

# —PC Fiberlynx—

## PC Fiberlynx KVM Extension System User Guide



Part Number 15.00.018  
Revision B  
January 2002

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## Disclaimer & Revisions

Operation of this equipment in a residential area is likely to cause interference in which case the user, at his or her own expense, will be required to take whatever measures may be required to correct the interference.

**Attention:** *This product has been designed to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against such interference when operating in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with this guide, may cause harmful interference to radio communications.*

Changes or modifications to this device not explicitly approved by Lantronix will void the user's authority to operate this device.

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

Date	Rev.	Part No.	Comments
January 2002	B	15.00.018	Updated regulatory info. Incorporated PC and SUN models. Add video record info. Updated to Lantronix style.

# Declaration of Conformity

(according to ISO/IEC Guide 22 and EN 45014)

**Manufacturer's Name & Address:**

Lightwave Communications, 100 Washington Street, Milford, CT 06460 USA

*Declares that the following product:*

**Product Name & Model:** PC Fiberlynx

*Conforms to the following standards or other normative documents:*

**Safety:**

EN60950: 1992+A1, A2, A3, A4, A11

**Electromagnetic Emissions:**

EN55022 Class A: 1998 (CISPR 22, Class A: 1993, A1: 1995, A2: 1996)

EN1000-3-2/A14: 2000

EN10003-3: 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

**Supplementary Information:**

This Class A digital apparatus complies with Canadian ICES-003 (CSA) 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 product also complies with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

The PC Fiberlynx carries the **CE** mark since it has been tested and found compliant with the following standards:

Safety: EN 60950

Emissions: EN 55022 Class A

Immunity: EN 55024

See additional specification information in Section 5 of this manual.

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*For Your Notes*

## 1: System Overview

The PCFiberlynx from Lightwave Communications is an inexpensive fiber optic extension system for PC-compatible or SUN computers. A user may be located up to 1000 meters from the CPU and have complete interaction with the CPU through keyboard, mouse, serial, video, and audio devices.

Two models of PCFiberlynx systems are available:

- PS/2 type, for PC-compatible computers and peripherals (pn 200.100.02xx)
- PC/SUN, for PC or SUN type computers and peripherals (pn 200.100.01xx)



The PCFiberlynx consists of a matched pair of units: a **transmitter** (shown above) and a **receiver** (shown below). The transmitter is located with the CPU, and has a LOCAL MONITOR connector to support a monitor near the CPU if needed, while the receiver is located with the user peripherals (keyboard, mouse, Primary user monitor, etc.) and also supports an Auxiliary monitor, if desired.

A six-strand fiber-optic cable is used to connect the two units. The fiber optic cable uses ST-type connectors on its fibers. There are no metallic connections between the units.



A cable kit is included with the PCFiberlynx to connect the transmitter to the CPU. All cables in this kit are ten feet long; longer cables are also available from Lightwave Communications.

