



TMCAT17 Series

User Guide
Release 1.0

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This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential environment may cause harmful interference.

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If a power cable is included with this product, it must be used exclusively for this product.



Power Safety Guidelines

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.

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. See Specifications.
- 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.



Warning: Rack mounted equipment is not to be used as a shelf or a work space.

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Chapter 1 Introduction

Congratulations on purchasing Raritan's TMCAT17 LCD KVM switch, and/or a MasterConsole CAT (MCCAT) user station. This user guide explains how to use these devices to access and control multiple computers or servers.

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Product Overview

TMCAT17 LCD KVM switch functions as a keyboard/video/mouse switch, which enables you to control multiple computers from a single set of keyboard, mouse (or touchpad), and monitor.

The product comes with a built-in LCD monitor, keyboard and touchpad. It features the connection of computers through standard Category 5 (Cat5) unshielded twisted-pair (UTP) cables.

If you connect Raritan's MasterConsole CAT (MCCAT) KVM switches to the TMCAT17 switch to form a "two-tier" system, the number of computers can be expanded up to 256 computers.

You need these components to set up one TMCAT17 system:

- TMCAT17 switch
- MCCAT user station (optional)
- MCCAT Computer Interface Modules (MCIMs) or MCUTP cables

TMCAT17 Switch

The TMCAT17 LCD KVM switch provides channel ports for connecting computers and a user port for connecting an optional MCCAT user station.

A maximum of two users can access the TMCAT17 switch and connected computers simultaneously when you connect the MCCAT user station to the TMCAT17 switch.

The product has two models: TMCAT1728 with 8 channel ports and TMCAT17216 with 16 channel ports.

MCCAT User Station

An MCCAT user station connects a set of keyboard, mouse and monitor to a compatible KVM switch. After connecting the user station to the TMCAT17 switch, two users can access the system at a time.

There is only one MCCAT user station model: MCCAT-UST.

MCCAT Computer Interface Module (MCIM)

The MCIM transmits keyboard, mouse and video signals between the connected computer and the TMCAT17 switch. One computer requires one MCIM only. There are two types of them.

- USB type
MCIM-USB comes with an HD15 VGA connector and a USB connector.
- PS/2 type
MCIM-PS2 comes with an HD15 VGA connector, a PS/2 keyboard connector, and a PS/2 mouse connector.

MCUTP Cable

One MCUTP cable is a combination of Computer Interface Module (CIM) and Cat5 UTP cable so you can use it in place of the MCIM.

The MCUTP cable is *not* compatible with Windows 98 operating system. Use MCIM for computers running Windows 98.

There are three types of them.

- USB type
This type comes with an HD15 VGA connector, a USB connector and an RJ-45 connector.

Model	Cable length
MCUTP06-USB	0.6 meter (2 feet)
MCUTP20-USB	2 meters (6.5 feet)
MCUTP40-USB	4 meters (13 feet)
MCUTP60-USB	6 meters (20 feet)

- PS/2 type
This type comes with an HD15 VGA connector, a PS/2 keyboard connector, a PS/2 mouse connector and an RJ-45 connector.

Model	Cable length
MCUTP06-PS2	0.6 meter (2 feet)
MCUTP20-PS2	2 meters (6.5 feet)
MCUTP40-PS2	4 meters (13 feet)
MCUTP60-PS2	6 meters (20 feet)

- Sun USB type

This type comes with an HD15 VGA connector, a Sun USB connector and an RJ-45 connector.

Model	Cable length
MCUTP06-SUSB	0.6 meter (2 feet)
MCUTP20-SUSB	2 meters (6.5 feet)
MCUTP40-SUSB	4 meters (13 feet)
MCUTP60-SUSB	6 meters (20 feet)

Product Photos

TMCAT1728 or TMCAT17216 (Front View)



MCCAT-UST (Front and Rear View)



MCUTP20-PS2 Cable



MCUTP20-USB or MCUTP20-SUSB Cable



Product Features

TMCAT17 Switch

- A user can control multiple computers per unit. The number of computers that can be controlled varies depending on the model you purchased:
 - **TMCAT1728** can control a maximum of 8 computers
 - **TMCAT17216** can control a maximum of 16 computers
- Support a maximum of 256 computers if cascading MCCAT switches
- Support two-user operation
- Support the PC Share mode
- Multi-platform support, including MS-DOS, Windows 2000/2003/NT/XP/Vista, Macintosh OS9/OSX, Linux (Red Hat, Novell Suse), SCO Unix, and Sun Solaris
- Support IBM, Dell, HP, and Sun servers
- Support the video resolution up to 1600x1200
- Enable users to be located away from the computers up to:
 - 100 feet (30.48 meters) for video resolution at 1600x1200
 - 150 feet (45.72 meters) for video resolution at 1280x1024 or below
- Interconnect with computers via standard Cat5 UTP cables
- Feature simple system control and management with the OSD interface
- With the “keep-alive” technology, you can add, remove, and hot-swap components without interruption to the computers
- The **Scan** function enables the system to automatically cycle through all channels, and updates the channel status
- The **Skip** function enables the system to bypass "inactive" channels

*Note: An "active" channel is the channel port where the TMCAT17 switch detects the connection of a powered MCIM or MCUTP cable. An "inactive" channel is the opposite. See **What are Active and Inactive Channels** (on page 30) for more information.*

- The **Login** mechanism prevents unauthorized access to the TMCAT17 switch and connected computers
- Easy firmware upgrade via a standard RS-232 serial cable

Note: The integrated LCD display supports the video resolution up to 1280x1024 only, but the external monitor, which is connected to the TMCAT17 switch via the MCCAT user station, can support the resolution up to 1600x1200.

MCCAT User Station

- Interconnect with a compatible KVM switch via a standard Cat5 UTP cable
- Support a standard USB or PS/2 keyboard and mouse
- Easy firmware upgrade via a standard RS-232 serial cable

Package Contents

You may purchase the TMCAT17 switch alone or both of the TMCAT17 switch and MCCAT user station.

TMCAT17 Switch

- TMCAT17 switch x 1
- Power cord x 1
- Rackmount kit x 1 (including brackets and associated screws)
* Mounting depth adjustable from 560 to 900 mm
- Quick Setup Guide x 1
- Warranty card x 1

MCCAT User Station (Optional)

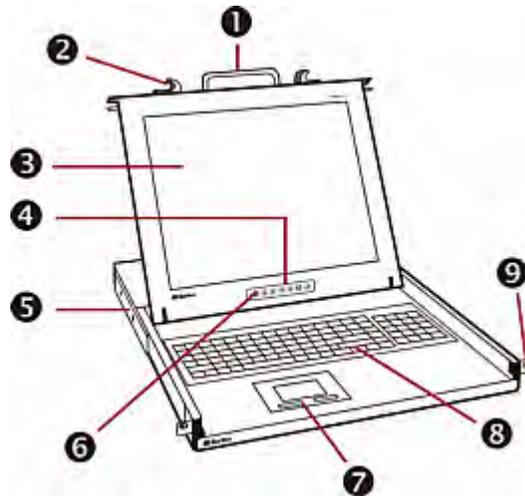
- MCCAT user station x 1
- Power adapter x 1
- Quick Setup Guide x 1
- Warranty card x 1

Structure Diagrams

This section provides a brief introduction to the components on the front and rear sides of the TMCAT17 switch and user station.

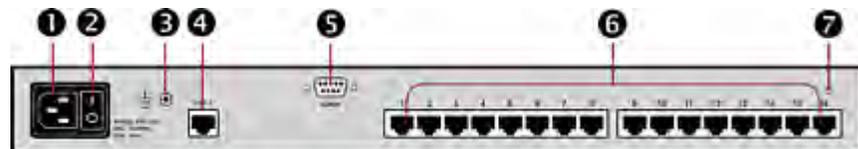
TMCAT17 Switch

Front View



❶	Handle	Allows you to carry the TMCAT17 device or pull it out of the rack.
❷	Latches	Lock or unlock the LCD panel and keyboard assembly.
❸	LCD display	Displays the video.
❹	LCD controls	Activate and navigate through the LCD OSD interface.
❺	Support brackets	Support the TMCAT17 device when the brackets are inserted into the mounting brackets installed in the rack.
❻	LCD power switch and LED	The LCD power switch toggles the LCD display's power on or off. <ul style="list-style-type: none"> ▪ When on, the adjacent LED is lit (blue). ▪ When off, the LED is not lit.
❼	Touchpad mouse and buttons	The touchpad controls the onscreen mouse pointer, and adjacent buttons function as mouse buttons.
❽	Keyboard	Inputs characters or commands.
❾	Mounting ears	Secure the TMCAT17 device in place when it is installed in the rack.

Rear View



❶	Power socket	Connects a power cord.
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②	Power switch	Toggles the power on or off.
③	Ground screw	Connects a grounding wire.
④	User 2 port	Connects an optional MCCAT user station.
⑤	Admin port	Connects a computer for upgrading the firmware.
⑥	Channel ports	Connect computers. Depending on the model you purchased, the device may have 8 or 16 channel ports.
⑦	Reset button	Resets all settings to factory defaults.

MCCAT User Station

One MCCAT user station can connect a set of keyboard, mouse and monitor to any of these devices:

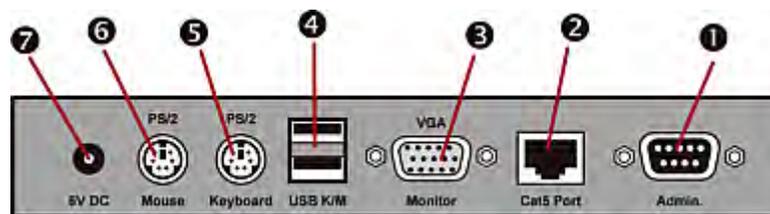
- A compatible KVM switch, including MCCAT28, MCCAT216, TMCAT1728, or TMCAT17216.
- A computer. See **User Station Direct Mode** (on page 66) for more information.

Front View



①	Power LED	Indicates whether the device is turned on. When lit, it is turned ON. When off, there is no power supply to the device.
---	-----------	--

Rear View



①	Admin port	Connects a computer for upgrading the firmware.
②	Cat5 port	Connects a compatible KVM switch or a computer.
③	VGA port	Connects a VGA monitor.

④	USB K/M ports	Connect a USB keyboard and mouse.
⑤	PS/2 keyboard port	Connects a PS/2 keyboard.
⑥	PS/2 mouse port	Connects a PS/2 mouse.
⑦	Power jack	Connects a power adapter.

Warning: Do NOT connect both PS/2 and USB keyboards or both PS/2 and USB mice simultaneously. If you do so, only the USB keyboard and/or mouse work properly.

Chapter 2 Quick Start

In This Chapter

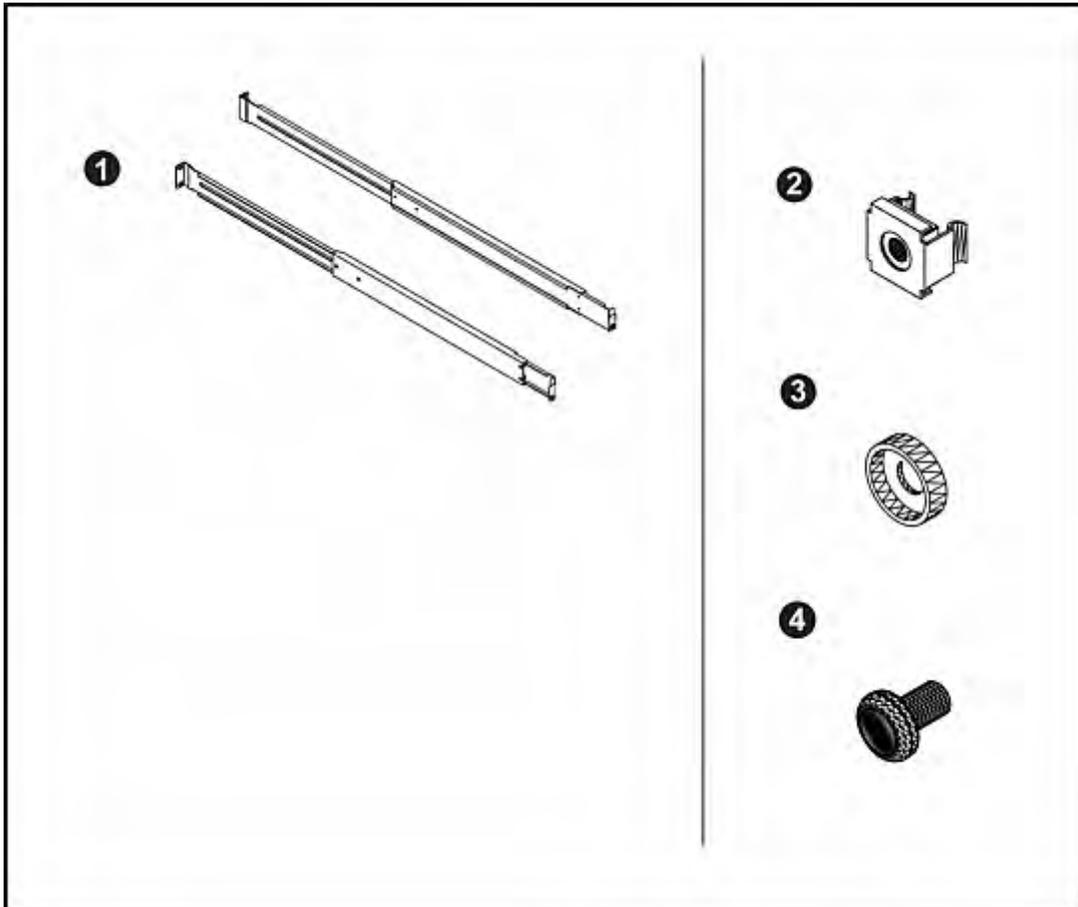
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Before Installation

- It is very important to locate the TMCAT17 in a suitable environment.
- The surface for placing and fixing the TMCAT17 should be stable and level or mounted into a suitable cabinet.
- Make sure the place has good ventilation, is out of direct sunlight, away from sources of excessive dust, dirt, heat, water, moisture, and vibration.
- Convenience for connecting the TMCAT17 to the related facilities should be well considered too.

Rackmount Installation

Rackmount Kit

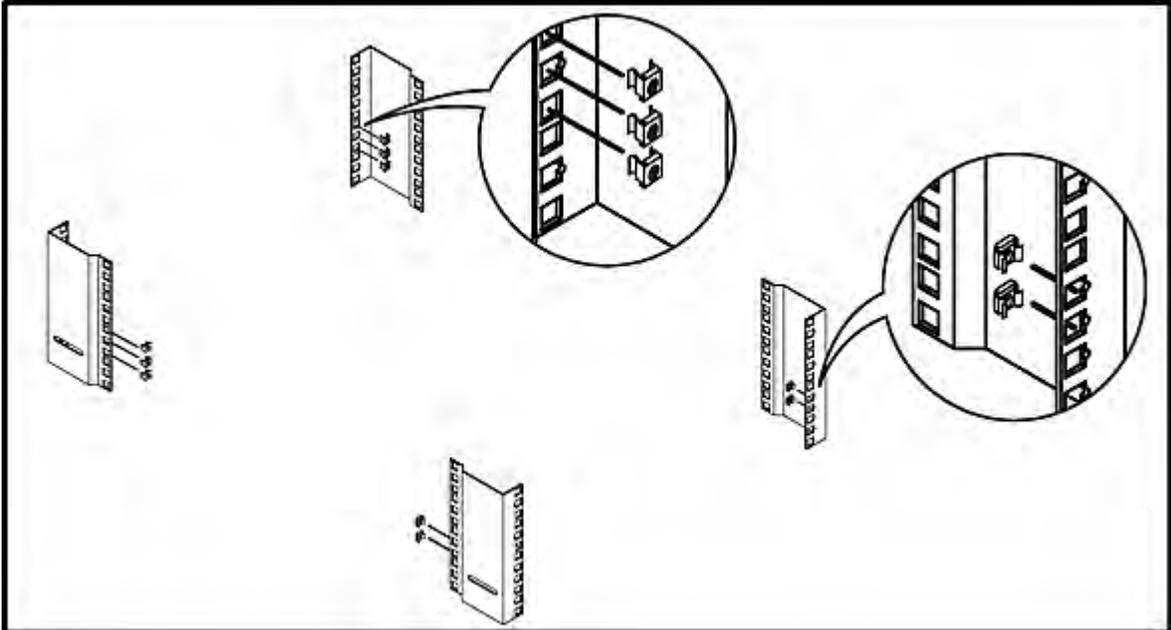


Component list

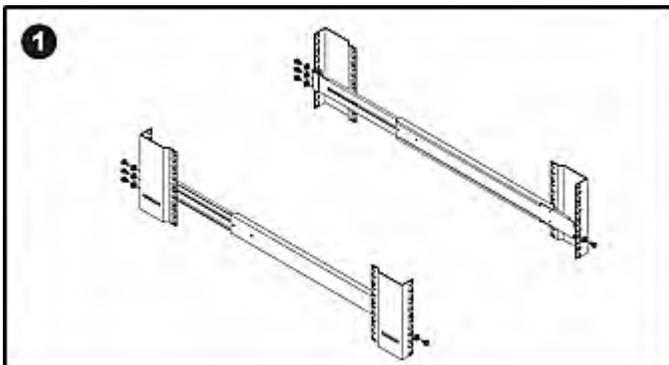
①	Mounting brackets
②	M6 cage nuts
③	M6 washers
④	M6 screws

Rack-Mounting the TMCAT17 Device

Before rack-mounting the device, make sure M6 cage nuts have been inserted into the holes of vertical rails where you intend to mount TMCAT17.

