin expansion ports, and P2-UMT832M has one 68-pin expansion port. These represent input ports.
- One or more Paragon II Stacking Units connect to a Paragon II Main Unit through stacking cables in a daisy chain connection—that is, the expansion port of a P2-UMT832M connects to the expansion output port of a P2-UMT832S, and the expansion input port of this P2-UMT832S connects to the expansion output port of another P2-UMT832S to form a daisy chain.
- The Main Unit can be a Base Unit or a second-tier or third-tier device.
  - The Stacking Unit that connects to a Main Unit becomes an automatic extension of the Main Unit.

System Constraints:

- The Base Unit should be a P2-UMT1664M / P2-UMT832M Main Unit.
- The Base Unit's hardware and firmware versions must always be the latest released version of Paragon II product in a closed configuration system.
- A Paragon I product with hardware version HW3 (running Paragon II firmware) can accommodate only one Stacking Unit.

Note: The easiest way to determine if the hardware version of your Paragon I unit is HW3 is to check the number of its stacking ports on the rear side. If it has only one stacking port, the hardware version is HW3.

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- Up to three P2-UMT832S units (Stacking Units) can be connected to one P2-UMT832M unit (Main Unit).
- Only one P2-UMT1664S unit (Stacking Unit) can be connected to one P2-1664M unit (Main Unit).
- A maximum of 128 channel ports (Main Unit + Stacking Units) is permitted. When a P2-UMT1664M unit acts as the Main Unit, only one P2-UMT1664S Stacking Unit can be in daisy chain with it. When a P2-UMT832M unit acts as the Main Unit, up to three P2-UMT832S Stacking Units can be in the daisy chain.
- You cannot mix unlike configurations of Main Units and Stacking Units. For example, you cannot use a P2-UMT832S Stacking Unit with a UMT1664 Main Unit and vice versa.
- These cannot be used as Stacking Units: P2-UMT1664M, P2-UMT832M, UMT1664, UMT832 (Paragon I with hardware version HW3).

Important: Never power off a Stacking Unit when it is still CONNECTED to a Main Unit. Doing so will cause the channel color display in the OSUI Selection Menu to become abnormal. To power off the Stacking Unit, you must disconnect it from the Main Unit first. See *Important Note about Powering Off the Stacking Unit* **(on page 36) for additional information.**

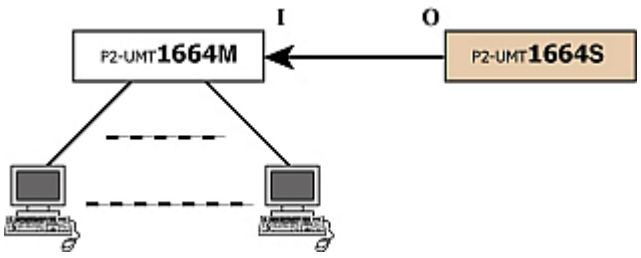
Standard Stacked Configurations

This section shows both of supported and unsupported connection configurations. In the diagrams of this section, two letters "I" and "O" represent the following meanings:

I	Input
O	Output

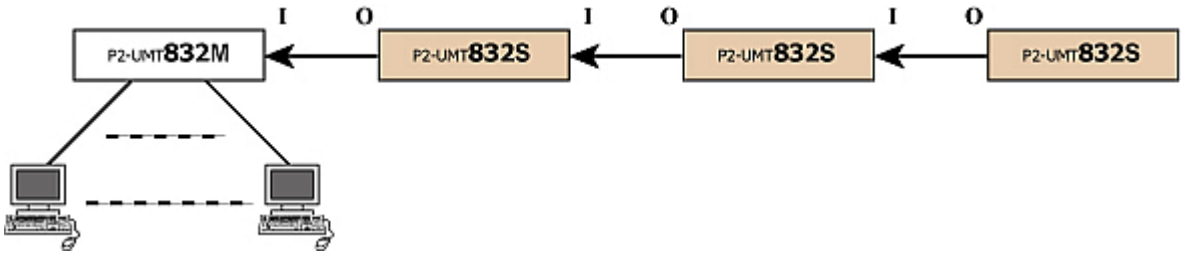
Single Base with Stacking

Example A: Non-blocked System—P2-UMT1664M
Standard configuration—any user can access any channel port in the system.

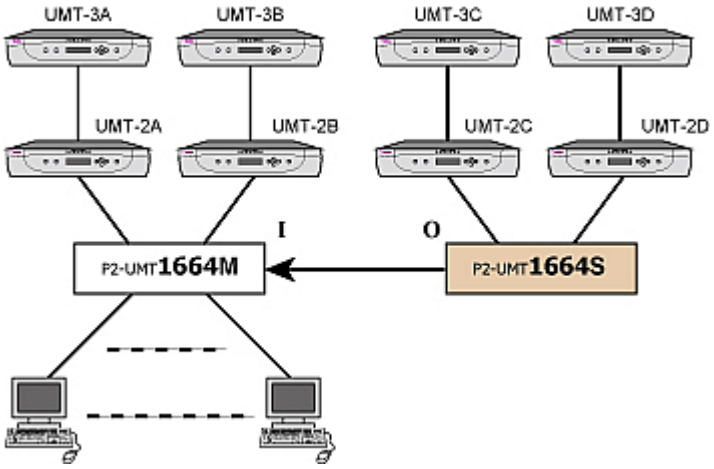


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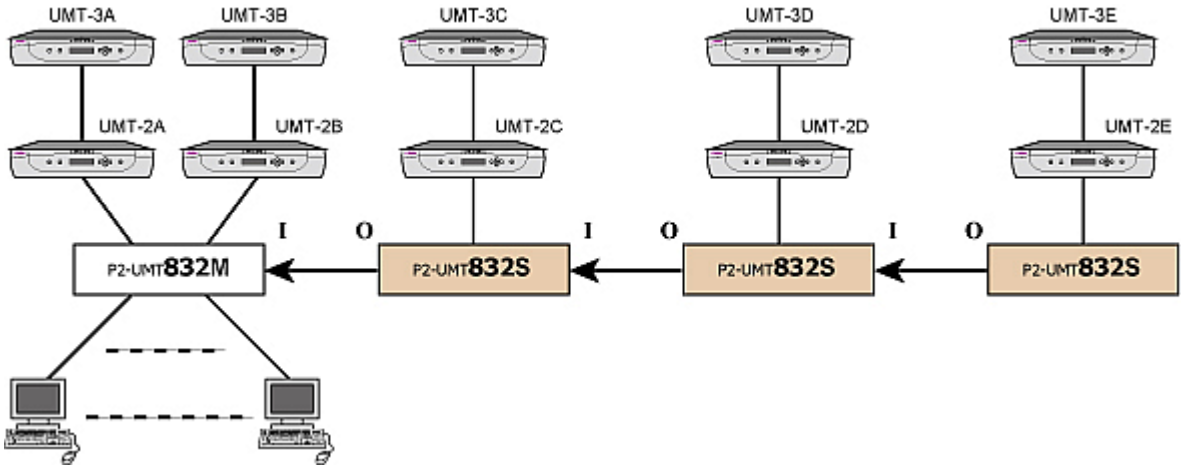
Example B: Non-blocked System—P2-UMT832M
Standard configuration—any user can access any channel port in the system.



Example C: P2-UMT1664M—Stacked and Tiered
Standard configuration—any user can access any channel port in the system.



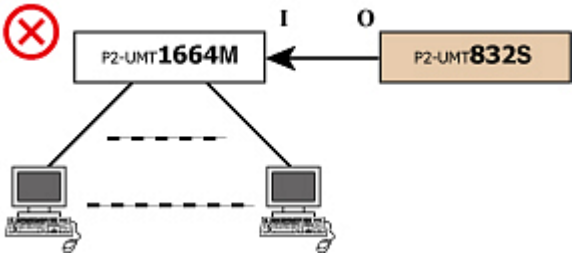
Example D: P2-UMT832M—Stacked and Tiered
Standard configuration—any user can access any channel port in the system.



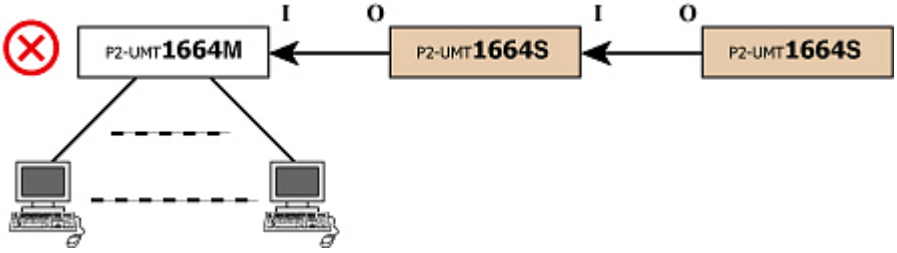
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Example E: Illegal Configuration

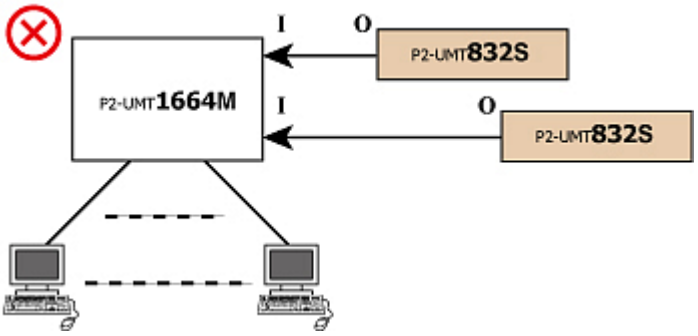
Illegal configurations are those that are not currently supported by Paragon II.



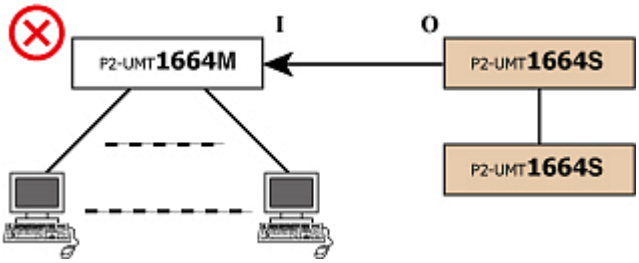
Example F: Illegal Configuration



Example G: Illegal Configuration



Example H: Illegal Configuration



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Non-Standard Tiered Configurations

Guidelines for Existing Firmware Versions

Non-Standard tiered configurations are those configurations supported by Paragon II, but require special procedure in order to function properly. These include:

- Triangle Configuration
- Single Diamond Configuration
- Redundant Configuration

Recovery:

- After any re-connection subsequent to the Non-Standard tiered configuration, all Paragon switches should undergo a **FUNC** reset to clear the database. See "**Reset Unit**" under ***Paragon II Front Panel Display and Controls*** (on page 16) for more information on clearing the database. This procedure should be performed starting from the third-tier device down to the Base Unit.
- Whenever a third-tier Paragon switch is replaced, all of the second-tier Paragon switches and Base Units should undergo a **FUNC** reset.
- Whenever a second-tier Paragon switch is replaced, all of the Base Units should undergo a **FUNC** reset.
- Whenever a base-tier Paragon switch (Base Unit) is replaced, only the new Paragon switch should undergo a **FUNC** reset.

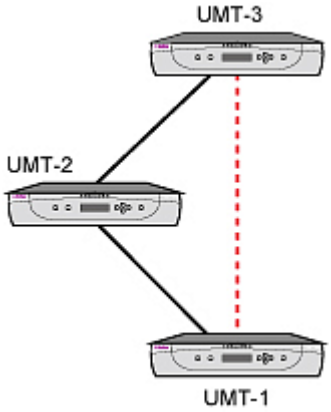
Triangle Configuration

➢ *The following procedure must be followed to ensure this configuration functions properly:*

After re-connection, all Paragon switches must undergo a **FUNC** reset to clear the switches' database. See "**Reset Unit**" under ***Paragon II Front Panel Display and Controls*** (on page 16) for more information on clearing the database. This procedure should be performed starting from the third-tier device down to the Base Unit.

- Execute the **FUNC** reset in the following order: UMT-3 → UMT-2 → UMT-1.

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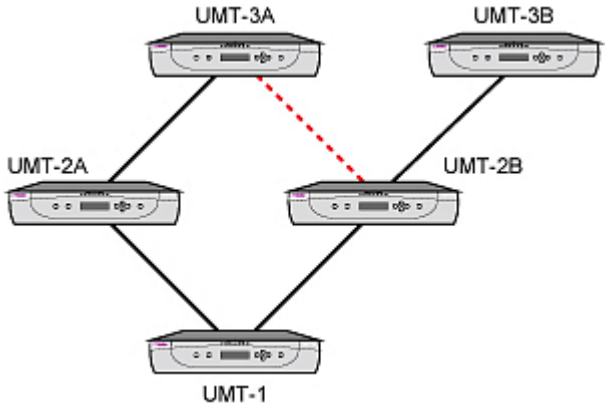
Diamond Configurations

Single diamond configuration:

A user configured on the second tier and connected to UMT-2A has access only to UMT-3A, while a user connected to UMT-2B can access both UMT-3A and UMT-3B. The Base Unit (UMT-1) administrator has access to all Paragon switches in the single diamond configuration.

➢ *The following procedure must be followed to ensure this configuration functions properly:*

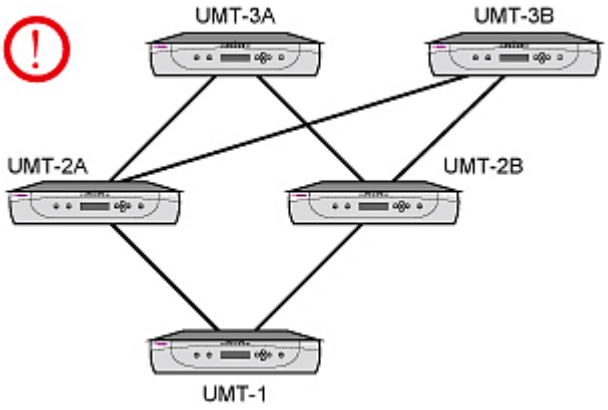
- After re-connection, all Paragon switches should undergo a **FUNC** reset to clear the database. See "**Reset Unit**" under ***Paragon II Front Panel Display and Controls*** (on page 16) for more information on clearing the database. This procedure should be performed starting from the third-tier device down to the Base Unit.
- Execute the **FUNC** reset in the following order: UMT-3A → UMT-2A → UMT-2B → UMT-1.



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Double diamond configuration

Officially, the Double Diamond configuration is NOT a Raritan-approved solution if Stacking Units or P2-HubPac is included in the configuration. Therefore, it is highly recommended to avoid this configuration especially when using Paragon II Stacking Units or P2-HubPac.



