

User Guide

DisplayPort 1.4 Fiber Optic Extender, 1x LC
DVI-7380



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WARNING – Product Safety

1. Do not dismantle the product housing or modify the printed circuit board module as this may result in electrical shock or burn.
2. Do not attempt to service this product yourself as opening or removing the product housing may expose you to dangerous voltages or other hazards. Refer all servicing to qualified service personnel.
3. Keep this product away from liquids. Spills into the product housing may result in fire, electrical shock, or equipment damage. If liquid spills into the housing, unplug the product immediately. Have the product checked by a qualified service engineer before using it again.
4. Place the product in an even and stable location. If the product falls or is dropped, it may cause an injury and/or malfunction.
5. Avoid exposing the product to extreme temperatures or to high humidity levels as this may result in damage to the product.
6. Only use the supplied External AC Power Adapter. The use of other power adapters may cause this product to fail or may cause a fire.
7. Do not twist or exert excessive force on the ends of the connected cables as this can cause them to malfunction. Take precaution to ensure that all connected cables are not forced to bend beyond their minimum bend radius.
8. **WARNING: Invisible Laser Radiation.** Do not view directly with optical instruments or look into beam.

Product Liability

Every effort has been made to ensure that this product is free of defects. DVI Gear cannot be held liable for the use of this product or for any direct or indirect consequential damages arising from its use. It is the responsibility of the users of this product to check that it is suitable for their requirements and that it is installed correctly.

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1.0 INTRODUCTION

The DVI-7380 is a high-performance, cost-effective, DisplayPort Optical Extender designed to meet and exceed even the most demanding system requirements. It supports a wide array of signal types and provides long-distance extension over a single fiber cable. This extender supports DisplayPort signals with resolutions up to 8K /30p, embedded audio, bi-directional IR, RS-232 and two 10/100 BaseT Ethernet ports. It can extend these signals over distances of more than 5.0 miles (> 8,000 meters) using Single-Mode Fiber cables and up to 300 meters using Multi-Mode Fiber.

Each extender set consists of an optical transmitter unit (TX) and an optical receiver unit (RX). The TX converts the AV signals into light pulses for transmission over a single strand of Multi-Mode or Single-Mode fiber optic cable. The RX converts the light pulses back to AV signals for the display, as well as other downstream devices. By using advanced fiber optic technology, without any compression, this product provides superior picture quality over greater distances than other extension methods, such as copper cables or CAT-X extenders. Together, these features make the DVI-7380 the ideal, cost-effective solution for system designers and integrators who need to extend high resolution DisplayPort signals over extreme distances with flawless image quality.

Our digital video distribution products have been serving the professional AV industry for more than twenty (20) years. Today, DVI Gear offers a full range of high performance products, including: Scalable, Uncompressed AV-over-IP Systems; Switchers; Splitters, Scalers; Up/Down/Cross-Converters; Format Converters; as well as a wide range of long-reach Digital Cables, Extenders, and Fiber Optic Transmission systems.

1.1 Features

The DVI-7380 offers several exceptional features:

- Supports resolutions up to 7680x4320 /30p (4:4:4), without using compression
- Extends DisplayPort, Ethernet (10/100Base-T), RS-232, and bidirectional IR over a single strand of fiber optic cable
- HDCP 1.4 and HDCP 2.2 compliant
- Maximum extension distances:
 - Single-Mode Fiber: > 5.0 miles (~ 8,000 m)
 - OM3 Multi-Mode Fiber: > 1,000 feet (~ 300 m)
- Optical fiber transmission is immune to environmental signal noise
- Low RFI / EMI profile for sensitive applications
- Locking DC power connectors for added security and reliability
- Heavy-duty mounting brackets are included



