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# 1 INTRODUCTION

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## Overview

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**Connect PRO™** is proud to announce the **Master-IT PRO** professional line of KVM switches. With the use of one keyboard, one monitor, and one mouse, multiple computer systems can be accessed and controlled. Designed for both industrial and office use, the **Master-IT PRO** functions independently of the operating system and does not require any additional interface cards or software. Installation is simply a matter of connecting cables. Front panel buttons, hot-key commands, and On-Screen-Display features provide easy operation and computer selection.

The **Master-IT PRO** is available in 2, 4, 8, & 16 port models, as well as Dual-Console configurations providing connectivity for over 128 systems from a single console. All models support both PS/2 and AT/Serial mice and keyboards and are easily installed in standard 19" server racks with the exception of the PR-12, which is not rack mountable.

The On-Screen-Display (OSD) is an optional facility and is available on all models with four or more ports. The OSD includes features for automatic scanning of select systems, secure port authentication, visual port identification, and cascade systems monitoring.

Firmware upgrades are standard, and for those special projects, the **Master-IT PRO** can be configured with specially designed firmware to accommodate the most unique industrial applications.

The **Master-IT PRO** is the best cost-effective and space saving solution for industrial and office applications.

## Features

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- Manage over 128 systems with one or two consoles.
- All hot-swappable ports.
- System selection by front panel buttons, or hotkey commands.
- Supports 1920 x 1440 video resolution.
- Supports 200 MHz bandwidth.
- Auto-Scan facility.
- 19" rack-mountable (except PR-12).
- Two-Tier cascadable.
- Buzzer sound for switching confirmation.
- Supports PS/2 & AT/Serial mice & keyboards.
- Individual port buttons and LEDs.
- Project specific firmware available.

## Configurations

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The *Master-IT PRO* can be set up as a *Single Master* or cascaded in a *Master/Slave* configuration.

A *single master* involves only one *Master-IT PRO* KVM switch, and has the keyboard, monitor and mouse directly connected to its' console ports.

A cascaded configuration involves “*daisy-chaining*” a *slave Master-IT PRO* KVM switch to the *master* unit. The KVM switch which has the keyboard, monitor and mouse directly connected to it is considered the *master*. All others are considered as *slaves*. The *master* must have an equal number or more PC ports than the *slave*. Do not attempt to configure a slave with more PC ports than the master.

In a cascaded configuration, the *PC ports* of the *master* are used to “*daisy-chain*” to the *console ports* of the *slave*. Only PC ports 1 through 8 can be used to “*daisy-chain*” to the console ports of the slave.

## 2 INSTALLATION ---

### *Installation Overview* ---

Installation is simply a matter of connecting cables to their appropriate ports on each *Master-IT PRO* and each computer.

Prior to beginning the installation procedures, verify that all *Master-IT PRO* KVM switches are powered OFF.

Once the configuration is completed, add consoles, cables and computers in the following order:

1. If necessary, install the optional rack-mount kit to *each Master-IT PRO* KVM switch and mount it in the rack. Then mount the cable support bar to the back of the rack.
2. Connect the 9V DC 500mA power adapter to each *Master-IT PRO* KVM switch.
3. Connect the keyboard, monitor, and mouse directly to the console ports of the *master*.
4. Connect one end of each Premium 3-in-1 cable to an available PC port on each *Master-IT PRO* KVM switch.
5. Connect the other end of each Premium 3-in-1 cable to each computer. Then power ON each computer. Computers that are already powered ON can be connected at any time.

### *Components* ---

Bellow is a list of components that make up a complete *Master-IT PRO* configuration.