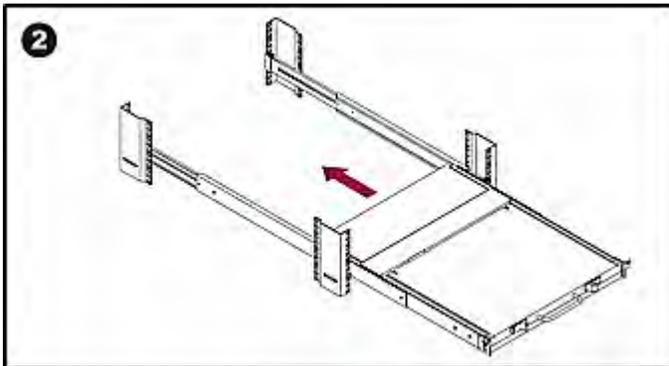


► To rack-mount the device:

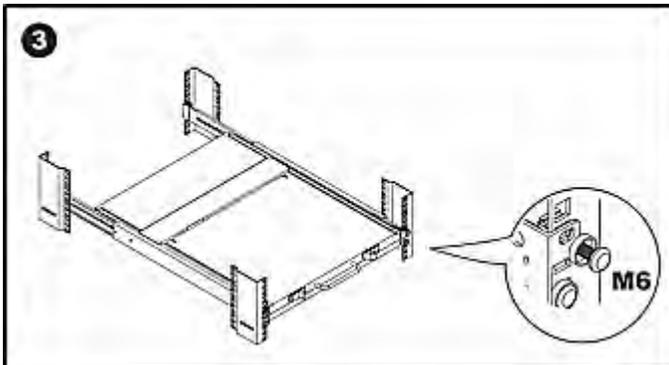


- Adjust the mounting brackets to fit the depth of your rack.
- Attach them to vertical rails, using M6 screws and washers.

Leave all M6 screws slightly loose until you finish the installation in Step 4.

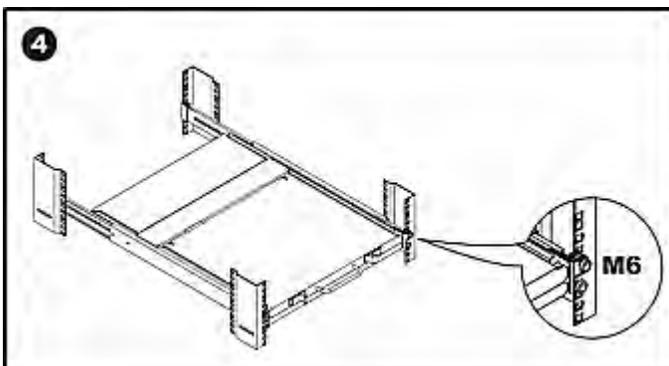


- Pick up TMCAT17.
- Line up the rear of support brackets on the TMCAT17 with the front of mounting brackets installed in the rack.
- Push TMCAT17 to make the support brackets slide into the slots of mounting brackets.
- Continue pushing TMCAT17 until the mounting ears contact vertical rails.



- Secure both mounting ears to vertical rails, using M6 screws and washers.

This step must be finished, or failure to complete it may cause damage to the device.



- Tighten all screws on both sides.
- Installation completed.

Installing a Basic System

Preparing Requisite Items

Collect these components or devices before connecting computers.

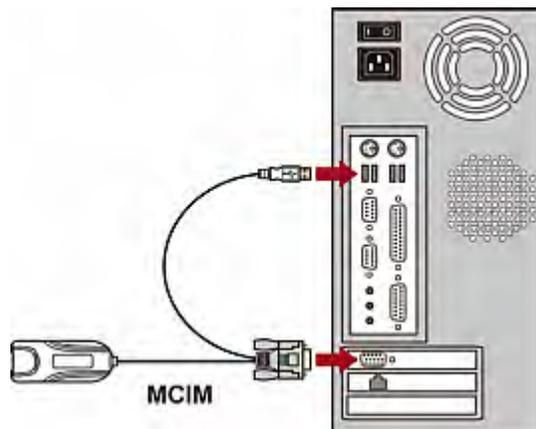
- MCIMs or MCUTP cables (one per computer)
- If using MCIMs, Cat5 UTP cables are required

The MCUTP cable is *not* compatible with Windows 98 operating system. Use MCIM for computers running Windows 98.

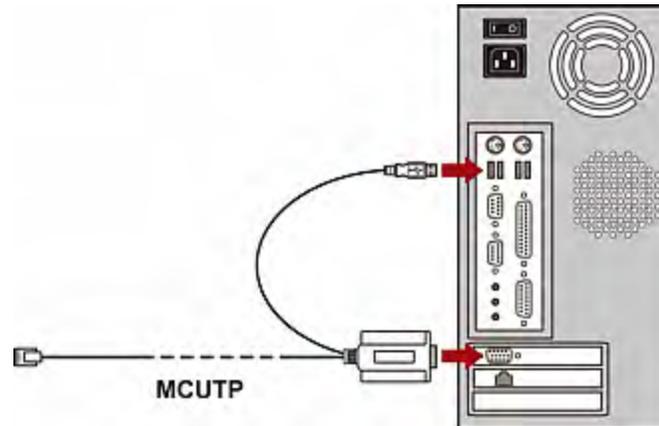
Note: If the computer is a Sun server, you must prepare the Sun USB MCUTP cable or DCIM-USB G2 instead of MCIM.

Connecting the Equipment

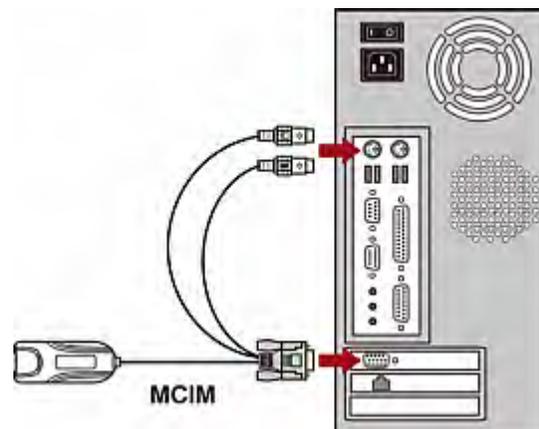
1. Turn OFF all devices, including the TMCAT17 switch and computers.
2. Connect one MCIM or MCUTP cable to the computer.
 - *If using MCIM-USB or USB MCUTP cable:*
 - a. Plug the MCIM or MCUTP's USB connector into one of the computer's available USB ports.
 - b. Plug the MCIM or MCUTP's video connector into the computer's VGA port.



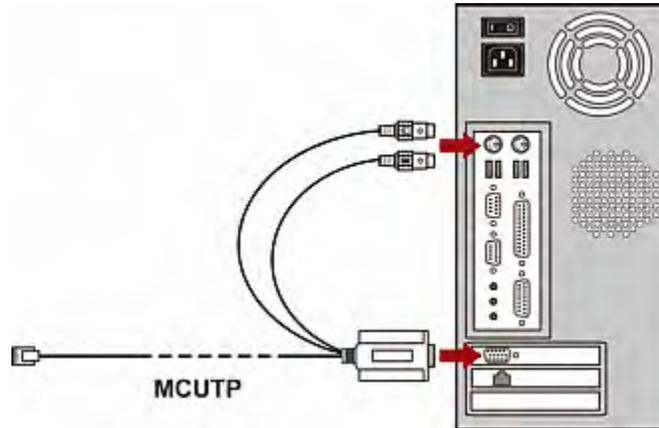
- OR -



- *If using MCIM-PS2 or PS/2 MCUTP cable:*
 - a. Plug the MCIM or MCUTP's PS/2 mouse connector into the computer's PS/2 mouse port.
 - b. Plug the MCIM or MCUTP's PS/2 keyboard connector into the computer's PS/2 keyboard port.
 - c. Plug the MCIM or MCUTP's video connector into the computer's VGA port.



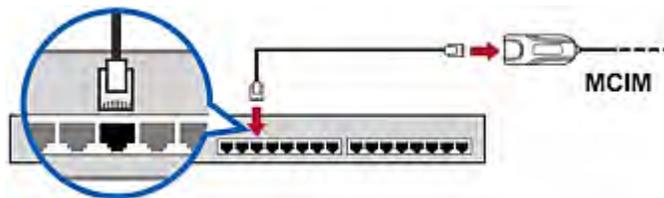
- OR -



- *If using the Sun USB MCUTP cable:*
 - a. Plug the MCUTP's Sun USB connector into one of the available USB ports on the Sun server.
 - b. Plug the MCUTP's video connector into the VGA port on the Sun server.

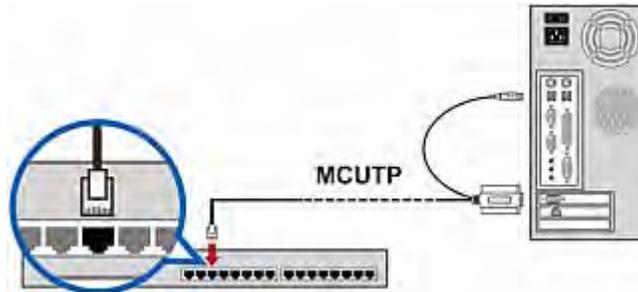
*Note: See **Supporting Sun Servers** (on page 39) in the User Guide for more information.*

3. Connect the computer to the TMCAT17 switch.
 - *If using the MCIM:*
 - a. Plug one end of a Cat5 UTP cable into the RJ-45 port of the MCIM being connected with the computer.
 - b. Plug the other end of the Cat5 UTP cable into one of the channel ports on the TMCAT17 switch.

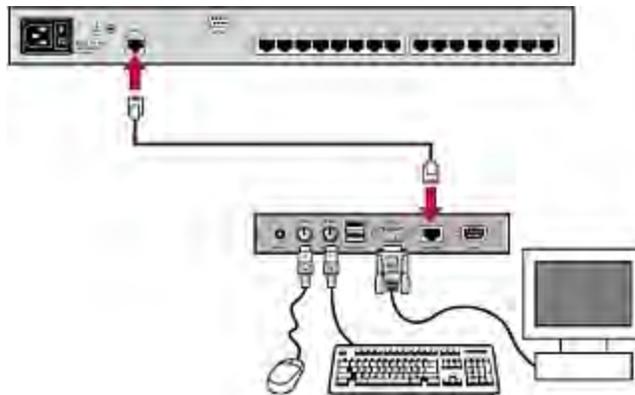


- *If using the MCUTP cable:*

- Plug the MCUTP cable's RJ-45 connector into one of the channel ports on the TMCAT17 switch.



4. Repeat Steps 2 to 3 to connect more computers.
5. (Optional) Connect the MCCAT user station to the **User 2** port on the TMCAT17 switch via a standard Cat5 UTP cable. For more information, see the *Quick Setup Guide* shipped with the user station or the section titled **Connecting a User Station (Optional)** (on page 17) in the User Guide.



Tip: The TMCAT17 switch is compatible with the Paragon II enhanced user station, P2-EUST (see "P2-EUST User Station" on page 83). If you have P2-EUST, you can connect it, instead of the MCCAT user station, to the TMCAT17 switch.

6. Connect an appropriate power cord to every device in the system.

Connecting a User Station (Optional)

You can connect the MCCAT user station to any compatible KVM switch, such as the "two-user" MCCAT switch or TMCAT17 series, to increase the number of users who can access the KVM switch and computers.

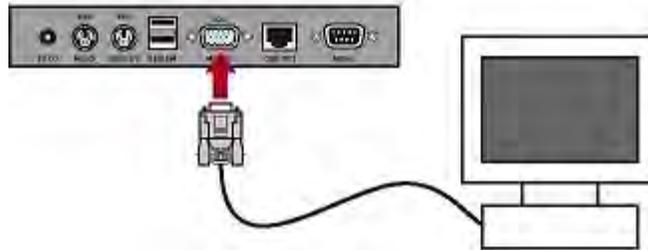
1. Connect the PS/2 or USB keyboard and mouse to the user station.
 - a. Plug the mouse's connector into the PS/2 or USB port on the user station.

- b. Plug the keyboard's connector into the PS/2 or USB port on the user station.



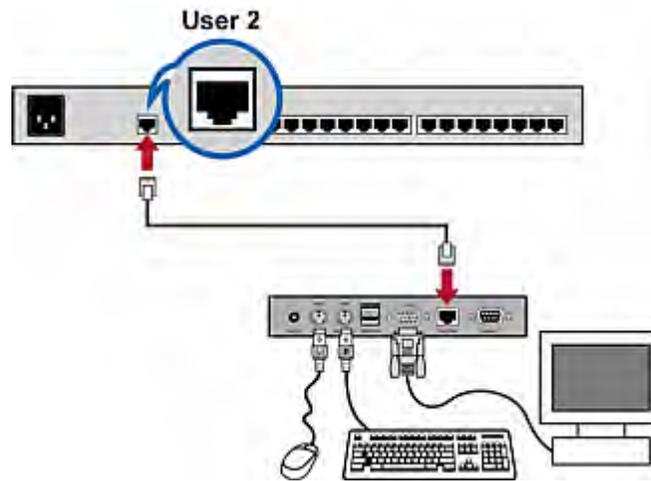
Warning: Do NOT connect both PS/2 and USB keyboards or both PS/2 and USB mice simultaneously. If you do so, only the USB keyboard and/or mouse work properly.

2. Connect the VGA monitor to the user station.



3. Connect the user station to the KVM switch via a standard Cat5 UTP cable.
 - a. Plug one end of the Cat5 cable into the **Cat5 Port** of the user station.

- b. Plug the other end of the cable into the **User 2** port of the KVM switch.



4. Connect the power adapter to the user station.
 - a. Plug one end of the power adapter into the power jack of the user station.
 - b. Plug the other end of the power adapter into the appropriate power outlet.
5. Turn on the connected monitor.

After finishing the installation and turning on all devices, you can use the keyboard, mouse, and monitor connected with the user station to access computers connected to the KVM switch.

*Tip: The TMCAT17 switch is compatible with the Paragon II enhanced user station, **P2-EUST** (see "**P2-EUST User Station**" on page 83). If you have P2-EUST, you can connect it, instead of the MCCAT user station, to the TMCAT17 switch.*

Using the TMCAT17 Switch

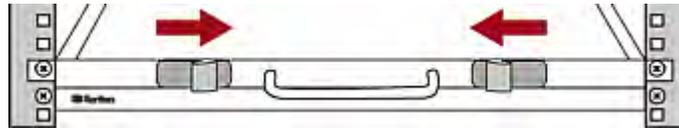
Opening TMCAT17

This section describes how to physically open the LCD KVM switch when it is installed in a rack.

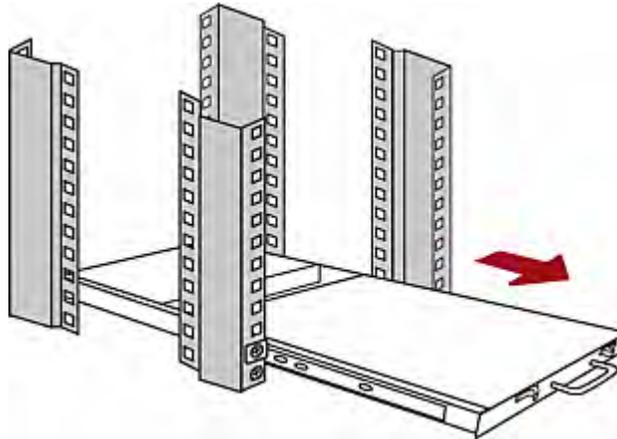
Note: The diagrams are for illustration, and may not look exactly the same as the LCD KVM switch you purchased or the rack in your workplace.

► **To open the device:**

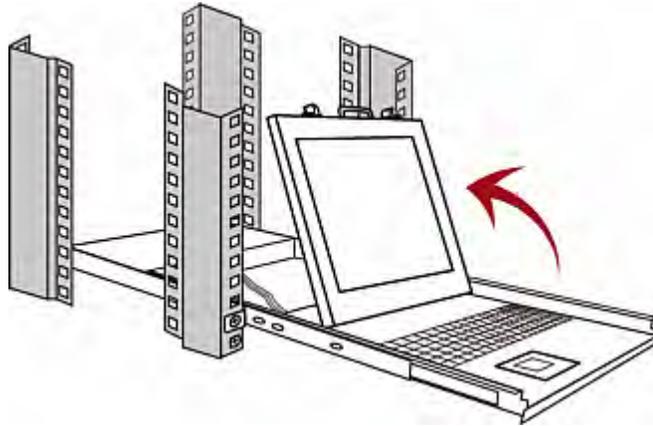
1. Push the latches toward the center to unlock the assembly of the LCD panel and keyboard tray.



2. Grasp the handle and pull the assembly out.



3. Flip up the LCD panel to a suitable angle.



4. Turn on the LCD KVM switch by pressing the power switch on the rear panel.
5. Verify if the LCD's power LED is lit blue. If not, turn on the LCD display by pressing the LCD's power switch at the bottom of the LCD panel.