## 2: Installation

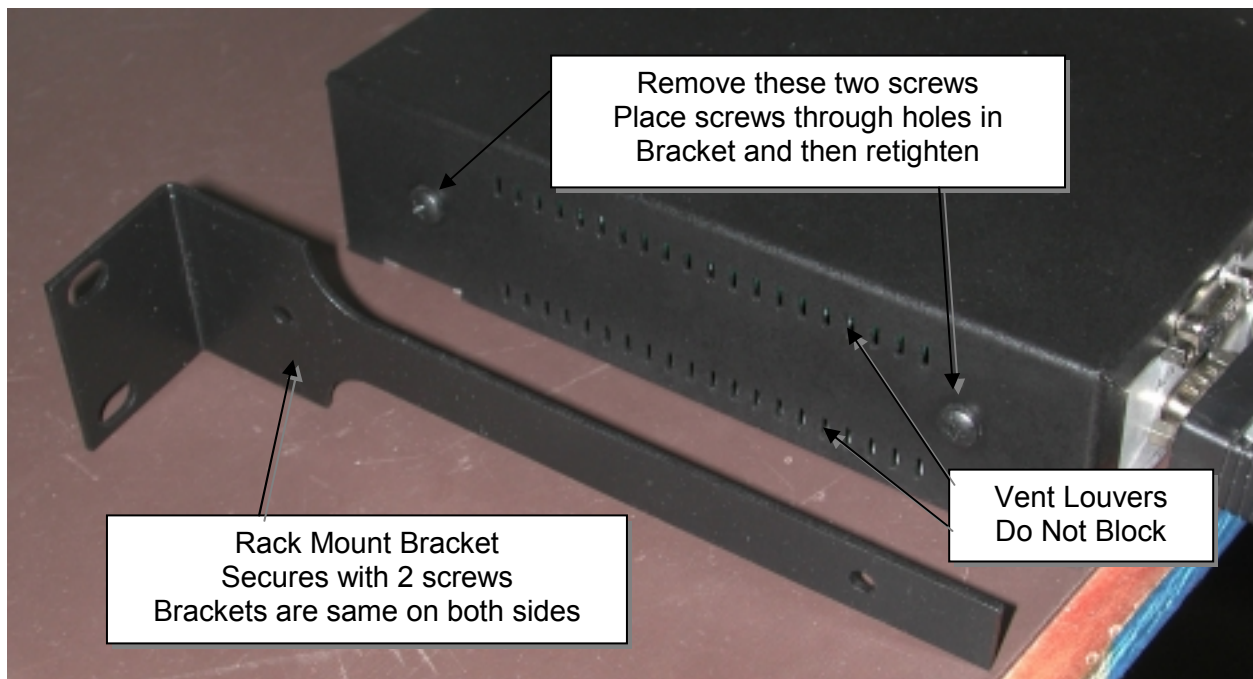
Do not open the PCFiberlynx chassis; there are no user-serviceable parts inside.

### 2.1 Desktop Use

Installation of the PCFiberlynx is simple and requires no special tools for desktop use. All connections use industry-standard cabling and connectors. A ten foot long cable kit (P/N 200.0230) is included with the PCFiberlynx to connect the transmitter unit to the CPU. This cable kit includes: one male-to-male HD15 (VGA) video cable, two male-to-male 6 pin mini-DIN keyboard and mouse cables, one male-to-female DB9 serial cable, and two 3.5 mm stereo audio cables. Eight rubber feet are also included to use the PCFiberlynx on a desktop.

### 2.2 Rack Mount

The PC Fiberlynx units may be rack-mounted in a conventional 19-inch equipment rack. If rack mounting, the user must install the rack mounting brackets (provided in the box with the unit) and properly secure the unit in their rack. The PC Fiberlynx mounts from the front flanges only (no rear support is required) using screws from your rack's manufacturer. If rack mounting, the rubber feet included with the PC Fiberlynx are not required.





If rack-mounting the PC Fiberlynx system, the following considerations may apply:

### **Elevated Operating Ambient Temperature**

If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than the room ambient temperature. Consideration should be given to installing the equipment in an environment compatible with the maximum rated ambient temperature.

### **Reduced Air Flow**

Be sure that adequate airflow is allowed in the cabinet or enclosure, and that the louver vents on either side of the PC Fiberlynx chassis are not blocked.

### **Mechanical Loading**

Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading. Dress the cables to prevent undue pulling or weight, as the chassis is normally mounted from the front (for flush appearance) while the cables are attached from the rear of the chassis.

### **Circuit Overloading**

Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### **Reliable Earthing**

Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connection other than direct connections to the branch circuit (e.g., use of power strips).

## **2.3 Site Preparation**

1. Shutdown the CPU and disconnect the user peripherals (keyboard, mouse, monitor, etc.).
2. Move the CPU and the user devices to their respective operating locations. Run a 6-strand fiber optic cable with ST connectors between the CPU location and user station. Fiber optic cable is available in custom and standard lengths from Lightwave Communications.
3. Provide power connections for the PCFiberlynx units at each location, as well as power for the CPU and any powered user peripherals (such as a monitor and speakers). The PCFiberlynx uses a universal power supply.

