



*KVM Extenders*

# KVME 1000 & 1225 Series

**KVM Extender (extends keyboard, VGA/RGB video, DVI, mouse, serial & audio ports up to 3300 ft)**

**KVME 1xxx-ST**: Duplex ST Fiber Connectors

**KVME 1xxx-LC**: Duplex LC Fiber Connectors

**KVME 1xxx-SC**: Duplex SC Fiber Connectors

## **USER'S MANUAL**

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# 1. Introduction

## 1.1 KVME Series

The CyberResearch KVME Series is a digital fiber optic extension system utilizing only two fibers to assure absolute end-to-end signal integrity. The KVME Series system consists of a pair each containing a Transmitter unit and a Receiver unit.

The KVMEs allow the user to select either PS2, SUN Serial or USB Keyboard and Mouse devices for use at the desktop without concern for the interface at the CPU as all conversions (i.e. PS2 to USB, USB to SUN...) are transparently handled before they reach the CPU.

The firmware of the KVME Series KVM extenders are field ungradable, allowing for quick and easy support of changes required by our customers.

All models listed below are available with either SC-, ST- or LC- type connectors:

KVME 1000

KVME 1225

## 1.2 LASER Information

**LASER RADIATION  
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS  
CLASS 1M LASER PRODUCT**

**Caution:**

**In order to avoid possible exposure to laser energy, it is good practice to attach the fiber optic cables prior to applying power to the KVM EXTENDER. If the fiber optic cable should become disconnected, DO NOT attempt to look into the cable or the panel mounted connector.**



## 1.3 System Features

The KVME Series is designed for high resolution video extension applications. Each KVME system includes the following common features:

- Remote access to entire “desktop” CPU connections up to 1000 meters. (3280 feet)
- All copper cabling is industry standard
- Uses multi-mode optical fibers
- Units are stand alone and rack mountable (brackets included)
- Digital transmission ensures signal integrity
- Supports PS2, Sun Legacy, USB keyboard and mouse (user can operate PS2 KB/MS, USB KB/MS and SUN KB/MS simultaneously)
- Local video, keyboard and mouse at CPU end
- Duplex stereo audio
- RGB supported to 1920 x 1200
- DVI supported to 1920 x 1200
- BNC for stereo graphics emitter
- Front panel programmable for unique video formats
- Universal conversions between DVI and Analog RGB (DVI source to DVI or RGB display; RGB source to DVI or RGB display) **Not available on DVI only units!!**
- Universal keyboard and mouse conversions (any of the three supported keyboard/mouse types will work with CPU, regardless of source type)

## 1.4 Technical Specifications

<b>Storage Temperature</b>	-20 to 70 °C (-4 to 158 ° F), 10 to 90% RH, non-condensing
<b>Supply Voltage</b>	100-240 VAC, 50 -60 Hz, Universal
<b>Power Consumption</b>	Transmitter: <15 Watts, typical Receiver: <15 Watts, typical
<b>Heat Dissipation</b>	< 60 BTU's per hour
<b>Laser Output Specifications</b>	Wavelengths are 778, 800, 825, 850nm Maximum laser power output in the fiber is 4.0 dBm
<b>Audio</b>	Line in Impedance: 550 Ohm Line Out Impedance: 10K Ohm
<b>Enclosure Dimensions</b>	Approx. 17.25in x 14.17in x 1.75in high (43.82cm x 35.99cm x 4.45cm high)
<b>Weight</b>	Transmitter: 11 lbs (4.99 kg) Receiver: 11 lbs (4.99 kg)
<b>Shipping Weight</b>	Pair: 37 lbs (16.78 kg) Transmitter: 23 lbs (10.43 kg) Receiver: 23 lbs (10.43 kg)
<b>Shipping Container Dimensions</b>	24 in x 22 in x 9.5 in high (60.96 cm x 55.88 cm x 24.13 cm high)
<b>AC Power Cable</b>	IEC power cable (International connections may differ)
<b>Panel Connectors</b>	Refer to Section 2.4.2 and 2.4.3 to view Rear Panels of all KVM
<b>Optical Cables: 2 Fiber or 3 Fiber cables are available</b>	Multi-mode, 50 um or 62.5 um, SC-, ST- or LC- type connectors. (Fiber cable is either customer supplied or can be ordered from CyberResearch, Inc.)
<b>Front panel Display</b>	Transmitter and Receiver: 2 x 24 Liquid Crystal Display

## 2. Product Overview

### 2.1 Intended Application

The KVME Series from CyberResearch, permits the placement of a Receiver module (desktop devices) up to 1000 meters (3280 ft) away from the controlling computer without loss of signal fidelity. Traditional copper cables are limited to 10 meters (32.81 ft) in such applications. Each KVME Series system consists of a pair of electronic units connected by a multi-mode fiber optic cable. The Transmitter unit connects to the computer with suitable cables (PS2/USB/SUN/Video/Serial/Audio) and the Receiver unit provides connections to the user interface devices.

**Caution: The KVME Series is a Class 1M Laser Product that emits near infrared light.**

**DO NOT VIEW DIRECTLY WITH MAGNIFYING OPTICAL INSTRUMENTS!**

### 2.2 Increased Security and Efficiency

The ability to remote the CPU away from the user allows more control of the computer environment. With the KVME Series it is now possible to position the desktop devices in virtually any setting while keeping the computer secure in a remote location.

### 2.3 Mounting the KVME Series Extender

You may choose to rack mount your KVME Series or place it on a shelf or desktop (feet included). The front panel display should be visible and front panel buttons need only to be accessible if initial setup of the system is required. All connections are made to the rear of the chassis.

### **2.3.1 Rack Mount or Desktop**

The KVME Series Transmitter and Receiver may either be installed in an EIA-standard 19 inch rack (1U tall), or placed on a shelf or desktop. For shelf use, rubber feet are provided and the rack mounted brackets may be removed. The KVME Series Transmitter and Receiver chassis do not need to be opened or accessed. The sturdy metal case allows units to be stacked, as required.

**NOTE:** Be sure to leave adequate ventilation space on both sides of the units, especially if units are being stacked. Each rack mount bracket is held on by 4 screws. The brackets may be positioned so that the unit sits forward or recesses in your rack. If the brackets are removed or repositioned, it is not necessary to re-use the extra rack mount screws.

### **2.3.2 Front Panel Display and Buttons**

The front-panel LCD display should be visible and accessible for system setup. The front panel buttons are to configure special video settings and to review existing KVME Series configurations. (Refer to FIG. 11)

### **2.3.3 Convection Cooled**

The KVME Series does not require special cooling or ventilation other than what is normally provided in the equipment rack. No fan means that it does not add to the ambient noise in your equipment room and it is less prone to equipment failure. Be sure not to block the air vents on the sides of the unit, and leave space on both sides. If mounted in an enclosed rack, it is recommended that the rack have a ventilation fan to provide adequate airflow through the unit(s).

## 2.4 Connecting the KVME Series Extender

All physical connections to the product use industry-standard connectors. All connections are found on the rear of the Transmitter and Receiver units.

### 2.4.1 Fiber Cable

Fiber optic cable must run between the location of the Transmitter unit (near your CPU) and the Receiver unit (near your desktop devices). The standard multi-mode fiber optic cable must be 50 or 62.5 micron, terminated with an SC-, ST- or LC- type fiber optic connector and no longer than 3280 running feet (1000 meters). Be careful not to kink or pinch the fiber optic cable as it is being installed, and keep all bend radii to no less than 3 inches (76.2mm). (Refer to FIG.10)

### Fiber

#### **Units with 2 Fiber Connections :**

Fiber connections are made from Fiber L1 on the TX to Fiber L1 on the RX, connections are also made from Fiber L2 on the TX to Fiber L2 on the RX. Fiber L1 is the high speed channel and is used to transmit video data to the client video display. Fiber L2 is the low speed channel and is used to carry mouse and keyboard data.

#### **Units with 3 Fiber Connections :**

The first pair of connectors L1 and L2 are used for video while the third connector L3 is a low speed, bi-directional connector for handling keyboard and mouse.

## 2.4.2 KVME Series "Transmitter"

The Transmitter connects to your CPU video port using a DVI-D to DVI-D cable. If a VGA connection is required, standard adapters are available from CyberResearch and third party suppliers to make other combinations.