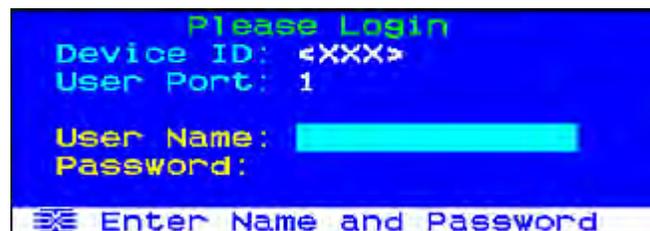
Login

The login mechanism prevents unauthorized users from accessing the system or changing settings. To access any computer, you may log in with any user account. To configure the system settings on the Administration Menu, you must log in with the administrator account.

Note: <XXX> shown in the diagrams represents the model name, which varies according to the product you purchased.

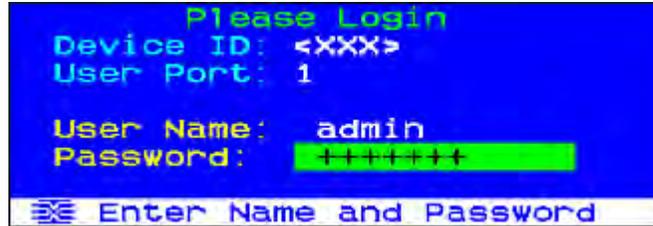
► To log in to the TMCAT17 system:

1. The Login box appears on the screen after turning ON the TMCAT17 system.

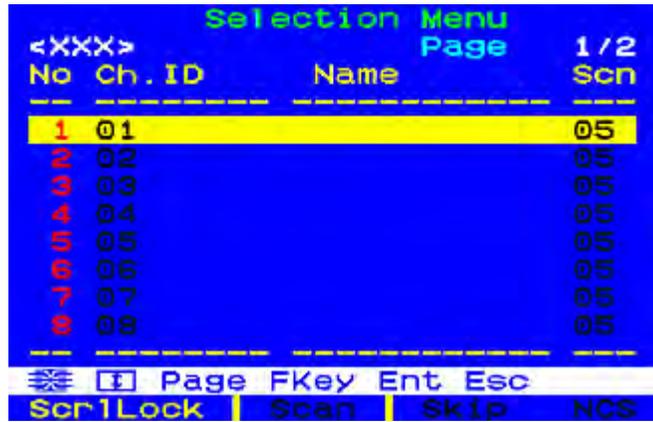


2. Type your user name and password. For example, if you are the administrator, the user name is "admin," and the default password is "raritan."
 - a. Type `admin` in the User Name field, and press Enter.

- b. Type raritan in the Password field, and press Enter. The password is case sensitive.



- 3. The Selection Menu appears, indicating your login is successful.



Important: It is strongly recommended to change the default password for the security of your TMCAT17 system. For more information, see *Changing Passwords* (on page 45) in the User Guide.

Accessing a Computer or Channel

Use the Selection Menu to access any computer connected to the TMCAT17 switch.

The first OSD menu that appears after login is the Selection Menu, which does not show any channel name by default until you assign them.

<XXX>	No	Ch. ID	Name	Page	1/2 Scn
	1	01			05
	2	02			05
	3	03			05
	4	04			05
	5	05			05
	6	06			05
	7	07			05
	8	08			05

Page Fkey Ent Esc
Scr1Lock | Scan | Skip | NCS

► To select a channel on the Selection Menu:

1. If you do not find the channel on the current page, press Page Down or Page Up to go to the next or previous page.
2. Press ↓ or ↑ to move the highlight bar to the channel you want to select.

Tip: You can press the corresponding number shown in the No column for that channel to quickly highlight it.

3. Press Enter.

The Selection Menu disappears. The video of the accessed computer appears on the screen. You can control the computer with the keyboard and mouse.

TMCAT17 switches do not support real-time channel detection. Do NOT disconnect the current computer and reconnect a different one to the channel you are accessing, or you may have mouse or keyboard input issues with that channel. When this occurs, re-select the channel on the Selection Menu to solve the problem.

► To select a different channel on the Selection Menu:

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Highlight another channel and press Enter.

For more information on the Selection Menu, see **Selection Menu** (on page 28) in the User Guide.

Logout

After completing your tasks in the TMCAT17 system, you should log out to prevent unauthorized people from accessing the system.

► **To log out of the TMCAT17 system:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F9.

The Login box appears, indicating that you have successfully logged out.

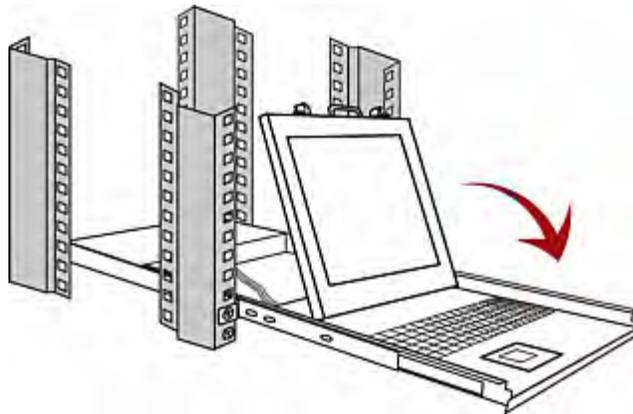
Closing TMCAT17

This section describes how to close the LCD KVM switch installed in a rack.

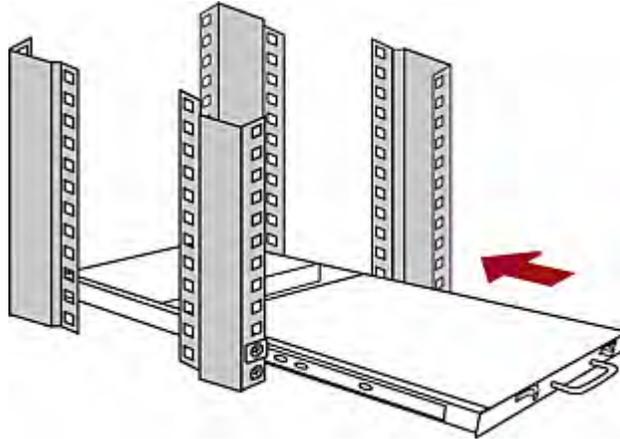
Note: The diagrams are for illustration, and may not look exactly the same as the LCD KVM switch you purchased or the rack in your workplace.

► **To close the TMCAT17 device:**

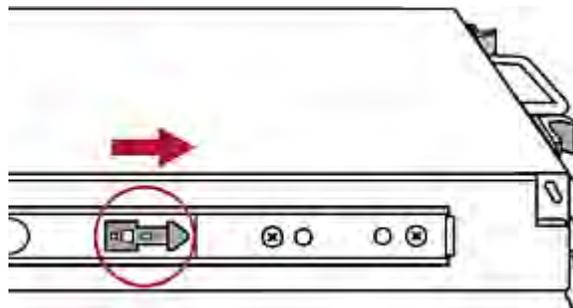
1. Press down the LCD panel until it contacts the keyboard tray.



2. Push the assembly of the LCD panel and keyboard tray back into the rack until you hear the click sound of latches.



Note: If the assembly is stuck and cannot be pushed back, then push the black arrows on both sides while pushing back the assembly.



Chapter 3 Introduction to the OSD Interface

The OSD interface offers these functions:

- Channel selection
- System configuration
- Displaying product information

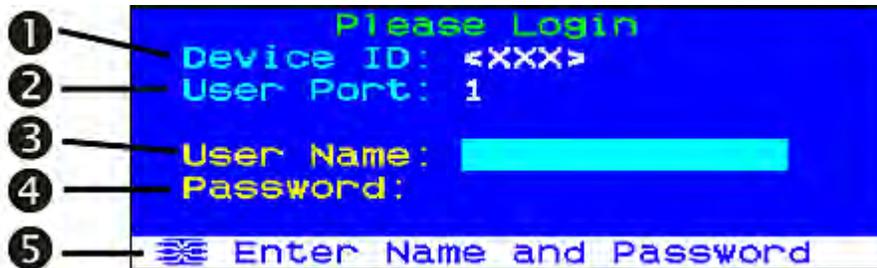
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OSD Layout

This section indicates the main elements displayed on the OSD images.

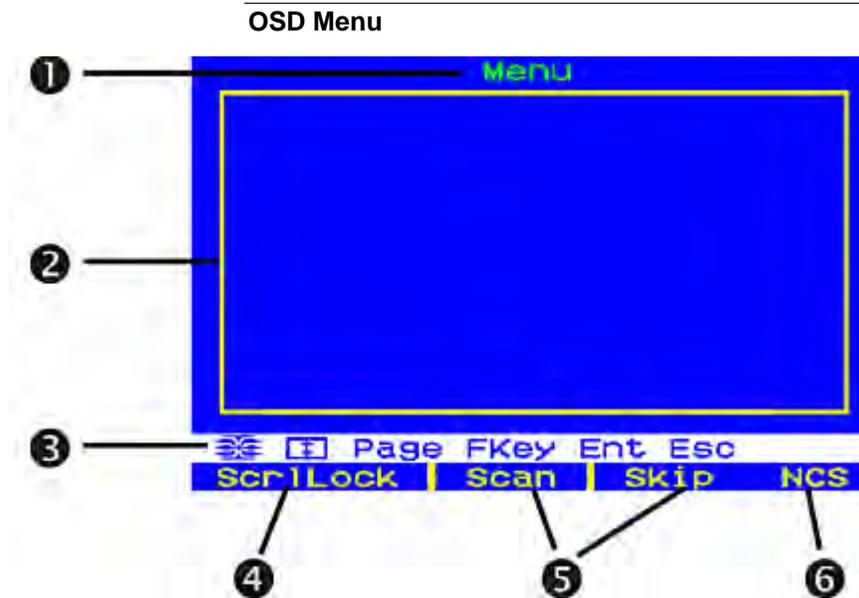
Login Box



❶	Device ID	The name of the TMCAT17 switch that you are operating. Factory default is the model name. You can customize this name. See Renaming the TMCAT17 Switch (on page 44) for more information.
❷	User Port	Current input/output devices* via which you access the TMCAT17 switch and connected computers. <ul style="list-style-type: none"> • 1 refers to the input/output devices directly connected with the TMCAT17 switch. • 2 refers to the input/output devices connected with the MCCAT user station, which is connected to the User 2 port of the TMCAT17 switch.
❸	User Name	The field where you type the administrator or user account for login.
❹	Password	The field where you type the password for login.

5	Message bar	The location that displays messages or prompts relevant with current OSD screen.
---	-------------	--

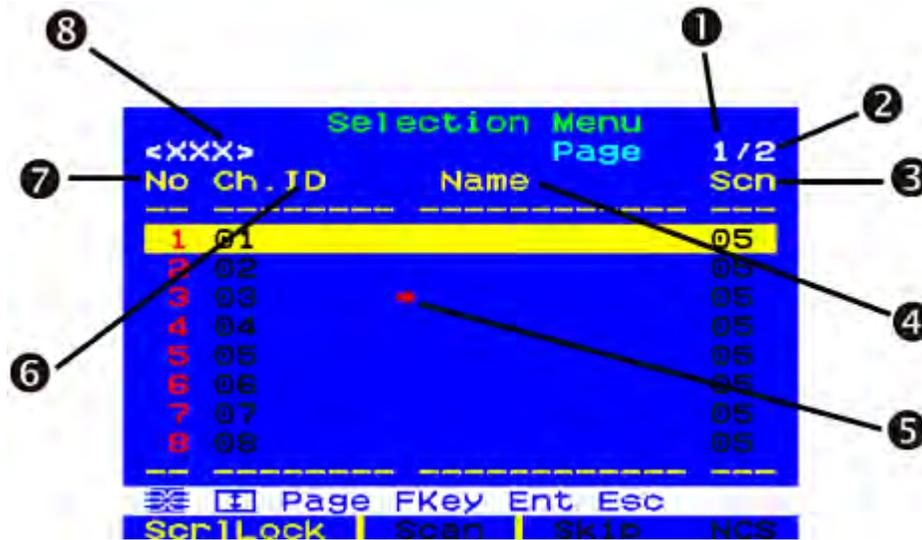
* Input/output devices refer to the keyboard, mouse, and monitor.



1	Menu title	The title of the current menu or submenu.
2	Data display area	The area that displays information or settings of the current menu or submenu.
3	Message bar	The location that displays messages or prompts relevant with current OSD screen.
4	Current hot key	The hot key that activates the OSD. The default is Scroll Lock (ScrlLock).
5	Status of the Scan and Skip functions	If the Scan or Skip function is turned ON, the color turns yellow. Otherwise, the color is black.
6	Status of N, C, and S	N represents NumLock, C represents Caps Lock, and S is Scroll Lock. If any function is turned ON, its color turns yellow. Otherwise, the color is black.

Selection Menu

In addition to the OSD menu's main layout, the Selection Menu provides additional elements, which are helpful for locating and selecting channels.



①	Current page number	The number of current page.
②	Total of pages	The total number of pages.
③	Scn	The scan rate in seconds for each channel. If the channel is connected to a second-tier KVM switch, it shows dashes (- -) instead.
④	Name	The channel name that you have specified, if any.
⑤	Channel selection indicator	If you are accessing any channel, the red arrow appears on the OSD to indicate the channel you are accessing.
⑥	Ch. ID	The channel port number. If sorting the Selection Menu by channel name, the system precedes each channel port number with the TMCAT17 switch's name.
⑦	No	The number that you can press for quickly selecting the desired channel.
⑧	Device name	The name of current TMCAT17 switch whose channels are displayed on the screen. Factory default is the model name.

*Tip: The Selection Menu is sorted by channel number by default, but you can sort it based on channel names. See **Switching the Channel Sorting** (on page 35).*

Activating the OSD

The OSD disappears after you access any channel. To access a different channel or change the system settings, you must activate the OSD.

▶ **To activate the OSD:**

- Press the hot key (default: Scroll Lock) twice QUICKLY.

You can assign a hot key other than Scroll Lock. See **Changing the Hot Key** (on page 46).

Deactivating the OSD

You can have the OSD interface disappear from the screen at any time *after selecting a channel for access*.

▶ **To deactivate the OSD:**

- Press Esc once or several times until the OSD disappears.

Variations of Highlight Colors

The highlight bar can change its colors to indicate different statuses when you are changing settings on specific menus or submenus.

1. The highlight color is **yellow** in the beginning, indicating that you *cannot* make changes to the current field.
2. Press Enter, and the highlight color turns **green** or **light blue**, indicating that you *can* make changes to the current field.
3. After making changes, press Enter or Esc, and the highlight color turns **yellow** again, indicating that you *cannot* make changes to the current field.

The difference between pressing Enter and Esc is:

- If pressing Enter, you confirm to retain the changes made to the field.
- If pressing Esc, you abandon the changes made to the field, and the field returns to the original value or option.

Channel Colors

Different channel colors on the Selection Menu represent different channel statuses. Channel colors vary according to these criteria:

- The channels are active or inactive. See **What are Active and Inactive Channels** (on page 30).
- The channels are being accessed or not.

*Note: The TMCAT17 system does not auto-detect and update the channel status in real time. To ensure you get the latest channel status, perform the channel refreshing. See **Refreshing Channel Statuses** (on page 40).*

What are Active and Inactive Channels

One of the factors that affect channel colors is the active/inactive status of a channel, which varies based on the power status of the connected CIM or MCUTP cable. This section explains the definition of active and inactive channels.

Active Channels

The TMCAT17 switch recognizes a channel as being active when it detects that the channel port is connected to a powered CIM or MCUTP cable. A CIM or MCUTP cable is powered when the computer or device that it connects supplies power to it via the PS/2 keyboard or USB port.

A CIM or MCUTP cable always receives power in this scenario:

- The CIM or MCUTP's PS/2 keyboard or USB connector is plugged into a computer or device that is turned ON.

The CIM or MCUTP cable may or may not be powered when the computer is turned OFF, which varies depending on the computer's design.

Tip: You can check the CIM's LED to find whether it is powered. If it is powered, the LED is flashing. Otherwise, the LED light is off continuously.

Inactive Channels

The TMCAT17 switch recognizes a channel as being inactive when it does *not* detect that the channel port is connected to a powered CIM or MCUTP cable, which involves these scenarios:

- No CIM or MCUTP cable is connected to the channel port.
- A CIM or MCUTP cable is connected to the channel port, but it is unpowered as its PS/2 keyboard or USB connector is not plugged into any computer or device.

The CIM or MCUTP cable may or may not be powered when the computer is turned OFF, which varies depending on the computer's design.

Channel Colors and Statuses

This table indicates channel statuses and corresponding channel colors.

Color	Channel status
Black	This is an inactive channel.
Green	<p>This is an active channel that you can access.</p> <ul style="list-style-type: none"> • In the Private mode, active channels are green as long as the other user is NOT accessing them. • In the PC Share mode, every active channel is green no matter the other user is accessing them or not.
Red	<p>This is a channel, either active or inactive, which you <i>cannot</i> access.</p> <ul style="list-style-type: none"> • In the Private mode, a channel is red when the other user is accessing it. If the channel is connected to a second-tier device, all channels of that second-tier device are red, too. • In the PC Share mode, a channel is red only when it is connected to a second-tier device that is being accessed by the other user. In addition, all channels of the accessed second-tier device are red.

OSD Operation Keys

When you have logged in to the system, and the OSD is displayed on the screen, you can use these keys to navigate through the OSD menus, change settings, and so on.