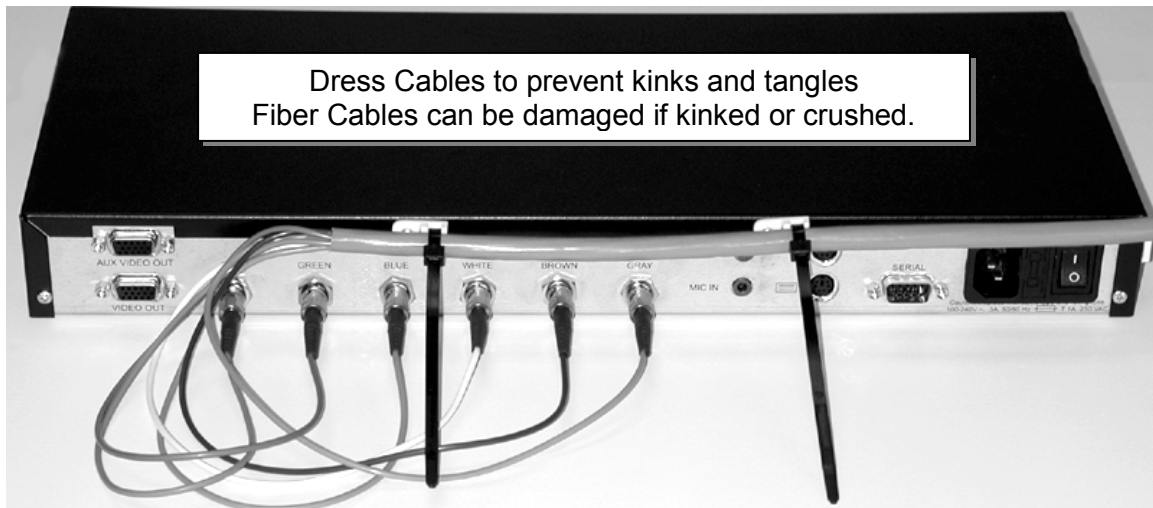
The PC/SUN models of PC Fiberlynx (part numbers 200.100.01xx) are similar to the PC-only version (part numbers 200.100.02xx). The difference is the SUN keyboard and mouse connection is made using a single MiniDIN-8 cable, rather than two PS/2 cables. All other devices and peripheral connections are the similar to the PC-only models.



The PC Fiberlynx for PC/SUN Receiver is shown above. The PC/SUN Transmitter is similar.

## 2.4 Connecting Fiber Optic Cable

1. Situate the transmitter and receiver units close to their final locations. Run the fiber optic cable to these locations with enough slack to prevent strain from damaging the cable.
2. Attach the individual fiber strands to the ST connectors on the back of each unit. Each strand on the transmitter end should be attached to the same connector as on the receiver end (i.e., red to red, blue to blue, etc.). Try to use the strand with the color indicated on the connector; note any substitutions to avoid confusion.



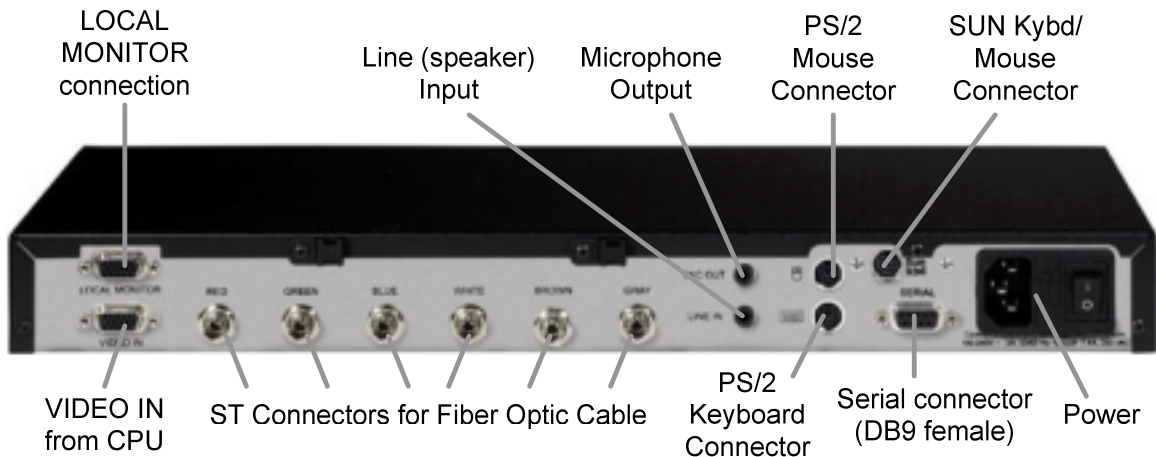
3. Use the provided strain relief device to prevent damage to the fiber optic cable. The strain relief ties may be trimmed if desired. When placing the transmitter and receiver in the final location, be sure to allow sufficient space behind each unit to prevent excessive bending of the fiber.