KVME 1000 & 1225 Fiber Optic Transmitter  
ST or SC Connectors Available

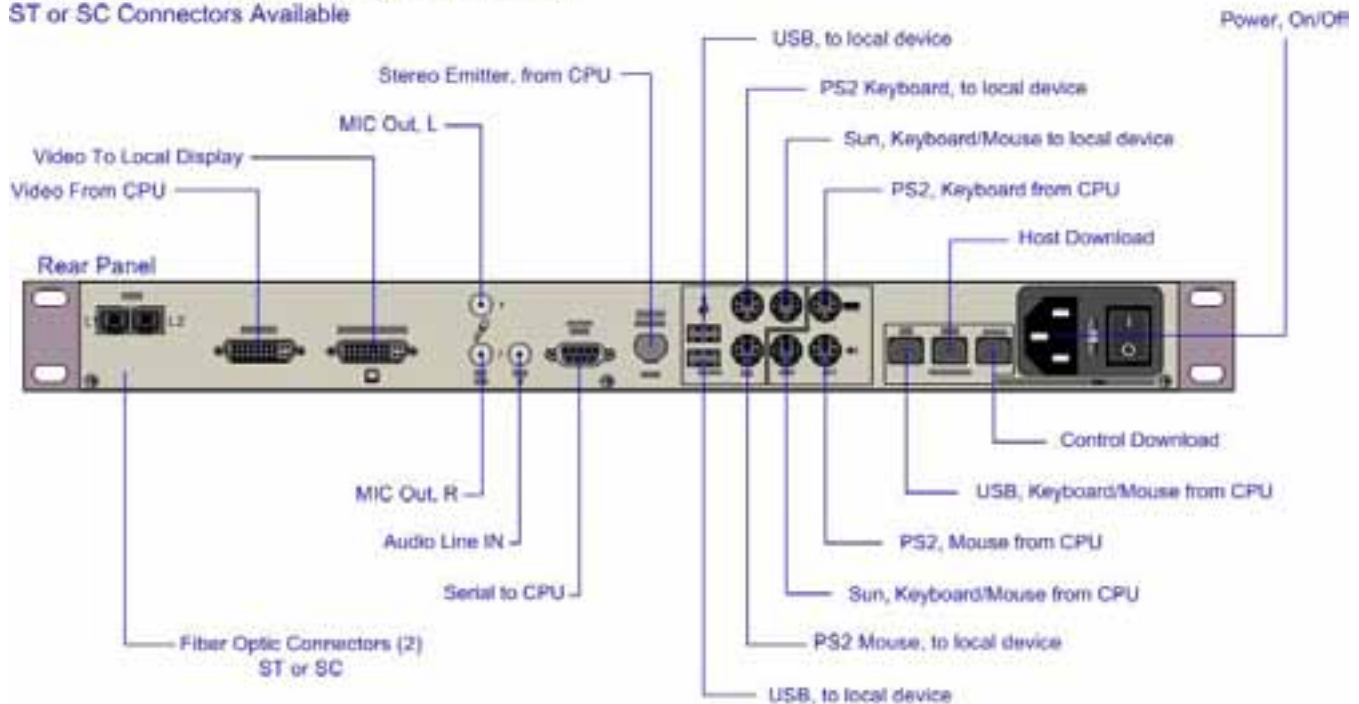


FIG. 1

## **Transmitter Video Theory of Operation**

The analog RGB video is digitized before transmitting the signals over fiber optic cable. A high speed video analog to digital (A/D) converter is used for this purpose. When an analog video source is connected to the transmitter, the horizontal and vertical frequencies are measured and matched to a resolution in a lookup table where the rest of the parameters to configure the A/D are stored. Once configured, the selected resolution, vertical frequency, and horizontal frequency are then displayed on the Transmitter LCD under the \*video menu. If an unknown video source is connected to the extender, "N/A" will be displayed on the \*Video menu.

In order to reproduce the video signal with the greatest accuracy, the exact video timings of the source must be known. Please refer to the "Supported Analog (VGA) Resolutions" table for a list of pre-loaded resolutions. If you are using a video resolution not listed in the table (N/A appears on the LCD), you will need to contact CyberResearch. Please gather as much of the following information as possible before contacting us:

Pixel (Dot) Clock: \_\_\_\_\_ MHz

Horizontal Frequency: \_\_\_\_\_ kHz

Vertical Frequency: \_\_\_\_\_ Hz

Total Pixels per line: \_\_\_\_\_ pixels

Active Pixel per line: \_\_\_\_\_ pixels

Horizontal Sync: \_\_\_\_\_ pixels

Horizontal Back Porch: \_\_\_\_\_ pixels

Active Lines per frame: \_\_\_\_\_ lines

Vertical Back Porch: \_\_\_\_\_ lines

NOTE: If you are creating your own video format, it is best to use the H and V timings listed in the resolution table as a guideline. Then an existing format can be modified via the front panel as opposed to waiting for one to be created by CyberResearch.

## **The CPU and the TX Connector**

Video connections to the CPU are made between the video output card of the CPU and the TX DVI-D/DVI-I connector labeled "FROM CPU" (closest to fiber connectors). The additional video connector is for a local administrator to view the video output at the TX unit.

The analog VGA inputs are converted to a fiber optic suitable form and transmitted to the RX unit.

## **Modifying the Analog RGB Video Parameters**

It is possible for one resolution to have different video timings, which could cause a less than perfect display on the remote side. For example, take 1280x1024x60 Hz. The VESA standard has 1688 pixels in one line, whereas a SGI format has 1680 pixels. The transmitter lookup table is configured for the VESA standard, but can be easily modified to support the SGI format. (Refer to Section 7.2.6 for step by step instructions.)



**FIG.4**

**FIG.4:** 1280x1024x60 on an SGI computer with the PLLDIV set at 1688 (default value). Notice the columns.



**FIG.5**

**FIG.5:** 1280x1024x60 on an SGI computer with the PLLDIV modified to 1680.



## Supported Analog(VGA) Resolutions

Resolution		Vertical Freq(Hz)	Horizontal Freq(kHz)	Pixel Clock Freq(Mhz)	Video Standard	KVME 1225	KVME 1000
Pixels	Lines						
640	480	60	31.47	25.175	Industry Standard	Yes	Yes
640	480	72	37.86	31.500	VESA	Yes	Yes
640	480	75	37.5	31.500	VESA	Yes	Yes
640	480	85	43.27	36.000	VESA	Yes	Yes
720	400	70	31.47	28.322	Industry Standard	Yes	Yes
800	600	56	35.16	36.000	VESA	Yes	Yes
800	600	60	37.88	40.000	VESA	Yes	Yes
800	600	72	48.08	50.000	VESA	Yes	Yes
800	600	75	46.88	49.500	VESA	Yes	Yes
800	600	85	53.67	56.250	VESA	Yes	Yes
1024	768	60	48.36	65.000	VESA	Yes	Yes
1024	768	70	56.48	75.000	VESA	Yes	Yes
1024	768	75	60.02	78.750	VESA	Yes	Yes
1024	768	85	68.68	94.500	VESA	Yes	Yes
1024	768	96s	77.47	103.500	SGI	Yes	Yes
1152	864	75	67.5	108.000	VESA	Yes	Yes
1152	900	66	61.845	94.500	Sun	Yes	Yes
1152	900	76	71.808	108.000	Sun	Yes	Yes
1280	768	60	47.78	79.500	VESA	Yes	Yes
1280	960	60	60	108.000	VESA	Yes	Yes
1280	960	85	85.94	148.500	VESA	Yes	Yes
1280	960	96s	95.26	159.200	SGI	Yes	Yes
1280	1024	60	63.98	108.000	VESA	Yes	Yes
1280	1024	72	76.93	129.250	SGI	Yes	Yes
1280	1024	75	79.98	135.000	VESA	Yes	Yes
1280	1024	76	81.92	140.250	SGI	Yes	Yes
1280	1024	85	91.15	157.500	VESA	Yes	Yes
1280	1024	96s	102.05	163.277	SGI	Yes	Yes
1280	1024	96s	104.9	176.640	SGI	Yes	No
1400	1050	60	65.3	121.750	VESA	Yes	Yes
1400	1050	60	67.1	128.910	SGI	Yes	Yes
1400	1050	96s	106.3	205.400	SGI	Yes	No
1400	1050	96s	107.42	201.950	SGI	Yes	No
1600	1200	60	75	162.000	VESA	Yes	Yes
1600	1200	65	81.3	175.500	VESA	Yes	No
1600	1200	70	87.5	189.000	VESA	Yes	No