- *Master-IT PRO* KVM switch.
- Connect*PRO*™ Premium 3-in-1 KVM Cables.
- A power adapter with a rating of 9V DC 500mA and polarity of positive-on-center.
- *Master-IT PRO* Rack-Mount Kit. (*optional*)
- *Master-IT* Multi-Media module. (*optional*)

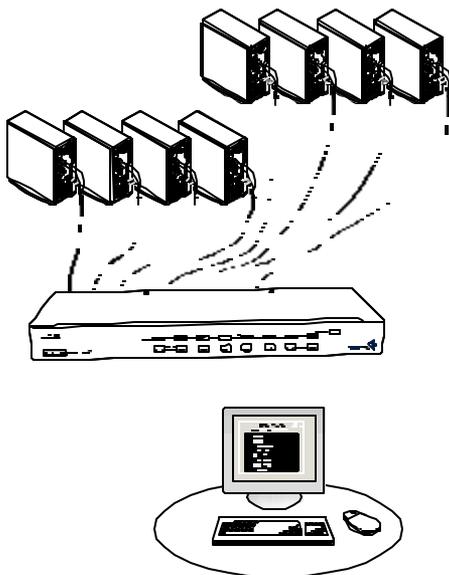
## Single Master Configuration

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A *Single Master* configuration involves only one *Master-IT PRO* KVM switch into which the PS/2 keyboard, monitor and PS/2 mouse are directly connected as well as the computers.

Connecting a PS/2 keyboard, a PS/2 mouse and a monitor directly to the designated *CONSOLE* ports of any *Master-IT PRO* model will automatically configure that KVM switch as the *master*. (There are two sets of console ports on the *PR-28* for two sets of PS/2 keyboards, mice and monitors).

Once the *console* ports are occupied, connect multiple sets of premium 3-in-1 cables (Part #: PS-1P) to the computer ports of the *Master-IT PRO* to complete a *Single Master* configuration. See figure 1.



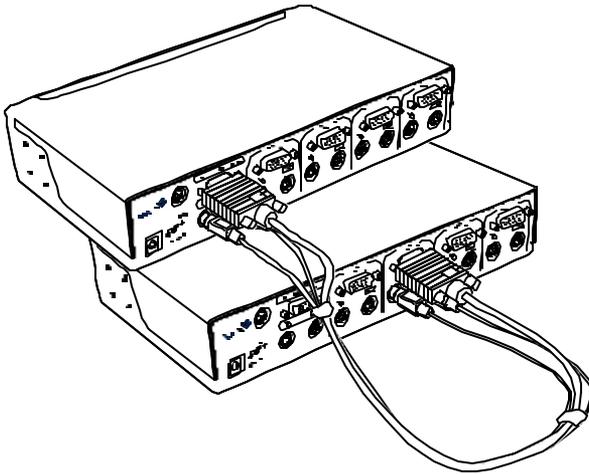
**Figure 1.** Single Console Connection

## Cascade Configuration (Master/Slave)

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A cascade configuration consists of one *master* unit and one or more *slave* units. The *master* unit has the PS/2 keyboard, PS/2 mouse and VGA monitor directly connected to its' *console* ports, from which the operator will access any computer. Additional levels of one or more *Master-IT PRO* switches can be connected to PC Ports 1~8 of a *MASTER* or *SLAVE* unit to expand the number of computers that can be accessed and controlled, thereby creating a *cascade* configuration.

The *Master-IT PRO* will automatically configure itself to be either a *master* or a *slave*. All models can be mixed in a cascade configuration. A master must have an equal number or more PC ports than the slaves. Do not attempt to configure a slave with more ports than the master. See figure 2.



**Figure 2.** Cascade Configuration

## **Dual-Console Configuration**

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The advanced **Dual-Console Master-IT PRO**, has the same functionality and features as the single console version. However, it also enables individual access and control from either of two separate consoles at different locations. Currently available in an 8-port configuration, ConnectPRO™ can specially manufacture the Dual-Console version in 2, 4 & 16 ports to accommodate your project requirements.

The **Dual-Console Master-IT PRO** is the IT Managers' solution for Bi-locational command and control.

## **External Power Supply**

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In the event that additional power is required, a 9V DC 500mA power adapter is supplied with a polarity of positive-on-center.

In a *Single Master* configuration, an external power supply may not be required unless power starvation is evident.

In a *cascade* configuration, the power adapter should be connected to the *master* and each *slave* to facilitate the On-Screen-Display (OSD) functions.