## 2.5 Connecting the CPU

Connecting the PC Fiberlynx is simple as it uses industry-standard connectors for each end of the connection: at the CPU end, and at the remote or User end. Both models of PC Fiberlynx will connect in a similar fashion at both ends; the only difference is that the **PC/SUN model** has connections for both PC (PS/2) and SUN computers and keyboard and mice.

The **PS/2 Only** model does not have a SUN Keyboard and Mouse connector.

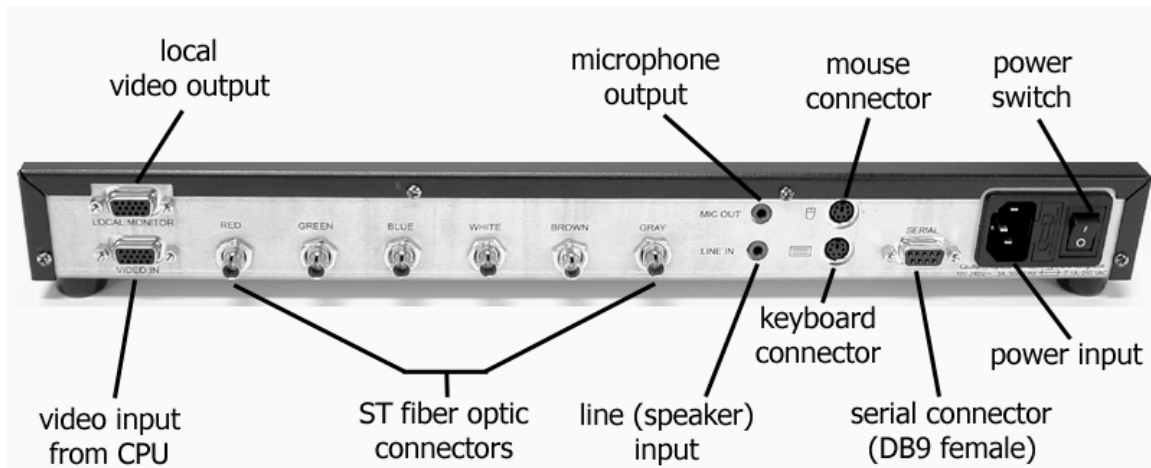
### SUN / PC model



PCFiberlynx (SUN/PC) transmitter

1. Place the CPU with the PCFiberlynx transmitter. Connect the keyboard and mouse ports of the CPU to the keyboard and mouse ports of the PCFiberlynx transmitter using the two 6-pin mini-DIN cables (PS/2), **or** using the one mini-DIN8 cable (SUN).
2. Connect the video output of the CPU to the lower video connector of the transmitter using the provided HD15 (VGA) cable. A monitor may be attached to the upper video connector to view the video output of the CPU locally.
3. Connect the CPU audio ports to the transmitter using the provided 3.5 mm audio cables. The port marked "MIC OUT" on the transmitter connects to the microphone port on the CPU, while the "LINE IN" port on the transmitter connects to the speaker port on the CPU.
4. Connect the CPU serial port to the transmitter serial port using the provided cable.
5. Connect the transmitter to AC power and turn on the switch. The status LEDs found on the front of the unit should light.