Redundant Configuration

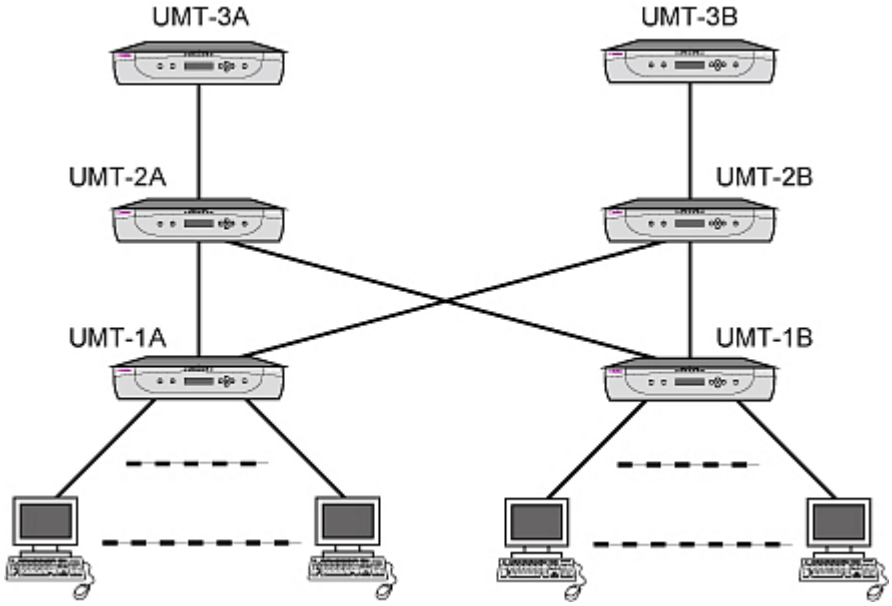
These configurations are simply more complex configurations, and might be used to ensure redundancy; every Base Unit is configured to another, in case of individual system failure.

➢ *The procedure outlined below must be followed to ensure this configuration functions properly:*

- After installation, all Paragon switches should undergo a **FUNC** reset to clear the database. See "**Reset Unit**" under ***Paragon II Front Panel Display and Controls*** (on page 16) for more information on clearing the database. This procedure should be performed starting from the third-tier device down to the Base Unit.
- Execute the **FUNC** reset in the following order: UMT-3A → UMT-3B → UMT-2A → UMT-2B → UMT-1A → UMT-1B.
- Whenever a third-tier Paragon switch is replaced, all of the second-tier Paragon switches and Base Units should undergo a **FUNC** reset.
- Whenever a second-tier Paragon switch is replaced, all of the Base Units should undergo a **FUNC** reset.

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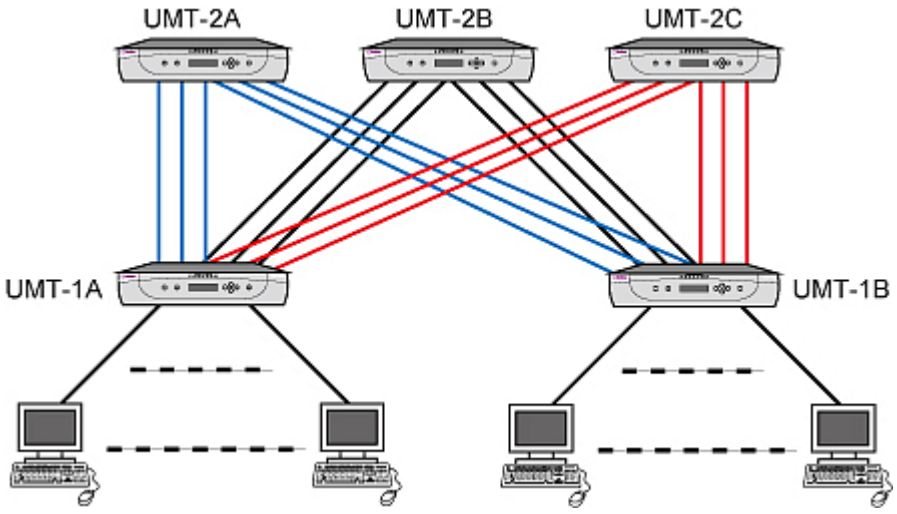
- Whenever a base-tier Paragon switch (Base Unit) is replaced, only the new Paragon switch should undergo a **FUNC** reset.



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In order to make a redundant configuration system operate more efficiently, the following connection scheme between tiers is recommended:

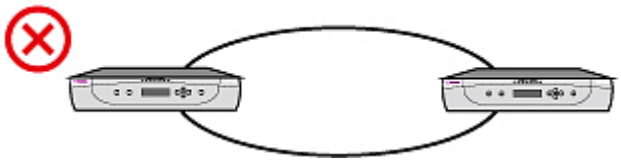
- Assume there are two Paragon Base Units: UMT-1A and UMT-1B
- Assume there are three second-tier Paragon switches: UMT-2A, UMT-2B, and UMT-2C
- Channel connection of UMT-1A
  - Channel ports 3*N+1 (1, 4, 7….) connect to UMT-2A user ports sequentially, starting from user port 1
  - Channel ports 3*N+2 (2, 5, 8….) connect to UMT-2B user ports sequentially, starting from user port 1
  - Channel ports 3*N (3, 6, 9….) connect to UMT-2C user ports sequentially, starting from user port 1
- Channel connection of UMT-1B
  - Channel ports 3*N+1 (1, 4, 7….) connect to UMT-2A user ports sequentially, starting from the available user port.
  - Channel ports 3*N+2 (2, 5, 8….) connect to UMT-2B user ports sequentially, starting from the available user port.
  - Channel ports 3*N (3, 6, 9….) connect to UMT-2C user port sequentially, starting from the available user port.



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Loop-Back Configuration

This dead-loop setup will cause server database conflict and should therefore never be used.



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P2-HubPac Configuration and Multiple Video

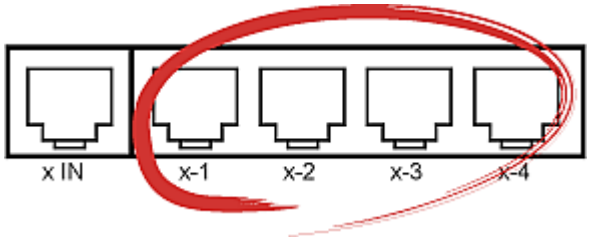
Read this section if performing the Multiple Video function in a Paragon II system in which the P2-HubPac is installed.

Configuration for Multiple Video

In order to perform the Multiple Video function in a system involving the P2-HubPac, **each "switch port" of the same five-port cluster of the P2-HubPac must be attached to a Paragon switch connected to a DIFFERENT Base Unit**.

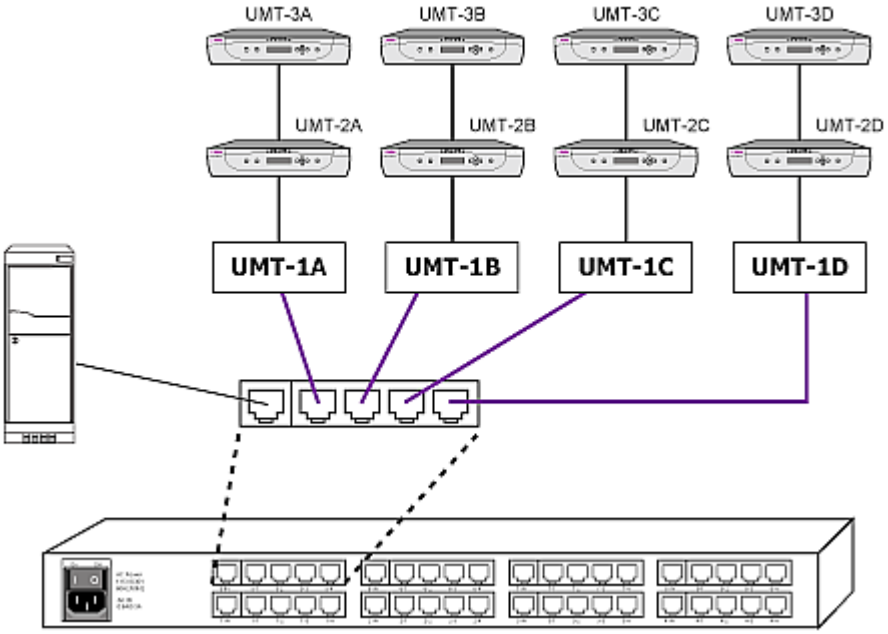
In other words, the Paragon switches connected to the same cluster cannot share the same Paragon Base Unit.

This diagram indicates the four switch ports on a five-port cluster. The switch ports are marked as *x-1*, *x-2*, *x-3* and *x-4* respectively (x represents the cluster number).



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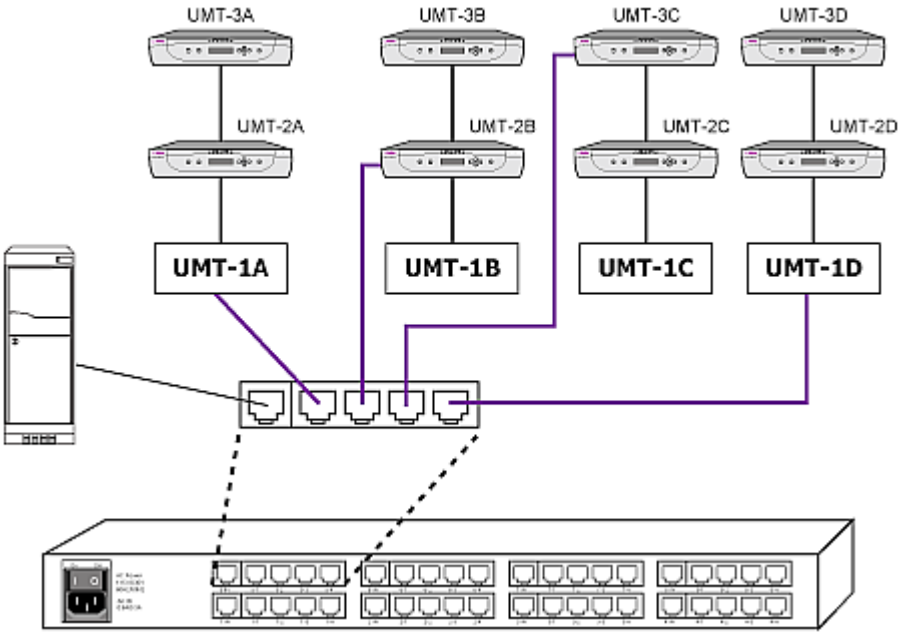
In the following illustrations, the Paragon Base Units are *UMT-1A*, *UMT-1B*, *UMT-1C* and *UMT-1D*. You can connect the HubPac's switch ports either to the Base Units or to the "Stacking Units" attached with these Base Units. The Multiple Video function works properly in such a configuration.



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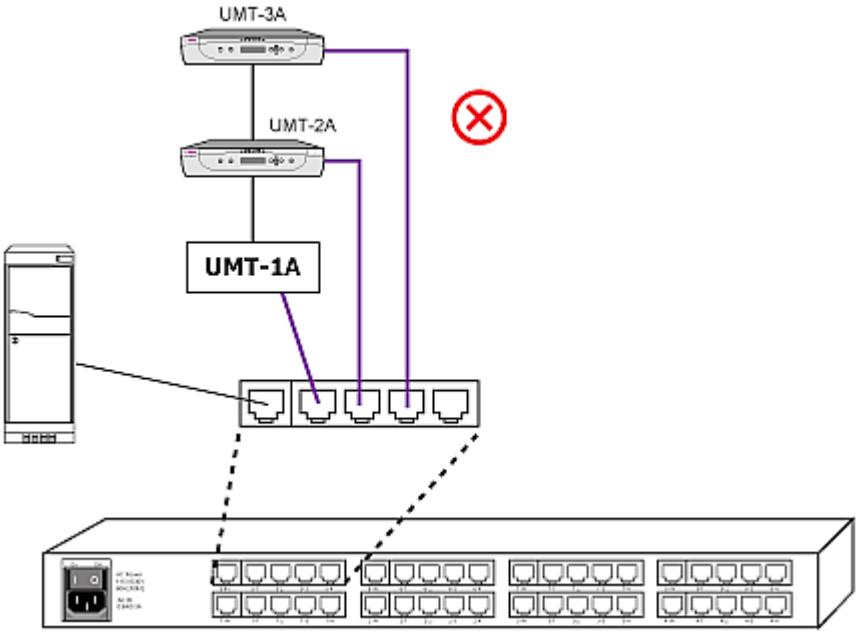
—OR—

You may connect the switch ports to the tiered Paragon switches of *different* Base Units. The Multiple Video function remains workable in this configuration.



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The following diagram illustrates a P2-HubPac configuration in which regular channel access will work properly but *the Multiple Video function will fail*. To use the Multiple Video feature properly, do not connect the P2-HubPac to the Paragon Base Unit and its tiered Paragon switches.



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Chapter 8 Firmware Upgrade

To incorporate the newest Paragon II features, you can upgrade Paragon II Main Units, Stacking Units, user stations and P2-HubPac with the latest firmware on Raritan's website. Upgrades can be done via the network or the RS-232 connection.

Read the following sections if the device you want to upgrade is a Paragon Main Unit, Stacking Unit or user station. If the device is P2-HubPac, see ***P2-HubPac Upgrade Operation*** (on page 163) in this chapter for the upgrade procedure.

In This Chapter

General Update Procedure 153
Failsafe Upgrade Feature 156
P2-HubPac Upgrade Operation 163

General Update Procedure

Procedures for firmware upgrade of the Paragon II Main Unit, Stacking Unit, and user stations (P2-UST, P2-EUST or P2-EUST/C) all include these major steps.

STEP 1: Download the latest firmware and release notes
STEP 2: Establish a connection between the device and the PC running Paragon Update
STEP 3: (Optional) Verify the stacking-related configuration
STEP 4: Launch the Paragon Update utility

➢ *STEP 1: Download the latest firmware and release notes*

1. Use your browser to visit Raritan's ***Firmware Upgrades webpage*** (http://www.raritan.com/support/firmwareupgrades).
2. Click **Paragon II** to locate the latest firmware version for the device you want to upgrade.
3. Click that firmware.
4. Click **START DOWNLOAD**.
5. Click **Save** and specify the location to save the file.
6. After the download completes, unzip the downloaded file. The extracted files include the newest Paragon Update utility, .hex files, and so on. The .hex file is a firmware file.

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7. (Optional) For some versions, such as version 4.2, the associated release notes are not covered in the downloaded firmware file, so locate the release notes and download it by repeating the above steps 4 to 6.
8. Read the release notes for any necessary information.

➢ *STEP 2: Establish a connection between the device and the PC running Paragon Update*

The device intended to upgrade must be connected to the PC that will run the Paragon Update utility. There are two types of connections depending on your device.

- **Network**: If your device comes with a LAN port, such as Paragon II Main Unit, upgrade it by connecting it to the network and assigning an IP address to it. However, for Paragon II Stacking Unit, it must be upgraded by connecting to the Main Unit which is connected to the network.
- **RS-232 Cable**: For those devices without the network port, such as user stations, this is the only method to upgrade them. Connect the device to one of the serial ports of the PC that runs the Paragon Update utility via the RS-232 cable.

Note: One DB9 male-to-female serial (RS-232) cable is shipped with the user station. It is a direct cable that can be used to upgrade the firmware with TXD, RXD and GND signals.

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➢ STEP 3: (Optional) Verify the stacking-related configuration

This step is necessary when any Stacking Unit is connected to the Main Unit and the firmware upgrade of Stacking Units is also desired. For regular firmware upgrade which does not involve the boot loader or failsafe feature, Paragon allows you to update the Main Unit and "ALL" Stacking Units that are connected to it in one single operation.

Before upgrading the Stacking Units, ensure these requirements are met.