Resolution		Vertical Freq(Hz)	Horizontal Freq(kHz)	Pixel Clock Freq(Mhz)	Video Standard	KVME 1225	KVME 1000
Pixels	Lines						
1600	1200	72	90.1	196.000	Industry Standard	Yes	No
1600	1200	75	93.8	202.500	VESA	Yes	No
1920	1080	60	68.04	163.300	SGI Onyx2	Yes	Yes
1920	1080	72	80.64	199.990	SGI Octane2	Yes	No
1920	1080	72	81.07	211.440	HDTV	Yes	No
1920	1080	72	84.4	216.000	SGI	Yes	No
1920	1154	72	85.68	211.460	SGI Tezro	Yes	No
1920	1200	60	74.6	193.250	VESA	Yes	No
1920	1200	60	76.32	183.170	SGI Onyx2	Yes	No
1920	1200	72	88.99	219.630	SGI Octane2	Yes	No
2048	1120	60	69.54	183.310	SGI Onyx2	Yes	No
2048	1120	72	83.45	219.97	SGI Onyx2	Yes	No
<b>Resolutions Tested, But Not Guaranteed</b>							
Resolution		Vertical Freq(Hz)	Horizontal Freq(Hz)	Pixel Clock Freq(Mhz)	Video Standard	KVME 1225	KVME 1000
Pixels	Lines						
1920	1200	75	92.7	228.78	SGI Octane2	Yes	No
1600	1200	85	106.25	229.500	VESA	Yes	No
1920	1200	72	90.07	236.000	Industry Standard	Yes	No

Table 1

## **Audio**

Audio out of the CPU to the speakers is connected using the provided cable between the Line out of the CPU and the single audio jack labeled "LINE OUT" on the back of the TX unit.

A pair of microphone connections are provided on the KVME Series Transmitter for stereo recording. The microphone connections on the back of the CPU are connected to the respective "L" and "R" connections on the back of the Transmitter unit.

## **Serial**

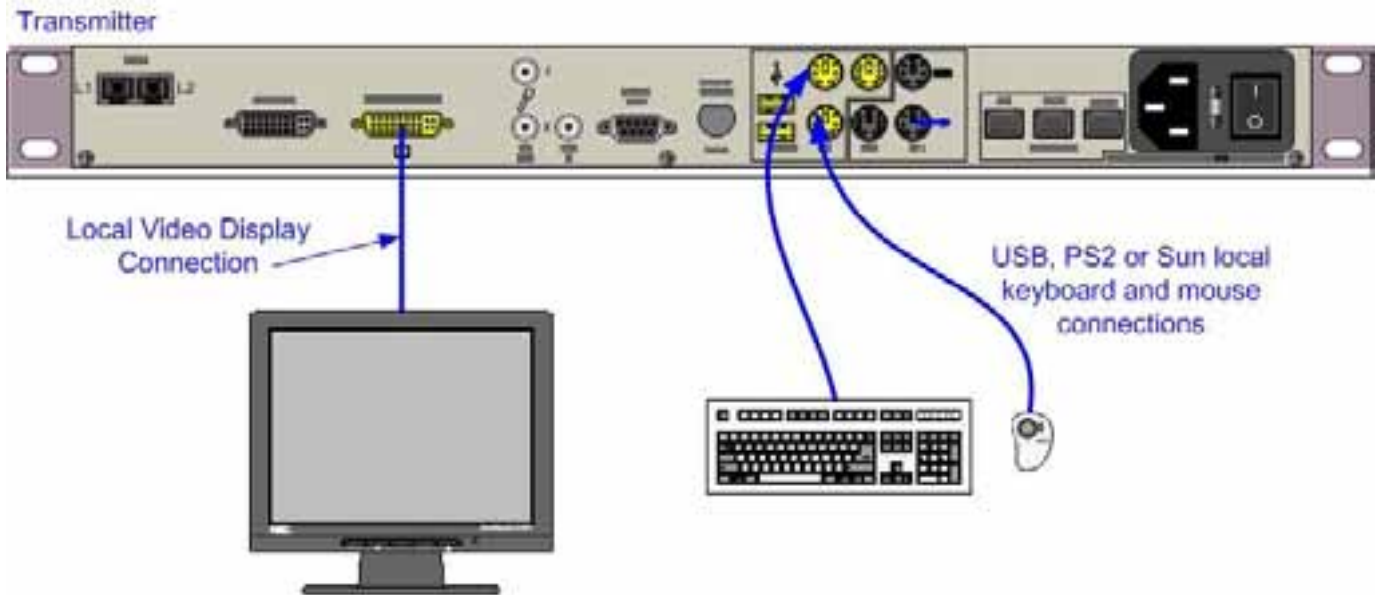
Serial connections are made between the CPU serial port and the Transmitter unit on the DB9 connector provided.

## **Stereo Emitter**

The stereo emitter connection is used for relatively low speed AC signals to drive stereo emitters for advanced graphic systems.

## **Local KM Connections and Video**

These provide the system administrator Keyboard and Mouse access to the CPU. Access is provided so that the system administrator can perform CPU repair or maintenance. The system administrator does not need to know the KM connection type to the CPU as all appropriate KM conversions for the CPU are handled transparently by the KVME Series.



Local KVM Console Connection Diagram.  
Connect local display as shown and either PS2, USB, or Sun keyboard and mouse.

**FIG.6**

### **Local USB A Connectors (Rectangular)**

The system administrator may at any time connect a USB keyboard, mouse or tablet to these connectors.

### **Local PS2 Mini-Din Connectors (6 Pin)**

The system administrator may at any time connect a PS2 mouse (5 button, wheel or three button) to the bottom PS2 connector. A PS2 keyboard is connected to the top connector.

## **Local SUN Serial legacy Mini-Din Connectors (8 Pin)**

The system administrator may connect a SUN, Serial Keyboard and Mouse and gain access to the CPU at any time.

**NOTE: The keyboard and mouse are connected to the CPU via either PS2, USB or Sun serial connections. You may not use multiple interfaces between the CPU and Transmitter unit. If connecting PS2, connect both keyboard and mouse between CPU and Transmitter unit.**

## **SUN Serial CPU Connections**

A cable is connected between the bottom SUN connector and the CPU. You may not use PS2 or USB if you select the SUN Keyboard to the CPU. (Refer to Appendix A, Supported Configurations)

## **PS2 CPU Connections**

If using PS2, a pair of cables will need to be placed between the CPU and the Transmitter unit. The top PS2 connector labeled with a diagram of a keyboard is the connection to the CPU keyboard. The bottom PS2 connector labeled with a diagram of a mouse is the connection to the CPU.

## **USB Connections**

### **Units with 3 USB-B (square) connectors:**

The USB connection is made using a single cable between the DEV port and the CPU. This single connector provides multiple USB interfaces for keyboard, mouse, tablet and firmware upgrades. The tablet interface is utilized if an operator is using a Wacom Tablet, models Intuos2 or Graphire3. The user must specify which tablet is used on the front panel of the transmitter unit.

The user may also configure the keyboard to be an APPLE keyboard and provide the special function keys needed by APPLE. If APPLE keyboard is specified, the tablet may not be used, if the tablet is specified the special function APPLE keys may not be used. (Refer to Appendix A, Supported Configurations)