▶ **To switch between menus:**

Key	Function
F1	Switches to the Help menu
F2	Switches to the Selection Menu
F5*	Switches to the Administration Menu

* Only the administrator has the permission to access the **Administration Menu** (see "**System Settings**" on page 42).

▶ **To switch between pages:**

Key	Function
Page Up	Switches to the previous page
Page Down	Switches to the next page
Home	Switches to the first page
End	Switches to the last page

▶ **To select fields or channels:**

Key	Function
Tab*	Moves forward
Shift+Tab*	Moves backward
Arrow keys (↑, ↓, ←, →)	Move the highlight bar
Enter	Confirms the selection of the field or channel

* The key or key combination is not applicable to the Selection Menu.

▶ **To change the values or options of the selected fields:**

Key	Function
Arrow keys (↑, ↓, ←, →)	Switch between available options, or adjust the numeric values of certain fields after the highlight color turns green
Enter	Confirms the current selection or the changes you

Key	Function
	make
Esc	Cancels the current selection or the changes you make

▶ **To exit from the menu or system:**

Key	Function
Esc	Exits from the current menu or submenu
F9	Logs you out of the TMCAT17 system

▶ **Others:**

Key	Function
F6	Toggles the Scan function on or off
F7	Toggles the Skip function on or off
S	Saves the changes you make to the current menu or submenu
G	Accesses the Channel Configuration submenu of the second-tier devices in a <i>two-tier</i> system

Chapter 4 Advanced Operation

This chapter introduces more features about the operation of the product.

If your TMCAT17 system is a two-tier system, make sure you follow these guidelines:

- All of the second-tier MCCAT switches have been programmed as the second-tier devices.

If not, the operation or configuration you perform at the TMCAT17 base switch applies to the base switch alone instead of the whole system. For programming instructions, see **STEP (A): Programme an MCCAT Switch as a Second-Tier Device** (on page 87).

- Always perform the operation or configuration at the TMCAT17 base switch (the first tier).

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Supporting Sun Servers.....	39
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Switching the Channel Sorting

The Selection Menu is sorted by channel number by default, but you can sort it based on channel names.

► **To switch the channel sorting:**

- Press F12 when the Selection Menu is displayed.

The Selection Menu switches from the current sorting to the other sorting.

Sorting by channel number

Selection Menu			
<XXX>	Page	1/2	
No	Ch. ID	Name	Scn
1	01	Win Vista	05
2	02	Win XP	05
3	03	Win 2000	05
4	04	Linux	05
5	05	Unix	05
6	06	Sun	05
7	07	HP	05
8	08	Email server	05

Page FKey Ent Esc
Scr1Lock | Scan | Skip | NCS

Sorting by channel name

Selection Menu by Name		
Name	Ch. ID	Page
Email server	<XXX>.08	1/2
HP	<XXX>.07	
Linux	<XXX>.04	
Sun	<XXX>.06	
Unix	<XXX>.05	
Win 2000	<XXX>.03	
Win Vista	<XXX>.01	
Win XP	<XXX>.02	

Page PCName FKey Ent Esc
Scr1Lock | Scan | Skip | NCS

Tip: When the Selection Menu is sorted by channel name, you can type initial character(s) of the desired channel's name to quickly locate the names beginning with matching character(s).

Cycling Through Channels

You can turn on the Scan function to have the TMCAT17 system automatically display the video of every computer one by one on the screen. If the system scans a channel port where a second-tier device is connected, it will scan all channels of the second-tier device first before proceeding with the next channels on the base switch.

The channel status will be updated after channel scanning so you can perform channel scanning whenever you need to retrieve the latest channel status.

*Tip: You can customize the scan rate. See **Changing the Scan Rate** (on page 44) for more information.*

► **To turn on the Scan function:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F6. The Scan status at the bottom of the OSD turns yellow.
3. Press Esc to quit the OSD.

The system displays the video of each channel one by one on the screen. When a channel is being scanned, its channel name and number will show up for seconds.

*Tip: You may shorten the overall scanning time by scanning "active" channels only. For more information, see **Accessing Active Channels Only** (on page 36).*

► **To turn off the Scan function:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F6 again. The Scan status at the bottom of the OSD turns black.

Accessing Active Channels Only

To avoid accessing any inactive channels when scanning or manually selecting channels, turn on the Skip function.

The system behaves differently with the Scan function being turned on or off.

- **When the Scan function is ON**

The system scans active channels only by skipping all inactive channels. See **What are Active and Inactive Channels** (on page 30).

- **When the Scan function is OFF**

The system allows you to select active channels only, which are displayed in green on the Selection Menu.

- ▶ **To turn on the Skip function:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F7. The Skip status at the bottom of the OSD turns yellow.
3. Press Esc to quit the OSD.

- ▶ **To turn off the Skip function:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F7 again. The Skip status at the bottom of the OSD turns black.

Sharing the Computer

The product provides two operation modes: Private and PC Share mode. Private mode allows only one user to access a channel at a time, but PC Share mode allows multiple users to access the same channel simultaneously.

PC Share mode functions in one of these scenarios:

- The administrator has turned on the **PC Share mode** (see "**Changing the Operation Mode**" on page 47).
- You are accessing the channels of the "second-tier" devices.

Note: The user from the base switch always shares second-tier channels with the "local" user, who operates the keyboard and mouse directly connected to the second-tier device. This is because the PC Share mode is automatically applied to all second-tier devices regardless of the operation mode selected at the base switch.

- ▶ **To share the computer:**

1. Ensure that the PC Share mode is activated or applied.
2. Now you can share the same channel with the other user. Depending on the channel access sequence, you may or may not be able to control the computer.
 - If you access the channel earlier than the other user—you can control the computer, and the other user can only view the video.
 - If you access the channel later than the other user—the other user can control the computer, and you can only view the video.

► **To release the computer control:**

If you are the controlling user, you can release the computer control by doing one of these:

- Exit from the channel by selecting another channel or logging out
- Both of you and the other user who accesses the same channel stop using the keyboard and mouse for 5 seconds

After the computer control is released, any user who first generates the keystroke or moves the mouse gains the control of the computer.

Note: It is normal that initial keyboard or mouse inputs are not processed by the computer when the computer control is being shifted to one of the users.

Activating the Help Menu

When the OSD is displayed on the screen, you can view its help at any time. The Help menu shows:

- OSD function keys and their brief descriptions
- Product information, including:
 - Firmware version
 - Hardware version
 - FPGA version
 - Serial number

```
Help/Information
F1 Help / ESC Exit
F2 Channel Selection
F5 Administrative Functions
F6 Toggle Scan On/Off
F7 Toggle Skip On/Off
F9 Logout
F12 Sort by Channel/Name

Firmware Ver: 2A16
Hardware Ver: 01
FPGA Ver: 011
Serial Number: AG62222345

FKey Esc
Scr1Lock | Scan | Skip | NCS
```

► **To access the Help menu:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F1.

Supporting Sun Servers

The product supports Sun servers. To connect Sun servers, you must use the CIM or MCUTP cable designed for Sun servers, that is, DCIM-USB G2 or MCUTPxx-SUSB, where xx represents the cable length.

▶ **To connect Sun servers via the MCUTPxx-SUSB cables:**

- See Steps 2 to 3 in the section: **Connecting the Equipment** (on page 14).

▶ **To connect Sun servers via DCIM-USB G2:**

1. Move the slide switch on the back of the DCIM-USB G2 to the right side so that the character "S" is visible. "S" refers to the Sun server.
2. Connect the DCIM-USB G2 to the Sun server.
 - Plug the CIM's USB connector into one of available USB ports on the Sun server.
 - Plug the CIM's video connector into the VGA port on the Sun server.
3. Connect the Sun server to one of the channel ports on the TMCAT17 switch via a standard Cat5 UTP cable.
 - Plug one end of the Cat5 UTP cable into the RJ-45 port of the CIM being connected with the Sun server.
 - Plug the other end of the Cat5 UTP cable into one of the channel ports on the TMCAT17 switch.

Emulating Special Sun Keys

Special Sun keys, such as the Again and Props keys, are unavailable on regular keyboards.

If connecting a Sun keyboard to the TMCAT17 switch, these special Sun keys do NOT function when its keyboard signals pass through the **User 2** port of any switch.

As these keys are either unavailable or do not function properly, you must use combination keys to emulate them.

Combination Keys Table

This table lists special Sun keys and corresponding combination keys.

Sun key	Combination keys
Again	Ctrl + Alt + F2
Props	Ctrl + Alt + F3
Undo	Ctrl + Alt + F4
Front	Ctrl + Alt + F5
Copy	Ctrl + Alt + F6
Open	Ctrl + Alt + F7
Paste	Ctrl + Alt + F8
Find	Ctrl + Alt + F9
Cut	Ctrl + Alt + F10
Help	Ctrl + Alt + F11
Mute	Ctrl + Alt + F12
Compose	Ctrl + Alt + * (the asterisk symbol on the keypad)
Volume +	Ctrl + Alt + + (the plus symbol on the keypad)
Volume -	Ctrl + Alt + - (the minus symbol on the keypad)
Stop	Pause/Break

Refreshing Channel Statuses

The TMCAT17 system does not automatically update channel statuses if you change the hardware configuration, such as channel swapping, turning on or off any computer. To get the up-to-date channel statuses, do one of these:

- If many channels are impacted:
 - Power cycle the TMCAT17 system by turning it OFF and then ON, or
 - Perform the Scan function until all channels are scanned at least once. See **Cycling Through Channels** (on page 36).

- If few channels are impacted, you can access impacted channels one by one to update their channel statuses. See **Accessing a Computer or Channel** (on page 23).

Chapter 5 System Settings

You can adjust the TMCAT17 system settings on the Administration Menu. Only the administrator has the permission to access this menu so you must log in using the administrator account, which comprises the following user name and password by default.

- User name: *admin*
- Password: *raritan*

If your TMCAT17 system is a two-tier system, make sure you follow these guidelines:

- All of the second-tier MCCAT switches have been programmed as the second-tier devices.

If not, the operation or configuration you perform at the TMCAT17 base switch applies to the base switch alone instead of the whole system. For programming instructions, see **STEP (A): Programme an MCCAT Switch as a Second-Tier Device** (on page 87).

- Always perform the operation or configuration at the TMCAT17 base switch (the first tier).

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Assigning or Modifying Channel Names

By default there are no channel names assigned to any connected devices on the Selection Menu. Only channel port numbers are available. It is not easy to identify the computers or devices without appropriate channel names, so you should specify a channel name for each connected computer or device.

► **To specify or change channel names:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the third submenu, Channel Configuration. To select the submenu, either press 3, or press ↓ to highlight it and then press Enter. The Channel Configuration submenu appears.
4. If you do not find the channel on the current page, press Page Down or Page Up to go to the next or previous page.
5. Press ↓ or ↑ to highlight the channel name you want to modify, and press Enter. The yellow highlight color turns light blue.
6. Type a new name up to twelve characters. The highlight color turns green when you type.
7. Press Enter to confirm the new name. The highlight color turns yellow again.
8. Repeat Steps 4 to 7 to modify more channel names.
9. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

*Note: To name the channels of the second-tier devices in a two-tier system, see **Setting Up the Second-Tier Channels** (on page 92) for information.*

Changing the Scan Rate

When the Scan function is ON, the system scans each channel for 5 seconds by default. You can change the scan rate of each channel. Valid range is 5 to 24 seconds.

► **To change scan rates:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the third submenu, Channel Configuration. To select the submenu, either press 3, or press ↓ to highlight it and then press Enter. The Channel Configuration submenu appears.
4. If you do not find the channel on the current page, press Page Down or Page Up to go to the next or previous page.
5. Press ↓ or ↑ to highlight the channel whose scan rate you want to modify.
6. Press Tab or → to select the field in the Scn column, and press Enter. The highlight color turns green.
7. Press any arrow key to adjust the numeric value by 1, or type two numeric digits. Then press Enter. The highlight color turns yellow.
8. Repeat Steps 4 to 7 to change the scan rates for other channels.
9. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Renaming the TMCAT17 Switch

The default device name of each TMCAT17 switch is its model name. You can customize the name for better identification of the device.

*Note: The device name does not accept special characters, such as *, &, %, <>, and so on.*

► **To change the name of the TMCAT17 switch:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.

3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Device ID field, and press Enter. The highlight color turns green.
5. Type the new name up to 12 characters, and press Enter. The highlight color turns yellow.
6. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

*Note: In a two-tier system, you name the base switch by following the procedure in this section, but name each second-tier MCCAT switch by naming corresponding channels on the base switch. See **Assigning or Modifying Channel Names** (on page 43).*

Changing Passwords

It is strongly recommended to change the default password for the security of your TMCAT17 system.

The default password for the administrator account (Admin) is "raritan" (all lower case), and there are no passwords for any user accounts by default.

► To change passwords:

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the second submenu, User Configuration. To select the submenu, either press 2, or press ↓ or ↑ to highlight it and then press Enter. The User Configuration submenu appears.
4. Press ↓ or ↑ to highlight the user account whose password you want to change.
5. Press P. The message "Enter old password" appears on the message bar.
6. Type the current password, and press Enter. Note the password is case sensitive.
 - If there are no passwords, press Enter or Esc.
7. The message "Enter new password" appears on the message bar. Type a new password up to eight characters, and press Enter.

8. The message "Confirm password" appears on the message bar. Re-type the new password, and press Enter.
 - When the message "Password Changed" appears on the message bar, the password is changed successfully.
9. Repeat Steps 4 to 8 to change the passwords for other user accounts.

Important: Write down your new passwords and keep them in a safe place. If you forget your passwords, there are no ways to retrieve them. You must delete that user account and re-create a new one.

Changing the Hot Key

You use the hot key to activate the OSD when it is not displayed on the screen. The default hot key is Scroll Lock. You can assign a key other than Scroll Lock as the hot key. Available options include Scroll Lock, Left Alt, Left Shift, Caps Lock, and Num Lock.

► **To change the hot key setting:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Hotkey field, and press Enter. The highlight color turns green.
5. Press any arrow key to switch between available options, and press Enter to confirm your selection. The highlight color turns yellow.
6. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Important: In a two-tier system, you must log in to the base switch and every second-tier MCCAT switch using the keyboard directly connected to them, to change the hot key assignment one by one.

Changing the Operation Mode

There are two operation modes in the TMCAT17 system: Private and PC Share modes.

- Private mode: When a user is accessing any channel, the other user cannot access the same channel unless the first user exits from that channel.
- PC Share mode: Multiple users can access the same channel simultaneously. Only the user who first presses any key on the keyboard or moves the mouse can control the computer, and the other user can only view the video. See ***Sharing the Computer*** (on page 37) for more information.

► **To change the operation mode:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Operation Mode field, and press Enter. The highlight color turns green.
5. Press any arrow key to switch between available options, and press Enter to confirm your selection. The highlight color turns yellow.
6. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Important: Even though you have turned on the PC Share mode at the base switch, you **CANNOT** share the same channels of the second-tier devices with the other user who also logs in to the base switch. For more information, see *Limitations of the Two-Tier System* (on page 87).

Setting Up the Green Mode

Green Mode is the power-saving mode for the monitor. When the TMCAT17 system does NOT detect any keystrokes or mouse activities for a preset period of time after you access a channel, the system enters the Green Mode, and the screen becomes blank. You can turn on or off the function, or change the length of time for which the keyboard and mouse must be idle before the system enters the Green Mode.

► **To turn on the Green Mode and adjust the timing:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Green Mode field, and press Enter. The highlight color turns green.
5. Press any arrow key to select the option, On, and press Enter. The highlight color turns yellow.
6. Change the timing setting if necessary.
 - a. Press Tab or → to select the timing field to the right, and press Enter. The highlight color turns green.
 - b. Press any arrow key to adjust the numeric value by 1, or type two numeric digits. Then press Enter. The highlight color turns yellow.
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Note: When the monitor enters the power-saving mode, you can press any key or move the mouse to wake it up.

► **To turn off the Green Mode:**

1. Select the Green Mode field by following Steps 1 to 4 described above.
2. Press any arrow key to select the option, Off, and press Enter. The highlight color turns yellow.
3. Press S to save the changes or Esc to quit the current menu or submenu.

- If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Setting Up the Logoff Timeout Function

You can turn on the Logoff Timeout feature so when a logged-in user stops using the keyboard and mouse for a preset period of time, the TMCAT17 system automatically logs out of that user.

► To turn on the Logoff Timeout function and adjust the timing:

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Logoff Timeout field, and press Enter. The highlight color turns green.
5. Press any arrow key to select the option, On, and press Enter. The highlight color turns yellow.
6. Change the timing setting if necessary. The default is 5 minutes.
 - a. Press Tab or → to select the timing field to the right, and press Enter. The highlight color turns green.
 - b. Press any arrow key to adjust the numeric value by 1, or type two numeric digits. Then press Enter. The highlight color turns yellow.
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

► To turn off the Logoff Timeout function:

1. Select the Logoff Timeout field by following Steps 1 to 4 described above.
2. Press any arrow key to select the option, Off, and press Enter. The highlight color turns yellow.
3. Press S to save the changes or Esc to quit the current menu or submenu.

- If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Hiding the Login Box

The Login box is continuously displayed on the screen by default. You can have the system automatically hide the Login box when no one makes any attempts to log in for a preset period of time. The function is called Login Blank, and it helps save the monitor's power during the idle time.