- The Stacking Units are properly connected to the Main Unit and powered on.
- The "Stacking Support" setting in the Main Unit corresponds to the number of connected Stacking Units—that is, if there are three Stacking Units connected to the Main Unit, set the setting to 3. See the "Stacking Support" section under ***Paragon II Front Panel Display and Controls*** (on page 16) for additional information.
- The value of the "Set Stack ID" setting in every connected Stacking Unit is unique: 1 up to 3. See ***Installing the Paragon P2-UMT832S Stacking Unit*** (on page 35) for additional information.

Note: For "special" firmware upgrade involving the boot loader or failsafe feature, only one Stacking Unit is allowed to be connected to the Main Unit at one time. See the ***Stacking Units*** (on page 159) section of ***Failsafe Upgrade Feature*** (on page 156) for more information.

➢ STEP 4: Launch the Paragon Update utility

Specify the device(s) to upgrade and the appropriate firmware in the Paragon Update utility. Note that Paragon Update utilized to upgrade devices must be the latest version downloaded along with the firmware. This is to ensure the upgrade is performed successfully. The update utility's filename is "ParagonUpdate_xxx.exe" (xxx represents the version).

1. Double click "ParagonUpdate_xxx.exe." The Paragon Update window appears.
2. Enter the information of the device that you want to upgrade in the Paragon Update utility, including the device's name, IP address or the number of the serial port where the device connects, and so on.
3. Select the device by selecting its checkbox (☑).
4. Click **Load Hex File** and navigate to select the appropriate firmware file.

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5. Click **Send To Paragon**.
6. Click **Yes**. Then the utility starts to upgrade the selected device. If the device is a Main Unit, the Main Unit and every Stacking Unit (if any) connected to it are upgraded at one time.

For more details of the Paragon Update utility, see **Paragon Manager User Guide**, which is available on the "User Manuals & Quick Setup Guides" CD or on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation).

Note: Usually the .hex file for updating the firmware of both the Main and Stacking Units is the one whose name is "P2-xxx" (xxx represents the version) unless you are updating these units for obtaining failsafe upgrade feature or it is an update failure case for the Stacking Unit. If so, see later sections in this chapter for the appropriate .hex file.

Failsafe Upgrade Feature

In the past, whenever a firmware update failure occurred on the Paragon II Main Unit, Stacking Unit or a P2-UST user station, a return to Raritan is required for function restoration. Now Raritan provides the FAILSAFE upgrade capability, which enables you to restore its function back to normal by yourself when any update failure occurs.

The versions of firmware and/or boot loader required for different devices to support the failsafe upgrade feature

Device	Required version
Main Unit	Firmware version: **Any version after 3B0K** Boot loader version: **0C4 or later**
Stacking Unit	Main Unit's firmware version: **3E5 or later** Stacking Unit's boot loader version: **0C5 or later**
P2-EUST or P2-EUST/C user station	Firmware version: **Any version**
P2-UST user station	Firmware version: **1F9 or later**

Note: Boot loader is displayed as "F/W Loader" on the Front Panel LCD display.

The above-mentioned devices in Paragon II version 4.2 or later are already implemented with the failsafe upgrade feature. If your devices belong to earlier versions, you can upgrade them with the appropriate Paragon Update utility (version 2.4.1 or later). See subsequent sections for how to upgrade different devices for failsafe upgrade feature.

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Main Units

➢ *To update Main Units for Failsafe Upgrade feature*

To obtain the failsafe capability for your Paragon II Main Unit, you must follow three major steps.

STEP 1: Remove all Stacking Units
STEP 2: Upgrade the boot loader
STEP 3: Upgrade the firmware code

Important: During the boot loader upgrade process, the Main Unit's settings are not accessible. Therefore, please note down your Main Unit's IP address before starting the boot loader upgrade.

STEP 1: Remove all Stacking Units

1. Disconnect any Stacking Unit(s) from the Main Unit.
2. Set the Main Unit's stacking support to "0." See the "Stacking Support" section under ***Paragon II Front Panel Display and Controls*** (on page 16) for additional information.
3. The Main Unit restarts itself.

STEP 2: Upgrade the boot loader

Although you may upgrade the Main Unit through TCP/IP, it is highly recommended to upgrade the boot loader by connecting the cross-over network cable between the Main Unit and the PC with Paragon Update to avoid any potential risk.

1. Download the appropriate firmware version from Raritan's website. See **STEP 1: Download the Latest Firmware and Release Notes** under ***General Update Procedure*** (on page 153) for details.
2. Launch the Paragon Update utility: select "R-P2BL-0C4.hex" as the firmware update file, and click the "Send To Paragon" button. See **Paragon Manager User Guide** for detailed operation.
3. Wait until the upgrade process finishes.

Important: Interrupting the boot-loader upgrade process could result in permanent damage to the system.

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4. When the update completes, a message “Device Update Successful” appears on the PC's monitor. The Main Unit's LCD panel displays the following message, which indicates the boot loader is upgraded successfully.



STEP 3: Upgrade the firmware code

Follow the procedures described in ***General Update Procedure*** (on page 153) to upgrade the Main Unit with the latest firmware whose name is “P2-xxx.hex” (xxx represents the version).

➢ *To verify the firmware version*

Use the Function Menu on the Front Panel to check the firmware version. See ***Paragon II Front Panel Display and Controls*** (on page 16) for more information.

➢ *To recover Main Units after upgrade failure*

When any upgrade failure takes place, you can simply return the function back to normal with the Main Unit's failsafe capability.

1. Check the Front Panel LCD display to see whether the Main Unit enters the boot loader mode as shown below:



   If not, press and hold ◁ and ▷ on the Front Panel of the Main Unit simultaneously, and power cycle the Main Unit at the same time. This forces it to enter the boot loader mode.

2. Repeat the same upgrade procedure:
   - Activate the Paragon Update utility again
   - Select the same firmware file that was chosen when the upgrade failure occurred
   - Click the **Send To Paragon** button. For details on the operation of the Paragon Update utility. See *Paragon Manager User Guide* for more details.

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Stacking Units

➢ *To update Stacking Units for Failsafe Upgrade feature*

If the boot loader version of your Stacking Unit is earlier than 0C5, it does not have the failsafe capability, and you must upgrade it if the failsafe feature is desired. The upgrade of the Stacking Unit for failsafe capability requires these requisites:

- Keep only one Stacking Unit connected to the Main Unit at one time.
- The Main Unit must be implemented with Paragon II 4.2 firmware or later as detailed below.

Firmware compartment	Version
Boot loader	0C4 or later
Firmware code	3E5 or later

The major upgrade procedures may vary depending on the situation of your devices. For example, if the boot loader version of your Main Unit is already 0C4 and the firmware version is 3E5, you can skip STEP 1 below.

STEP 1: Update the Main Unit's boot loader to 0C4 and firmware to 3E5 or later
STEP 2: Keep only one Stacking Unit connected
STEP 3: Update the Stacking Unit's Firmware

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STEP 1: Update the Main Unit's boot loader to 0C4 and firmware to 3E5 or later

There are two types of scenarios:

- The boot loader version of the Main Unit is earlier than 0C4—you must upgrade its boot loader to 0C4 or later. See **Updating Main Units for Failsafe Upgrade Feature** in ***Main Units*** (on page 157) for details.
- The boot loader version of the Main Unit is 0C4 or later, but its firmware code is earlier than 3E5—download the firmware of version 4.2 or later, and upgrade it by following the procedure described in ***General Update Procedure*** (on page 153). The firmware file to choose is P2-xxx.hex (xxx represents the version).

STEP 2: Keep only one Stacking Unit connected

To upgrade the Stacking Unit for obtaining the failsafe capability, only one unit is allowed to connect to the Main Unit at one time. If there are more than one Stacking Unit or no Stacking Unit connected to the Main Unit, you must do the following:

1. Power off the Main and Stacking Units.
2. Connect only one Stacking Unit to the Main Unit.
3. Power on the Stacking Unit first.
4. Power on the Main Unit.
5. Set the Main Unit's stacking support to 1. See the "Stacking Support" section under ***Paragon II Front Panel Display and Controls*** (on page 16) for additional information.
6. Set the Stacking Unit ID to 1. See step 6 of ***Installing the Paragon P2-UMT1664S Stacking Unit*** (on page 35) for additional information.
7. Power off both units.
8. Power on the Stacking Unit first.
9. Power on the Main Unit.

STEP 3: Update the Stacking Unit's firmware

Both of the Stacking Unit's firmware code and boot loader will be updated after the following is done.

1. Make sure the Main Unit is connected, via network, to the PC that will run Paragon Update.
2. Launch the Paragon Update utility: select "R-P2SBL-0C5.hex" as the firmware file, and click the "Send To Paragon" button. See *Paragon Manager User Guide* for detailed operation.

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Important: Do NOT interrupt the upgrade process. Otherwise it results in permanent damages.

3. Stacking Unit automatically restarts itself after the update completes.

➢ *To verify the firmware version*

Use the Function Menu on the Front Panel to check the firmware version. See ***Paragon II Front Panel Display and Controls*** (on page 16) for more information.

➢ *To recover Stacking Units after upgrade failure*

If a Stacking Unit encounters the update failure, with its failsafe capability, you can restore the Stacking Unit's function by yourself.

1. Make sure only one Stacking Unit (the one that encounters the update failure) is connected to the Main Unit. If not, see **STEP 2** in the previous section "**Updating Stacking Units for Failsafe Upgrade Feature**" for instructions.
2. Check the Front Panel LCD display on the Stacking Unit to see whether it enters the boot loader mode as shown below:



   If not, press and hold **FUNC** and **ESC** on the Front Panel of the Stacking Unit simultaneously, and power cycle the Stacking Unit at the same time. This forces it to enter the boot loader mode.

3. Follow the steps outlined in ***General Update Procedure*** (on page 153) to upgrade your Stacking Unit, but you must choose "R-P2SBL-0C5.hex" as the firmware file.

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User Stations

The failsafe capability is a standard feature of P2-EUST and P2-EUST/C. P2-UST with firmware version earlier than 1F9 does not have this feature. For an older P2-UST, you can upgrade its firmware to get the failsafe feature.

➢ *To update user stations for Failsafe Upgrade feature (P2-UST Only)*

The procedures are the same as those outlined in ***General Update Procedure*** (on page 153). Note that the filename for upgrading the P2-UST user station for failsafe capability is "V5_1F9.hex" or later.

➢ *To verify the firmware version*

At the upgraded user station:

1. Activate the Paragon OSUI by pressing the hot key (default: **Scroll Lock**) twice quickly.
2. Press **F8** to display the user station's version information.

➢ *To recover user stations after upgrade failure*

As long as your user station has the failsafe capability, you can restore its function whenever the upgrade failure occurs.

1. Power cycle the user station.
2. Repeat the same upgrade process until the upgrade is finished successfully.

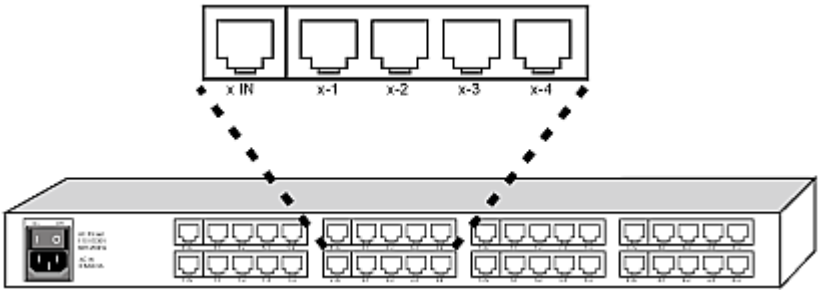
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P2-HubPac Upgrade Operation

In order to upgrade your P2-HubPac, it must be running at version 0C6 or later. To upgrade it, you must obtain a USB-to-RS485 cable (model: P2-IAPCIM) from Raritan. If you don't have the cable, please contact Raritan Technical Support. A special USB-to-RS485 driver is also needed and can be obtained from Raritan Technical Support.

Different from other Paragon II devices, the firmware upgrade of the HubPac requires the same upgrade operation to be performed 8 times on the same HubPac device. This is because the HubPac contains 8 five-port clusters and each cluster needs to be upgraded one after another.

The following diagram illustrates a five-port cluster, where x indicates the cluster number.



Firmware upgrade of the HubPac covers these major steps:

STEP 1: Get the latest firmware, driver and release notes
STEP 2: Connect one cluster of the HubPac to the PC
STEP 3: Install the USB-to-RS485 driver on the PC
STEP 4: Launch the Paragon Update utility (version 2.4.4 or later)
STEP 5: Repeat STEP 2 and STEP 4 for the other clusters

➢ *STEP 1: Get the latest firmware, driver and release notes*

1. Visit Raritan's ***Firmware Upgrades webpage*** (http://www.raritan.com/support/firmwareupgrades).
2. Locate and download P2-HubPac's firmware and associated release notes.

   The download procedure is similar to the procedure described in the section titled ***STEP 1: Download the Latest Firmware and Release Notes*** (see "General Update Procedure" on page 153) earlier in this chapter. Therefore, you can refer to that section for details.

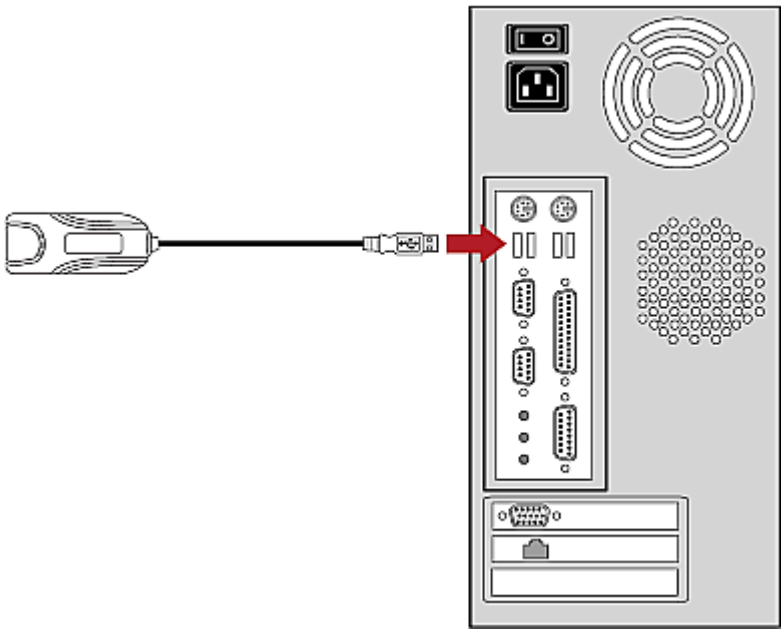
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3. Obtain the USB-to-RS485 driver from Raritan Technical Support.

➢ *STEP 2: Connect one cluster of the HubPac to the PC*

Now you can connect the HubPac, through the USB-to-RS485 cable, to the PC that is used to upgrade the HubPac.

1. Connect the USB connector of the USB-to-RS485 cable to one USB port of the PC.



2. Connect one CAT5 UTP cable to the RS232 (RS485) connector of the USB-to-RS485 cable.



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3. Connect the other end of the same CAT5 UTP cable to the server connection port of one cluster on the HubPac. The server connection port is the leftmost port on a cluster, and it is marked as **x IN**, where x is the cluster number.