### **Units with 6 USB-B (Square) Connectors**

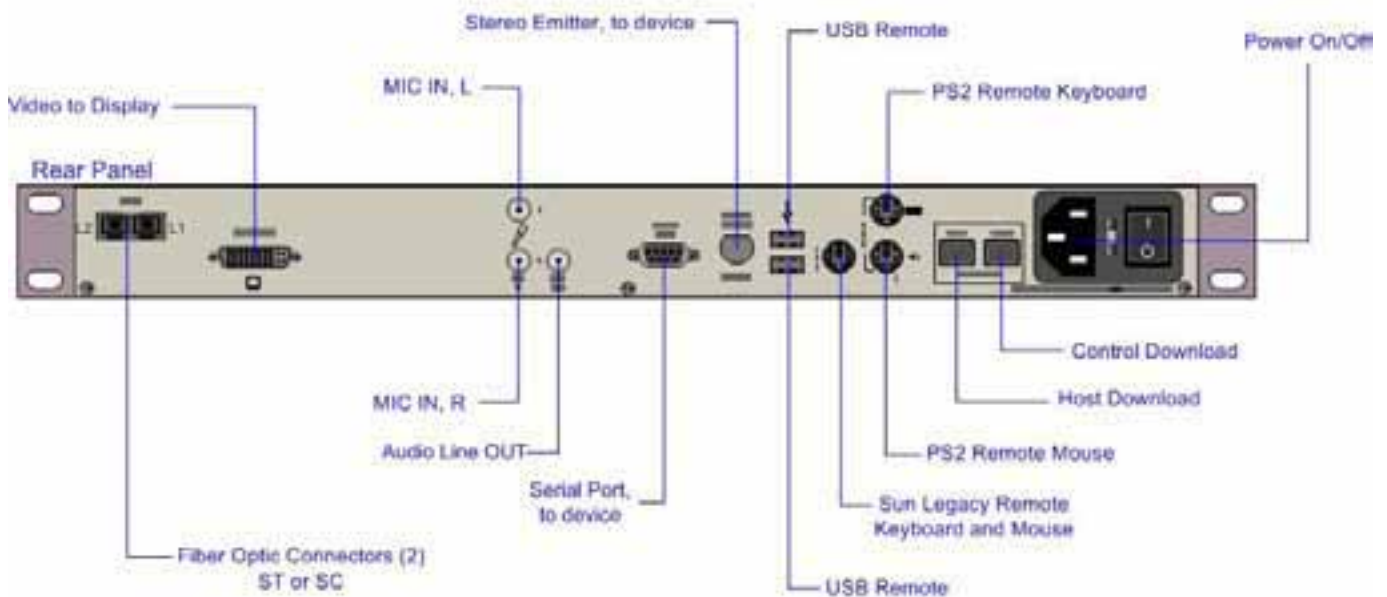
The USB connections to this unit are made with 3 cables between the CPU and Transmitter unit. The top left most USB-B connector (KB) provides the keyboard interface and emulates an APPLE keyboard to provide special key support (no transmitter menu configuration is needed using this connector). The middle USB-B connector is used for the Mouse and the right most USB-B connector is used as the Wacom Tablet. (Refer to Appendix A, Supported Configurations)

## 2.4.3 KVME Series "Receiver"

The receiver connects to your display/monitor video input using a DVI-D cable (if monitor has a DVI-D connector) or a VGA, HD15 (if monitor has a VGA/HD15 connector). Standard adapters are available from CyberResearch and other third party suppliers if necessary to make other connections.

The connections of the KVME Series "Receiver" are utilized in the following manner:

**KVME 1000 & 1225 Series Fiber Optic Receiver**  
ST or SC Connectors Available



**FIG. 7**

## **Video**

Video connection to the user monitor is made between the video output of the receiver unit and an appropriate monitor. Depending on the version of KVME Series you have, you may make only the DVI connection or DVI/VGA.

## **Audio**

Audio out of the KVME Series to the speakers is connected using the provided cable between the "LINE OUT" of the back of the receiver and the users speakers.

A pair of microphones may be connected to the KVME Series receiver unit for stereo recording.

## **Serial**

Serial connections are made between the users serial device and the receiver serial port at the DB9 connector provided.

## **Stereo Emitter**

The stereo emitter connection is used for relatively low speed AC signals to drive stereo emitters for advanced graphic systems.

## **USB A connectors (Rectangular)**

The system user may connect a USB keyboard, mouse or tablet to these connectors on the receiver. (Refer to Appendix A, Supported Configurations)

## **PS2 Mini-Din Connectors (6 Pin)**

The system user may connect a PS2 mouse (5-button, wheel or three button) to the bottom PS2 connector. A PS2 keyboard is connected to the top PS2 connector. (Refer to Appendix A, Supported Configurations)

## SUN Serial Legacy Mini-Din Connectors (8 Pin)

The system user may connect a SUN Serial Legacy Keyboard and Mouse to the top SUN connector on the receiver. (Refer to Appendix A, Supported Configurations)

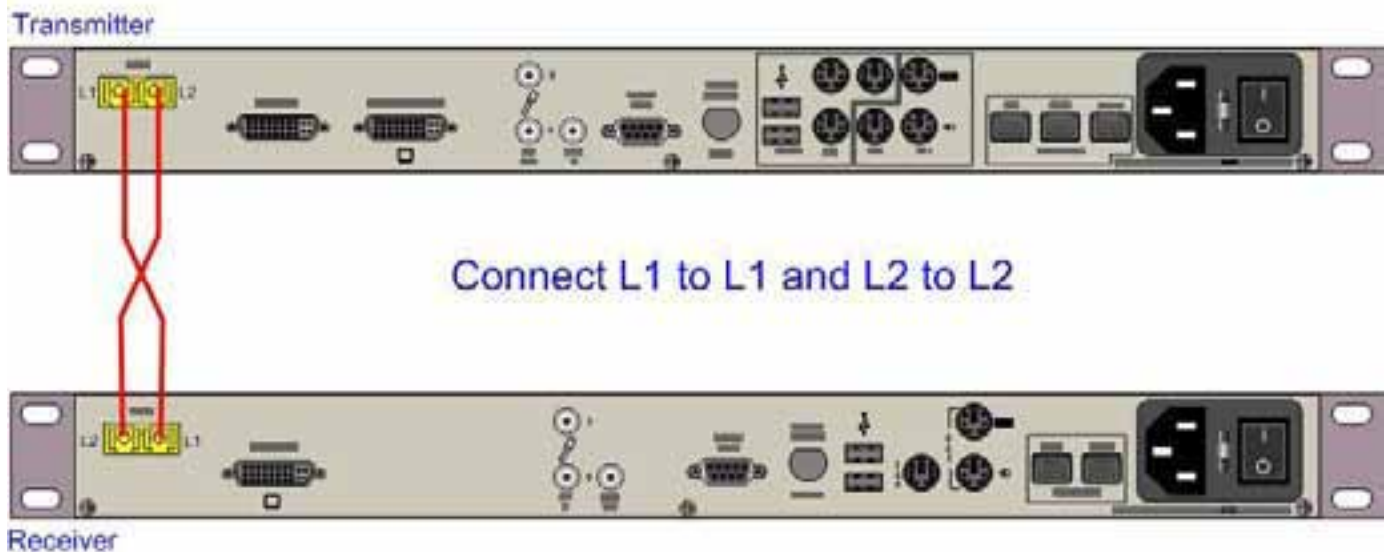
The KVME Series has an internal universal power supply. Each unit (TX and RX) requires approximately 15W of electrical power. The switching power supply accepts nominal AC input voltage between 100-240VAC with a frequency range between 50-60Hz.

## 2.5 Order of Installation Events

In order to properly use the KVME Series system, you must follow this order of events for the initial power-up.

1) Install and connect your Fiber Optic cable(s) between the Transmitter and Receiver units as shown below.

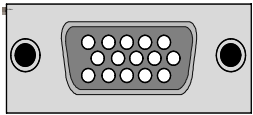
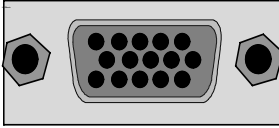
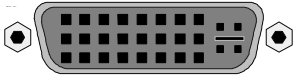
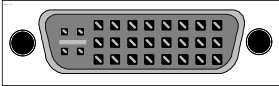
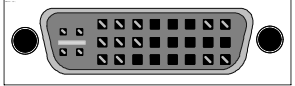
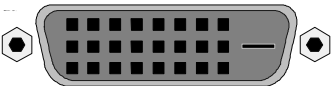
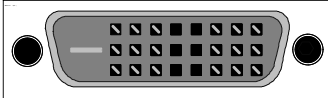
**KVME 1000 & 1225 Series Fiber Connection Diagram**  
ST or SC Connectors Available



**FIG.10**



- 2) Connect the supplied AC Power Cords to both units, and plug them into a suitable power source, but leave the power switch OFF.
- 3) Connect the CPU to the Transmitter unit, using the proper cable. (Refer to Table 2) Connect the KM Device to the CPU and turn ON the TX unit. (Refer to Appendix A, Supported Configurations)
- 4) Finally, connect the desktop devices (monitor, keyboard and mouse) to the Receiver unit using the proper cables (Refer to Table 2), then turn the Receiver ON. (Refer to Appendix A, Supported Configurations)
- 5) Do not hot plug the keyboard and mouse PS2 cables.

