



Optical DVI+USB Extender

*User's Manual
for the M5-1001*

Manual Contents

Manual Contents	1-0
Welcome!, Product Description	1-1
System Requirements for Setup	1-2
Installation	1-3
Troubleshooting, Maintenance, Technical Support	1-5
Product Specifications	1-6
Warranty Information	1-7
Regulatory Statements	1-8

Pictorials

Figure 1 – Overall Optical DVI+USB Extender system	1-1
Figure 2 – Connection of DVI, USB, and RS232 cables between Uplink box and a computer	1-3
Figure 3 – Connection of DVI, USB, and RS232 cables between Downlink box and display and devices	1-3
Figure 4 – Connection of duplex SC fiber cables	1-4
Figure 5 – Connection of AC/DC power adaptor	1-4

Welcome!

Congratulations on your purchase of the M5-1001, Optical DVI+USB extender. This manual contains information that will assist you in installing and operating the product.

Product Description

The M5-1001 module offers up to 10 kilo-meters extension of DVI digital graphic data and USB data and RS232C serial data over fiber, directly connected between computers and displays or USB or RS232C devices. Two boxes, located one in the computer and the other in the display or devices are connected to each of them by a 1.0 m DVI copper cable or USB or RS232C cables. Between two boxes, the SC patch cord fiber bundled cable enables to transmit not only TMDS graphic data and USB data over it but also the Digital Display Channel (DDC2B) interface and Hot-plug function are performed over the same fiber cable.

Shipping Group of M5-1001 Optical DVI+USB extender

- **Tx and Rx boxes:** One Uplink(Tx) Box & One Downlink(Rx) Box.
- **AC/DC power adapter:** Two +12V/3A units (including AC cord).
- **User's Manual**
- **Option:** Duplex SC Fiber Patch Cord bundled cable (Single mode glass fiber).

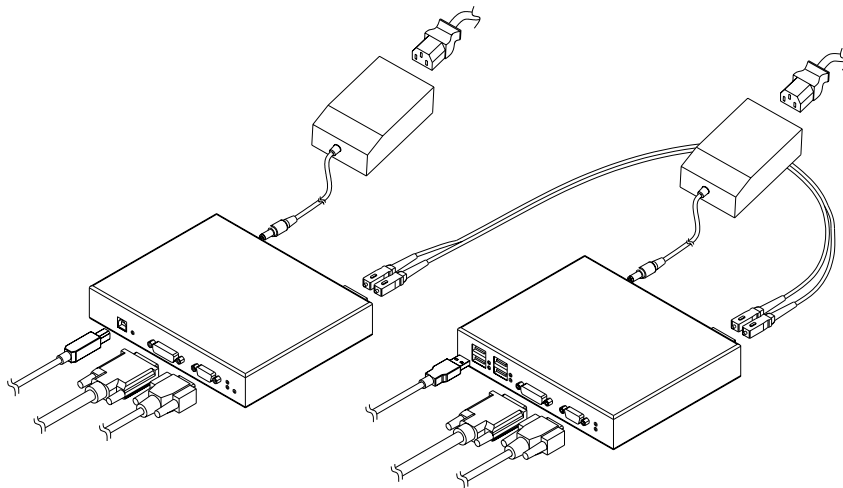


Figure 1 – Overall Optical DVI+USB Extender system

System Requirements for Setup

- **Hardware requirements**
 - You have a graphic controller card with a DVI port in your Windows/Mac (Mac is option), or SUN system. It should support the maximum graphic resolution feature of the display to be connected.
 - In case of using a computer, no special memory size, CPU speed and chipsets are required.
 - The USB controller and devices should be compatible with USB1.1.
 - Proper initial trial of the entire platform with its application using a short length copper cable is recommended prior to install with the optical link.
- **Software requirements**
 - No special needs, if the DVI graphic controller and display peripheral are operational with the platform's OS and application.
 - All OS, Windows/Mac, Unix, and SUN would recognize automatically in the boot-up process the 4 port USB hubs.
- **AC/DC Power Adapter Technical Advisory**

The power of M5-1001 is designed to supply to each module of Tx and Rx by plugging to each of the power plugs.

Installation

Important: Please use the installation procedure below. Improper, or no operation may result if the start-up sequence is not correctly followed.

Step 1

Carefully unpack the contents of the shipping group. Before next step, ensure that your graphic card is set at no higher than SXGA (1,280x1,024) 60Hz in direct connection of copper DVI cables.