Note: Raritan strongly recommends that you disconnect all Paragon switches from the HubPac to avoid any improper transmission of signals from Paragon switches during the firmware upgrade.

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➢ *STEP 3: Install the USB-to-RS485 driver on the PC*

The USB-to-RS485 cable connects the HubPac and the PC that is used to upgrade the HubPac. Prior to the upgrade, install the USB-to-RS485 driver obtained from Raritan Technical Support on the PC. This driver is supported in both of Windows XP and 2000.

Driver installation

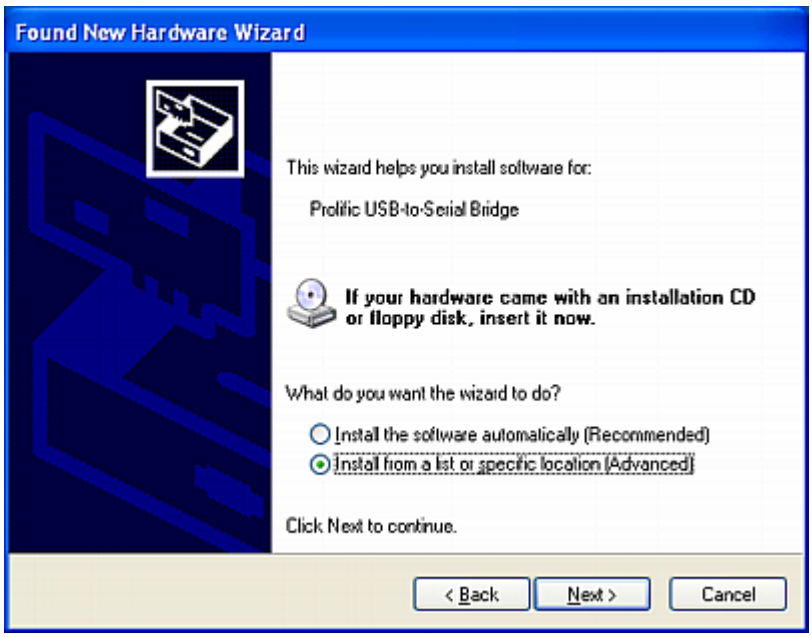
The Windows operating system (Windows XP or 2000) automatically detects the connected USB-to-RS485 cable, and the *Found New Hardware Wizard* dialog appears.

1. Select "Yes, this time only" and click **Next**.



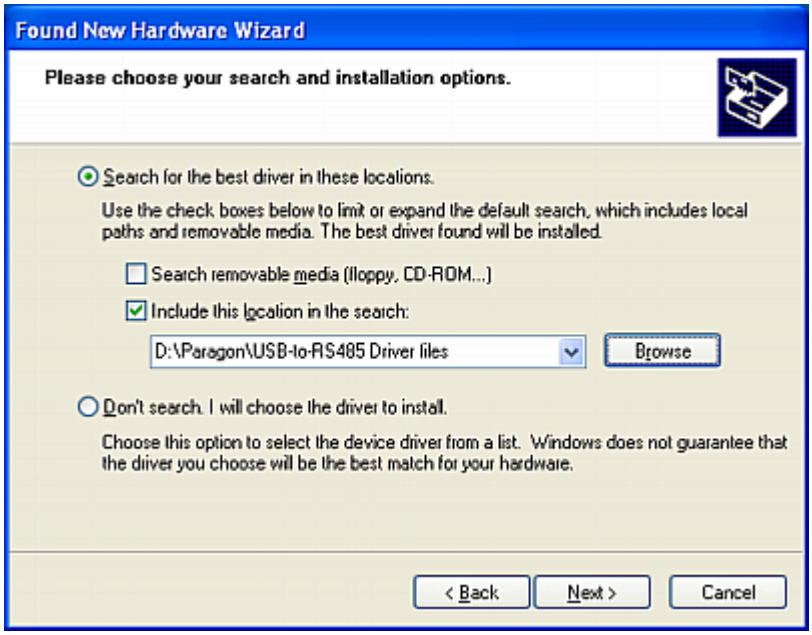
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2. Select "Install from a list of specific location (Advanced)" and click **Next**.



3. Select "Search for the best driver in their locations."

4. Select "Include this location in the search" and click **Browse** to navigate to the location where the USB-to-RS485 driver files are stored. Ensure the other option "Search removable media (floppy, CD ROM...)" is NOT selected.



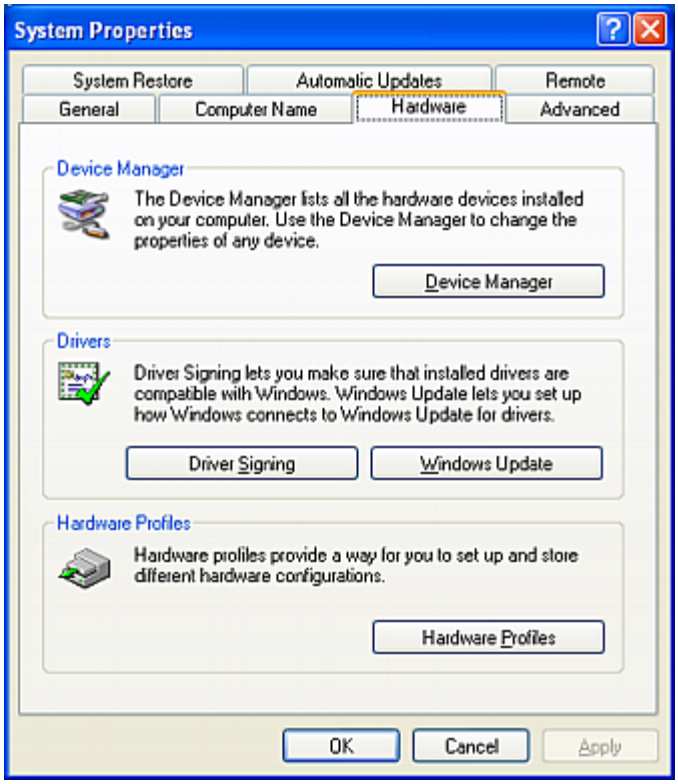
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5. Click **Next**.
6. If a *Hardware Installation* dialog appears, click **Continue Anyway** to continue the driver installation.
7. Click **Finish** to complete the driver installation.

Checking the COM port number

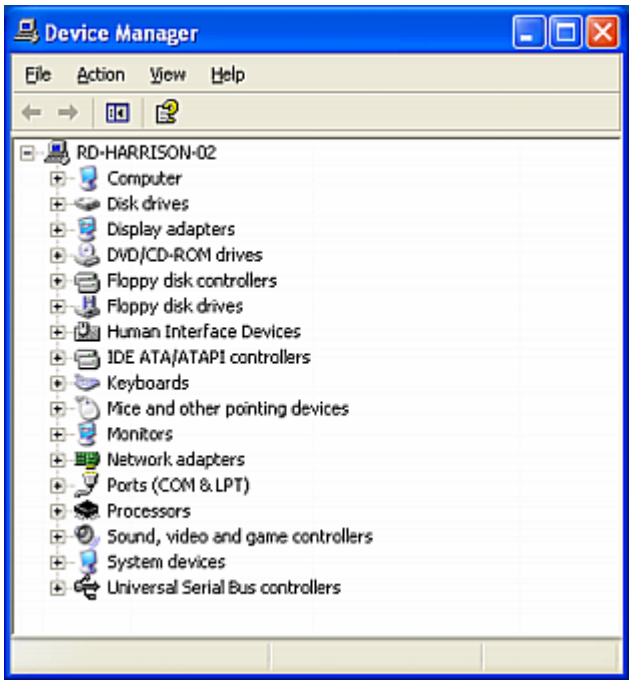
After connecting the USB-to-RS485 cable to the PC and installing the driver, the PC assigns a COM port to it. This port number is indispensable for the firmware upgrade. Therefore, follow the procedure below to retrieve the port information.

1. Choose **Start** > **Control Panel** > **System**. The *System Properties* dialog appears.
2. Click the **Hardware** tab.



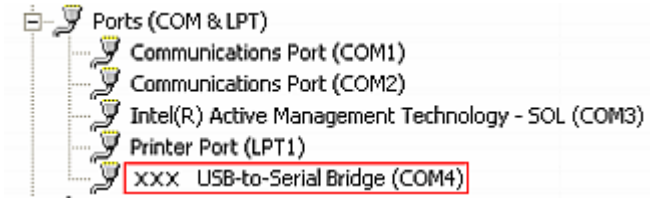
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3. Click **Device Manager**. The *Device Manager* window appears.



4. Click the plus (+) symbol beside **Ports (COM & LPT)** to expand the item.

5. Locate "USB to Serial Bridge (COMx)," where x is the COM port number that your PC assigns to the USB-to-RS485 cable. Write down the COM port number for later use.



Note: If you cannot find "USB to-Serial Bridge (COMx)," either the USB-to-RS485 driver has not been installed or the USB-to-RS485 driver installation was not successful. If this occurs, reinstall the USB-to-RS485 driver by following the procedure described in the previous section.

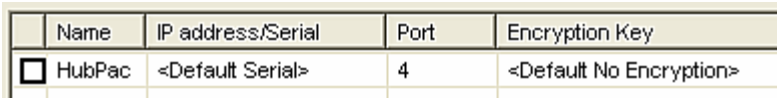
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➢ *STEP 4: Launch the Paragon Update utility (version 2.4.4 or later)*

After the hardware connection is completed, you can execute the Paragon Update utility to upgrade the firmware. Note that Paragon Update version 2.4.4 or later supports this firmware upgrade. Earlier versions do not have this capability. Please use the latest version of the Paragon Upgrade utility which you downloaded along with the HubPac firmware to ensure the success of the upgrade.

Prior to the firmware update with Paragon Update, ensure the P2-HubPac is powered ON.

1. Double click "ParagonUpdate_xxx.exe" (xxx represents the version). The *Paragon Update* window appears.
2. Specify the device information of the connected HubPac.
   a. Type a name for the HubPac in the **Name** field.
   b. Select <Default Serial> in the **IP adddress/Serial** field.
   c. Type the COM port number that your PC assigns to the HubPac in the **Port** field.



3. Select the checkbox (☑) beside the HubPac device.
4. Click **Load Hex File** and navigate to select the appropriate firmware file.
5. Click **Send To Paragon**.
6. Click **Yes**. The utility starts to upgrade the "connected cluster" of the HubPac.
7. When the connected cluster is upgraded successfully, the "Device Update Successful" message appears.

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Keep the *Paragon Update* window open if other clusters of the same HubPac are not upgraded yet. See the subsequent section for more information.

For more details of the Paragon Update utility, see **Paragon Manager User Guide**.

➢ *STEP 5: Repeat STEP 2 and STEP 4 for the other clusters*

Now you have upgraded one cluster of the HubPac by following the above procedure. To upgrade the other clusters, repeat the following procedure on each cluster:

1. Disconnect the Cat 5 cable attached with the USB-to-RS485 cable from the HubPac cluster on which the upgrade has finished.
2. Reconnect the Cat 5 cable to the server connection port of "another cluster" on the same HubPac, as described in **STEP 2: Connect one cluster of the HubPac** to the PC.
3. Click **Send to Paragon** in the *Paragon Update* window to upgrade the connected cluster. The procedure is the same as those described in **STEP 4: Launch the Paragon Update utility (version 2.4.4 or later)**.

Upon upgrading 8 clusters successfully, the P2-HubPac firmware update is complete.

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Appendix A Specifications

In This Chapter

Specifications of Paragon II Components.....172
Cat 5 Cable Guidelines.....176

Specifications of Paragon II Components

Paragon II switch	Description	Dimensions	Weight	Power
P2-UMT1664M	16 users x 64 server ports, expansion slot, stacking port, network port	17.32" (W) x 11.41" (D) x 3.5" (H) 440mm (W) x 290mm (D) x 89mm (H)	12.52 lbs 5.68 kg	100V/240V 50/60 Hz 0.6A
P2-UMT832M	8 users x 32 server ports, expansion slot, stacking port, network port	17.32" (W) x 11.41" (D) x 1.75" (H) 440mm (W) x 290mm (D) x 44mm (H)	9.83 lbs 4.46 kg	100V/240V 50/60 Hz 0.6A
P2-UMT442	4 users x 42 server ports, expansion slot, network port	17.32" (W) x 11.41" (D) x 1.75" (H) 440mm (W) x 290mm (D) x 44mm (H)	10.13 lbs 4.59 kg	100V/240V 50/60 Hz 0.6A
P2-UMT242	2 users x 42 server ports, network port	17.32" (W) x 11.41" (D) x 1.75" (H) 440mm (W) x 290mm (D) x 44mm (H)	10.03 lbs 4.54 kg	100V/240V 50/60 Hz 0.6A

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Paragon II Stacking Unit	Description	Dimensions	Weight	Power
P2-UMT1664S	64 expansion server ports for stacking with P2-UMT1664M	17.32" (W) x 11.41" (D) x 3.5" (H) 440mm (W) x 290mm (D) x 89mm (H)	11.99 lbs 5.44 kg	100V/240V 50/60 Hz 0.6A
P2-UMT832S	32 expansion server ports for stacking with P2-UMT832M unit	17.32" (W) x 11.41" (D) x 1.75" (H) 440mm (W) x 290mm (D) x 44mm (H)	8.99 lbs 4.08 kg	100V/240V 50/60 Hz 0.6A

Paragon II user station	Description	Dimensions	Weight	Power
P2-UST	Analog access point with PS/2, USB and Sun consoles	11.4″ (W) x 10.1″ (D) x 1.75″ (H) 290mm (W) x 255mm (D) x 44mm (H)	4.3 lbs 1.9 kg	100V/240V 50/60 Hz 0.6A
P2-EUST	Analog access point that provides enhanced video for PS/2, USB and Sun consoles	11.4″ (W) x 10.1″ (D) x 1.75″ (H) 290mm (W) x 255mm (D) x 44mm (H)	4.3 lbs 1.9 kg	100V/240V 50/60 Hz 0.6A
P2-EUST/C	Analog access point that provides enhanced video for USB consoles and a built-in card reader for authentication	11.4″ (W) x 10.1″ (D) x 1.75″ (H) 290mm (W) x 255mm (D) x 44mm (H)	4.3 lbs 1.9 kg	100V/240V 50/60 Hz 0.6A

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Specifications of Paragon II Components

Paragon II user station	Description	Dimensions	Weight	Power
P2-USTIP1	Remote digital access point for one KVM/IP user	17.2″ (W) x 11.46″ (D) x 1.72″ (H) 440mm (W) x 291mm (D) x 44 mm (H)	8.05 lbs (3.65 kg)	115V/230V 50/60 Hz 0.3A
P2-USTIP2	Remote digital access point for two KVM/IP users	17.2″ (W) x 11.46″ (D) x 1.72″ (H) 440mm (W) x 291mm (D) x 44 mm (H)	8.16 lbs (3.7 kg)	115V/230V 50/60 Hz 0.6A

Paragon II CIMS	Description	Dimensions	Weight
P2CIM-APS2	CIM for PS/2., provides automatic skew compensation with P2-EUST or P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.20 lb 0.07 kg
P2CIM-APS2-B	CIM for IBM BladeCenter with PS/2, provides automatic skew compensation with P2-EUST or P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.20 lb 0.07 kg
P2CIM-ASUN	CIM for Sun, provides automatic skew compensation with P2-EUST or P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.13 lb 0.06 kg

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Paragon II CIMS	Description	Dimensions	Weight
P2CIM-AUSB	CIM for USB, provides automatic skew compensation with P2-EUST or P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.20 lb 0.07 kg
P2CIM-AUSB-C	CIM for USB, provides automatic skew compensation, and emulates a card reader when used with P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.20 lb 0.07 kg
P2CIM-AUSB-B	CIM for IBM BladeCenter with USB, provides automatic skew compensation with P2-EUST or P2-EUST/C	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.20 lb 0.07 kg
P2CIM-PWR	CIM for Integrated Power Control	1.3″ (W) x 3.0″ (D) x 0.6″ (H) 32mm (W) x 77.4mm (D) x 15.6mm (H)	0.066 lb 0.03 kg
P2CIM-APS2DUAL	Doubles the number of users that may access a specific PC or server, and provides automatic skew compensation with P2-EUST or P2-EUST/C	1.42″ (W) x 3.39″ (D) x 0.65″ (H) 36mm (W) x 86mm (D) x 16.5mm (H)	0.17 lb 0.08 kg

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Paragon II CIMS	Description	Dimensions	Weight
P2CIM-AUSBDUAL	Doubles the number of users that may access a specific PC or server, and provides automatic skew compensation with P2-EUST or P2-EUST/C	1.42" (W) x 3.39" (D) x 0.65" (H) 36mm (W) x 86mm (D) x 16.5mm (H)	0.17 lb 0.08 kg

Cat 5 Cable Guidelines

Use only straight-through-pinned four-pair (eight-wire) Cat 5 unshielded twisted pair (UTP) cables, terminated with standard RJ45 plugs, for the Cat 5 cabling links in your Paragon system.