<p><b>If CPU has any of the following connectors:</b></p>	<p><b>Use corresponding cables:</b></p>
 <p style="text-align: center;"><b>HD15(M)</b></p>	 <p style="text-align: center;"><b>HD15(F)</b></p>
 <p style="text-align: center;"><b>DVI-I CONNECTOR PANEL</b></p>	 <p style="text-align: center;"><b>DVI-I CONNECTOR CABLE</b></p> <p style="text-align: center;"><b>OR</b></p>  <p style="text-align: center;"><b>DVI-A CONNECTOR CABLE</b></p>
 <p style="text-align: center;"><b>DVI-D CONNECTOR PANEL</b></p>	 <p style="text-align: center;"><b>DVI-D CONNECTOR CABLE</b></p>

**Table 2**

## **2.6 Firmware Upgrades**

Firmware upgrades are available through the factory, please call for technical assistance.

## 2.7 Front Panel Usage





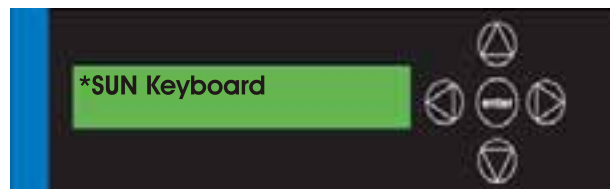
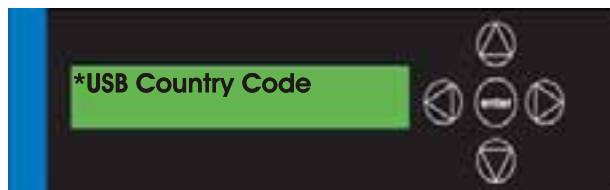
FIG. 11



### 2.7.1 General Front Panel Usage

Once the unit is powered up, the initial display is shown as follows:



This displays the device type and revision of the base unit (you may have a different revision than what is shown). By pressing the arrow  or  keys, the KVME Series allows you to enter into the main menu. All main root menu items are displayed with an \*. They are as follows:



Once an \* root menu item is displayed, you can then use the  or  arrow keys to review settings or make changes, if allowed. The Vis menu functionality is as follows:

<b>Display</b>	<b>Modifiable</b>	<b>Description</b>
<b>*System</b>		
LS Connected	NO	An indication of the fiber status from the TX to RX.
DVI Connected	NO	An indication of whether DVI Video is input to the Vis TX.
VGA Connected	NO	An indication of whether VGA Video is input to the Vis TX.
Load Defaults	YES	Loads factory default video configurations.
Store Values	YES	Store video configurations.
KM Device	NO	Revision of the vis portion that plugs into the CPU.
KM Remote Host	NO	Revision of the Vis KM Host on the RX unit.
KM Local Host	NO	Revision of the Vis KM Host on the TX unit.
TX Control	NO	Revision of the TX unit laser and front panel control.
RX Control	NO	Revision of the RX unit laser and front panel control.
FPGA Version	NO	Revision of the FPGA used for video generation.
PS2 KB Scan	NO	Indicates a value of 1,2 or 3 for the scan code that the device is told to emulate. If 0, then the keyboard is not properly installed.
PS2 Mouse	NO	Indicates a value of 0,3 or 4 for the mode that the device is told to emulate. If 255, then the mouse is not properly connected to the CPU.
Chip TDA8754	NO	Factory Use.
Apple KB	YES	Used when no daughter card is installed and the KM to PC port is designed to operate as an Apple KB with special function keys. If YES, then the Wacom tablet is eliminated.
Wacom Tablet	YES	Used when no daughter card is installed and the KM to PC port is designed to operate as Wacom Tablet (Intuios2 or Graphire 3). If this menu is other than "No Tablet", then the Apple KB is eliminated.
Debug Values	YES	Factory Use.
<b>*USB Country Code</b>		
USB Country	NO	The country code of the USB KB that the Vis reports itself as being. This is the last USB KB country applied to the remote host. Most hardware is not localized and thus this value would be zero (0), which is displayed As "Not Supported"
USB Device	NO	A bit pattern that indicates which ports have been enumerated at the Vis device side. The bits are laid out as Bit0=KB, Bit1=MS, Bit2=TBLT, Bit3=DWNLD, Bit4=Daughter Card_KB, Bit5= Daughter_MS, Bit6=Daughter_TBLT.
<b>*Sun Keyboard</b>		
Sun Keyboard	NO	The type of keyboard (3,4,5,6...) that the Vis reports itself as being. This is The last SUN KB type applied to the remote host.
Sun Country	NO	The country code of the SUN Serial KB that the Vis reports itself as being. This is the last SUN KB country code applied to the remote host.
Sun Serial Kb	NO	Reports TRUE if the SUN CPU has enabled the Serial KB.

<b>Display</b>	<b>Modifiable</b>	<b>Description</b>
<b>* Video</b>		
Resolution	NO	Active pixels x active lines vertical rate
Horizontal Frequency	NO	Horizontal frequency
CYCLONE_VDLY	YES	Vertical back porch of video (Hbp), measured in lines. Reducing Vbp will shift the video upwards, but may cut off the bottom of the screen. Increasing Vbp will have the opposite effect.
CYCLONE_VACT	YES	Active vertical line count (Vactive). Set to number of active lines.
TDAIPZ	YES	The charge pump and internal resistance value for the VCO filter. The A/D will not be able to generate an accurate clock if the setting is out range.
TDAPHASE	YES	A 5 bit value that adjusts the A/D sampling phase in 32 steps. Used to eliminate phase shifts. Horizontal lines are symptoms of an incorrect setting.
TDAVCO	YES	VCO gain control for the PLL. The A/D will not be able to generate an accurate clock if the setting is out of range.
TDAPLLDIV	YES	Total pixels in one line. The number must be exact or you will not be able to produce a "perfect" picture. Vertical bars are a symptom of an incorrect value. Total pixels=Active pixels+Hfront porch(pixels) +Hsync(pixels) + Hback porch (pixels)
TDAHSYNC	YES	Horizontal sync (Hsync) of video, measured in pixels.
TDAHBACK	YES	Horizontal back porch (Hbp) of video, measured in pixels.
TDAHDISPL	YES	Total active pixels in one line.
TDAHSYNSEL	YES	Input Hsync select. Set to 0 for all inputs.
TDAVSYNCSEL	YES	Input Vsync select. Set to 0 for separate HV input, set to 1 for CSYNC or SOG.
NativeH	NO	For use by Tech Support to determine user video settings.
NativeV	NO	For use by Tech Support to determine user video settings.
TDACTIVITY	NO	For use by Tech Support to determine user video settings.

**2.7.2 Saving Changes:** Saves video configurations so that after powering up, the device can recall customer video settings.



Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Store Values is displayed as shown below then press enter.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option. Using up or down arrow buttons scroll until you get to the CyberResearch, Inc. screen as shown above.

### 2.7.3 Restoring Factory Defaults:

 Loads factory default video configurations.

Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Load Defaults is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option.



Using the right arrow button, scroll right until Store Values is displayed as shown below  
Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option. Using up or down arrow buttons scroll until you get to the CyberResearch, Inc. screen as shown below.





**2.7.4 Utilizing Tablet Interface:** Used when no daughter card is installed and the KM to PC port is desired to operate as a Wacom Tablet (Intuos2 or Graphire3)



Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Wacom Tablet is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until the desired tablet (No Tablet, Intuos2 or Graphire3) appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option.

Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Store Values is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option. Using up or down arrow buttons scroll until you get to the CyberResearch, Inc. screen as shown below.



**2.7.5 Utilizing Apple Keyboard:** Used when no daughter card is installed and the KM to PC port is desired to operate as an Apple Keyboard with the special function keys.



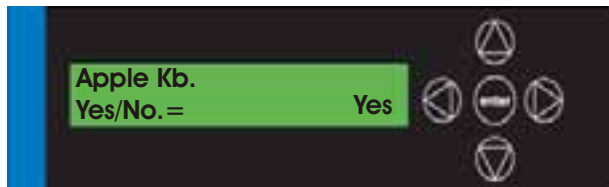
Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Apple Kb is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option.



Using the right arrow button, scroll right until Store Values is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option. Using up or down arrow buttons scroll until you get to the CyberResearch, Inc. screen as shown below.



### 2.7.6 Modifying an Existing Video Modeline: Modified to support the alternate timing.

#### Example of modifying an existing video modeline:

The native resolution for use with the latest generation of DLP projectors is 1400x1050\_96Hz (SXGA+). The KVME 1225 modeline can be easily modified to support the alternate timing listed in the table below. Differences are highlighted.