## **Multi-Media Module (optional)**

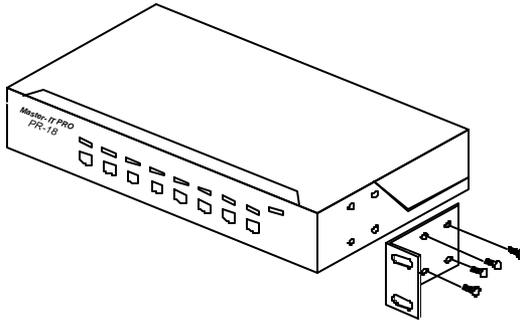
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The *Master-IT Multi-Media Module*, MAV-108, can be connected to any 4 through 8 port *Master-IT PRO* KVM switch, through it's Mini-DIN-8 link port. It allows the operator to simultaneously perform audio tasks from either the currently selected computer or from a computer that is on a different port entirely. The MAV-108 is a true multi-tasking facility. (Figure 4.)

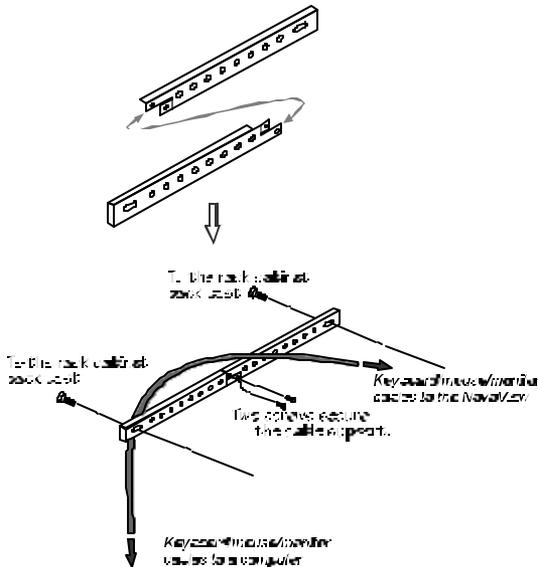
## Rack-Mount Kit (optional)

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An optional Rack-Mount Kit is available for *Master-IT PRO* models with 4 through 16 ports. It fits perfectly in standard 19" server racks. The kit includes side mount brackets, and a cable support bar, which mounts on the back of the rack enclosure. (Figure 5.)



**Figure 3.** Rack-Mount Kit Side Brackets



**Figure 4.** Rear Cable Support Bar.

### 3 OPERATION

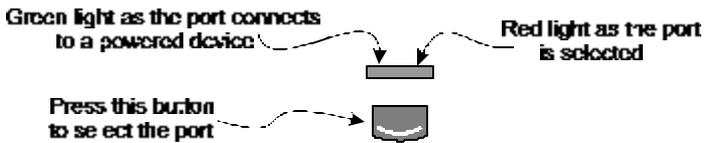
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#### Front Panel Buttons

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Each *Master-IT PRO* model has front panel buttons, which can be used to initiate different functions manually. They can be used to select ports, initiate the Auto-Scan function, and reset keyboard and mouse connectivity.

To select a port to access a connected computer, simply press the corresponding front panel button once.



**Figure 5.** Front Panel Button & LED

To initiate keyboard and mouse reset, simultaneously press and release the #1 & #2 front panel buttons for 5 seconds.

Each model with more than two ports will have its' own pair of front panel buttons designated for activating Auto-Scan manually. Simultaneously pressing and releasing these two buttons will initiate the auto-scan function. To deactivate auto-scan, press and release the *left* CTRL keyboard key twice or press the reset button combination.

#### Front Panel LED Indicators

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The LED indicators above the front panel buttons illuminate green and red to verify that there is a powered on computer occupying that port, and to show that a particular port has been activated.

Green indicates that a port is occupied with a powered ON computer. Red indicates that port has been activated.

## **Buzzers and Beeps**

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Whenever a command or event is initiated, either a buzzer or beep will sound to indicate a successful or failed command.

A built-in buzzer generates a high-pitch beep for correct hot-key command; otherwise, one low-pitch beep for error

## **Hot-Key Commands**

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### **To SELECT A PORT:**

In a *single master* configuration, press and release the left CTRL key twice, followed by the keys that represent the number of the port that has the computer.

For example, to select a computer that is connected to port 5, press and release the left CTRL key twice, then press the #5 key once.

**CTRL** , **CTRL** , **5**

In a cascade configuration (master/slave), press and release the *left* CTRL key twice, followed by the number key that represents the port on the *master* that is being used to *daisy-chain*, then press the number key that represent the port on the *slave* that the computer is connected to.