► **To turn on the Login Blank function and adjust the timing:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the Login Blank field, and press Enter. The highlight color turns green.
5. Press any arrow key to select the option, On, and press Enter. The highlight color turns yellow.
6. Change the timing setting if necessary.
 - a. Press Tab or → to select the timing field to the right, and press Enter. The highlight color turns green.
 - b. Press any arrow key to adjust the numeric value by 1, or type two numeric digits. Then press Enter. The highlight color turns yellow.
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Note: When the monitor enters the power-saving mode, you can press any key or move the mouse to wake it up.

► **To turn off the Login Blank function:**

1. Select the Login Blank field by following Steps 1 to 4 described above.
2. Press any arrow key to select the option, Off, and press Enter. The highlight color turns yellow.

3. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Managing User Accounts

The product provides one administrator account and seven user accounts by default. They are Admin and User01 through User07. You cannot remove or rename the administrator account (Admin), but you can rename, remove or add user accounts.

Renaming User Accounts

You can rename existing user accounts.

► **To rename a user account:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the second submenu, User Configuration. To select the submenu, either press 2, or press ↓ or ↑ to highlight it and then press Enter. The User Configuration submenu appears.
4. Press ↓ or ↑ to highlight the user account you want to rename, and press Enter. The highlight color turns light blue.
5. Type a new name up to eight characters, and press Enter. The highlight color turns yellow.
6. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Adding User Accounts

You can have up to 127 user accounts by creating new accounts.

► **To add new user accounts:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.

3. Select the second submenu, User Configuration. To select the submenu, either press 2, or press ↓ or ↑ to highlight it and then press Enter. The User Configuration submenu appears.
4. Press Insert. The system creates a new user account with the name syntax—User<xx>, where <xx> is the sequential number, following the last existing user account.
5. The message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to confirm the addition, or N or Esc to cancel the addition.
6. Repeat Steps 4 to 5 to add more user accounts.
7. Press Esc to quit the current submenu.

The system does not assign any password to a new user account by default. To assign any password, see **Changing Passwords** (on page 45). To change the user name, see **Renaming User Accounts** (on page 51).

Deleting User Accounts

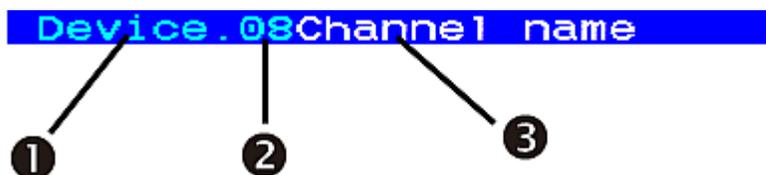
You can remove obsolete user accounts when necessary.

► **To delete user accounts:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the second submenu, User Configuration. To select the submenu, either press 2, or press ↓ or ↑ to highlight it and then press Enter. The User Configuration submenu appears.
4. Press ↓ or ↑ to highlight the user account you want to delete, and press Delete.
5. The message "Delete this user [Y/N/ESC]" appears on the message bar. Press Y to confirm the deletion, or N or Esc to cancel the deletion.
6. Repeat Steps 4 to 5 to delete more user accounts.
7. Press Esc to quit the submenu.

Setting Up the Channel ID Display Function

Whenever you access any channel to which a computer or any non-KVM-switch device is connected, a line of text comprising the device name, channel number and name appears on the screen for seconds. The line is the "ID" of the accessed channel.



❶	Current KVM switch's name.
❷	Channel number.
❸	The text in white is the channel name. If no channel name has been assigned to the accessed channel, this part is blank.

You can determine whether the system displays the channel ID, how long and even where on the screen it displays the ID by changing the OSD settings.

Setting Up the ID Display Function

► **To turn on the ID display function and adjust the display timing:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the ID Display field, and press Enter. The highlight color turns green.
5. Press any arrow key to select the option, On, and press Enter. The highlight color turns yellow.
6. Change the ID Display timing if necessary.
 - a. Press Tab or → to select the timing field to the right, and press Enter. The highlight color turns green.
 - b. Press any arrow key to adjust the numeric value by 1, or type two numeric digits. Then press Enter. The highlight color turns yellow.

- To display the ID continuously on the screen, select "- -" (dashes).
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

► **To turn off the ID display function:**

1. Select the ID Display field by following Steps 1 to 4 described above.
2. Press any arrow key to select the option, Off, and press Enter. The highlight color turns yellow.
3. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Adjusting the ID Display Position

► **To adjust the channel ID position:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the "ID" item in the Display Position field, and press Enter.
5. The sample ID bar appears on the screen.



-Move Enter-Exit

Now move it to the position you prefer by pressing the arrow keys.

6. Press Enter to confirm the new position.
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Adjusting the OSD Menu Position

You may move the OSD menu to the position you prefer on the screen.

► **To adjust the OSD menu position:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the first submenu, System Configuration. To select the submenu, either press 1, or press ↓ or ↑ to highlight it and then press Enter.
4. Press Tab or Shift+Tab to highlight the "Menu" item in the Display Position field, and press Enter. The highlight color turns green.
5. Now move the OSD menu to the position you prefer by pressing the arrow keys.
6. Press Enter to confirm the new position. The highlight color turns yellow.
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing Esc, the message "Save the changes [Y/N/ESC]" appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Resetting System Settings

You may clear current system settings and have all settings return to factory defaults. These settings are:

- All settings involved on the Administration Menu, including:
 - System Configuration
 - User Configuration
 - Channel Configuration

► **To reset system settings:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the fourth submenu, Factory Default Reset. To select the submenu, either press 4, or press ↓ or ↑ to highlight it and then press Enter.

4. The message "Reset To Default [Y/N/ESC]" appears on the message bar. Press Y to reset the system, or N or Esc to cancel the reset.
5. When you hear the beep sound and see the login box displayed on the screen, the system reset is complete.

In a two-tier system, reset the base switch only. Do not reset the second-tier devices unless necessary. If you reset second-tier devices, ensure that you **re-programme them** (see "**STEP (A): Programme an MCCAT Switch as a Second-Tier Device**" on page 87).

Chapter 6 LCD Panel Operation

You can customize visual display properties of the built-in LCD display, such as colors and image position, by changing the settings on the LCD OSD menu.

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- OSD Submenus.....58
- Changing LCD OSD Settings60
- Auto-Adjusting Display Settings61
- Resetting LCD OSD Settings62
- Quitting the LCD OSD Menu62

LCD Controls

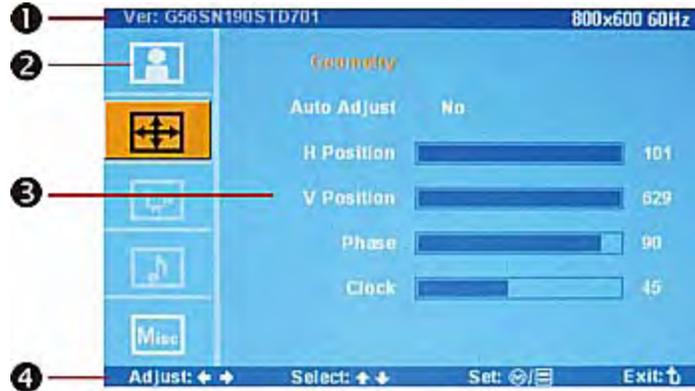
The buttons at the bottom of the LCD panel are used to control the LCD display and navigate through the LCD's OSD interface.



Button	Function
	Turn on/off the LCD display. <ul style="list-style-type: none">▪ Adjacent LED turns blue when turned on.▪ Adjacent LED is <i>not</i> lit when turned off.
	Two functions: <ul style="list-style-type: none">▪ Activate the LCD's OSD interface.▪ Confirm the current selection when an OSD menu or field is highlighted.
	Two functions: <ul style="list-style-type: none">▪ Move the highlight on the LCD OSD menu.▪ functions as a shortcut button to auto-adjust visual display settings without activating the LCD's OSD interface.
	Adjust the value or switch among available options after any OSD field is selected.
	Exit from current LCD OSD menu or submenu.

LCD OSD Layout

You can view the LCD information, and adjust the visual images displayed and the LCD OSD properties through LCD OSD menus.



Number	Information	Description
①	OSD title	The bar shows the LCD version, and the resolution and refresh rate applied to current video image.
②	Submenu section	The left column shows the OSD submenus. Only three submenus are available: Image, Geometry, and Misc.
③	Setting section	The right column shows the fields available in the selected submenu.
④	Help bar	The bar shows the buttons that work with the LCD OSD menu.

OSD Submenus

Only three submenus are enabled for TMCAT17: Image, Geometry, and Misc.

Image

This submenu determines how the screen image is displayed.



- Brightness: Adjust background black level of the screen image.
- Contrast: Adjust the difference between the image background (black level) and the foreground (white level).
- Color Temp: The screen color is not user-configurable -- always at 9300K.
- Red: Adjust the red color.
- Green: Adjust the green color.
- Blue: Adjust the blue color.

Geometry

The submenu controls geometry, clock and phase settings.



- Auto Adjust: Fine tune the video signal to eliminate waviness and distortion. The "Auto Adjusting" message is displayed during the process.
- H Position: Align the screen image left or right.
- V Position: Align the screen image up or down.
- Phase: Adjust the phase setting.
- Clock: Adjust the clock setting.

Misc

This submenu provides other OSD or screen settings, and the reset function.



- Language: Select the language in which the LCD's OSD interface is displayed.
- OSD Position: Determine the position of the LCD OSD on the screen.
- Display Mode: Adjust the LCD display's video resolution.
- OSD Time: Set the time duration in seconds that the LCD OSD is visible after the last time any button of the LCD controls is pressed.
- Ratio: Adjust the screen image's ratio.
- Reset: Restore the LCD OSD settings to factory defaults.

Changing LCD OSD Settings

Follow this procedure to change the settings on the LCD OSD menu.

► **To change the OSD settings:**

1. Press . The LCD OSD menu appears.

2. Press  or  to select the submenu (icon) you want, and press  to confirm. When a submenu is selected, it is highlighted in orange.
3. Press  or  to select the field whose value or option you want to change. When a field is selected, it is highlighted in blue.
4. Press  or  to adjust the value or switch among available options.
5. To adjust more fields on the same submenu, repeat Steps 3 to 4.

Note: Some settings like the Display Mode field may close the LCD OSD menu after changing the option or value. If so, start from Step 1 if you want to change other LCD OSD settings.

6. Press  to quit the current submenu.
7. To adjust the settings on the other submenus, repeat Steps 2 to 6.
8. Press  to quit the LCD OSD menu.

Auto-Adjusting Display Settings

Instead of customizing the LCD display settings manually, you can have the LCD automatically configure all visual settings according to the video signals it receives.

There are two ways to perform the auto-adjustment function: the UP button on the LCD control or the LCD's OSD interface.

► To auto-adjust visual display settings using a button:

1. Ensure you have accessed a channel, and the LCD OSD menu is not displayed on the screen.
2. Press .

A message "Auto Adjusting" is displayed on the screen, and the screen flickers momentarily until it finds the ideal profile.

► To auto-adjust visual display settings using the LCD OSD:

1. Press . The LCD OSD menu appears.
2. Press  or  to select the Geometry submenu, and press  to confirm.
3. Press  or  to select the Auto Adjust field.

4. Press  or  to select the option, Yes, and then press  to confirm.

A message "Auto Adjusting" is displayed on the screen, and the screen flickers momentarily until it finds the ideal profile.

Resetting LCD OSD Settings

You can restore all of LCD OSD settings to factory defaults at any time.

► **To reset OSD settings:**

1. Press . The LCD OSD menu appears.
2. Press  or  to select the Misc submenu, and press  to confirm.
3. Press  or  to select the Reset field.
4. Press  or  to select the option, Yes, and then press  to confirm.

Important: You must press  in this step, or the reset function is not performed.

5. Press  twice to quit the LCD OSD menu.

If you change any LCD OSD settings after finishing Step 4, the later changes are not reset.

Quitting the LCD OSD Menu

The LCD OSD menu automatically disappears if there is no activity from the LCD control for the period of time specified in the "OSD Time" field (usually 8 seconds by default). You can also manually exit from the LCD OSD menu whenever you want.

► **To exit from the OSD manually:**

- Press  once or several times until the LCD OSD menu disappears.

Chapter 7 Keyboard Layout Settings (for Sun USB MCUTP Cable)

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. With the Sun USB MCUTP cable, you can change the keyboard's layout setting to match your keyboard type if you are not using a US English keyboard (the factory default).

Note: The keyboard-layout change function is not applicable to USB or PS/2 MCIM and MCUTP cable.

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Changing Keyboard Layout Settings

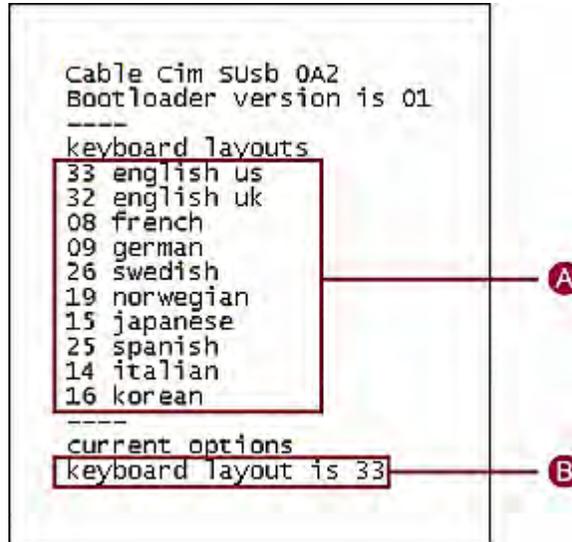
When you connect a Sun USB MCUTP cable to a Sun server and your keyboard is not US English (code 33), you have to change the keyboard layout setting by entering the keyboard setting mode.

► **To change the keyboard layout setting:**

1. Highlight the channel of the desired server on the Selection Menu, and press Enter.
2. Activate a text editor on the server.

3. Press Left Ctrl + NumLock to enter the setting mode. A message similar to the following appears in the text editor.

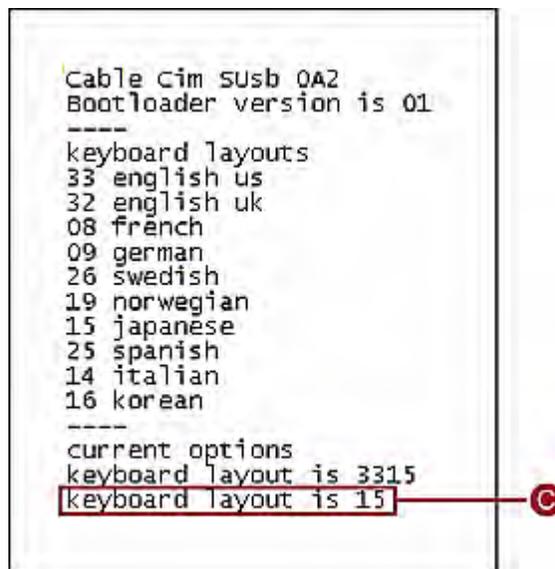
```
Cable C1m SUSb 0A2
Bootloader version is 01
----
keyboard layouts
33 english us
32 english uk
08 french
09 german
26 swedish
19 norwegian
15 japanese
25 spanish
14 italian
16 korean
----
current options
keyboard layout is 33
```



A	Frequently-used keyboard layout codes
B	Current keyboard layout is US English (code 33)

4. Press the appropriate keyboard layout code, and then the last line shows the newly-typed code. For example, if you type the Japanese keyboard code 15, the last line shows the keyboard layout is 15.

```
Cable C1m SUSb 0A2
Bootloader version is 01
----
keyboard layouts
33 english us
32 english uk
08 french
09 german
26 swedish
19 norwegian
15 japanese
25 spanish
14 italian
16 korean
----
current options
keyboard layout is 3315
keyboard layout is 15
```



C	Newly-changed keyboard code
----------	-----------------------------

5. Press Esc to exit the setting mode.
6. Log out of the server.
 - If a message appears, asking whether you want to save the text file, you can ignore it.
7. Log in to the server.

Important: You must log out of the server and then log back in for the changed keyboard setting to be effective.

Keyboard Layout Codes

The keyboard setting mode displays only frequently-used keyboard layout codes on the screen. For other layout codes, see the table.