Step 2

With system power turned **off**, connect the upstream Transmitter box to the DVI and USB receptacle of a computer by a DVI and a USB copper cable, respectively. Even without USB connection, this product works. If necessary, the RS232 cable plugs to the D-sub 9-pin connector.

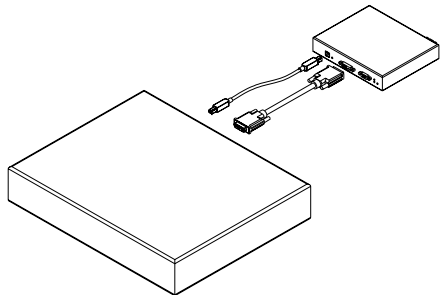


Figure 2 – Connection of DVI, USB, and RS232 cables between Transmitter box and a computer

Step 3

In the same way as above, connect the Receiver box into the DVI receptacle of the display, the USB devices and the RS232 device by the other DVI, USB, and RS232 copper cables, respectively. The receiver offers a connection of 4 USB devices.

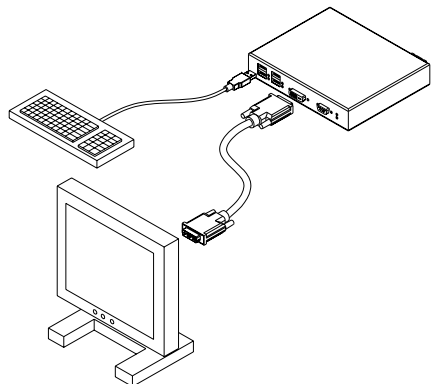


Figure 3 – Connection of DVI, USB, and RS232 cables between Receiver box and display and devices

1-3 Installation

Step 4

Remove the module dust covers and connect a duplex SC fiber cable to SC receptacles of the Transmitter and Receiver boxes, as shown in Fig. 4. Carefully ensure the duplex connectors are fully engaged.

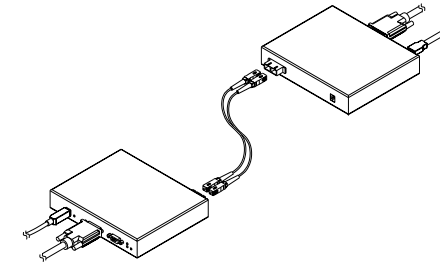


Figure 4 – Connection of duplex SC fiber cables

Notice: Please DO NOT look directly into the SC receptacles of both Transmitter and Receiver boxes, while they are powered on, although they are regulated strictly enough to operate under the Laser Class I, classified by CDRH/FDA for eye safety.

Step 5

Connect an AC/DC power adaptor to both of the Transmitter and Receiver boxes as your availability of AC outlets. You can find power indicators lit on in the both boxes.

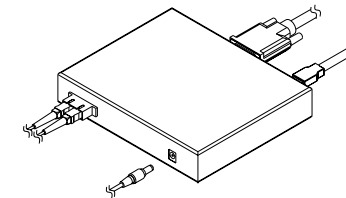


Figure 5 – Connection of AC/DC power adaptor

Step 6

Power on the computer and display or connected devices. Ensure the link indicators are light on, presenting secure connection of SC duplex fiber cables and the DVI indicator in the Transmitter box light on, presenting secure connection of the DVI cable. You can find USB indicators being connected to your USB devices.

Tip 1: After initial installation as guided in the above, we recommend you to power On and Off while all connections are set and the Tx/Rx boxes are powered in.

Tip 2: Avoid “hot plugging” the Tx or Rx boxes as this is not recommended practice with live digital voltages.

1-4 Installation (continued)

Troubleshooting

The display displays only black screen.

- Check that all AC and DC plugs and jacks used by external power supplies (both Opticis and others) are firmly connected.
- Ensure that power bars are live.
- Ensure that the Tx and Rx boxes plug correctly to the computer and display, respectively.
- Check if the computer and display are powered on and properly booted.
- Reset the M5-1001 using Reset button on Uplink and Downlink
- Ensure your graphic card is set at not higher than SXGA (1,248x1,024) at 60Hz refresh ratio.
- Re-boot up the system after reconnecting the optical system cable.

Screen is distorted or displays noises.

- Check if the graphic resolution is properly set. Go to the display properties and tap the settings. Ensure that the resolution sets less than SXGA (1,248x1,024) at 60Hz refresh ratio.
- Reset the M5-1001 using Reset button on Uplink and Downlink
- Reset the system.
- Power down, disconnect and reconnect the optical system cable or DC power adaptors, and power up.