For example, to select a computer that is connected to port # 8 of a *slave*, when port # 1 of the *master* is used to *daisy-chain*, press and release the *left* CTRL key twice, then press and release the #1 key, then press and release the #8 key.

**CTRL** , **CTRL** , **1** , **8**

## TO INITIATE OR DEACTIVATE AUTO-SCAN:

Press and release the left CTRL key twice, followed by the F1 key once.

**CTRL** , **CTRL** , **F1**

To deactivate the *Auto Scan* feature, *press* and *release* the *left* CTRL key twice.

When *Auto Scan* detects any keyboard or mouse activity, it suspends the scanning until activity stops; it then resumes with the next computer in sequence. The length of the *Auto Scan* interval (*Scan Rate*) is adjustable. Locked devices will be skipped during the scan.

The *Auto Scan* facility automatically displays either all computers that are powered ON or individually selected computers chosen by the operator, one-by-one at a fixed interval.

## TO INITIATE MANUAL SCAN:

Press and release the left CTRL key *twice*, followed by the F2 key *once*.

**CTRL** , **CTRL** , **F2**

*Manual Scan* enables manual back and forth switching between computers that are powered ON. Locked devices cannot be scanned.

Press - (up) arrow key or ^ (down) arrow key to select the previous or the next computer in sequence. To deactivate *Manual Scan*, press any other key.

## TO ADJUST THE SCAN RATE INTERVAL:

To adjust the *Scan Rate* interval, press and release the *left* CTRL key *twice*, followed by the F3 key *once*.

**CTRL** , **CTRL** , **F3**

Entering this key sequence sets the time duration between switching to the next computer.

One to four beeps will sound to indicate a scan rate interval of **3**, **8**, **15** and **30** seconds respectively.

## TO ADJUST THE KEYBOARD TYPOMATIC RATE:

To adjust keyboard typematic rate (characters/sec), press and release the *left* CTRL key *twice*, followed by the F4 key *once*.

**CTRL** , **CTRL** , **F4**

Each time this key sequence is entered, 1 to 4 beeps will sound corresponding to **10**, **15**, **20** and **30** characters/sec respectively.

This typematic setting will override the typematic settings of the computers' BIOS and the operating system.

## TO INITIATE AUDIO-STICK:

To initiate or deactivate the Audio-Stick feature, press and release the *left* CTRL key *twice*, followed by the F5 key *once*.

**CTRL** , **CTRL** , **F5**

Each time this hot-key sequence is entered, an **ON** or **OFF** state is initiated and 1 or 2 beeps will sound corresponding to ON or OFF respectively. This hot-key sequence facilitates the *optional* MAV-108 multi-media module which would be LINKed to a designated MASTER unit of a *Master-IT PRO* configuration.

When set to ON, audio selection follows computer selection. When set to OFF, audio selection stops following computer selection. This allows the operator to listen to a particular computer's audio signals while operating other computers.

## On-Screen-Display (OSD) ---

### To INITIATE OSD:

Press and release the *left* CTRL key *twice* to view the hot-key menu. Press and release the *left* CTRL key *three times* to view the KVM MENU.

The *Hot-Key Menu* shows instructions for the various OSD functions. Use this as a guide to become familiar with its' functions.

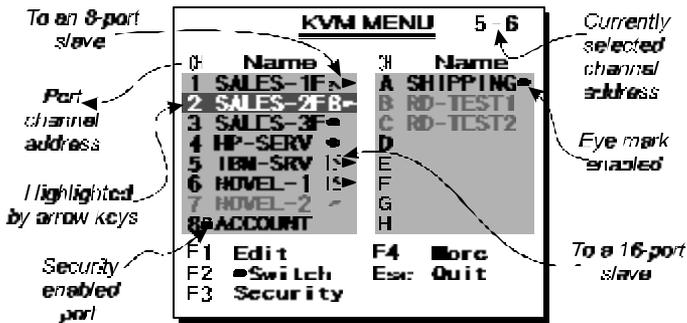
The *KVM Menu* shows a list of the computers with corresponding channel addresses, names and status information.