Parameter	Supported Timing	Alternate Timing
Resolution	1400x1050_96s	1400x1050_96s
Pixel Clock (MHz)	201.95	205.40
Horizontal Frequency (kHz)	107.42	107.42
Vertical Refresh (Hz)	96	96
Horizontal Total Pixels	1880	1920
Horizontal Active (Pixels)	1400	1400
Horizontal Front Porch(Pixels)	24	24
Horizontal Sync Width(Pixels)	168	168
Horizontal Back Porch(Pixels)	288	328
Vertical Total Lines (Lines)	1119	1119
Vertical active lines (Lines)	1050	1050
Vertical Front Porch (Lines)	3	3
Vertical sync (Lines)	7	7
Vertical Back Porch (Lines)	59	59

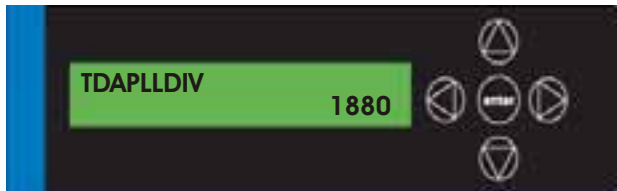
**Table 2**



Using the arrow down button, scroll down to \*Video as shown below.



Using the right arrow button, scroll right until TDAPLLDIV is displayed as shown below. Then press ENTER.



The Horizontal Pixel needs to be changed to 1920 to reflect the Alternate Timing listed on Table 2. Move the cursor under the number you want to change by pressing the right or left arrow button. Use the arrow up or down buttons to increment or decrement the number. Once number is entered correctly, press ENTER.



Using the right arrow button, scroll right until TDAHBACKL is displayed as shown below Then press ENTER.



The Horizontal Backporch (Pixes) needs to be changed to 328 to reflect the Alternate Timing listed on Table 2. Move the cursor under the number you want to change by pressing the right or left arrow button. Use the arrow up or down buttons to increment or decrement the number. Once number is entered correctly, press ENTER.



Using the right or left arrow button, scroll to return to \*Video menu option.

Using the arrow down button, scroll down to \*System as shown below.



Using the right arrow button, scroll right until Store Values is displayed as shown below. Then press ENTER.



Using the arrow up or down button scroll until YES appears as shown below. Then press ENTER.



Using the right or left arrow button, scroll to return to the \*System menu option. Using up or down arrow buttons scroll until you get to the CyberResearch, Inc. screen as shown below.



## 3. Regulatory and Safety

### 3.1 Safety Requirements

#### 3.1.1 Symbols Found on Product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with requirements.

##### 3.1.1.1 Class 1M Laser Labeling



LASER RADIATION  
DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS  
CLASS 1M LASER PRODUCT



## **3.2 Regulatory Compliance**

The CyberResearch KVME Series products are designed and made in the USA. The KVME Series products have been tested by a nationally recognized testing laboratory and found to be compliant with the following standards (both domestic USA and many international locations).

### **3.2.1 North America**

These products comply with the following standards:

Safety

- UL60950:2000
- CAN/CSA C22.2 No. 60950-00

Laser Safety

- CDRH 21 CFR 1040.10
- Class 1M laser Product
- Accession Number TBD

Electromagnetic Interference

- FCC CFR47, Part 15, Class A
- Industry Canada ICES-003 Issue 2, Revision 1

### **3.2.2 Australia & New Zealand**

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

### **3.2.3 European Union**

#### **3.2.3.1 Declaration of Conformity**

Name and address:

CyberResearch, Inc.  
25 Business Park Drive  
Branford, Ct 06405  
Telephone (203) 483-8815

Product name

- Model: KVME 1200 & 1225 Video Extension Systems

These products comply with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

### **3.2.3.2 Standards with which the Products Comply**

Safety

- IEC60950:1992 +A1,A2,A3,A4,A11

Laser Safety

- IEC60825:2001 Parts 1 and 2
- Class 1M laser Product

Electromagnetic Emissions

- EN55022: 1994 (IEC/CSP1R22:1993)
- EN61000-3-2/A14:2000
- EN61000-3-3:1994

Electromagnetic Immunity

- EN55024:1998 Information Technology Equipment-Immunity Characteristics
- EN61000-4-2:1995 Electro-Static Discharge Test
- EN61000-4-3:1996 Radiated Immunity Field Test
- EN61000-4-4:1995 Electrical Fast Transient Test
- EN61000-4-5:1995 Power Supply Surge Test
- EN61000-4-6:1996 Conducted Immunity Test
- EN61000-4-8:1993 Magnetic Field Test
- EN61000-4-11:1994 Voltage Dips & Interrupts Test

### **3.2.4 Supplementary Information**

The following statements may be appropriate for certain geographical regions and might not apply to your location.

**NOTE:** 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 when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference to radio communications at his own expense.

**NOTE:** This Class A digital apparatus complies with Canadian ICES-003 and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B Class A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

**WARNING:** This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

### **3.2.5 Product Serial Number**

The KVME Series products have a unique serial number, imprinted on a small silver label that is placed on the bottom of the chassis. The serial number includes a date-code. The format for the date-code is two digits for the month; two digits for the day and four digits for the year and two or three digits for a unique unit number. This serial number is also found on the original shipping carton.

## Appendix A - Supported Configurations

Here are the allowed configurations of the KVME Series:

### Keyboard and Mouse Connection Diagram.

USB from Computer to Transmitter.

PS2, USB and/or Sun Keyboard and Mouse to Receiver.