## PS/2-Only model

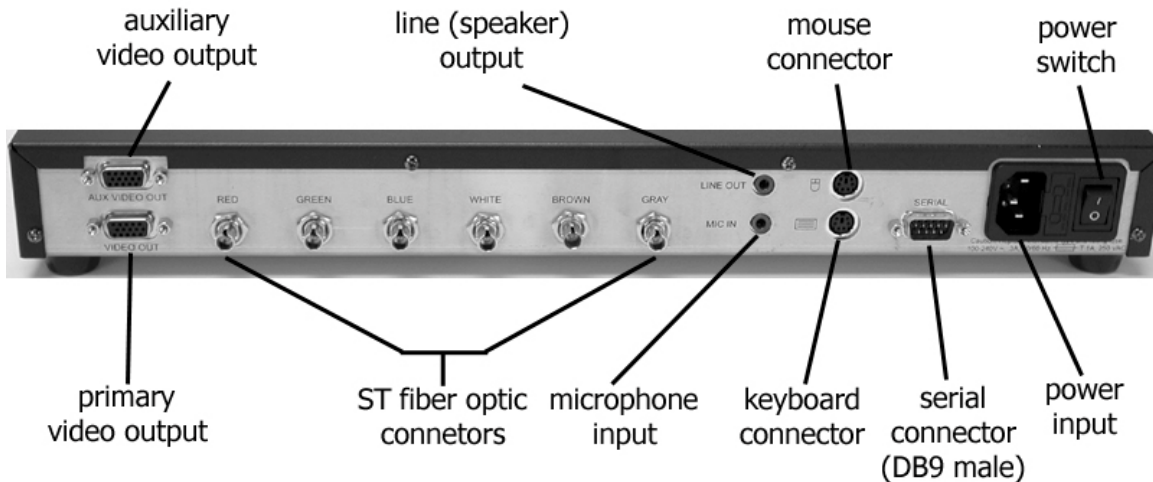


PCFiberlynx (PS/2 Only) transmitter

1. Place the CPU with the PCFiberlynx transmitter. Connect the keyboard and mouse ports of the CPU to the keyboard and mouse ports of the PCFiberlynx transmitter using the provided 6 pin mini-DIN cables.
2. Connect the video output of the CPU to the lower video connector (**VIDEO IN**) of the transmitter using the provided HD15 (VGA) cable. A monitor may be attached to the upper video connector to view the video output of the CPU locally.
3. Connect the CPU audio ports to the transmitter using the provided 3.5 mm audio cables. The port marked "MIC OUT" on the transmitter connects to the microphone port on the CPU, while the "LINE IN" port on the transmitter connects to the speaker port on the CPU.
4. Connect the CPU serial port to the transmitter serial port using the provided cable.
5. Connect the transmitter to AC power and turn on the switch. The status LEDs found on the front of the unit should light.

## 2.6 Connecting the User Peripherals

Like the Transmitter end, both models of PC Fiberlynx receiver will connect in a similar fashion; the only difference is that the **PC/SUN model** has connections for both PC (PS/2) and SUN computers and keyboard and mice. The **PS/2 Only** model does not have a SUN Keyboard and Mouse connector; it is shown below.



PCFiberlynx (PS/2 Only) receiver

1. Place the PCFiberlynx receiver on or near the user station. Connect the keyboard and mouse to the proper ports on the receiver. If using the SUN keyboard and mouse, the SUN keyboard is connected to the mini-DIN8 connector, and the mouse connects to the Keyboard.
2. Connect the monitor to the receiver: the lower HD15 (**VIDEO OUT**) connector is the primary video connector. The upper HD15 connector is for an auxiliary monitor; this monitor will show identical information as the primary monitor.
3. Connect the audio devices to the receiver. The lower connector, marked "**MIC IN**", is for use with a microphone only. The upper connector, marked "**LINE OUT**", is for connection to powered speakers or headphones.
4. Connect the serial device to the receiver. The receiver's serial port behaves like the DB9 serial port found on the back of a PC, and will connect to any device that would normally connect to a PC.
5. Connect the receiver to AC power and turn on the switch. The status LEDs found on the front of the unit should light.

## 2.7 Auxiliary Monitors

The PC Fiberlynx installation supports a total of three monitors when installed. All monitors will have the same video information displayed. The VIDEO OUT on the PC Fiberlynx Receiver is the Primary Video device. The video signal is determined by the settings established by your video card for the monitor connected to the VIDEO OUT connector.

Your application may require an auxiliary monitor at the user end, and one is supported using the AUX VIDEO OUT jack (HD15 female) on the PC Fiberlynx Receiver.

If a local monitor is desired near the CPU, a monitor may be connected to the LOCAL MONITOR connector (HD15 female) on the PC Fiberlynx Transmitter.

## 2.8 Power Up Sequence

The Power-Up Sequence of the system is relatively simple: make sure all of the connections are intact, and turn your CPU on last.