### To EXIT OSD:

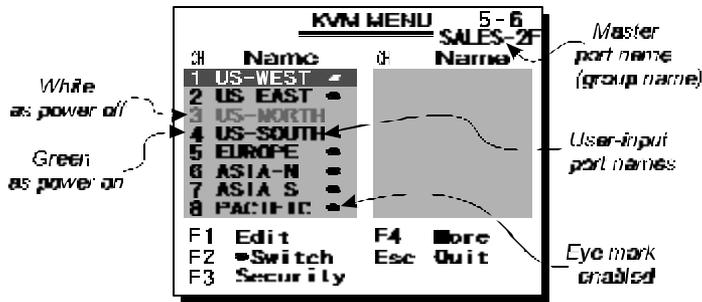
Press and release the **ESC** key once.

### To LABEL A PORT:

To edit a name entry of a *computer* or a *Master-IT PRO slave* unit. Use the - (up) and  $\bar{\text{~}}$  (down) arrow keys to highlight a channel, then press the **F1** key followed by an 8 character name entry. Valid characters are **A~Z**, and **0~9** and the **dash** character. Lowercase letters are automatically converted to capitals. Press the **BACKSPACE** key to make changes. All name entries are retained until changed by the operator, even if the unit is completely powered OFF or in storage.



Press "Enter" to the slave  
**SALES-2F**



**Figure 6. On-Screen-Display**

## TO SELECT A COMPUTER FROM WITHIN THE OSD:

Use the **↑** (up), **↓** (down), and **→** (right) arrow keys on the keyboard, to choose the computer, then press the **ENTER** key to finalize the selection.

### TRIANGLE MARK (▶):

A triangle mark (▶) to the right of a name indicates the port is cascaded to a *Slave*; the number at the left of the triangle mark shows the number of ports the *Slave* has, i.e. **8▶** for *PR-18*. Pressing the **ENTER** key brings you one level down and another screen pops up listing the names of the computers on that *Slave*. The name of the *Slave* will be shown at the upper right corner of the OSD menu. It is useful when grouping computers and still be able to see the group name.

## EYE MARK (👁):

An eye mark (👁) to the right of a name indicates this computer is selected to be monitored while in Scan mode. In OSD, this mark can be switched on or off by pressing and releasing the F2 key *once*.

## TO LOCK A DEVICE WITH A PASSWORD:

1. Scroll to the desired port where the device is connected, then press and release the F3 key *once*. Only one device can be locked at a time, either a computer or a Master-IT PRO KVM switch that has been configured as a slave.
2. Type in up to four characters for the password, then press and release the ENTER key *once* to complete the lock. A lock mark (🔒) will indicate that port is secure.

There are two ways to access a locked device:

- a. Permanently unlock a device from within OSD by pressing and releasing the F3 key *once*, then enter the password.
- b. Temporarily unlock a device for access by selecting a locked port and typing in the password when prompted. The device will then automatically return to the LOCKED status when any other port is selected.

## NOTE:

If the password is forgotten or lost, the only way to regain access is to permanently disable the security function by removing all possible power sources from the Master-IT PRO unit that has been configured as the MASTER unit. All computers and slave units as well as the 9V power adapter must be removed from the master unit.

## 4 APPENDIX

### Part Descriptions

#### Master-IT PRO Models:

Model #	PR-12	PR-14	PR-18	PR-116	PR-28	PR-216
# of Console Ports	1	1	1	1	2	2
# of PC Ports	2	4	8	16	8	16
Max.# of Computers Controllable	4	16	64	128	128	128
Max. # of Cascade Levels	2	2	2	2	2	2

#### Connect PRO™ Premium 3-in-1 Cable Models:

Part #	PS-06P	PS-10P	PS-15P	PS-25P	PS-50P	PS-100P
Length	6 ft.	10 ft.	15 ft.	25 ft.	50 ft.	100 ft.
Connectors	PS/2 (m/m)					
	DB-9 (m/f)					

m/m = male to male connectors

m/f = male to female connectors

#### Master-IT PRO Rack-Mount Kit Models:

Master-IT PRO Rack-Mount Kit Part #	PR-12	PR-14	PR-18	PR-116	PR-28	PR-216
	n/a	RX-1	RX-2	RX-3	RX-2	RX-3

n/a = not available

#### Master-IT PRO Power Adapter:

Part #	AD-0950
Rating	9Volt DC 500mA
Polarity	Positive on Center

#### Master-IT Multi-Media Module:

Part #	MAV-108
# of Ports	8
Type of Ports	Microphone & Speaker

## Troubleshooting

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If at any time the *Master-IT PRO* behaves abnormally, Consult the following table for possible solutions. As always, first verify that all cables are connected correctly and securely, and that all power adapters necessary are connected and functioning.