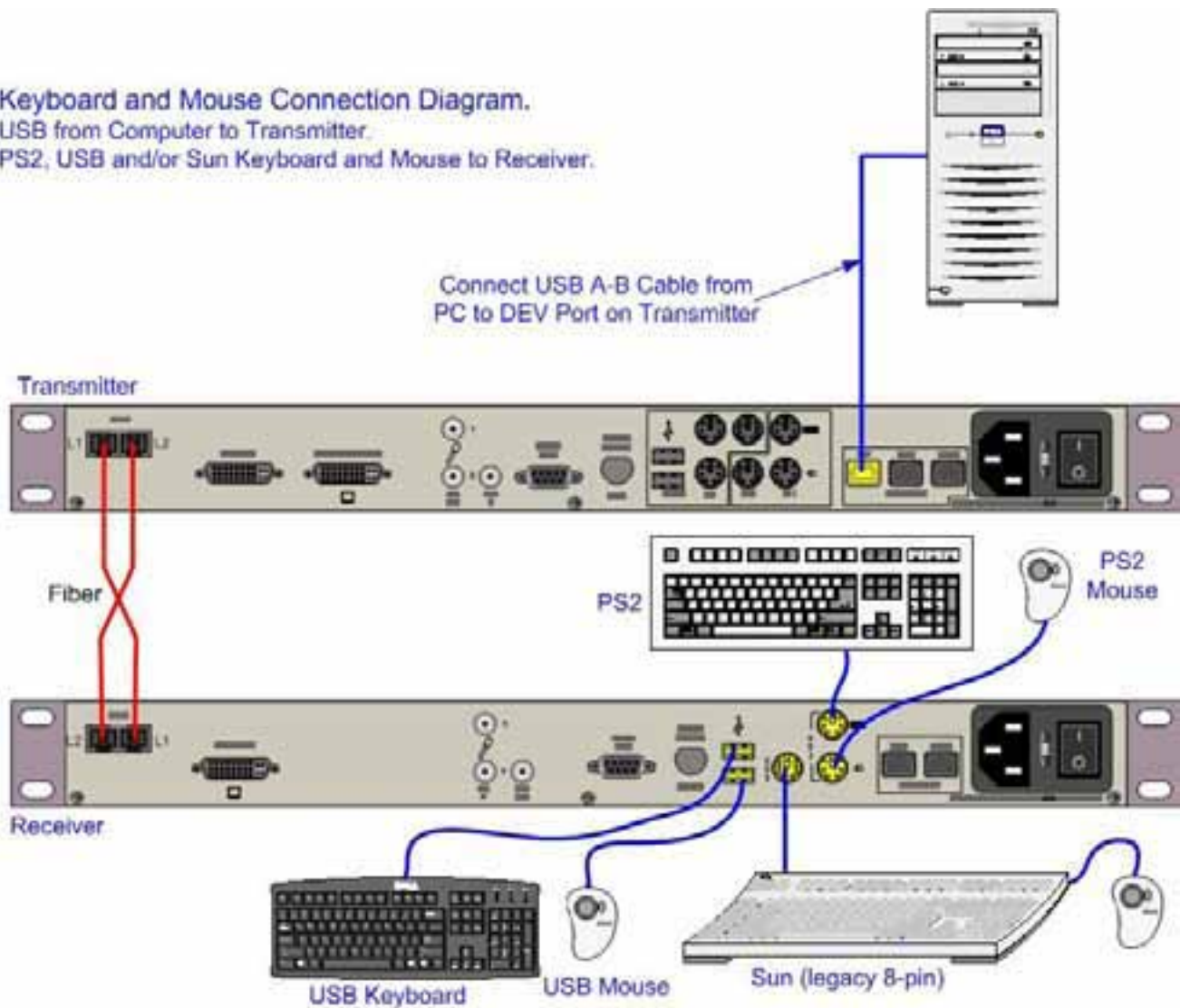
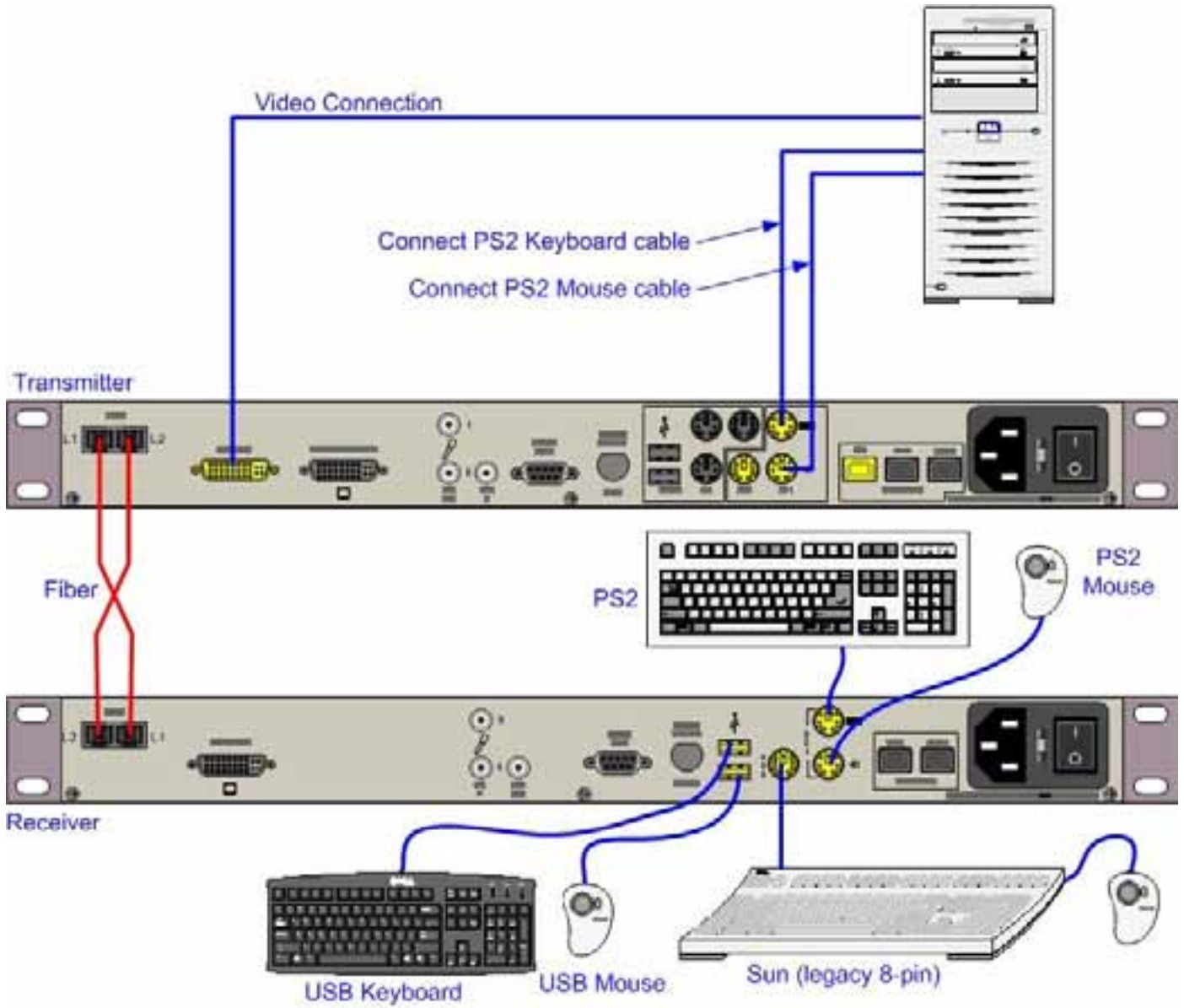


FIG.12



**Keyboard and Mouse Connection Diagram.**  
 PS2, USB or Sun 8-pin from Computer to Transmitter (PS2 shown).  
 PS2, USB and/or Sun Keyboard and Mouse to Receiver.

**FIG.13**

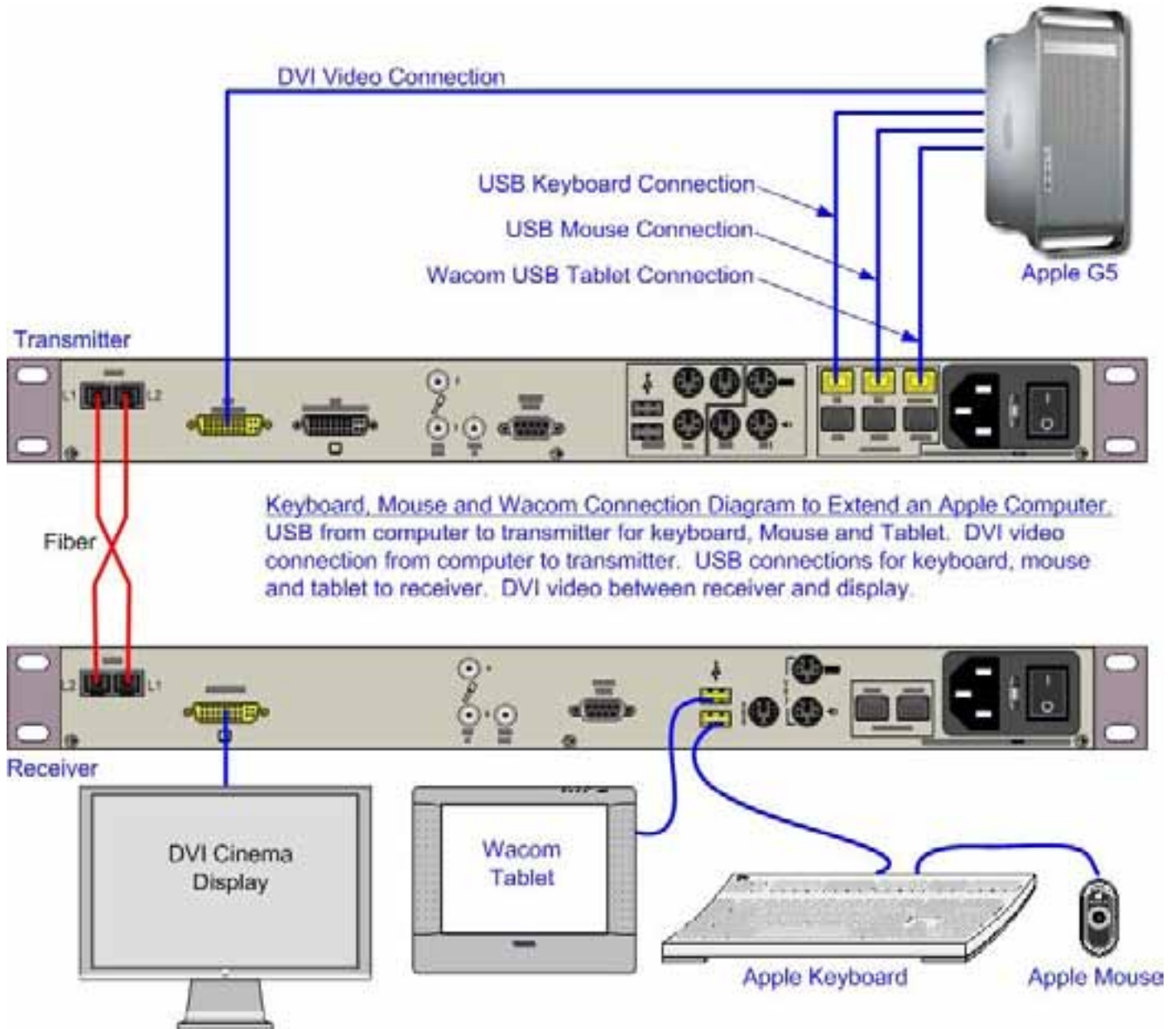


FIG.14



## **Appendix B - Troubleshooting Guide**

<b><u>Description of Problem</u></b>	<b><u>Action</u></b>
no video, keyboard or mouse	check fibers check video input
no keyboard or mouse	check fibers check PS2 km connections check USB connections check SUN connections
no speakers	check audio connection
serial port not working	check serial port connection
modifications to menu option values not working	check to see if changes were saved, if not then re-save

### **Action**

#### **Check Fibers:**

At front panel of TX unit, press the down arrow until \*System is shown. Press the right arrow once until LS Connected is shown. If the indication is NO, then fibers may be swapped or disconnected, please ensure proper fiber connection.