### Video Record

Your CPU may or may not be concerned with the video connection, depending on the type of video card you are employing. In some cases, a **'video record'** is established between the video card and the primary monitor during power up (or reboot), which determines the operating characteristics of the video output. If this is the case, you must follow this order of events.

Assuming that the components are installed, but your computer, the monitor and both PC Fiberlynx units are turned off:

1. Turn on the Monitor connected to VIDEO OUT on the Receiver.
2. Turn on the PC Fiberlynx Receiver (near the user end).
3. Turn on the PC Fiberlynx Transmitter (near the CPU).
4. Turn on the CPU. Allow the system to boot and establish the video record.
5. Turn on any other installed Monitors after a video signal is established at the remote end.

The CPU will establish the 'video record', if your video card requires this, from the Monitor connected to the VIDEO OUT connector on the PC Fiberlynx Receiver. If no monitor is connected to the VIDEO OUT connector but a monitor is connected to the LOCAL MONITOR connector of the PC Fiberlynx Transmitter, the video record can be established using that monitor (e.g., during installation). So long as the CPU is not rebooted and the connections are not broken, the video record information is maintained and will support the monitor when connected to the VIDEO OUT connector.

## 3: Operation

Once the CPU is operating, the PCFiberlynx will be transparent to the user. It will appear as though the user peripherals are directly attached to the CPU.

Both the transmitter and receiver may be powered off while the CPU is on, without causing a 'break' signal to be received by the CPU which may cause it to lock up. As long as all cables remain connected between the CPU and transmitter, the CPU will continue to operate without error due to hardware disconnection.

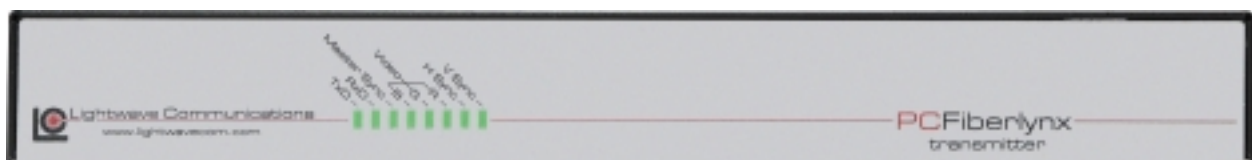
If there is no signal to the receiver (e.g., if the transmitter has no power or the fiber optic cable is broken or disconnected), the three keyboard status lights (Num Lock, Caps Lock, and Scroll Lock) will flash together.

### 3.1 Video Resolution

The PCFiberlynx supports resolutions from 640x480 to 1280x1024.

### 3.2 Front Panel LEDs

The front panel LEDs indicate status of the PCFiberlynx. The transmitter and receiver lights indicate status as marked on the front panel. The tables below outline the light status and possible solutions to the status abnormalities. Note that any flashing or blinking LEDs will not flash in step; all LEDs will flash at separate rates.



#### *Transmitter Unit*

<b>label</b>	<b>appearance</b>	<b>status</b>	<b>action</b>
TxD	blinking green	normal	
	solid green	unit not transmitting data	<ul style="list-style-type: none"> <li>• cycle power</li> </ul>

<b>label</b>	<b>appearance</b>	<b>status</b>	<b>action</b>
RxD	blinking green	normal	
	solid red or orange	not receiving data	<ul style="list-style-type: none"> <li>• check fiber connections</li> <li>• cycle power on both units</li> </ul>
Master Sync	blinking green	normal	
	solid red	incorrect video sync format	<ul style="list-style-type: none"> <li>• check video sync format and change to separate horizontal and vertical</li> <li>• check video input connection</li> <li>• make sure "Video In" connector is used</li> </ul>
Video B	solid green	normal	
	unlit	not receiving proper video signal	<ul style="list-style-type: none"> <li>• check that the CPU is on</li> <li>• check that the CPU is not in suspend/power saver mode</li> <li>• check video input connection and cable</li> </ul>
Video G	solid green	normal	
	unlit	not receiving proper video signal	<ul style="list-style-type: none"> <li>• check that the CPU is on</li> <li>• check that the CPU is not in suspend/power saver mode</li> <li>• check video input connection and cable</li> </ul>
Video R	solid green	normal	
	unlit	not receiving proper video signal	<ul style="list-style-type: none"> <li>• check that the CPU is on</li> <li>• check that the CPU is not in suspend/power saver mode</li> <li>• check video input connection and cable</li> </ul>
H Sync	blinking green	normal	<ul style="list-style-type: none"> <li>• if only H Sync light is flashing, sync may be composite format</li> </ul>
	unlit or solid green	improper sync signal or no sync signal	<ul style="list-style-type: none"> <li>• check sync format</li> <li>• check video input connection and cable</li> </ul>
V Sync	blinking green	normal	<ul style="list-style-type: none"> <li>• if only H Sync light is flashing, sync may be composite format</li> </ul>
	solid green	improper sync signal	<ul style="list-style-type: none"> <li>• signal may be composite or H sync only – check format at CPU</li> </ul>
	unlit	no sync signal	<ul style="list-style-type: none"> <li>• check sync format</li> <li>• check video input connection and cable</li> </ul>