If your existing Cat 5 site-wiring system meets these requirements, feel free to send the signals through your site's patch panels, existing wiring, and so on, but you should keep the number of patches and splices to a minimum to avoid degrading the video signals. Maximum end-to-end cabling distance from any server to any user station should not exceed 1000 feet (304 m).

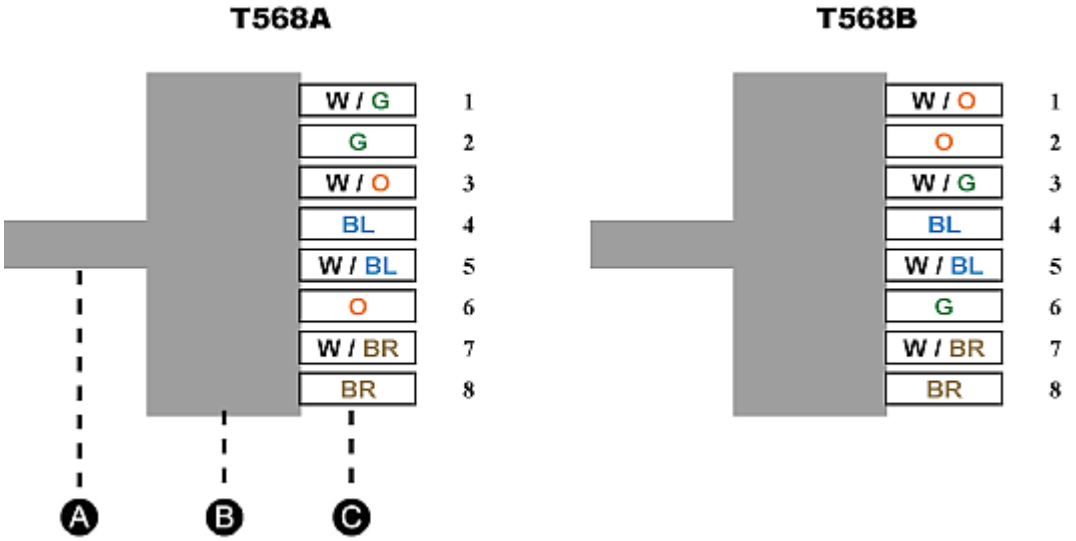
Please note that although users and servers can be located up to 1000 feet apart, for optimal video quality, limit cable length between the user station and CIM to less than 100 feet (30.5 m). For good video quality, limit cable length between the user station and CIM to less than 500 feet (152 m).

Looking into an RJ45 socket on any Paragon component, or looking at the cable plug from behind with the tab on the bottom, Pin 1 should be on the left and Pin 8 on the right, and the wires should be arranged this way, as per the TIA-568B standard:

Pin	Color	Function	Pair
1	White/Orange	TX (transmit signals)	Pair 2
2	Orange/White	RX (receive signals)	Pair 2
3	White/Green	TX	Pair 3
4	Blue/White	RX	Pair 1

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Pin	Color	Function	Pair
5	White/Blue	TX	Pair 1
6	Green/White	RX	Pair 3
7	White/Brown	TX	Pair 4
8	Brown/White	RX	Pair 4



Component	
A	Cat 5 cable
B	RJ45 connector
C	Pin

Color	
W	White
G	Green
O	Orange
BL	Blue
BR	Brown

Note: Use the configuration for T568A OR the configuration for T568B.

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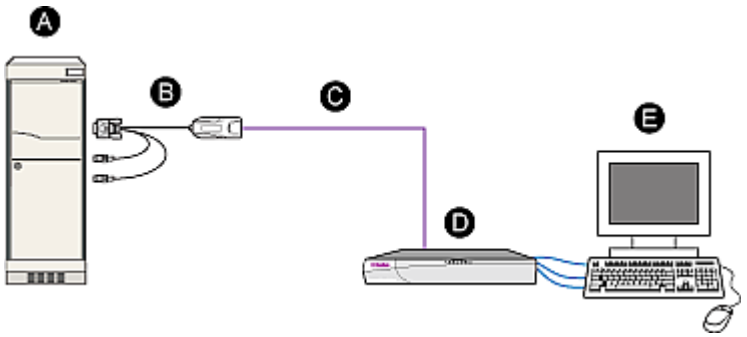
Appendix B User Station Direct Mode

A Paragon user station set to Direct Mode can be directly connected to a Paragon CIM, either temporarily for emergency "crash cart" access or permanently for non-switched extension purposes, without having to go through a Paragon Base Unit.

➢ *To create a "Direct Mode" connection*

1. If you have not already done so, follow the instructions in steps 5A and 5B of ***Installing a Paragon System with a Single Matrix Switch*** (on page 24) to attach the CIM to the server.
2. If you have not already done so, plug in and power on your server or computer.
3. Power off the user station.
4. Run Cat 5 cabling directly between the user station and the CIM.
5. Power on the user station. It should display a "DIRECT Mode: CIM connected" message on the screen.

While the user station is in Direct Mode, if the Cat 5 cabling between the user station and the CIM becomes disconnected at any point for more than three to four seconds, the user station will exit Direct Mode. To re-establish Direct Mode, repeat the above steps.



A	Server
B	CIM
C	Cat 5 cable
D	User station
E	Monitor, keyboard and mouse (connected to the user station)

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➢ *To return to normal operation from "Direct Mode"*

1. Power OFF the user station.
2. Disconnect the opposite end of the Cat 5 cabling from the CIM.
3. Connect the opposite end of the Cat 5 cabling to a user port of a Paragon Base Unit.
4. Run other Cat 5 cabling from the channel port of a Paragon Base Unit to the CIM.
5. Power ON the user station.

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Appendix C Tiering and Compatibility

In This Chapter

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Double Diamond Configuration.....184

Tiering Matrix

		BASE TIER			
		UMT x HW2	UMT x HW3 with 3A3 Firmware	UMT x HW3 with 3.2 Firmware[2]	P2-UMT1664M/ 832M/442/242
Upper/Lower Tiers	P2-UMT1664M / 832M/442/242				✓
	P2-UMT1664S/832S 1			Stack[1]	Stack[1]
	UMT x HW3 with 3.2 Firmware[2]			✓	✓
	UMT x HW3 with 3A3 Firmware		✓	✓	✓
	UMT x HW2	✓	✓	✓	✓
	UKVMSPD Z-CIM	✓	✓	✓	✓
	P2ZCIM			✓	✓

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		BASE TIER			
		UMT x HW2	UMT x HW3 with 3A3 Firmware	UMT x HW3 with 3.2 Firmware[2]	P2-UMT1664M/ 832M/442/242
Upper/Lower Tiers	AUATC	✓	✓	✓	✓
	IBMX-330	✓	✓		
	HubPac	✓	✓		✓
	P2-Hubpac			✓	✓
	Blade CIMs				✓

As a general rule, the very latest hardware and firmware should reside on the lowest tier (that is, Base Unit).

[1] Stacking Unit has no user ports so it cannot be cascaded as an upper tier to a lower tier switch.

[2] UMT x HW3 has no memory card slot, so maximum servers/expandability will be 1800 servers.

Note: The easiest way to determine if the hardware version of your Paragon I unit is HW3 is to check the number of its stacking ports on the rear side. If there is only one stacking port, the hardware version is HW3.

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Compatibility Matrix

	Paragon I			Paragon II
Feature/ Component	**HW2/2Z**	**HW3 (3A3 Firmware)**	**HW3 (P2 Firmware)**	**HW4M or above**
Y-CIMs	Yes	Yes	Yes	Yes
C, P, PD CIMs	Yes	Yes	Yes	Yes
UKVMSPD Z-CIMs	Yes	Yes	Yes	Yes
P2ZCIMs	No	No	Yes	Yes
P2-EUST or P2-EUST/C	No	No	Yes (UMT-3E0 and later)	Yes (UMT-3E0 and later)
P2-UST (V5)	No	No	Yes (UMT-3B0K and later/UST-1A7 and later)	Yes
UST1 (V1)	Yes (with 4L9P Firmware)	Yes (with 4L9P Firmware)	Yes (with 5J1 Firmware/ FPGA-0C and later)	Yes (with 5J1 Firmware/ FPGA-0C and later)
P2-USTIP1/2	No	Yes	Yes	Yes
Stacking ready	No	No	Yes	Yes
Hubpac8-RK	Yes	Yes	No	No
P2-Hubpac	No	No	Yes	Yes
Paragon Manager	No	No	Yes	Yes via LAN
Network Firmware upgrade	No	No	No	Yes
Integrated Power Control	No	No	Yes	Yes
Maximum Servers - 1664	N/A	1,800	1,800	10000 with optional memory card

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	Paragon I			Paragon II
Feature/ Component	**HW2/2Z**	**HW3 (3A3 Firmware)**	**HW3 (P2 Firmware)**	**HW4M or above**
Maximum Servers - 832	1,800	1,800	1,800	10000 with optional memory card
Maximum Servers - 442	1,800	1,800	1,800	10000 with optional memory card
Maximum Servers - 242	1,800	1,800	1,800	1,800
Maximum Servers - 2161	1,800	1,800	1,800	N/A
Maximum User Names	127	127	127	512 with optional memory card
PCCI compatibility	Yes - as a 2nd tier	Yes - as a 2nd tier	No[1]	No[1]

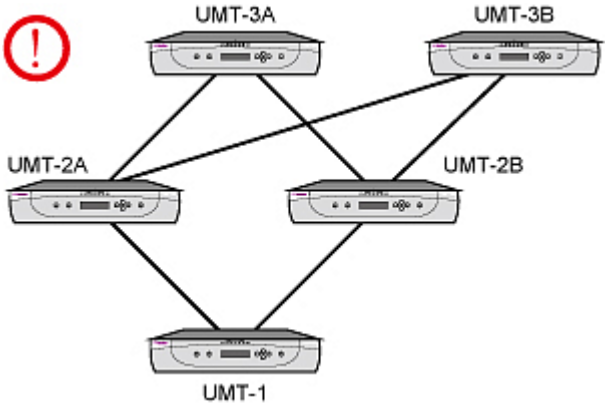
[1] PCCI compatibility is not available for Paragon versions 4.2 and 4.3 only, but remains available for earlier versions.

Note: Only one Stacking Unit can be connected per Paragon I HW3 switch.

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Double Diamond Configuration

Officially, the Double Diamond configuration is NOT a Raritan-approved solution if Stacking Units or P2-HubPac is included in the configuration. Therefore, it is highly recommended to avoid this configuration especially when using Paragon II Stacking Units or P2-HubPac.



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Appendix D Paragon II Rack Mount

Paragon II user stations and most matrix switches can be mounted in 1U (1.75", 4.4 cm) of vertical space in a standard 19" equipment rack, except that P2-UMT1664M switch shall be mounted in 2U (3.5", 8.9 cm) of space. To rackmount a Paragon switch, use the brackets and screws that came with the unit; to rackmount a user station, use Raritan's RUST-LM304 rackmount kit. (If you lose or damage a switch's brackets, replace them with the RUMT-1U-LM304 kit for any 1U switch or RUMT-2U-LM304 for a P2-UMT1664M.) You can mount a Paragon switch or user station facing the front of the rack or facing the rear.

In This Chapter

Forward Mount 185
Rear Mount 186

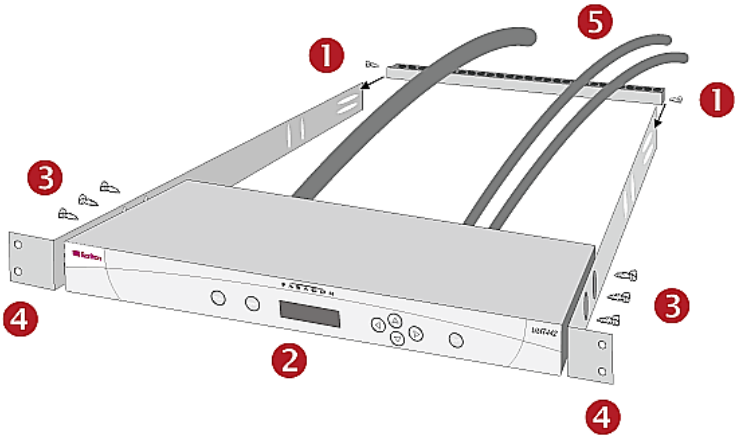
Forward Mount

The steps correspond to the numbers in the following diagrams.

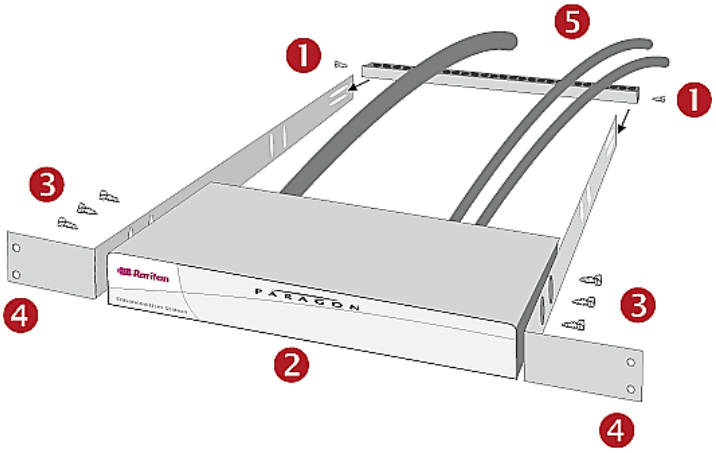
1. Secure the cable-support bar to the back end of the side brackets using two of the included screws.
2. Slide the user station or matrix switch between the side brackets, with its rear panel facing the cable-support bar, until its front panel is flush with the “ears” of the side brackets.
3. Secure the user station or switch to the side brackets using the remaining included screws (three on each side).
4. Mount the entire assembly in your rack and secure the side brackets' ears to the rack's front rails with your own screws, bolts, cage nuts, and so on.
5. When you attach cables to the connectors on the rear panel of the user station or switch, drape them over the cable-support bar.