#### **Check Video Input:**

At front panel of TX press the down arrow until \*System is shown. Press the right arrow and check the DVI and VGA Connected status to ensure that the video you intended to transmit is active. Vis 1 and 5 can transmit VGA and DVI. Some models can only transmit DVI. Attach a monitor to the back of the PC and ensure that the video card is working. Move this same monitor to the local video connector (farthest away from fiber) on the back of the TX unit. Connect video from the PC to the TX. Ensure proper fiber connection from TX to RX. Move monitor on local video input to RX unit and ensure video is present.

#### **Check PS2 KM Connections:**

For PS2 connection to the PC, press the down arrow key on the front panel of the TX unit until \*System is shown. Press the right arrow key until PS2 KB Scan Code is shown. This number should be 1,2,3 (2 for most PC's, 3 for SGI). Press the right arrow key again and review the PS2 Mouse Mode setting. The mouse mode should be 0,3 or 4.) being default mouse mode, 3 being intelli-mouse with wheel, and 4 being a 5 button mouse with wheel. The mode will be established by your operating system. If the PS2 KB Scan Code shows 0 or PS2 Mouse Mode shows 255, the connection for this device is not correct. Possible causes include the PC being booted without the PS2 cables connected, the PS2 cables are swapped or the cables are defective.

**Check USB Connections:**

When utilizing USB connections to the PC, press the down arrow key on the front panel of the TX unit until “\*USB Country Code” is shown. Press the right arrow key until “USB Device Enum” is shown. This number is a bitmap of USB devices used by the PC the bit0 represents the KB, bit1 the mouse, bit2 the tablet, bit3 the firmware download, bit4 USB daughter card KB, bit 5 USB daughter card MS, bit 6 USB daughter card tablet. The value shown should be a number other than zero.

**Check SUN Connections:**

When utilizing Sun Serial connections to the PC, press the down arrow key on the front panel of the TX unit until “\*Sun Keyboard” is shown. Press the right arrow key until “Sun Serial Kb En” is shown. The value shown is the type of Sun keyboard reported the PC. The number is established by the type of Sun keyboard last connected to the RX unit. If there has been no connection to a Sun keyboard on the RX unit, the default type is five.

**Check Audio Connection:**

Connect powered speakers (i.e., speakers with a wall mount power supply) to the audio out of the PC. Utilize a method of generating sound on the PC, for instance on Windows XP™, go to Start->Control Panel->Sounds and Audio Devices->Sounds Tab->Click on Asterisk->Click the box next to browse with the play triangle in it. After verifying that sound is operational, remove the speakers and utilize the audio cable provided (3 connections, stereo 3.5mm plug) to connect the same speaker audio port to the single metallic audio port on the back of the TX. Connect the speakers just utilized, to the RX singular metallic port. Repeat steps needed to produce sound.

**Check Speaker Connections:**

Connect a passive microphone to the microphone input of the PC. Utilize a method of recording sound on the PC, for instance on Windows XP™, go to Start->Accessories->Entertainment->Sound Recorder press the red record button (circle on right) and verify the sound is recorded. After verifying that the microphone is operational, remove the microphone and utilize the audio cable provided (3 connections, stereo 3.5mm plug) to connect the same microphone audio port to the top (L) microphone audio port on the back of the TX. Connect the microphone just utilized, to the RX top (L) port on the back of the RX. Repeat steps needed to record sound.

**Check Serial Port Connection:**

The connector on the back of the TX unit is configured as DCE, this means that the PC has to be configured to DTE, or data comes into the PC on pin 2 and is transmitted to the equipment on pin 3. The serial port is a full implementation, all 9 pins are active.

**Check Saved Changes:**

At front panel of TX unit, press the down arrow until \*System is shown. Press the right arrow once until Store Values is shown. Press Enter, down arrow to Yes and press Enter.



## Product Service

### Diagnosis and Debug

CyberResearch, Inc. maintains technical support lines staffed by experienced Applications Engineers and Technicians. There is no charge to call and we will return your call promptly if it is received while our lines are busy. Most problems encountered with data acquisition products can be solved over the phone. Signal connections and programming are the two most common sources of difficulty. CyberResearch support personnel can help you solve these problems, especially if you are prepared for the call.

To ensure your call's overall success and expediency:

- 1) Have the phone close to the PC so you can conveniently and quickly take action that the Applications Engineer might suggest.
- 2) Be prepared to open your PC, remove boards, report back-switch or jumper settings, and possibly change settings before reinstalling the modules.
- 3) Have a volt meter handy to take measurements of the signals you are trying to measure as well as the signals on the board, module, or power supply.
- 4) Isolate problem areas that are not working as you expected.
- 5) Have the source code to the program you are having trouble with available so that preceding and prerequisite modes can be referenced and discussed.
- 6) Have the manual at hand. Also have the product's utility disks and any other relevant disks nearby so programs and version numbers can be checked.

Preparation will facilitate the diagnosis procedure, save you time, and avoid repeated calls. Here are a few preliminary actions you can take before you call which may solve some of the more common problems:

- 1) Check the PC-bus power and any power supply signals.
- 2) Check the voltage level of the signal between SIGNAL HIGH and SIGNAL LOW, or SIGNAL+ and SIGNAL- . It CANNOT exceed the full scale range of the board.
- 3) Check the other boards in your PC or modules on the network for address and interrupt conflicts.
- 4) Refer to the example programs as a baseline for comparing code.

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## Warranty Notice

CyberResearch, Inc. warrants that this equipment as furnished will be free from defects in material and workmanship for a period of one year from the confirmed date of purchase by the original buyer and that upon written notice of any such defect, CyberResearch, Inc. will, at its option, repair or replace the defective item under the terms of this warranty, subject to the provisions and specific exclusions listed herein.

This warranty shall not apply to equipment that has been previously repaired or altered outside our plant in any way which may, in the judgment of the manufacturer, affect its reliability. Nor will it apply if the equipment has been used in a manner exceeding or inconsistent with its specifications or if the serial number has been removed.

CyberResearch, Inc. does not assume any liability for consequential damages as a result from our products uses, and in any event our liability shall not exceed the original selling price of the equipment.

The equipment warranty shall constitute the sole and exclusive remedy of any Buyer of Seller equipment and the sole and exclusive liability of the Seller, its successors or assigns, in connection with equipment purchased and in lieu of all other warranties expressed implied or statutory, including, but not limited to, any implied warranty of merchant ability or fitness and all other obligations or liabilities of seller, its successors or assigns.

The equipment must be returned postage prepaid. Package it securely and insure it. You will be charged for parts and labor if the warranty period has expired.

### **Returns and RMAs**

If a CyberResearch product has been diagnosed as being non-functional, is visibly damaged, or must be returned for any other reason, please call for an assigned RMA number. The RMA number is a key piece of information that lets us track and process returned merchandise with the fastest possible turnaround time.

### **PLEASE CALL FOR AN RMA NUMBER!**

#### ***Packages returned without an RMA number will be refused!***

In most cases, a returned package will be refused at the receiving dock if its contents are not known. The RMA number allows us to reference the history of returned products and determine if they are meeting your application's requirements. When you call customer service for your RMA number, you will be asked to provide information about the product you are returning, your address, and a contact person at your organization.

***Please make sure that the RMA number is prominently displayed on the outside of the box.***

• Thank You •

*Intentionally Blank*



***CyberResearch, Inc.***

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[www.cyberresearch.com](http://www.cyberresearch.com)