Receiver Unit

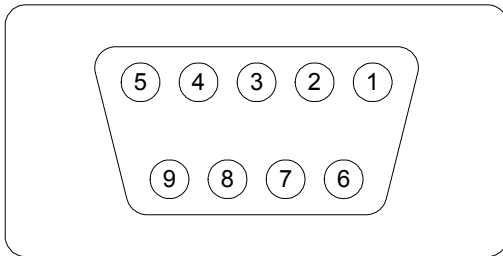


label	appearance	status	action
TxD	blinking green	normal	
	solid green	unit not transmitting data	<ul style="list-style-type: none"> <li>• cycle power</li> </ul>
RxD	blinking green	normal	
	solid red or orange	not receiving data	<ul style="list-style-type: none"> <li>• check fiber connections</li> <li>• cycle power on both units</li> </ul>
Master Sync	blinking green	normal	
	solid red or orange	not receiving sync data	<ul style="list-style-type: none"> <li>• check fiber connections</li> <li>• cycle power</li> </ul>
Video B left LED	off	normal	
	solid red / solid green	adjusting coarse gain / adjusting fine gain	normal at start if constantly adjusting: <ul style="list-style-type: none"> <li>• check fiber connection marked "BLUE"</li> <li>• check fiber distance between stations</li> <li>• check video source</li> </ul>
Video B right LED	blinking green	normal	
	red or orange	high gain mode	<ul style="list-style-type: none"> <li>• check fiber connection marked "BLUE"</li> <li>• check fiber distance between stations</li> </ul>
Video G left LED	off	normal	
	solid red / solid green	adjusting coarse gain / adjusting fine gain	normal at start if constantly adjusting: <ul style="list-style-type: none"> <li>• check fiber connection marked "GREEN"</li> <li>• check fiber distance between stations</li> <li>• check video source</li> </ul>
Video G right LED	blinking green	normal	

<b>label</b>	<b>appearance</b>	<b>status</b>	<b>action</b>
	red or orange	high gain mode	<ul style="list-style-type: none"> <li>• check fiber connection marked "GREEN"</li> <li>• check fiber distance between stations</li> </ul>
Video R left LED	off	normal	
	solid red / solid green	adjusting coarse gain / adjusting fine gain	normal at start if constantly adjusting: <ul style="list-style-type: none"> <li>• check fiber connection marked "RED"</li> <li>• check fiber distance between stations</li> <li>• check video source</li> </ul>
Video R right LED	blinking green	normal	
	red or orange	high gain mode	<ul style="list-style-type: none"> <li>• check fiber connection marked "RED"</li> <li>• check fiber distance between stations</li> </ul>
H Sync	blinking green	normal	<ul style="list-style-type: none"> <li>• if only H Sync light is flashing, sync may be composite format</li> </ul>
	unlit	improper sync signal	<ul style="list-style-type: none"> <li>• check sync format</li> <li>• check video input connection</li> </ul>
V Sync	blinking green	normal	<ul style="list-style-type: none"> <li>• if only H Sync light is flashing, sync may be composite format</li> </ul>
	unlit	improper sync signal	<ul style="list-style-type: none"> <li>• check sync format</li> <li>• check video input connection</li> </ul>