If a solution cannot be found in the table, send an email message to: support@connectpro.com. Be sure to clearly explain the symptoms and provide the following information:

1. The serial number and model number of the *Master-IT PRO* unit.
2. Types of operating systems being used.
3. Types of computers being connected: PS/2 or AT/Serial.
4. Brands and models of mouse and keyboard being used.
5. Type of configuration: Single Master or Cascade (master/slave).
6. Name of the person or business that purchased the *Master-IT PRO*.
7. Contact information of the user who is experiencing the difficulties.

<b>SYMPTOMS</b>	<b>CAUSES</b>	<b>SOLUTIONS</b>
No OSD screen.	<ul style="list-style-type: none"> <li>• No power.</li> <li>• Loose monitor connection.</li> <li>• Monitor is not a multi-synchronous type.</li> </ul>	<ul style="list-style-type: none"> <li>• After rebooting the computers, press and release the left CTRL key twice</li> <li>• Reconnect the monitor.</li> <li>• Use a multi-sync monitor.</li> </ul>
Keyboard error on boot.	<ul style="list-style-type: none"> <li>• Loose keyboard connection.</li> </ul>	<ul style="list-style-type: none"> <li>• Reconnect the keyboard cable, then reboot.</li> </ul>
Cannot access computers in a cascade configuration.	<ul style="list-style-type: none"> <li>• A <i>slave</i> unit has more ports than the <i>master</i>.</li> <li>• A <i>slave</i> unit has been daisy-chained to a port other than ports 1-8 of the <i>master</i>.</li> <li>• Power was installed to a <i>slave</i> before the slave was daisy chained to the <i>master</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the <i>slave</i> that has more ports than the <i>master</i> and reconnect it as the <i>master</i>.</li> <li>• Use only ports 1-8 of the master for daisy-chaining.</li> <li>• Remove all power sources and 3-in-1 cables from the slave, then reinstall the 3-in-1 cables first, and the power adapter last.</li> <li>• Press and release the front panel reset buttons.</li> </ul>
Keyboard strokes remain in a shifted state.	<ul style="list-style-type: none"> <li>• The computer was in shifted state when was last switched.</li> </ul>	<ul style="list-style-type: none"> <li>• Press both SHIFT keys for 5 seconds.</li> <li>• Remove and reinstall all power adapters and 3-in-1 cables. First reinstall the 3-in-1 cables, then the power adapters.</li> </ul>