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Front rackmount of a Paragon switch



Front rackmount of a Paragon user station



Rear Mount

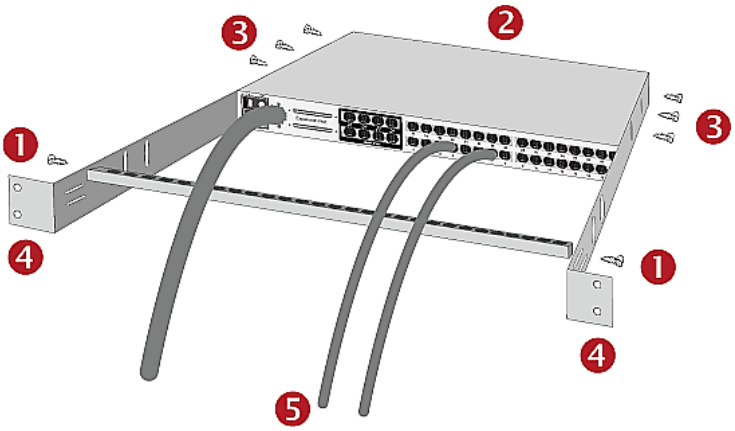
The steps correspond to the numbers in the following diagrams.

1. Secure the cable-support bar to the front end of the side brackets, near the side brackets' “ears,” using two of the included screws.
2. Slide the user station or matrix switch between the side brackets, with its rear panel facing the cable-support bar, until its front panel is flush with the back edges of the side brackets.
3. Secure the user station or switch to the side brackets using the remaining included screws (three on each side).

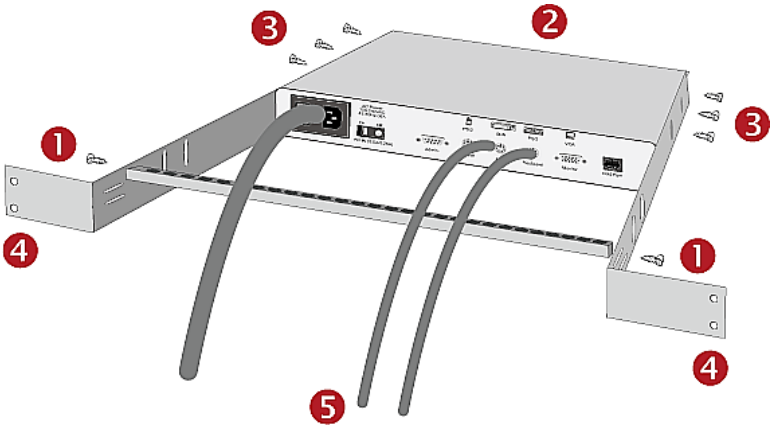
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4. Mount the entire assembly in your rack and secure the side brackets' ears to the rack's front rails with your own screws, bolts, cage nuts, and so on.
5. When you attach cables to the connectors on the rear panel of the user station or switch, drape them over the cable-support bar.

Rear rackmount of a Paragon switch



Rear rackmount of a user station



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Appendix E Connecting Serial Devices to Paragon II System

In This Chapter

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Installing a Serial CIM 189
Operating a Serial CIM 191

Introduction to Serial CIMs

To connect an ASCII serial device, LAN/WAN component or a server through a serial port (RS-232) to the Paragon II system, use one of our serial CIMs. They are P2CIM-SER, P2CIM-SER-EU and AUATC. These CIMs can emulate an ASCII terminal and convert the serial data from the ASCII device to VGA video (800x600x60) and PS/2 keyboard signals. This conversion allows users to access and operate any ASCII serial device connected to the Paragon II system.

The table lists the port difference of the serial CIMs:

Model	Serial port	Local port
P2CIM-SER	✓	
P2CIM-SER-EU	✓	
AUATC	✓	✓

Usually the use of P2CIM-SER or P2CIM-SER-EU is enough to satisfy your needs to access a serial device, unless you need to connect a local PS/2 or Sun keyboard and a VGA monitor to the device. In that case, choose AUATC, which provides a local port.

Here are some useful features of serial CIMs:

- Interoperates with an ASCII device in the On Line Mode as if the device were attached to a text terminal
- Edits, copies, marks, and/or resends data to the ASCII serial device or server in the Buffer Edit Mode
- Maintains eight pages of data in a circular buffer
- Provides 12 programmable keys for frequently-used character strings or commands

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Installing a Serial CIM

Take these steps to attach a serial CIM to the serial port of a serial device or server and to your Paragon II system.

Installing P2CIM-SER or P2CIM-SER-EU

The installation of P2CIM-SER or P2CIM-SER-EU is quite easy.

1. Connect the CIM to a serial port on the serial device or server, using its serial DB9 connector.
2. Connect the CIM to the Paragon system using a standard Cat 5 UTP cable.
3. Connect the CIM's USB connector to a powered USB port, or to a separately available Raritan PWR-SER-4 power adapter, to obtain power.

For additional information on the installation, see *Paragon and Dominion KX Serial Device CIM User Guide*. This user guide can be downloaded from Raritan's website by linking to ***the Paragon II section of the Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation/paragon-II/). and then clicking the **Terminal Converter User Guide**.

Installing AUATC

1. Run an appropriate cable from AUATC's DB25 female DTE connector to the device's serial port. The type of cable will depend on what type of connector the port is and whether it's pinned as DTE (for a data source/destination such as a server) or DCE (for a data-communicating device such as a modem). Here are the product codes of some cables we recommend if the port is:
   - DB9 male DTE (most PCs, some routers, and so on)
   - DB25 male DTE (some older PCs, routers, and so on)
   - DB25 female DCE (many external modems, and so on)

   If the device has some other type of serial port, call Raritan Technical Support.
2. If you need temporary “crash cart” access or permanent local control, you can set up a “local user station” (consisting of a keyboard and VGA monitor only) to AUATC. The keyboard can be either PS/2 or Sun type; a Sun keyboard will require a special setting in the Setup Screen.

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To set up a “local user station,” plug a PS/2 keyboard into AUATC's 6-pin mini-DIN connector, or a Sun keyboard into its 8-pin mini-DIN connector. Then plug a VGA monitor into AUATC's HD15 connector.

Note: This local station will contend for keyboard control with the remote user stations attached to Paragon user stations based on a fixed one-second activity timeout. As soon as there has been no keyboard activity from the local station for one second, a remote station can take keyboard control, and vice versa.

3. Plug in and turn on the device. If possible, set it to communicate at 9600 bps, 8 data bits, no parity, and 1 stop bit. (These don't have to be the permanent serial settings, but the device must be set this way to establish initial communication with AUATC; later you can configure both the device and AUATC to better settings. If the device can't be configured for these settings, you'll need to temporarily attach a server or other device that can be.)
4. Plug AUATC's power supply into AUATC and a working AC outlet. If AUATC is installed and operating properly, AUATC's green LED will start blinking: once per second while the CIM is idle, more quickly while it's passing data in either direction.
5. Connect one end of a Cat 5 UTP cable to the RJ45 port on AUATC. Connect the other end of the cable to RJ45 channel port #1 on the back of one of your Paragon Base Units, or to the RJ45 port on the back of a user station if you want Direct Mode access (see ***User Station Direct Mode*** (on page 178) for additional information).

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Operating a Serial CIM

P2CIM-SER or P2CIM-SER-EU

These CIMs provide different communication modes for you to operate the ASCII serial device.

- **On Line**—Communicating with an ASCII device. The terminal screen area displays the interactions with the ASCII device.
- **Help**—Help screen displayed (Pressing **Alt+F1** displays the Help screen.)
- **Set Up**—Setup screen displayed. (Pressing **Alt+F2** or **Alt+F3** enters set-up mode.)
- **Buffer Edit**—Buffer displayed. (Pressing **Alt+F4** enters buffer review/edit mode.)

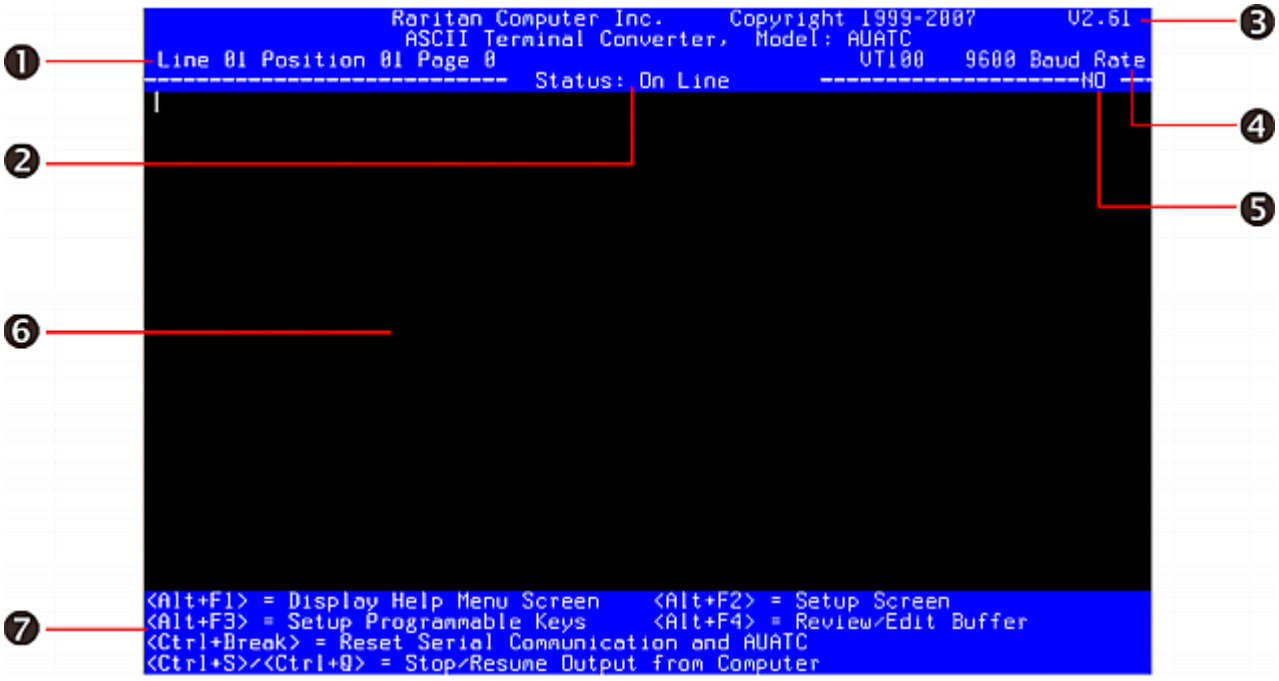
Raritan provides a detailed user guide about the operation and configuration of the two CIMs. Please see *Paragon and Dominion KX Serial Device CIM User Guide* for additional information. This user guide can be downloaded from Raritan's ***website*** (see Serial Device CIM User Guide - http://www.raritan.com/_downloads/pdfs/products/P2CIM-SER%20User%20Guide.pdf).

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AUATC

Screen Layout

AUATC produces eight-color video at 800 x 600 resolution, which can accommodate 32 lines of 80 text characters each. A typical ASCII terminal uses 24 lines, so AUATC uses the eight extra lines to provide system-status and help information. These eight lines are divided so that four are at the top of the screen and four are at the bottom.



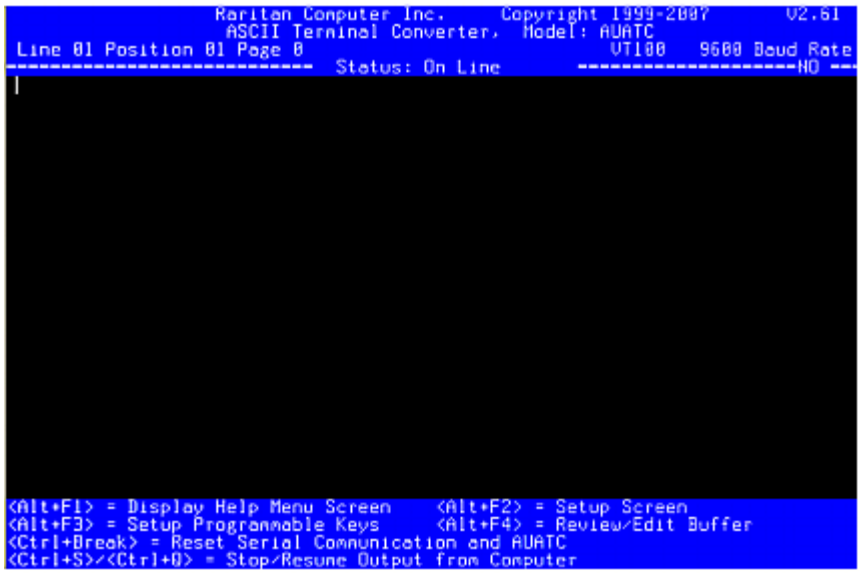
1	Cursor position and buffer page number
2	Communications status. The status can be one of the following: **On Line**—Communicating with an ASCII device. The terminal screen area displays the interactions with the ASCII device. **Help**—Help screen displayed (Pressing **Alt+F1** displays the Help screen.) **Set Up**—Setup screen displayed. (Pressing **Alt+F2** or **Alt+F3** enters the set-up mode.) **Buffer Edit**—Buffer displayed. (Pressing **Alt+F4** enters the buffer review/edit mode.)
3	Firmware version
4	Terminal type and baud rate

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5	Access indicator. It indicates one of the following: **LOC**—Local port is active, either PS/2 keyboard or Sun keyboard **RMT**—Remote port (RJ45) is active. **NO**—No port is active.
6	Terminal screen area (24 lines x 80 characters)
7	Command keys that can be used with the screen currently displayed

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On Line Mode



When you operate AUATC in On Line Mode, the main screen area displays your interactions with the ASCII device, as if it were the screen of an ASCII terminal. Simultaneously, the data stream being output by the device is stored in an eight-page circular buffer, so you can not only access and operate the device, but you can also review its historical data as needed. Because the buffer is circular, it always retains the most recent eight pages of data from the device; the newest data will overwrite the oldest data.