Maintenance

No special maintenance is required for the optical system cables and power supplies. Ensure that the cables and power modules are stored or used in a benign environment free from liquid or dirt contamination.

There are no user serviceable parts. Refer all service and repair issues to Opticis or its authorized distributor.

Technical Support and Service

For commercial or general product support, contact your reseller. For technical service, contact Opticis by email techsupp@opticis.com or visit its website at www.opticis.com.

Product Specifications

M5-1001 Optical DVI+USB Extender

- **Compliance with DVI standard:** supports DVI 1.0 of DDWG, using fiber-optic communication links and DDC2B.
- **Extension limit:** 2km (6,560feet) for SXGA (1,248x1,024) 24bit color at 60Hz refresh rate in ultimate operation. Distances up to 10km (32,800feet) using Virtual DDC-EEPROM.
- **USB and RS232C:** complies with USB1.1 (12Mbps) with 4 port hub and supports D-sub 9 Pin connectors for RS232C.
- **Fiber-optic Connection:** The transmitter and receiver boxes of M5-1001 have duplex SC receptacles connected to two 8/125µm or Single Mode glass fibers cables.
- **Mechanical specifications of Uplink and Downlink boxes**
 - **Dimensions:** 178mm / 146mm / 34mm (W/H/D)
 - **Weight:** 835.0 ± 3.0 gram for each of Uplink and Downlink.
- **Environmental Specifications**
 - Operating temperature: 0°C to 50°C
 - Storage temperature: - 20°C to 70°C

AC/DC Power Adapter

- **Power Input:** Universal AC 85-264V, 50/60Hz, AC power cord with power jack.
- **Power Output:** +12 V, 3.0 A SMPS DC-power Adapter
- **Cord DC Jack & length:** Core is 12 V and outer cylinder is GND. Length is 18.5 cm
- **AC Cord length:** 1.8m
- **Certification:** PSE, UL, cUL, FCC, CE, TUV-GS



Warranty Information

1 (One) Year Warranty

Opticis warrants this optical DVI+USB Extender to be free from defects in workmanship and materials, under normal use and service, for a period of one (1) year from the date of purchase from Opticis or its authorized resellers.

If a product does not work as warranted during the applicable warranty period, Opticis shall, at its option and expense, repair the defective product or part, deliver to customer an equivalent product or part to replace the defective item, or refund to customer the purchase price paid for the defective product.

All products that are replaced will become the property of Opticis.

Replacement products may be new or reconditioned.

Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

Opticis shall not be responsible for any software, firmware, information, or memory data of customer contained in, stored on, or integrated with any products returned to Opticis for repair under warranty or not.

Warranty Limitation and Exclusion

Opticis shall have no further obligation under the foregoing limited warranty if the product has been damaged due to abuse, misuse, neglect, accident, unusual physical or electrical stress, unauthorized modifications, tampering, alterations, or service other than by Opticis or its authorized agents, causes other than from ordinary use or failure to properly use the product in the application for which said product is intended.

FCC/CE Statement for regulation of Electro-magnetic emission

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 and 2 of FCC Rules, EN 55022/55024/61000-3 for CE certification. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction guide, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult a service representative for help.

Properly shielded and grounded cables and connectors must be used in order to comply with FCC/CE emission limits. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Certification for Safety

The extension system is certified pursuant to IEC60065 and its AC/DC power adapter is certified by UL1310, 1950, 60950 for North America, cUL or CSA for Canada, TUV-CE & GS for EU and PSE for Japan.

Certification of Eye Safety

This laser product is inside implemented by using 1310nm/1550nm Bi-di Transceivers, manufactured by Opticis Co., Ltd., which are all certified by CDRH/FDA referred in Accession Number 0210774 as classified in Laser Class1.

Opticis Locations

Opticis Co., Ltd.
#501 Byucksan Technopia
434-6 Sangdaewon-Dong, Chungwon-Ku
Sungnam City, Kyungki-Do
462-120, South Korea
Tel: +82 (31) 737-8033
Fax: +82 (31) 737-8079

Opticis North America Ltd.
330 Richmond street, Suite 100
Chatham, Ontario
Canada N7M 1P7
Tel: (519) 355-0819
Fax: (519) 355-0520

For order support, please contact your Distributor or Reseller.

For technical support, check with the Opticis web site www.opticis.com or contact techsupp@opticis.com