SYMPTOMS	CAUSES	SOLUTIONS
<p>The - and ~ keys do not work in <i>Manual Scan</i> mode.</p>	<ul style="list-style-type: none"> <li>• Either all computers are powered OFF or only one computer is powered ON.</li> <li>• <i>Scan type</i> is eye mark selected but no ports are eye mark selected in OSD.</li> </ul>	<ul style="list-style-type: none"> <li>• Power ON more than one computer.</li> <li>• Press the ESCAPE key to deactivate <i>Manual Scan</i> mode, then reconfigure eye marked ports.</li> </ul>
<p><i>Auto Scan</i> does not switch and it beeps every few seconds, also the red indicator flashes continuously.</p>	<ul style="list-style-type: none"> <li>• Either all computers are powered OFF or only one computer is powered ON.</li> <li>• <i>Scan type</i> is eye mark selected but no ports are eye mark selected in OSD.</li> </ul>	<ul style="list-style-type: none"> <li>• Power ON more than one computer.</li> <li>• Press the left CONTROL key twice or press any front panel button to deactivate <i>Auto Scan</i> mode, then reinitiate <i>Auto Scan</i> mode.</li> <li>• In OSD, reconfigure <i>eye marked</i> ports, then set the <i>Scan Type</i> for <i>eye marked</i> ports.</li> </ul>
<p>A double OSD image shows on cascade configurations.</p>	<ul style="list-style-type: none"> <li>• A <i>slave</i> unit has more ports than the <i>master</i>.</li> <li>• A <i>slave</i> unit has been daisy-chained to a port other than ports 1~8 of the <i>master</i>.</li> <li>• Power was installed to a <i>slave</i> before the slave was daisy chained to the <i>master</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the <i>slave</i> that has more ports than the <i>master</i> and reconnect it as the <i>master</i>.</li> <li>• Use only ports 1~8 of the master for daisy-chaining.</li> <li>• Remove all power sources and 3-in-1 cables from the slave, then reinstall the 3-in-1 cables first, and the power adapter last.</li> <li>• Press and release the front panel reset buttons.</li> </ul>
<p>The port label OSD is not located in the selected position as it should be.</p>	<ul style="list-style-type: none"> <li>• The size and position of the OSD will change if its' fixed resolution is different than the actual VGA resolution.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the the <i>F4</i> function in OSD to reposition the port label OSD.</li> </ul>
<p>Serial Mouse is not detected.</p>	<ul style="list-style-type: none"> <li>• The serial mouse adapter is not securely fastened.</li> <li>• The manufacturers of the serial mouse adapter and the mouse are different. Different manufacturers pin-out assignments often cause conflicts.</li> <li>• The serial mouse adapter should only be connected to a serial port on the computer.</li> </ul>	<ul style="list-style-type: none"> <li>• Verify that the serial mouse adapter is securely fastened to a serial port on the computer.</li> <li>• Use only a serial mouse adapter that was manufactured by the same company as the mouse.</li> </ul>

<b>SYMPTOMS</b>	<b>CAUSES</b>	<b>SOLUTIONS</b>
<p>Cannot switch to computers located on a slave.</p>	<ul style="list-style-type: none"> <li>• The cables are not securely fastened.</li> <li>• There is a another <i>slave</i> cascaded to the first <i>slave</i>.</li> <li>• The <i>slave</i> has more ports than the <i>master</i>.</li> <li>• The slave is cascaded from a port other than 1–8 of the master.</li> </ul>	<ul style="list-style-type: none"> <li>• Securely reconnect all cables.</li> <li>• Do not cascade a 3<sup>rd</sup> level slave to a 2<sup>nd</sup> level slave. Only one slave per port can be cascaded from the master.</li> <li>• Reconfigure the installation so that the master always has an equal number or more ports than the slave.</li> <li>• Cascade a slave only from ports 1–8 of the master.</li> <li>• Verify that the OSD menu on the master shows a triangle mark next to the port that is cascaded.</li> </ul>
<p>The switch occassionally and irregularly experiences various malfunctions.</p>	<ul style="list-style-type: none"> <li>• Insufficient power being supplied by the connected computers will result in power starvation to the switch.</li> </ul>	<ul style="list-style-type: none"> <li>• Connect a 9V DC 500mA power adapter (Part #: AD-0950) to the switch.</li> </ul>

## Specifications

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	<b>PR-12</b>	<b>PR-14</b>	<b>PR-18</b>	<b>PR-116</b>	<b>PR-28</b>	<b>PR-216</b>
# of Console Ports	1	1	1	1	2	2
# of Computer Ports	2	4	8	16	8	16
Max. # of Computers	4	16	64	128	64	128
On-screen display (OSD)	N/a	Yes				
Front panel button control	Yes					
Hot plug-and-play	Yes					
Hot-key control	Yes					
Rack-mount kit Part #	N/a	RX-1	RX-2	RX-3	RX-2	RX-3
Automatic scan interval	N/a	Yes				
Programmable scan interval	N/a	Yes				
VGA Resolution	1600x1200					
Console Connectors	DB-15 (f) PS/2 (f)					
Computer Connectors	DB-15 (m) PS/2 (f)					
Dimensions (L x W x H) (mm / in)	40x124x70 1.6x4.9x2.7	44x220x130 1.7x8.7x5.1	44x436x180 1.7x17.2x7.0	88x436x220 3.5x17.2x8.7	44x436x180 1.7x17.2x7.0	88x436x220 3.5x17.2x8.7
Power Supply	9V DC 500mA (positive on center)					