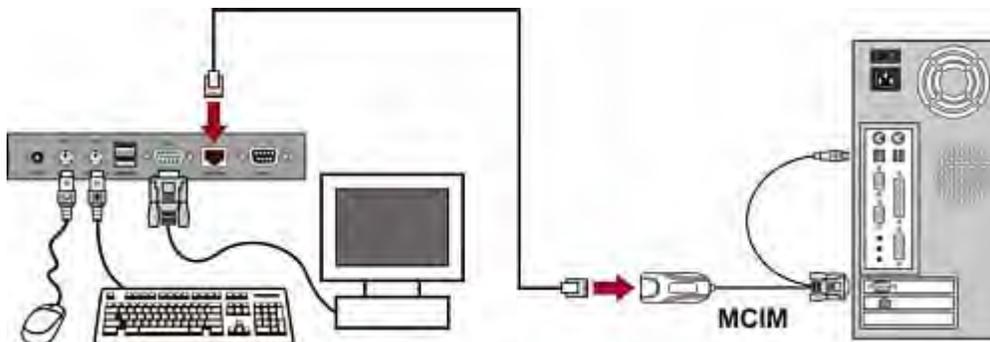
Language	Layout code	Language	Layout code
Arabic	01	Netherlands	18
Belgian	02	Norwegian	19
Canadian-Bilingual	03	Persian	20
Canadian-French	04	Poland	21
Czech Republic	05	Portuguese	22
Danish	06	Russia	23
Finnish	07	Slovakia	24
French	08	Spanish	25
German	09	Swedish	26
Greek	10	Swiss/French	27
Hebrew	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

Chapter 8 User Station Direct Mode

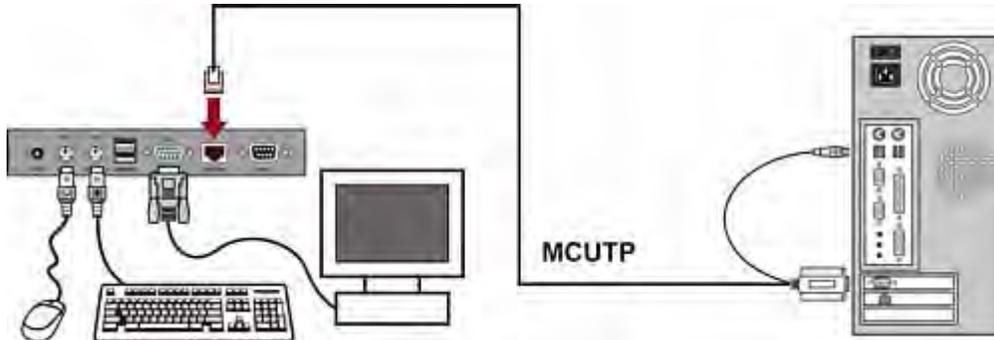
Sometimes when you have to cope with an emergency, such as the crash cart operation, you may need to connect the MCCAT user station to the computer directly. This is called Direct Mode.

► **To connect the MCCAT user station to the computer:**

1. Ensure that the MCIM or MCUTP cable remains connected to the computer that you want to operate. For information on connecting the MCIM or MCUTP cable, see **Connecting the Equipment** (on page 14).
2. Ensure that the keyboard, mouse and monitor remain connected to the **MCCAT user station** (see "**Connecting a User Station (Optional)**" on page 17).
3. Connect the computer to the MCCAT user station with a cable up to 100 feet (30.48 meters). A cable longer than 100 feet may degrade the video quality.
 - If using the MCIM:
 - a. Plug one end of the Cat5 UTP cable into the RJ-45 port of the MCIM being connected to the computer.
 - b. Plug the other end of the cable into the Cat5 Port of the user station.



- If using the MCUTP cable:
 - Plug the RJ-45 connector of the cable into the Cat5 Port of the user station.



Note: If any abnormal video issues occur, power cycle the MCCAT user station by unplugging and re-plugging its power adapter to resolve the problem.

Chapter 9 Firmware Upgrade

You can upgrade the firmware to benefit from the latest enhancements and features whenever new firmware is released on the Raritan website. The upgrade procedure for the TMCAT17 switch and MCCAT user station is the same, but the required firmware file is different. The upgrade process involves three steps:

- STEP (A): Download the latest firmware and upgrade utility
- STEP (B): Connect the desired device to the computer running the upgrade utility
- STEP (C): Launch the upgrade utility

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STEP (B): Connect the Desired Device to the Computer Running the Upgrade Utility69
STEP (C): Launch the Upgrade Utility.....70

STEP (A): Download the Latest Firmware and Upgrade Utility

1. Use your browser to visit **Raritan website** (<http://www.raritan.com>).
2. Click **Support > Firmware and Documentation**.
3. Locate the product name on the left pane and click it.
4. Click the appropriate version (or model) on the right pane.
5. Click **Firmware Upgrade**. The webpage showing a list of firmware files opens.
 - If this is your first time to download the firmware from the Raritan website, the Firmware Request form opens. Fill in the form, and click **Submit**.
6. When you see the hyperlinks or files on the right pane, click the appropriate one.
7. Click **Save** to save the file on your computer.
8. Specify the location where you want to save the file, and click **Save**. Wait until the download completes.
9. Extract the file if it is a compressed file.
10. (Optional) If the downloaded file does not include the 'release notes' document, locate the release notes on the Firmware and Documentation section, and double-click it to open or download it.
11. Read the release notes for any necessary information.

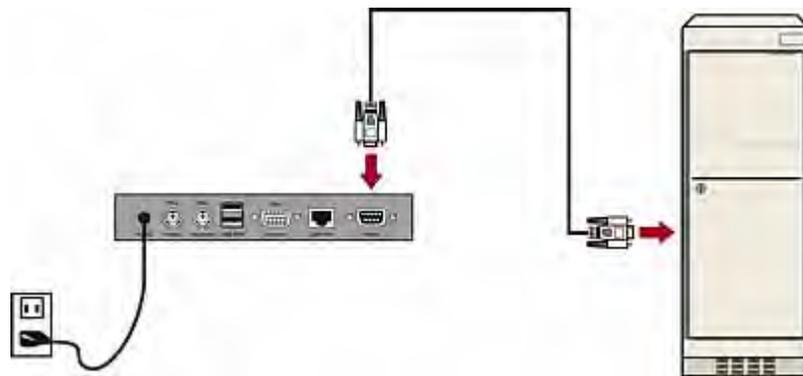
STEP (B): Connect the Desired Device to the Computer Running the Upgrade Utility

Prepare one DB9 male-to-female serial (RS-232) cable, and use it to connect the TMCAT17 switch or MCCAT user station to the computer where the upgrade utility is installed.

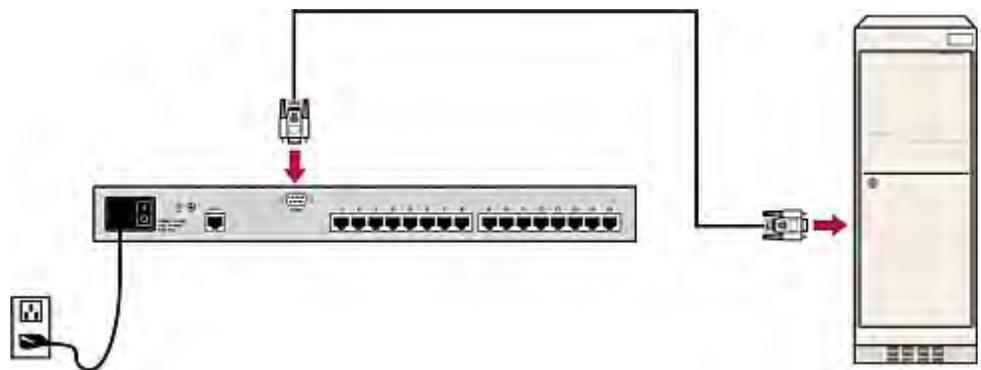
Note: If you don't have the cable, contact Raritan Technical Support for assistance.

1. Plug one end of the serial cable into one of the computer's serial ports.
2. Plug the other end into the **Admin** port of the TMCAT17 switch or MCCAT user station.

- **MCCAT User Station Connection**



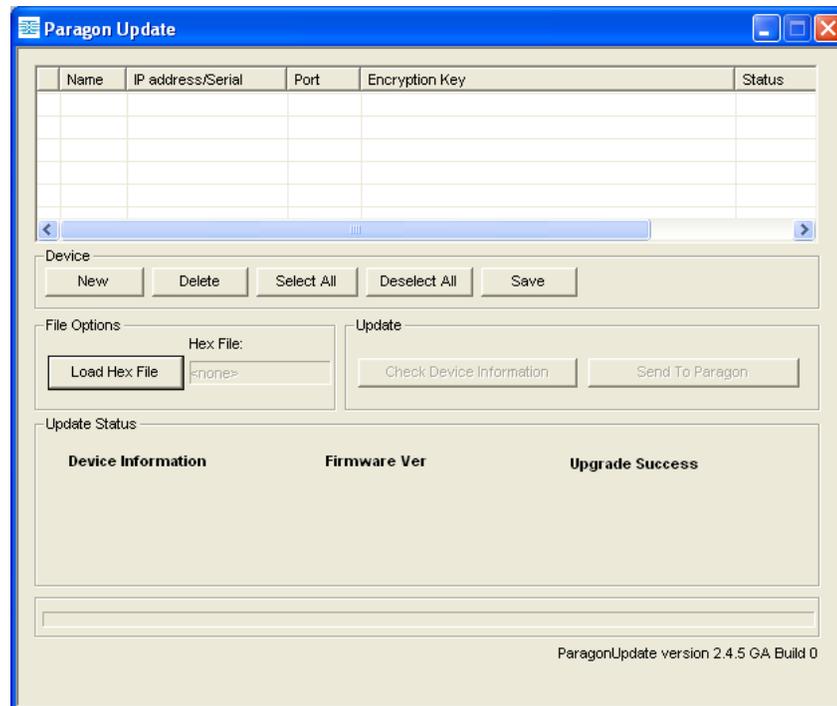
- **TMCAT17 Switch Connection**



STEP (C): Launch the Upgrade Utility

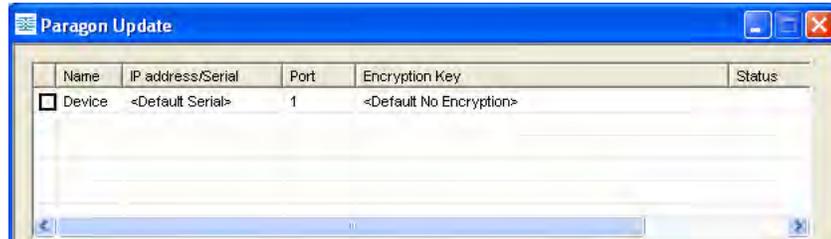
The upgrade utility for TMCAT17 switch and MCCAT user station is the same one for Raritan Paragon devices, that is, the Paragon Update utility. Paragon Update utility older than 2.4.3 does not support upgrading the TMCAT17 switch and MCCAT user station. To ensure the success of the upgrade, always use the latest upgrade utility downloaded along with the TMCAT17 firmware.

1. Double-click the upgrade utility—`ParagonUpdate_xxx.exe`, where `xxx` represents the version number. The Paragon Update utility opens.

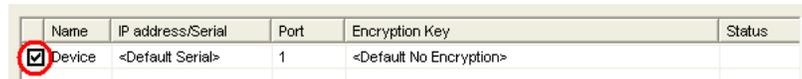


2. If the device that you want to upgrade is already listed in the dialog, go to Step 3. If not, follow this procedure to specify the device information:
 - a. Click New to add the device information.
 - b. Click the Name field and type the appropriate name for the device that you want to upgrade.
 - c. Ensure <Default Serial> is selected in the IP address/Serial field.
 - d. Click the Port field and type the appropriate number of the serial port. For example, if the device connects to the computer via COM 1, type 1, if via COM 2, type 2.

- e. Ensure <Default No Encryption> is selected in the Encryption Key field.
- f. (Optional) Click Save to save the device information so that next time you don't have to specify the same information again.



- 3. Select the checkbox next to the device that you want to upgrade.



- 4. Click Load Hex File. The Open dialog appears.
- 5. Navigate to where the appropriate firmware file (*.hex) is stored, select it and click Open. Firmware files for different devices are different:

Device		Filename syntax (*.hex)
KVM switch	MCCAT28 or MCCAT216	mcc2-xxx**
	TMCAT1728 or TMCAT17216	tm-mcc2-xxx**
MCCAT user station		MCCUST-xxx**

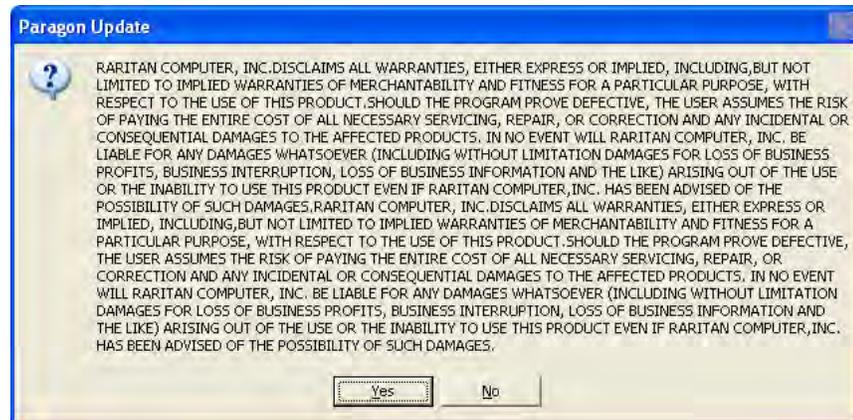
**xxx represents the firmware version number.



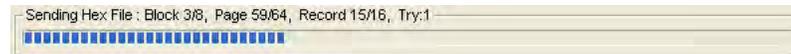
6. (Optional) If you want to view the current hardware and firmware version of the device, click Check Device Information.
 - a. Click Yes. The Check Device Information window opens.
 - b. To quit the window, click OK.

Note: MCCAT and TMCAT17 series belong to the same hardware type. The Check Device Information window always shows the hardware is MCCAT no matter the connected KVM switch is MCCAT or TMCAT17 series.

7. Click Raritan MasterConsole to perform the upgrade.
8. Click Yes when this message appears.



9. A progress indicator at the bottom of the dialog displays the upgrade status. The upgrade may last for several minutes.



10. The “Device Update Successful” message appears when the upgrade is finished successfully. Click OK.



For more information on the Paragon Update utility, download the *Paragon Manager User Guide* from Raritan's **Firmware and Documentation webpage** (<http://www.raritan.com/support/firmware-and-documentation/>).

Appendix A Specifications

In This Chapter

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TMCAT17 Specifications

Generic		
	TMCAT1728	TMCAT17216
Form factor	1U 19" rackmountable (482.6mm), can be mounted in 750mm and 900mm cabinets	
Display type	Grade A+ LCD, TFT panel display	
Display size	17" (431.8mm) diagonal	
Dimension (WxDxH)	442 x 570 x 41.6 mm	
Weight	44 lb. (20 kg)	
Contrast ratio	700:1 (typical)	
Viewing Angle		
Horizontal	80 / 80 degrees from center	
Vertical	80 / 80 degrees from center	
Display colors	16.2 million	
Maximum resolution	SXGA (1280 x 1024)	
Brightness	300 nit	
Keyboard	Notebook style	
Number of Keys	104/106 keys with numeric keypad	
Pointing device	Integrated touchpad with two-button control	
Color	Black	
KVM		
2nd user port	RJ-45 x 1	
Number of channel ports	8	16
Environment and others		
Operating temperature	0° to 50° C	

Storage temperature	-5° to 60° C
Humidity	5~90% RH, non-condensing
Power	AC, 110-240V, 50~60Hz, auto-switching
Certification	FCC, CE, UL, RoHS

Supported Video Resolutions

Note: The integrated LCD display supports the video resolution up to 1280x1024 only, but the external monitor, which is connected to the TMCAT17 switch via the MCCAT user station, can support the resolution up to 1600x1200.

Resolutions for the Built-in LCD Display

Screen resolution	Refresh rate (HZ)
640x350	70
640x480	60, 72, 75
720x400	70
800x600	60,72, 75
1024x768	60, 70,75
1152x864	60, 70, 75
1280x960	60, 75
1280x1024	60, 75

Resolutions for the External Monitor

Screen resolution	Refresh rate (HZ)
640x350	70, 85
640x400	85
640x480	60, 67, 72
720x400	70, 85
800x600	56, 60, 70, 72, 75, 85, 100
1024x768	60, 70, 75, 85, 100
1152x864	75
1152x870	75
1280x960	60, 85

Screen resolution	Refresh rate (HZ)
1280x1024	60, 75, 85
1600x1200	60

Appendix B Cable Length Limitations

You should limit the Cat5 cable length between TMCAT17 system components and connected computers for keeping optimal video quality. This section lists the maximum cable length or distance supported in different scenarios.

In This Chapter

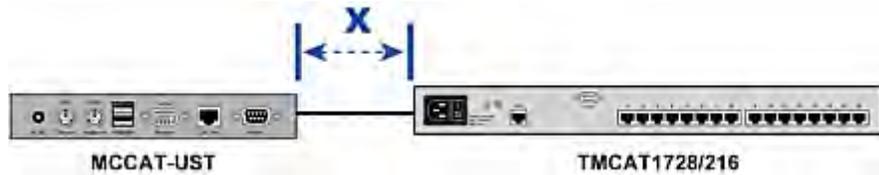
Maximum Distance between Users and TMCAT17 Switches.....76
 Maximum Distance between Users and Computers76
 Maximum Distance for User Station Direct Mode77

Maximum Distance between Users and TMCAT17 Switches

The cable length or distance between the MCCAT user station and TMCAT17 switch cannot exceed 100 feet.

Supported length

X= up to 100 feet (30.48 meters)

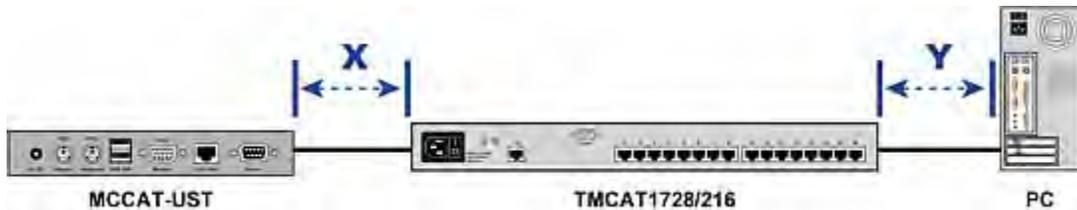


Maximum Distance between Users and Computers

Maximum cable length or distance between users and computers varies depending on video resolutions.