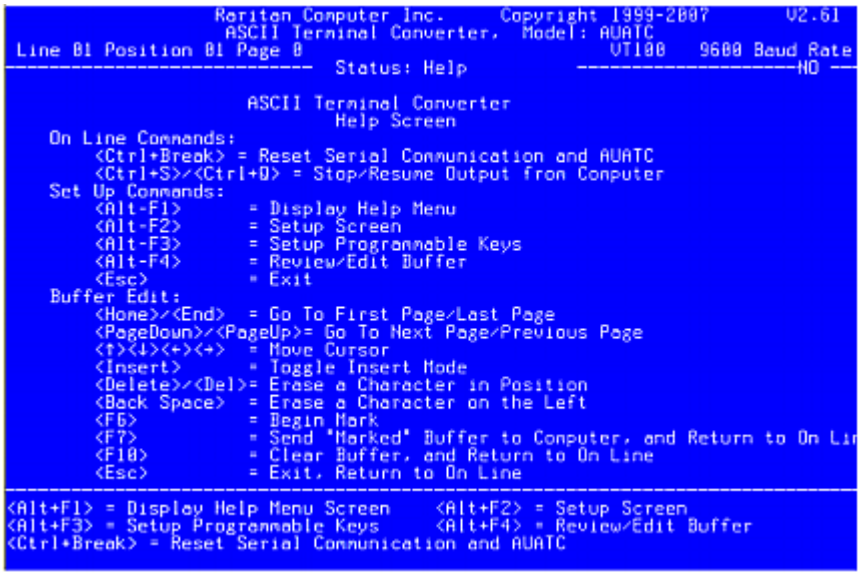
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Conveniently, you may program any of the PC keyboard's twelve function keys to trigger your most-often-used data-stream commands. Pressing any key set this way causes Paragon II to send the corresponding command to the device. During the online session, you can also send any of the following key combinations (press and hold **Ctrl** or **Alt**, press and release the command key, and release **Ctrl** or **Alt**) to control your communication with the device or to access AUATC's help and setup screens:

- **Ctrl** + **Break** (the **Pause/Break** key next to the **Scroll Lock** key): Resets both AUATC and the serial communication with the device.
- **Ctrl** + **S** (not case-sensitive): Sends a command to the device to temporarily stop it from sending any data; until the flow is allowed to resume, all output data will be queued by the device.
- **Ctrl** + **Q** (not case-sensitive): Sends a command to allow the device to resume sending data after being halted by the **CTRL** + **S** command.
- **Alt** + **F1**: Displays the Help screen.
- **Alt** + **F2**: Displays the Setup screen.
- **Alt** + **F3**: Displays the Set Up Programmable Keys screen.
- **Alt** + **F4**: Switch to Buffer Edit Mode.

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Help Mode



Buffer Edit Mode

AUATC stores the most recent eight pages of data from the attached ASCII device in a circular buffer. After switching the AUATC from On Line Mode to Buffer Edit Mode by pressing **Alt** + **F4**, you can review the contents of the buffer by moving the cursor with the arrow keys, **Page Up** , **Page Down** , **Home**, and **End**. You can also edit the data in the buffer with **Insert**, **Delete**, **Backspace**, and the other keys listed in the Help screen.



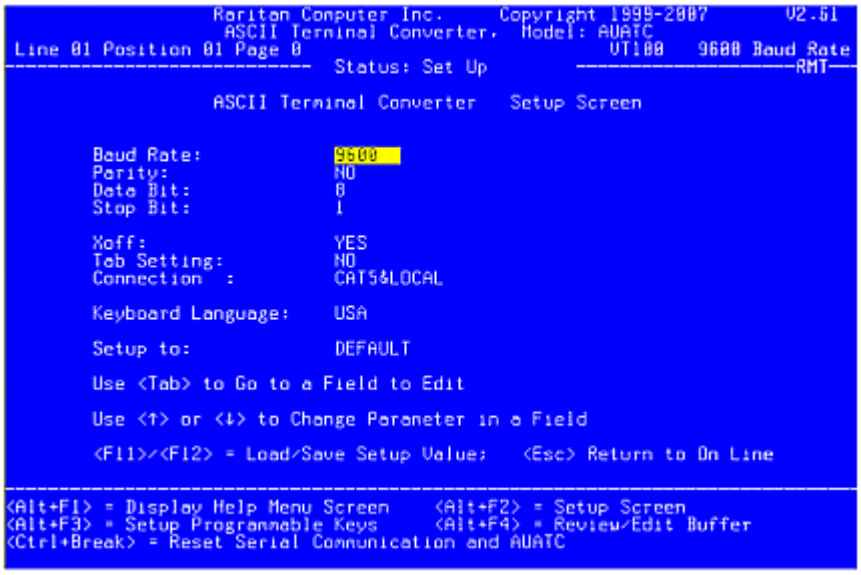
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Configuring AUATC

Press **Alt** + **F2** to activate the Setup Screen, where you can select your desired serial-communication parameters (such as baud rate.) and local/remote output. The initial parameters will always start at their factory defaults, so make sure that the serial port or device to which AUATC is attached is temporarily configured for 9600 bps, 8 data bits, no parity, and 1 stop bit. (If the port or device cannot support all of these settings, you must temporarily attach one that can.) Also, if you want to perform initial configuration with a "local user station," it must consist of a PS/2 keyboard and a VGA monitor.

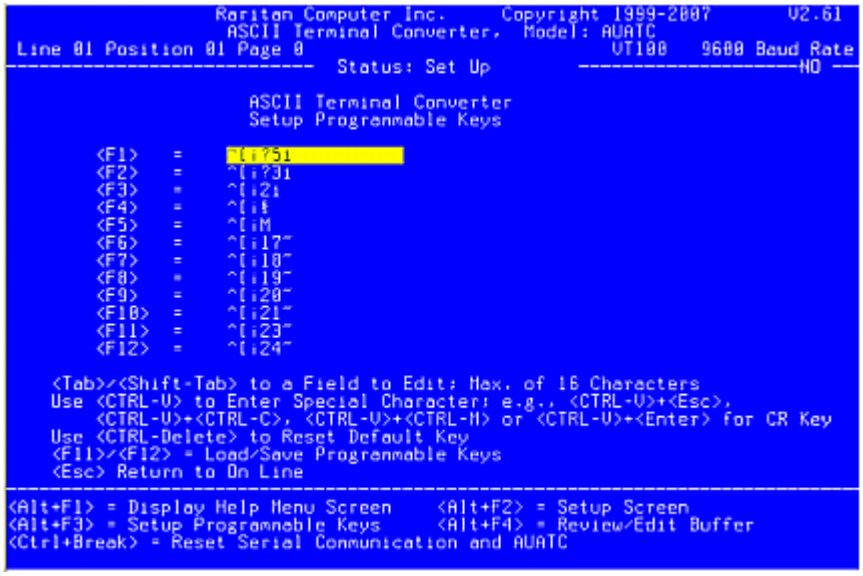
Available data-rate ("Baud Rate") settings are 2400, 4800, 9600, and 19,200 bps. You can select even, odd, or no ("None") parity; 7 or 8 data bits; and 1 or 2 stop bits (but 7 data bits requires 2 stop bits). The terminal type is fixed at VT100.

For local/remote connection, choose **CAT 5&LOCAL** if you connect the AUATC both to a local monitor via the VGA HD15 connector and to Raritan's Paragon switch via the Cat5 port (RJ45); choose **LOCAL** if the unit is connected to a local monitor only.



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To program any of your keyboard's twelve function keys with commands or data items you frequently have to send the device, activate the Set Up Programmable Keys screen by pressing **Alt** + **F3**. Once a string (with a maximum length of sixteen characters) has been assigned to a key, pressing that key while in On Line Mode will send the entire string to the device.



Troubleshooting AUATC

If you do not get a device prompt:

1. If AUATC's screen is displayed on your monitor with the top and bottom help windows, make sure that it indicates **On Line** status. If not, press **Esc** to return to On Line Mode.
2. Make sure that AUATC and the attached device are both receiving power. AUATC's power supply should be securely connected to both AUATC and a working outlet. Its LED (next to the 6-pin mini-DIN PS/2 mouse connector) should flicker quickly if data is being transmitted and blink once per second at other times.
3. Make sure that the cable between AUATC and the device is securely attached at both ends. This must be the null-modem cable included with AUATC or one just like it.
4. Make sure that the serial-communication settings of AUATC match those of the device. Press **Alt** + **F2** to check AUATC's settings in its Setup Screen.

If you do not get any video or the video is degraded or distorted:

1. Make sure that all of your cables are connected securely.

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2. Make sure that your monitor can handle 800 x 600 video resolution at a refresh rate of 60 Hz.
3. If you are at a remote user station's monitor, make sure that you are not running Cat 5 cable too far end-to-end. The total length of Cat 5 cabling from the serial device to the monitor should not be greater than 1000 feet (304 m).

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Appendix F Extra Keyboard/Mouse Information and Settings

In This Chapter

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Kensington Mouse Type Settings 206
Macintosh Key Mapping 208

Emulating Sun Keys with a PS/2 Keyboard

We recommend that you use a Sun keyboard and mouse at your user stations if there are any Sun servers in your Paragon system. If you must use a PS/2 keyboard to control a Sun server attached to your Paragon system, Paragon is able to perform some keyboard emulation. To emulate most of the special "extra" keys that are present on Sun keyboards but not on PS/2 keyboards, first press and hold either **Scroll Lock** or the combination of **Ctrl** and **Alt**; these function as permanent "Sun keystroke hot keys." (If **Scroll Lock** is your OSUI hot key or previous-channel hot key, you will want to use **Ctrl** + **Alt**.) Then press the corresponding character on the PS/2 keyboard:

While pressing a character hotkey, press this PS/2 keyboard key...	...to generate this Sun keyboard keystroke:
F2	Again
F3	Props
F4	Undo
F5	Front
F6	Copy
F7	Open
F8	Paste
F9	Find
F10	Cut
F11	Help
F12	Mute

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While pressing a character hotkey, press this PS/2 keyboard key...	...to generate this Sun keyboard keystroke:
* on the keypad	Compose
+ on the keypad	Vol +
- on the keypad	Vol -

The one exception to this procedure is the Sun keyboard's Stop character. To generate Stop with a PS/2 keyboard, hold down the **Pause/Break** key and press the letter **A**.

Changing the Keyboard Layout Settings

Different language versions of keyboards are provided for use in different countries. For example, the layout of a French keyboard is different from that of a US English keyboard. The Paragon CIMs enable you to change the keyboard's layout setting to match your keyboard if you are not using a US English keyboard (the factory default). Please note that different CIMs come with different keyboard setting methods so you should change your keyboard setting based on the CIMs.

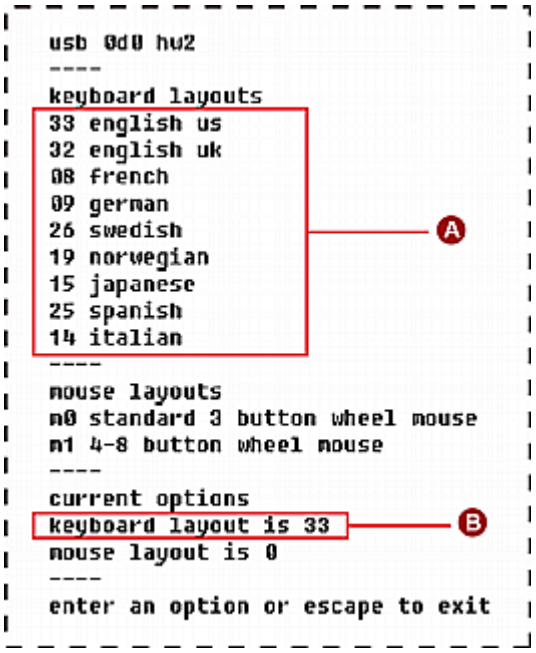
USB Keyboard Layout Settings (P2CIM-AUSB, P2CIM-AUSB-B or P2ZCIM-USB)

When you attach the server with a USB CIM and your keyboard is not US English (code *33*), you will have to change the keyboard layout setting. You need to press different hot key combinations to enter the setting mode based on your CIM types.

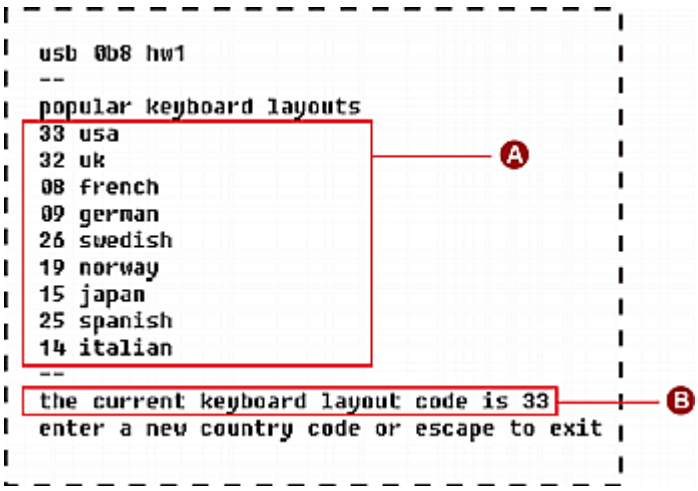
1. Select the channel of the desired server in the Selection Menu, and press **Enter**.
2. Activate a text editor, such as Notepad, on the server.
3. Press Left **Ctrl** + **NumLock** to enter the setting mode. A message similar to the following appears in the text editor.

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- **For P2CIM-AUSB:**



- **For P2CIM-AUSB-B or P2ZCIM-USB:**



A	Frequently-used keyboard layout codes
B	Current keyboard layout is US English (code 33)

4. Press the appropriate keyboard layout code (see the following table for codes).
5. Either press **Esc** to exit the setting mode or close the text editor.

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Generic Keyboard Layout Code

Language	Layout code	Language	Layout code
Arabic	01	Netherlands	18
Belgian	02	Norwegian	19
Canadian-Bilingual	03	Persian	20
Canadian-French	04	Poland	21
Czech Republic	05	Portuguese	22
Danish	06	Russia	23
Finnish	07	Slovakia	24
French	08	Spanish	25
German	09	Swedish	26
Greek	10	Swiss/French	27
Hebrew	11	Swiss/German	28
Hungary	12	Switzerland	29
International (ISO)	13	Taiwan	30
Italian	14	Turkish	31
Japan	15	UK	32
Korean	16	USA (Default)	33
Latin American	17	Yugoslavia	34

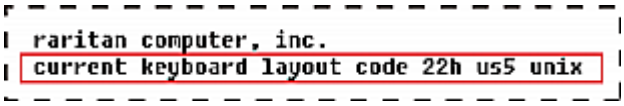
Sun Keyboard Layout Settings (P2CIM-SUN or P2CIM-ASUN)

When you connect a Sun keyboard to the user station to access a Sun server which is attached with P2CIM-SUN or P2CIM-ASUN, you must change the Sun keyboard's layout setting.

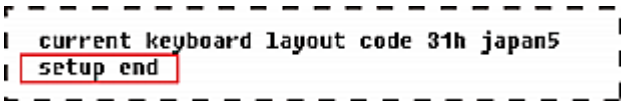
1. Select the channel of the desired Sun server in the Selection Menu, and press **Enter**.
2. Activate a text editor on the server.

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3. Press *Left* **Ctrl** + **Delete** to enter the setting mode. A message similar to the following appears in the text editor. The text inside the red rectangle indicates the current keyboard layout is set to US5 Unix (code 22).



4. Press the appropriate keyboard layout code (see the table in the end of this section for codes).
5. When you see a "setup end" message similar to the following, the setting is changed successfully.