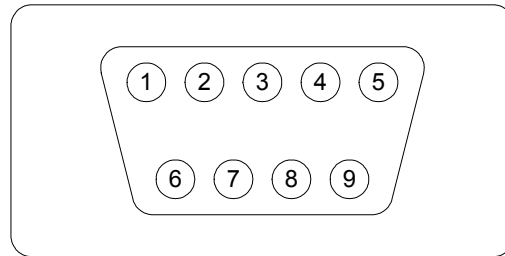
## 4: Appendix A Serial Port Pinouts

Transmitter Serial Connector

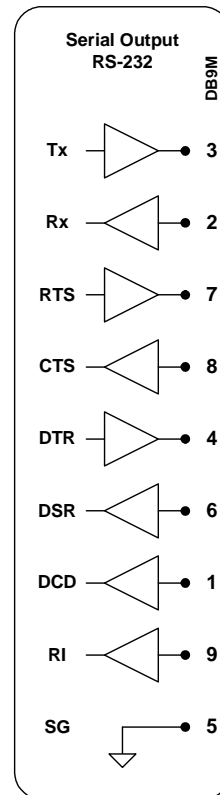
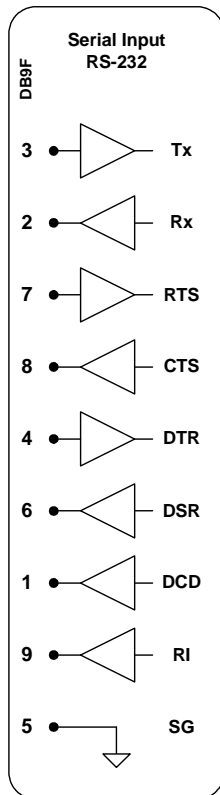


DB9 Female

Receiver Serial Connector



DB9 Male



- 1 - Data Carrier Detect (DCD)
- 2 - Receive Data (RxD)
- 3 - Transmit Data (TxD)
- 4 - Data Terminal Ready (DTR)
- 5 - Signal Ground (GND)
- 6 - Data Set Ready (DSR)
- 7 - Ready To Send (RTS)
- 8 - Clear To Send (CTS)
- 9 - Ring Indicator (RI)

## 5: Appendix B Specifications

### B.1 Physical

Width:	16.25 inches (41.2 cm)
Depth:	6.875 inches (7.5 cm)
Height:	1.75 inches (4.4 cm)
Shipping weight:	20 pounds (9.1 kg)

### B.2 Environmental

Operating temperature:	32°F (0°C) to 122°F (50°C)
Operating humidity:	10% to 90% RH, non-condensing
Storage temperature:	-4°F (-20°C) to 161°F (70°C)
Storage humidity:	10% to 90% RH, non-condensing

### B.3 Electrical

Universal AC input, auto-switching  
110/220 VAC 50/60 Hz ~1.0A  
IEC-type power input connector. Cordset provided with system.

### B.4 Optical

#### *B.4.1 LEDs and Detectors*

Wavelength:	850 nm
Loss budget:	7 dB

#### *B.4.2 Fiber Optic Cable*

Recommended cable:	FDDI-grade six strand
Maximum length:	3,310 feet (1000 meters)

## B.5 Interface

### *B.5.1 Video*

Connector:	HD15 female (VGA)
Sync format:	separate horizontal and vertical
Maximum resolution:	1280 x 1024

### *B.5.2 Keyboard and Mouse*

Connector:	6-pin mini-DIN
Format:	PS/2

### *B.5.3 Serial*

Transmitter Connector:	DB9 female
Receiver Connector:	DB9 male
Specification:	EIA-232
Maximum baud rate:	38,400

### *B.5.4 Audio*

Connector:	3.5 mm stereo jack
Line output impedance:	220 $\Omega$ <b>use powered speakers only</b>
Microphone impedance:	1 k $\Omega$

## B.6 Compliance and Certification

Entela Electrical Safety Certification (equivalent to UL 1950 and CSA 950)

Entela is a USA OSHA Nationally Recognized Testing Laboratory (NRTL), an accredited Certification Organization by the Standards Council of Canada (SCC), and an IECCE – CB Scheme National Certification Body (NCB) & Certification Body Testing Laboratory (CBTL).

CE certification

Conforms to FCC part 15, Class A