Resolution	Supported length
1280x1024 or below	X*+Y= up to 150 feet (45.72 meters)
1600x1200	X*+Y= up to 100 feet (30.48 meters)

* X can be up to 100 feet. See **Maximum Distance between Users and TMCAT17 Switches** (on page 76).

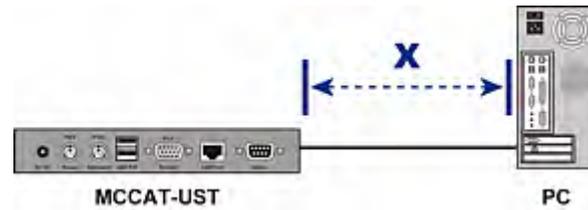


Maximum Distance for User Station Direct Mode

When you connect the MCCAT user station to a computer directly, that is, the Direct Mode, you should also limit the cable length for video quality. For information on the Direct Mode, see **User Station Direct Mode** (on page 66).

Supported length

X= up to 100 feet (30.48 meters)



Appendix C Compatibility with Other Raritan Products

TMCAT1728 and TMCAT17216 switches can work in conjunction with other Raritan devices, including:

- Analog KVM switches, such as MCCAT18 and MCCAT116
- Most of Paragon, Dominion and Serial CIMs.
- Paragon II enhanced user station -- P2-EUST
- Digital KVM switches, that is, Dominion KX II

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Analog KVM Switches

The TMCAT17 switch can work with any MCCAT KVM switches to form a *two-tier* system, including:

- MCCAT18
- MCCAT116
- MCCAT28
- MCCAT216

In the two-tier system, the TMCAT17 switch must function as the base tier, that is, the base switch. See **Two-Tier System** (on page 85) for more information.

User documentation for MCCAT switches can be downloaded from Raritan website's **Firmware and Documentation section** (<http://www.raritan.com/support/firmware-and-documentation/>).

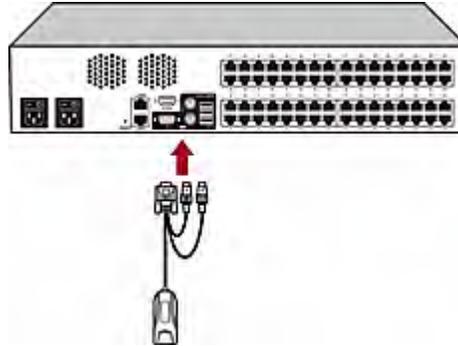
Digital KVM Switches

The TMCAT17 switch is compatible with all of Raritan's Dominion KX II KVM switches except for Dominion KX II-101. Instead of connecting a VGA monitor, mouse and keyboard to the Dominion KX II device for local access and configuration, you can connect a TMCAT17 switch to it.

► **To connect Dominion KX II to the TMCAT17 switch:**

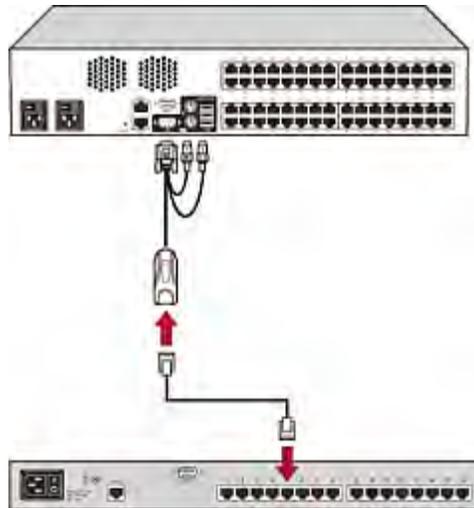
1. Connect an MCIM or any CIM compatible with the TMCAT17 switch to the Dominion KX II device.

- Plug the MCIM or CIM's VGA and PS/2 or USB connectors into the appropriate ports labeled **LOCAL USER** on the Dominion KX II device.



*Note: For a list of CIMs compatible with TMCAT17, see **Compatible CIMs** (on page 80).*

2. Connect the Dominion KX II device to the TMCAT17 switch via a Cat5 UTP cable.
 - a. Plug one end of the Cat5 UTP cable into the RJ-45 port on the MCIM or CIM connected to Dominion KX II.
 - b. Plug the other end of the cable into one of available channel ports on the TMCAT17 switch.



3. Repeat Steps 1 to 2 if you want to connect more Dominion KX II devices.

Then you can access the Dominion KX II device as well as the servers connected to it by selecting the channel where the Dominion KX II is connected on the TMCAT17's Selection Menu. To access Dominion KX II, you must log in twice -- the first time to the TMCAT17 switch, and then to the Dominion KX II device.

Note: The Dominion KX II integration is NOT considered a two-tier system, so choose "CPU" as the type of the Dominion KX II device.

For information on Dominion KX II, see the Dominion KX II User Guide, which can be downloaded from Raritan website's **Firmware and Documentation section** (<http://www.raritan.com/support/firmware-and-documentation/>).

Compatible CIMs

In addition to MCIM-PS2 and MCIM-USB, the TMCAT17 switch is also compatible with other Raritan Computer Interface Modules (CIMs). See the table in this section for information.

The way to connect these CIMs is the same as the way to connect MCIMs. See **Connecting the Equipment** (on page 14) for how to connect an MCIM.

CIM	Connector type
P2CIM-APS2	PS/2 and HD15 (video) connectors
P2CIM-AUSB	USB and HD15 (video) connectors
DCIM-PS2	PS/2 and HD15 (video) connectors
DCIM-USB	USB and HD15 (video) connectors
DCIM-USB G2 *	USB and HD15 (video) connectors
P2CIM-SER	RS-232 (serial) and USB connectors
P2CIM-SER-EU	RS-232 (serial) and USB connectors

* When connecting a DCIM-USB G2 to the computer, ensure the slide switch on the back of the CIM is moved to P for PC-based servers or moved to S for SUN servers.

Note: Although the TMCAT17 switch supports the use of P2CIM-APS2, it does NOT support the Pinnacle FastAction keyboard that P2CIM-APS2 supports.

Connecting a Serial Device via the Serial CIM

To connect an ASCII serial device, LAN/WAN component or a computer through an RS-232 serial port to the TMCAT17 system, use one of Raritan's serial CIMs: *P2CIM-SER* or *P2CIM-SER-EU*. 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. With this conversion, you can access and operate any ASCII serial device connected to the system.

Here are some useful features of the serial CIMs:

- Interoperates with an ASCII device in the On Line Mode as if the device were connected to a text terminal
- Edits, copies, marks, and resends data to the ASCII serial device or computer 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

Note: The P2CIM-SER and P2CIM-SER-EU are functionally identical. The only difference between the two is that the P2CIM-SER-EU supports a wider variety of non-English language keyboards and character sets.



❶	DB9 connector
❷	USB connector
❸	RJ-45 connector

The installation of P2CIM-SER or P2CIM-SER-EU is quite easy.

► To install a Serial CIM:

1. Connect the CIM to a serial port on the serial device or computer, using its serial DB9 connector.

2. Connect the CIM to the KVM switch, using a standard Cat5 UTP cable.
3. Plug the CIM's USB connector into a powered USB port, or into a separately available Raritan PWR-SER-4 power adapter, to obtain power.

For detailed information on the CIMs, see *Paragon and Dominion KX Serial Device CIM User Guide*, which is downloadable from the **Raritan website** (<http://www.raritan.com>).

► **To download the Paragon and Dominion KX Serial Device CIM User Guide:**

1. Use your browser to visit Raritan's **Firmware and Documentation section** (<http://www.raritan.com/support/firmware-and-documentation/>).
2. On the left pane, click Paragon II > Other Support Files.
3. On the right pane, click P2CIM-SER User Guide.
4. Click *Paragon II CIM Serial User Guide* to open it.
5. (Optional) You can save it on your computer by clicking the Save icon.

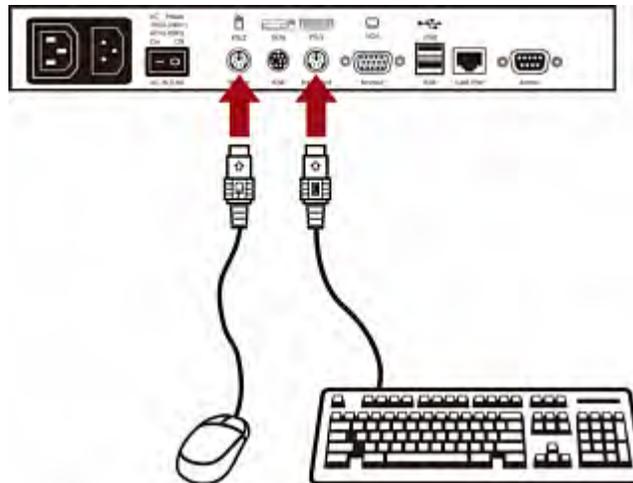
P2-EUST User Station

The TMCAT1728 and TMCAT17216 switches are compatible with the Paragon II enhanced user station (P2-EUST) *with the firmware version 3F0 or earlier*. If you have this device, you can use it in place of the MCCAT user station. Moreover, P2-EUST enables the user to be located at a distance up to 750 feet from the TMCAT17 switch. See **Supported Maximum Cable Length** (on page 84) for more information.

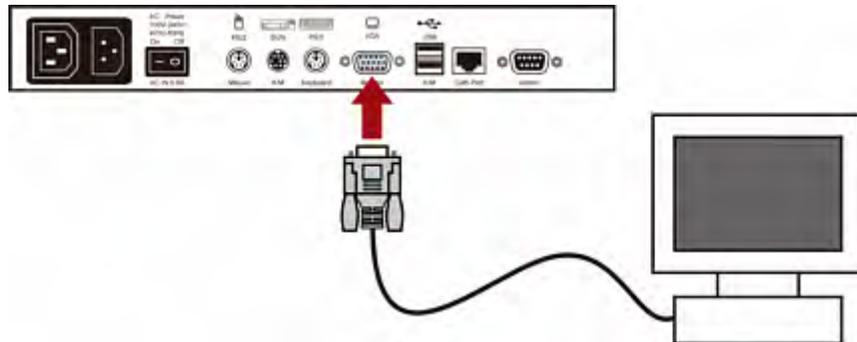
*Note: If your P2-EUST's firmware is higher than 3F0, you must downgrade the device to 3F0 or earlier versions for compatibility with TMCAT1728/216 switches. For more information on P2-EUST, see the Paragon II User Guide, which can be downloaded from the Raritan website's **Firmware and Documentation** section (<http://www.raritan.com/support/firmware-and-documentation/>).*

► **To connect the P2-EUST user station to the TMCAT17 switch:**

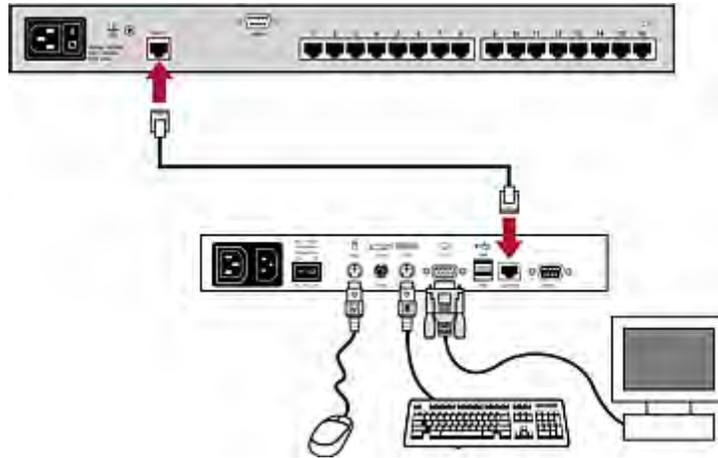
1. Connect the PS/2 or USB keyboard and mouse to the user station.



2. Connect the VGA monitor to the user station.



3. Connect the user station to the KVM switch via a standard Cat5 UTP cable.



4. Connect the power cord to the user station.
5. Turn on the user station and the monitor.

Note: Although the TMCAT17 switch supports the P2-EUST device, it does not support the Automatic Skew Compensation feature that is implemented with the P2-EUST device.

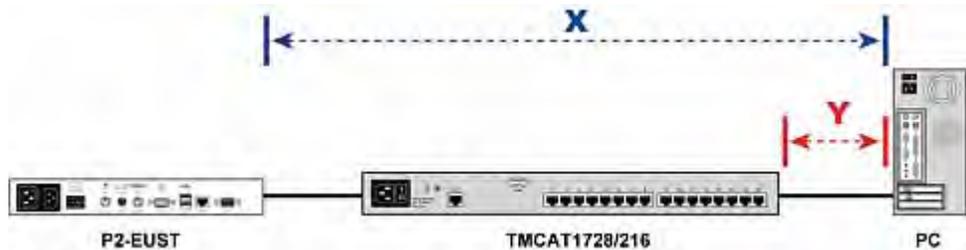
Supported Maximum Cable Length

The total cable length or distance between the P2-EUST user station and the computer can be up to 750 feet (228.6 meters).

Supported cable length

X= up to 750 feet (228.6 meters)

Y= up to 100 feet (30.48 meters) at 1600x1200, or up to 150 feet (45.72 meters) at 1280x1024 or below



Appendix D Two-Tier System

You can connect multiple MCCAT switches to organize a two-tier system, expanding the number of available channels. Different models can be mixed in the system. If the system completely comprises the 16-channel-port models, the number of connected computers can be expanded up to 256 computers.

*Note: User documentation for MCCAT switches can be downloaded from Raritan website's **Firmware and Documentation section** (<http://www.raritan.com/support/firmware-and-documentation/>).*

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Establishing a Two-Tier System.....	87
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Setting Up the Second-Tier Channels.....	92
Accessing the Second-Tier Channels.....	93
Returning to the Base Switch's OSD.....	94

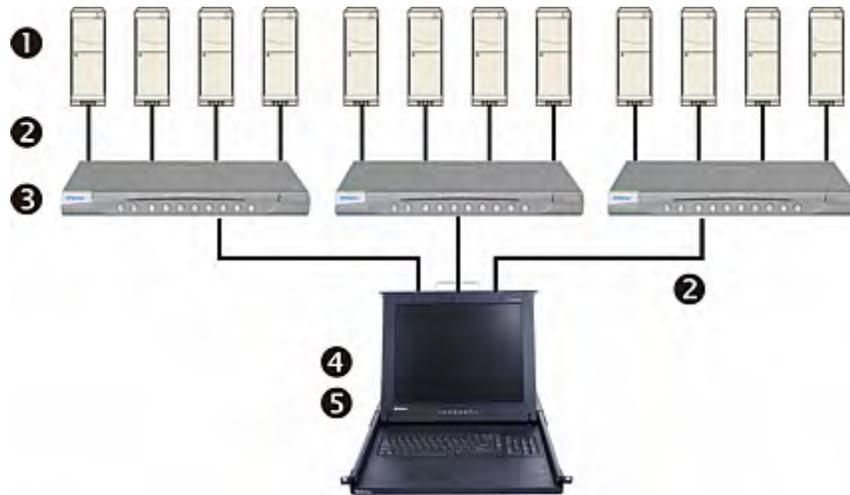
Overview

When you connect one MCCAT switch or more to a TMCAT17 switch, you are organizing a "two-tier" system.

All MCCAT switches connected to the same TMCAT17 switch are the SECOND-TIER devices, and the TMCAT17 switch that connects these second-tier devices is the "base switch," belonging to the FIRST TIER.

You can connect computers to any channel ports available in the system, including channel ports on the base switch.

Note: In a two-tier system, all front panel buttons on the second-tier MCCAT switches are automatically disabled.



①	Computers
②	Cat5 UTP cables
③	Second-tier MCCAT switches
④	TMCAT17 base switch (the first tier)
⑤	Input/output devices (keyboard, mouse, and monitor)

Limitations of the Two-Tier System

The two-tier system has several limitations.

- There is only one path (Cat5 UTP cable) between the base switch and each second-tier device. When a user from the base switch is accessing any channel of a second-tier device, there are no other paths left for the other user from the base switch to access the same second-tier device's channels.
- The user from the base switch always shares second-tier channels with the "local" user, who operates the keyboard and mouse directly connected to the second-tier device. This is because the PC Share mode is automatically applied to all second-tier devices regardless of the operation mode selected at the base switch.
- If you operate the input/output devices (keyboard, mouse and monitor) connected directly to a second-tier device, you only gain access to the channels of that specific second-tier device.

Establishing a Two-Tier System

Basically, there are four major steps to establish a two-tier system:

- STEP (A): Programme an MCCAT switch as a second-tier device
- STEP (B): Connect the second-tier MCCAT switch to the base switch
- STEP (C): Specify the type of the second-tier device on the OSD
- STEP (D): Connect computers to the TMCAT17 system

*Note: The major steps are applicable to both of "one-user" and "two-user" MCCAT switches. The only difference is that a "one-user" MCCAT switch does not have the **User 2** port so the way to connect it is different from the way to connect a "two-user" MCCAT switch. For instructions on connecting "one-user" MCCAT switches, see **How to Connect MCCAT18/116 Switches to the Base Switch** (on page 91).*

STEP (A): Programme an MCCAT Switch as a Second-Tier Device

Each MCCAT switch is programmed as a base switch by default. To establish a two-tier system, you must change the default programming of the MCCAT switches that you want to set as the second-tier devices.