6. Either press **Esc** to exit the setting mode or close the text editor.

Sun Keyboard Layout Code

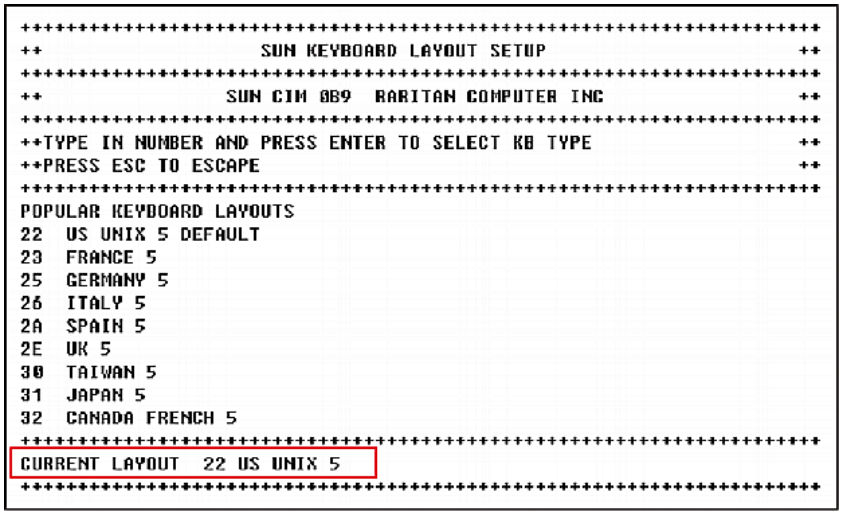
Country	Layout code	Country	Layout code
Canada Fr5	32	Netherland5	27
Canada Fr5 Tbits5	3F	Norway5	28
Czech5	35	Poland5	34
Denmark5	24	Portugal5	29
Estonia5	3A	Russia5	36
France5	23	Spain5	2A
Germany5	25	Sweden5	2B
Greece5	39	Switzer Fr5	2C
Hungary5	33	Switzer Ge5	2D
Italy5	26	Taiwan5	30
Japan5	31	Turkey5	38
Korea5	2F	UK5	2E
Latvia5	37	US5	21
Lithuania5	3B	US5 Unix (Default)	22

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Sun Keyboard Layout Settings (P2ZCIM-SUN)

When you connect a Sun keyboard to the user station to access a Sun server which is attached with P2ZCIM-SUN, you may need to change the Sun keyboard's layout setting.

1. Select the channel of the desired server in the Selection Menu, and press **Enter**.
2. Activate a text editor, such as Notepad, on the server.
3. Press *Left* **Ctrl** + **NumLock** to enter the setting mode. A message similar to the following appears in the text editor. The text inside the red rectangle indicates the current keyboard layout is set to US5 Unix (code 22).



4. Press the appropriate keyboard country code (see the above "Sun Keyboard Layout Code" table for codes).
5. Either press **Esc** to exit the setting mode or close the text editor.

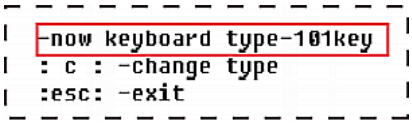
Switching between 101 and 102 keys (P2CIM-APS2)

In some operating systems, the pipe key (|) on the 102-key keyboard is not recognized and cannot be displayed on the screen. To make this key recognized, you should change the keyboard setting from 101-key to 102-key type. This function is supported by P2CIM-APS2 with firmware version 3C0 or later.

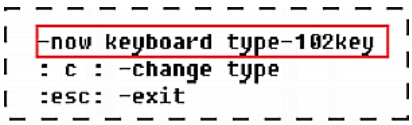
1. Select the channel of the server where the pipe key is not recognized, such as a Unix server.
2. Activate a text editor on the server.

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3. Press *Left* **Ctrl** + **Delete** to enter the setting mode. The following message appears in the text editor, indicating that you can change the keyboard setting now. The text "`-now keyboard type-101key`" means the current keyboard layout is 101-key version.



4. Press **c** to change the keyboard type.
5. **(Optional)** You can press *Left* **Ctrl** + **Delete** again to verify whether the current keyboard setting is 102-key. If the message shows "`now keyboard type-102key`"in the text editor, the current setting is 102-key keyboard.



6. Either press **Esc** to exit the setting mode or close the text editor.

To reverse the keyboard type from 102 keys to 101 keys, simply repeat the above steps 1 through 4.

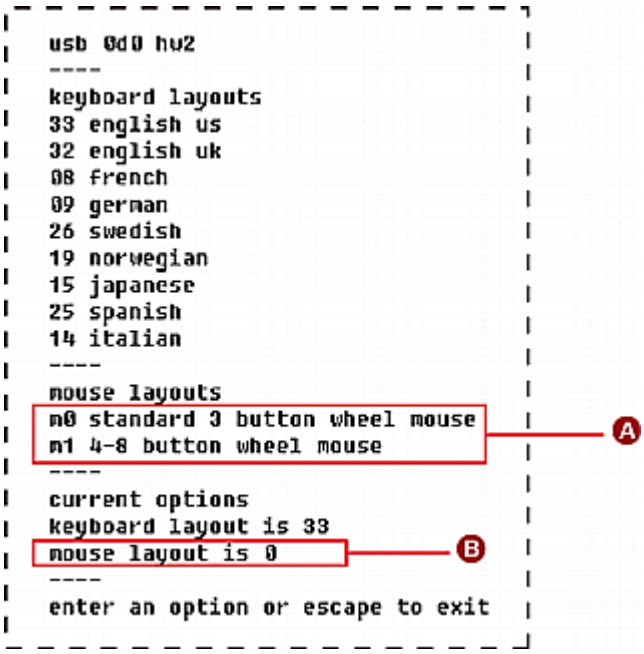
Kensington Mouse Type Settings

With P2CIM-AUSB (with firmware version 0D0 or later) and the P2-UST/P2-EUST (or P2-EUST/C) user station, you can use two types of multi-button Kensington mouse: one is Expert Mouse, and the other is Turbo Mouse trackball. By default the CIM allows you to use a 3-button wheel mouse, and you must change the mouse setting in order to use more buttons on the Kensington mouse.

1. Select the channel of the desired server in the Selection Menu, and press **Enter**.
2. Activate a text editor, such as Notepad, on the server.

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3. Press *Left* **Ctrl** + **NumLock** to enter the setting mode. A message similar to the following appears in the text editor.



A	Available mouse setting codes
B	Current mouse setting is set to standard 3-button wheel mouse (code 0)

4. Type **m1** to have the CIM support the use of 4-8 button wheel mouse.
5. Either press **Esc** to exit the setting mode or close the text editor.
6. Press the hot key (default: **Scroll Lock**) twice quickly to trigger the OSUI Selection Menu and re-select the same channel to make the new mouse setting effective.

To reverse the mouse type from 4-8 buttons to 3 buttons, simply repeat the above steps 1 through 3, and then type **m0**.

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Macintosh Key Mapping

If you use a Macintosh keyboard, you may want to know which keys are supported or recognized by Paragon II system. This is especially important when you want to use the Command Key combinations. Actually Paragon II system only recognizes regular PC keyboard and therefore all Macintosh keys are mapped with the PC keys based on each key's position. For unique Macintosh keys, which regular PC keyboard does not have, such as **F13** to **F15**, Paragon II system can neither recognize nor support them.

Mapped PC Keys for Macintosh Keys

Macintosh key	Mapped PC key
Command key	Windows key
Option	Alt
Shift	Shift
Control	Control
Tab	Tab
Left/Right/Up/Down Arrow	Left/Right/Up/Down Arrow
Caps Lock	Caps Lock
Escape	Escape
All alphabetical keys (A ~ Z) and numeric keys (0~9)	All alphabetical keys (A ~ Z) and numeric keys (0~9)
F1 ~ F12	F1 ~ F12
F13 ~ F15*	No mapping
Page Up/Down	Page Up/Down
Home/End	Home/End
Delete	Delete
Power*	No mapping
Help*	Insert
Volume control keys*	No mapping

* No appropriate mappings are found for these keys on PC keyboards, and these Mac keys may not function properly.

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Appendix G Recommendation for Better Video Quality

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Deployment Recommendations

In the Paragon II system, video quality is usually affected by these factors:

- Type of the user station: P2-UST, P2-EUST, or P2-EUST/C
- UTP cable length between the user station and the CIM (server)
- UTP cable type: Belden or non-Belden cable

P2-EUST and P2-EUST/C have the function of automatic skew compensation when used with P2CIM-APS2, P2CIM-AUSB, P2CIM-AUSB-C or P2CIM-ASUN, and thus provides better video quality than P2-UST. Belden cable is proven to provide better video quality than non-Belden cable in Raritan's lab. Therefore, our recommendation for good or even excellent video quality is as follows:

With non-Belden cables

Cable length (feet)	Deployment
0 ~ 1000	P2-EUST or P2-EUST/C*

With Belden cables

Cable length (feet)	Deployment
≤ 500	P2-UST, P2-EUST or P2-EUST/C
501 ~ 1000	P2-EUST or P2-EUST/C*

* For P2-EUST or P2-EUST/C to provide automatic skew compensation, make sure this user station is used with the appropriate CIM type: P2CIM-APS2, P2CIM-AUSB, P2CIM-AUSB-C, P2CIM-APS2DUAL, P2CIM-AUSBDUAL, P2CIM-ASUN, P2CIM-APS2-B, or P2CIM-AUSB-B.

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Supported Resolutions on P2-EUST and P2-EUST/C

Cable length (feet)	Resolution	Video refresh rate (Hz)
0 ~ 700	Up to 1600x1200	60, 75, 85
0 ~ 1000	Up to 1280x1024	60, 75, 85
0 ~ 1000	Up to 1920x1440**	60

** CRT monitor only

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Appendix H Other Components Working with Paragon II

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Paragon Manager Overview

Paragon Manager, Raritan's appliance management and configuration application, offers one coordinated graphical user interface that displays Device, User, Log, and Outlet information for your Paragon system. Paragon Manager can work with your Paragon II system, and allows you to manage various Paragon switches. This program is available on Raritan's website.

Installing Paragon Manager

To download Paragon Manager, please use the following steps. See *Paragon Manager User Guide* for additional information. This user guide is available on the "User Manuals & Quick Setup Guides" CD, or on Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation).

1. In your browser, navigate to ***Raritan's website*** (http://www.raritan.com).
2. Click **Support** in the top navigation bar.
3. Click **Firmware Upgrades** in the left navigation bar to expand it.
4. Click **Paragon II** to open its page.
5. Scroll down the page to locate the **Paragon Manager** section, and click on the desired Paragon Manager file link to download Paragon Manager.
6. Click **Save** to save this file to your system, and browse to the location where you want it stored. Click **Save** to continue.
7. The file is approximately 17MB and download takes a few minutes.
8. Navigate to where the files are saved on your system and click on the **ParagonManager-setup.exe** file to install Paragon Manager. Accept the default settings.

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When installation is complete, a shortcut to the application has been added to your **Start** menu.

PCCI Integration

In the PCCI (Paragon CommandCenter Integration) environment, Paragon II works within the P2SC setup, and we recommend you first read the **Paragon II System Controller (P2SC)** user manual for initial installation and configuration of your Paragon II System Controller unit. This document is available on the **"**User Manuals & Quick Setup Guides**"** CD included with your shipment, or on the *Support* section of your local Raritan website.

In North or South America, do the following:

1. Visit Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation) with your browser.
2. Scroll down the page to the **Paragon II System Controller** heading.
3. Click on the *User Guide* link.

Special Note:
Paragon II Releases 4.2 and 4.3 are not compatible with the Paragon II System Controller. They are considered "standalone" releases and are not supported for installation in a Raritan PCCI environment. As of release 4.3.1, Paragon II returned to compatibility with P2SC. Existing Paragon II System Controller customers may upgrade their Paragon II components to 4.3.1 or higher to benefit from recently added features and maintenance fixes. Please see the Paragon II 4.3.1 release notes for minimum firmware levels.

For information about the supported features in PCCI, download the document titled "Supported Paragon II Features in PCCI" from Raritan's ***Product Documentation webpage*** (http://www.raritan.com/support/productdocumentation/paragon-II/).

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Appendix I Troubleshooting

In This Chapter

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Paragon II FAQs Online.....215

Symptoms and Probable Causes

Symptom:	Probable cause:
No Power.	• Loose Power Cord. • Power switch is off. • Paragon II switch or user station surge protection invoked during a power recycling process. Power off the unit, wait for 20 seconds, and then power the unit on.
All computers have no video display.	• Loose Cat 5 UTP cable. • Loose monitor connection. • The user station is connected and functioning properly if **Num Lock** key lights keyboard's Num Lock LED.
Monitor video display for some connected computers is distorted.	Monitor type does not match video output designation from the server.
Keyboard non-functional, even though there is no keyboard error at power up. Cannot input to any computer.	• Loose keyboard connection to the user station. • Loose Cat 5 UTP cable. • Keyboard broken. Hot-swap with a new keyboard.
Repeated "Keyboard ERROR" at computer power-up.	• Loose cable from the server to the CIM. • Loose Cat 5e UTP cable. • Paragon II components may be out of order. Verify that the server recognizes a keyboard that is directly connected. Contact Raritan Technical support for assistance. See the last page for global contact information.

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Keyboard suddenly locks-up when a particular computer is selected, but operates normally when other computers are selected.	• Loose keyboard cable connection. • Voltage spike (increase) or brown out (decrease) in power supply to connected Paragon II switch. Power off the Switch, wait for 20 seconds, and then power on the unit. Powering Switch from a UPS avoids variation in power supply to Switch.
Repeated "MOUSE INSTALLATION FAILURE" at computer power-up.	• Loose mouse cable from the server to the CIM • Loose Cat 5 UTP cable. If an error occurs only with new servers being added to the system, contact Raritan Technical Support for assistance—mouse emulation firmware may need to be upgraded for compatibility with newer servers. See the last page for global contact information.
Mouse suddenly locks up when a particular computer is selected, but operates normally when other computers are selected.	• Loose cable from the server to the CIM. • Loose Cat 5 UTP cable. • Paragon II components may be out of order. Verify that the server works with a mouse directly connected. Contact Raritan Technical support for assistance. See the last page for global contact information.
On-Screen User Interface (OSUI) non-functional.	Replace the keyboard. OSUI works only with PS/2 or extended AT-style keyboards.
Video is "fuzzy" or out of focus.	Video Gain Adjustment is required (especially needed with LCD flat panel monitors). • Activate OSUI (by hitting the **Scroll Lock** key twice rapidly). • Use numeric keypad + and - keys to adjust the video image until it is in focus.

Powering-On Sequence of Multi-Tier Configuration

In a multi-tier configuration, the order of powering ON is critical to proper function.

When powering ON existing stable configurations (that is, if you are NOT replacing or adding Paragon switches and NOT swapping their order) or when you are Power Cycling a cascaded configuration, we recommend that you power on the Paragon switches in the following sequence:

1. Power ON the third tier (if a third tier exists).
2. Power ON the second tier.
3. Power ON the Paragon II base tier (first tier).

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For configurations where Paragon switches are added, replaced, or swapped (in order), we recommend:

1. Power ON the third tier (if a third tier exists).
2. Power ON the second tier.
3. Power ON the Paragon II base tier (first tier).
4. Perform a partial reset of the database on impacted switches. For example, if you swap the switches connected to the base tier, perform the partial reset on the base tier. If you swap the switches connected to the second tier, perform the partial reset from the second tier to the base tier.

User stations can be powered ON and OFF at any time as needed.

There is a five-second ON/OFF down time in the matrix switch or Paragon II power cycle.

Paragon II FAQs Online

Frequently Asked Questions for Paragon II are now located online at Raritan's ***Frequently Asked Questions (FAQ) webpage*** (http://www.raritan.com/support/technicalfaq).

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