► **To programme the MCCAT switch as a second-tier device:**

1. Turn OFF the MCCAT switch.
2. Press and hold down the channel number 2 button on the front panel, and turn ON the MCCAT switch simultaneously.
3. Continue holding down the channel number 2 button until you hear the beep sound.

- The TIER LED will be lit continuously, indicating that the MCCAT switch has been programmed as a second-tier device.
4. Repeat Steps 1 to 3 to change the programming of more MCCAT switches.

Note: To programme a second-tier device back as the base switch, follow the same procedure in this section but press the channel number 1 button instead. When the TIER LED's light is off, the device is programmed back as a base switch.

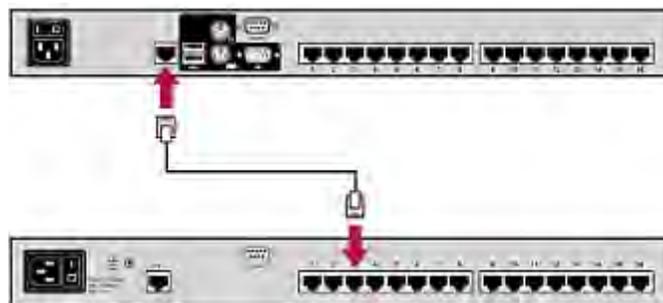
STEP (B): Connect the Second-Tier MCCAT Switch to the Base Switch

Connect MCCAT switches that have been programmed as second-tier devices to the TMCAT17 base switch. You can mix different MCCAT models in the system.

*Note: This section describes the connection of "two-user" MCCAT switches only. To connect "one-user" MCCAT switches, see **How to Connect MCCAT18/116 Switches to the Base Switch** (on page 91).*

► To cascade KVM switches:

1. Turn OFF all MCCAT switches and the base switch.
2. Connect the second-tier MCCAT switch to the base switch via a Cat5 UTP cable.
 - a. Plug one end of the Cat5 UTP cable into the **User 2** port on the second-tier MCCAT switch.
 - b. Plug the other end of the Cat5 UTP cable into one of the channel ports on the base switch.



*Tip: You can also connect "one-user" MCCAT switches to the base switch. See **How to Connect MCCAT18/116 Switches to the Base Switch** (on page 91) in the User Guide.*

3. Repeat previous step(s) to connect other second-tier MCCAT switches to the base switch.

4. Turn ON all second-tier devices.
5. After hearing the beep sound from the second-tier devices, turn ON the base switch.

Important: Make sure you turn on second-tier devices before turning on the base switch so that the base switch downloads up-to-date channel data from second-tier devices.

STEP (C): Specify the Type of the Second-Tier Device on the OSD

The TMCAT17 base switch cannot detect which types of devices are connected to the channel ports. You must specify the types properly on the Channel Configuration submenu. Otherwise, there are problems accessing the channels on the second-tier devices.

The table lists supported devices.

OSD option	Device type
CPU	Computer or any non-KVM-switch device, such as a router
CAT18	MCCAT18 switch
CAT116	MCCAT116 switch
CAT28	MCCAT28 switch
CAT216	MCCAT216 switch

► To specify the device type:

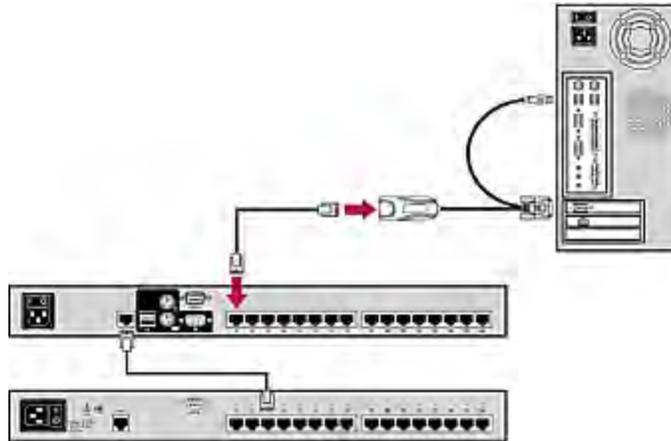
1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the third submenu, Channel Configuration. To select the submenu, either press 3, or press ↓ to highlight it and then press Enter. The Channel Configuration submenu appears.
4. Press ↓ or ↑ to highlight the channel whose device type you want to change.
5. Press Tab or → to select the field in the Device column, and press Enter. The highlight color turns green.
6. Press any arrow key to switch between available options, and press Enter to confirm your selection. The highlight color turns yellow.
7. Repeat Steps 4 to 6 until you specify correct device types for all second-tier devices.
8. Press S to save the changes or Esc to quit the current menu or submenu.

- If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

STEP (D): Connect Computers to the TMCAT17 System

You can connect computers to available channel ports of any KVM switch in the system, including channel ports on the base switch and second-tier devices. See Steps 1 to 4 of **Connecting the Equipment** (on page 14) for instructions on connecting computers.

MCIMs and MCUTP cables are mutually exclusive for making computer connections to a **second-tier** MCCAT28/216 switch. If both types are used to connect computers to a second-tier switch, video or OSD issues may occur.



One-User MCCAT Switches

You can connect "one-user" MCCAT switches to a TMCAT1728 or TMCAT17216 base switch for organizing a two-tier system.

Follow the major steps described in **Establishing a Two-Tier System** (on page 87) to install "one-user" MCCAT switches as second-tier devices. The only difference is that a "one-user" MCCAT switch does not have the **User 2** port so the way to connect it is different from the way to connect a "two-user" MCCAT switch. For instructions on connecting "one-user" MCCAT switches, see **How to Connect MCCAT18/116 Switches to the Base Switch** (on page 91).

MCUTP cables are compatible with two-user MCCAT switches, but *incompatible* with "one-user" MCCAT switches so you must use MCIMs to connect computers to "one-user" MCCAT switches.

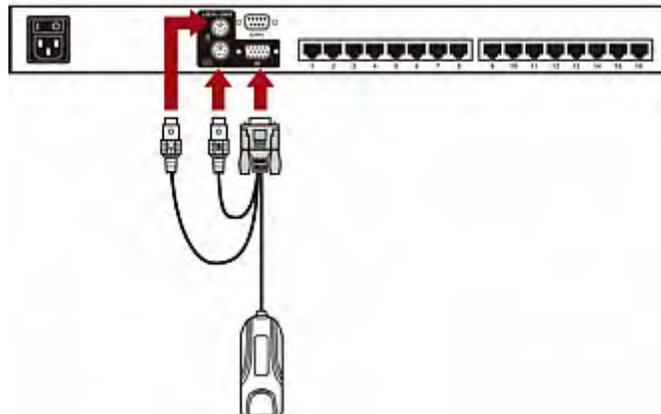
How to Connect MCCAT18/116 Switches to the Base Switch

A "one-user" MCCAT switch requires one MCIM-PS2 for connecting to the base switch.

Do NOT use MCUTP cables or any CIM other than MCIM-PS2 to connect "one-user" MCCAT switches to the base switch.

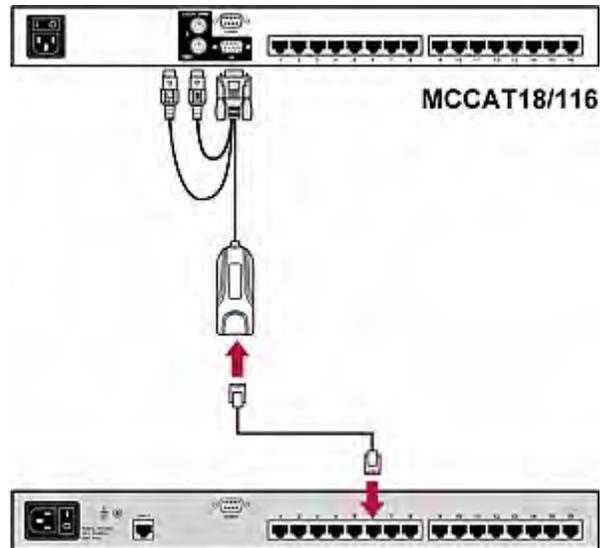
► **To connect "one-user" MCCAT switches to the base switch:**

1. Turn OFF all MCCAT switches.
2. Connect one MCIM-PS2 to the MCCAT18 or MCCAT116 switch that has been programmed as a second-tier device:
 - a. Plug the MCIM's PS/2 keyboard connector into the PS/2 keyboard port on the second-tier MCCAT switch.
 - b. Plug the MCIM's PS/2 mouse connector into the PS/2 mouse port on the second-tier MCCAT switch.
 - c. Plug the MCIM's video connector into the VGA port on the second-tier MCCAT switch.



3. Connect the second-tier MCCAT switch to the first-tier switch (base switch) via a Cat5 UTP cable.
 - a. Plug one end of the Cat5 UTP cable into the RJ-45 port of the MCIM being connected with the second-tier MCCAT switch.

- b. Plug the other end of the Cat5 UTP cable into one of the channel ports on the base switch.



4. Repeat previous step(s) to connect other second-tier MCCAT switches to the base switch.
5. Turn ON all second-tier devices.
6. After hearing the beep sound from the second-tier devices, turn ON the base switch.

Important: Make sure you turn on second-tier devices before turning on the base switch so that the base switch downloads up-to-date channel data from second-tier devices.

Setting Up the Second-Tier Channels

If you want to name or rename the channels of the second-tier MCCAT switches, or change their scan rates, you must trigger the Channel Configuration submenu of second-tier devices.

► **To activate the Channel Configuration submenu of the second-tier devices:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F5. The Administration Menu appears.
3. Select the third submenu, Channel Configuration. To select the submenu, either press 3, or press ↓ to highlight it and then press Enter. The Channel Configuration submenu appears.

4. If you do not find the channel on the current page, press Page Down or Page Up to go to the next or previous page.
5. Press **↓** or **↑** to highlight the channel where a second-tier MCCAT switch is connected, and press G. The Channel Configuration submenu of the selected second-tier device appears.
6. Now you can change the channel settings of the second-tier device.
 - To change the channel names, see **Assigning or Modifying Channel Names** (on page 43).
 - To change the scan rates, see **Changing the Scan Rate** (on page 44).
7. Press S to save the changes or Esc to quit the current menu or submenu.
 - If pressing S, then you can press Esc to return to the Channel Configuration submenu of the base switch.
 - If pressing Esc, the message “Save the changes [Y/N/ESC]” appears on the message bar. Press Y to save the changes, N to abort the changes, or Esc to return to the current menu or submenu.

Note: The second-tier channel names that you specify after logging in to the base switch are saved in the database of the base switch, not on each second-tier device. Therefore, these channel names are unavailable when you access the second-tier device by using the keyboard and mouse directly connected to it.

Accessing the Second-Tier Channels

The two-tier system automatically disables all front panel buttons on the second-tier devices so the only method to access the second-tier channels is the OSD. If you have properly established the two-tier system, you should be able to see the second-tier channels on the base switch's OSD.

► To access the second-tier channels:

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press **↓** or **↑** to highlight the channel where the second-tier device is connected. A channel connected to a second-tier device shows dashes (- -) in the Scn column.

Tip: You can press the corresponding number shown in the No column for that channel to quickly highlight it.

3. Press Enter. The Selection Menu lists the channels of the selected second-tier device.

4. If you do not find the channel on the current page, press Page Down or Page Up to go to the next or previous page.
5. Press ↓ or ↑ to highlight the channel you want.
6. Press Enter.

The video of the accessed computer appears on the screen. You can control the computer with the keyboard and mouse.

Returning to the Base Switch's OSD

After finishing your tasks with the second-tier computers, you can return to the Selection Menu of the TMCAT17 base switch for dealing with the computers connected to the base switch or accessing another second-tier device.

► **To return to the Selection Menu of the base switch:**

1. If you do not see the OSD on the screen, press the hot key twice QUICKLY to activate it. The default hot key is Scroll Lock.
2. Press F2 if the current OSD menu is not the Selection Menu.
3. Press Esc. Now the Selection Menu lists the channels of the base switch, with the base switch's name displayed on the top-left corner.

Appendix E Ground Screw

If you want to prevent any electrical shock, you can use the ground screw on the rear panel to provide a safe electrical path to the ground.

► **To prevent any potential shock hazard:**

- Connect the ground screw to a wiring system or wiring device.



Appendix F Resetting to Factory Defaults

You can reset the TMCAT17 device to restore all settings to factory defaults.

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Resetting the TMCAT17 device

The reset button on the rear panel allows you to reset the TMCAT17 device.



► **To reset to factory defaults:**

1. Press and hold down the reset button using a pointed tool, such as a pen.
2. Power cycle the TMCAT17 device by turning it OFF and back ON.
3. Release the reset button after the TMCAT17 device is powered ON and the Login box appears on the screen.

Default Settings

Field or function	Factory default
Administrator password	raritan (all lower case)
User passwords	No passwords for any user account (User01~User07)
Scan rate	5 seconds per channel
Operation Mode	Private
ID Display	On
▪ Timing	3 seconds
Green Mode	Off
▪ Timing	5 minutes
Hotkey	Scroll Lock

Field or function	Factory default
Login Blank	Off
▪ Timing	5 minutes
Logoff Timeout	On
▪ Timing	5 minutes

Appendix G Troubleshooting

Problem	Solution
No power	<ul style="list-style-type: none"> • Check the power cord. • Make sure the power switch is turned ON. • Check the cable connection from the computer to the TMCAT17 switch.
No video display for one or all computers	<ul style="list-style-type: none"> • Check the CIM's video connection to the computer. • Check the monitor and computer connected to the TMCAT17 switch: Turn off the TMCAT17 switch and computers. Connect the monitor to the computer directly, boot the computer, and make sure the monitor has the proper display. If it does not, the problem is either with your computer, or the monitor is not compatible with your computer. If it does display, continue the troubleshooting below.
The monitor cannot correctly display the video output from some of the computers	<ul style="list-style-type: none"> • The monitor probably does not match the video outputs. If the monitor is a single mode type VGA, all computers must have the same type of video output. • <i>(Note: this problem occurs most often with some IBM PS/2s and IBM 63xx, 85xx, and 95xx monitors.)</i> The intelligent type display card outputs video signals based on the monitor ID-pin setting in the connector of the monitor cable. If the ID-pin setting is incorrect, the monitor connected to the TMCAT17 switch may have no display, become monochrome instead of color, or become unstable. If this is the case, you will need to provide a proper ID-pattern to the display card. Call Raritan Technical Support (see the last page) for help if necessary.
All computers powered up without keyboard error, but the keyboard connected to the TMCAT17 switch has no control (cannot input to any computer)	<ul style="list-style-type: none"> • Make sure the keyboard is connected firmly to the TMCAT17 switch. Disconnect and reconnect the keyboard. • Replace the keyboard. (The TMCAT17 switch allows hot re-connection of the keyboard.) • In a two-tier configuration, check that the TMCAT17 switch with the keyboard connected is the first tier.
Repeated "KB ERROR" at power-up of computer	<ul style="list-style-type: none"> • The CIM's keyboard cable to the computer is loose. Secure the connection and turn on the computer again. • If the problem occurs after the TMCAT17 switch has been installed for a period of time, and occurs on computers that have previously worked with the TMCAT17 switch, then some components are out of order. Verify that the computer works with the keyboard when connected directly. Then contact your dealer or Raritan for help.
After a period of trouble-free operation, the keyboard connected to the TMCAT17 switch	<ul style="list-style-type: none"> • The most likely cause of the problem is either a voltage "spike" (increase) or a "brown out" (decrease) in the power supply, which would cause the microprocessors in the TMCAT17 switch to malfunction. A short-term solution to the problem is to try to recover

Problem	Solution
locks (unable to input keystrokes) when a particular computer is selected, but works normally when other computers are selected	<p>operation by turning the TMCAT17 switch off and on. Then, if necessary, restart all computers. The long-term method of avoiding this problem is to power the TMCAT17 switch from a UPS.</p> <ul style="list-style-type: none"> • Check the keyboard connection.
Repeated "MOUSE INSTALLATION FAILURE" at power-up of computer	<ul style="list-style-type: none"> • The CIM's mouse cable to the computer is loose. Secure the connection and turn on the computer again. • If the problem only occurs to new computers which are just added to the system, the firmware in the KVM (TMCAT17 internal mouse emulator) may need to be upgraded to a later version to be compatible with newer computers. Contact your dealer or Raritan for help.
After a period of trouble-free operation, the mouse connected to the TMCAT17 switch locks (unable to control mouse functions) when a particular computer is selected, but works normally when other computers are selected	<ul style="list-style-type: none"> • Try to identify if the problem is originating from the computer by reconnecting the computer to a different channel with a different cable. Then turn on the computer. If the problem is not with the cable or with a specific channel, connect the mouse directly to the computer. If the problem persists, then the computer's mouse port is out of order. Otherwise, contact your dealer or Raritan for help. • If the problem occurs after the TMCAT17 switch has been installed for a period of time, and occurs to computers that have previously worked with the TMCAT17 switch, then some components are out of order. Contact your dealer or Raritan Technical Support for help.
PS/2 keyboard or mouse does not work	<p>You may have connected USB keyboard or mouse to the MCCAT device. Keep only one set of keyboard and mouse connected to the MCCAT device, and disconnect the other set.</p>
Device does not operate in the OSD interface	<p>Replace the keyboard. OSD interface works with regular PS/2, USB, or extended AT style keyboards.</p>
The monitor cannot properly display the video output in the Direct mode	<p>Power cycle the MCCAT user station by unplugging and re-plugging its power cord.</p>

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