2.0 SPECIFICATIONS

Performance	
Standards Compliance	DisplayPort v 1.4, HDCP 1.4 / 2.2
Maximum Video Bit Rate	Supports HBR3 data rates: 4x Lanes @ 8.1Gbps, 32.4Gbps aggregate
Ethernet	10/100 BaseT
Supported Color Depth	Up to 48-bits per pixel
Supported Resolutions	Up to 8K: 7680 x 4320 / 30Hz (4:4:4)
Digital Audio Support	Up to 32 channels of inline 24-bit, 1536 kHz uncompressed PCM audio
Connections	
DisplayPort Input / Output	1 ea. 20-pin female DisplayPort connector
Optical	1 ea. LC fiber optic connector
Ethernet	2 ea. RJ-45 female connector
RS-232	1 ea. 3-pin Phoenix connector
IR Input / IR Output	IR IN: 1 ea. 3.5mm stereo mini-jack IR OUT: 1 ea. 3.5mm mini-jack
Power	1 ea. Screw-Locking 2.1 / 5.5 mm female connector
AUX Channel Support	
AUX Channel Communications	Supports bidirectional communications for EDID, HDCP, Link Training, etc.
AUX Channel Data Rate	1 Mbps
LED Indicators	
TX / RX Units	Front Panel LEDs: for Power, Optical Link, Status, HPD and Ethernet
Optical	
Optical Technology	CWDM (Coarse Wavelength Division Multiplexing) using 6 optical wavelengths
Laser Diodes	1270 / 1290 / 1310 / 1330nm 10Gbps CWDM DFB Lasers 1490nm / 1550nm 2.5Gbps CWDM DFB Lasers
Photo Diodes	1100 – 1620nm PIN Photo Detectors
WDM Filter Wavelengths	1270nm / 1290nm / 1310nm / 1330nm / 1490nm / 1550nm
Optical Wavelengths / Actual Data Rates	DisplayPort Lanes: 1270nm / 1290nm / 1310nm / 1330nm = 8.1Gbps AUX Channel, IR, RS-232, Ethernet Signals: 1490nm / 1550nm = 1.25Gbps
Optical Link Power Budget	8.0 dB (minimum)
Cable	
Maximum Cable Length (typical)	9/125 μ Single-Mode Fiber: > 5.0 miles (~ 8,000 meters) 50/125 μ OM3 Multi-Mode Fiber: > 1,000 ft. (~ 300 meters)
DVI Gear Fiber Cable	OFNP, Plenum rated – additional data and custom lengths available on request
Cable Jacket	OFNP, Plenum-rated, Black PVC Jacket
Cable Outside Diameter	0.2" (4.4 mm)



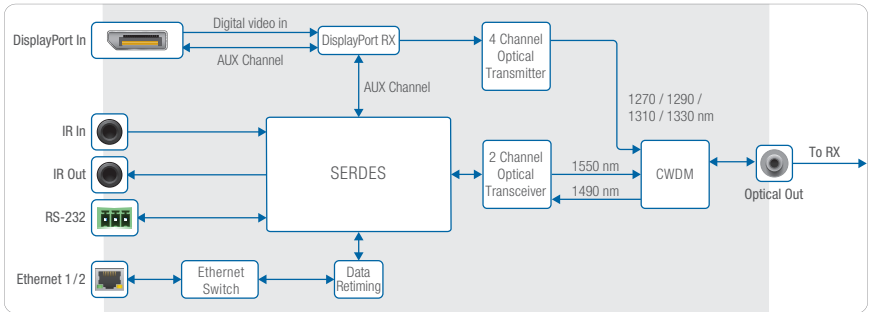
2.1 Specifications (Continued)

Mechanical	
Case Dimensions (H x W x D)	Without Brackets: 1.0" x 7.5" x 3.9" (26.0 mm x 190.0 mm x 99.5 mm) Width with Brackets: 8.5" (215.5 mm)
Weight	TX Unit: 568g / RX Unit: 563g
Construction	High-impact metal enclosure with jet black finish
Mounting Options	Mounting Brackets are included
Environmental	
Operating Temperature	14° to +158° F (-10° to +70°C)
Storage Temperature	-40° to +185° F (-40° to +85°C)
Operating / Storage Humidity	5% to 80% (non-condensing) / 5% to 95% (non-condensing)
Power Requirements	
Optical Transmitter / Receiver	Both TX and RX units must be powered by the supplied external power adapters
External AC Power Adapters	Model No: DVI-7216-PS Input: 100-240VAC / 50-60Hz 0.8A / Output: 12VDC, 2.0A
Maximum Power Consumption	DVI-7380-TX: 530 mA (6.0 watts) / DVI-7380-RX: 450 mA (5.4 watts)
Regulatory Approvals	
Fiber Optic Extender Unit	FCC Class B, CE, RoHS
Laser	US-FDA CDRH Class 1
External AC Power Adapters	FCC, CE, UL, C-UL, BSMI, CB, CCC, LVD, LPS, PSE, RCM, RoHS, WEEE
Warranty	
Limited Warranty	3 Years Parts and Labor
Model Numbers	
DVI-7380-TX	DisplayPort 1.4 Fiber Optic Transmitter, 1x LC
DVI-7380-RX	DisplayPort 1.4 Fiber Optic Receiver 1x LC
DVI-CUST-OPT	Custom Fiber Optic Cable, Plenum rated, Specify: Length, Fiber Type (MMF, SMF) and Connector (LC or ST)
Accessories Included ⁽²⁻¹⁾	Optional Accessories
1x External AC Power Adapter (DVI-7216-PS) with USA plug 1x User Guide 1x 3-Pin Phoenix Connector (Phoenix p.n. 1840379) 1x IR Transmitter (DVI-7360-IR-TX) (ships with DVI-7380-TX) 1x IR Receiver (DVI-7361-IR-RX) (ships with DVI-7380-RX) 2x Mounting Brackets with Screws	External AC Power Adapter (p.n. DVI-7216-PS) with Euro, UK, or Australia plugs +12 VDC Power Distribution Unit (p.n. DVI-7520-PDU) Custom Optical Cables (contact DVI Gear for details)

Note 2-1: The Transmitter and Receiver Units are sold separately.
The accessories shown here are included per unit.

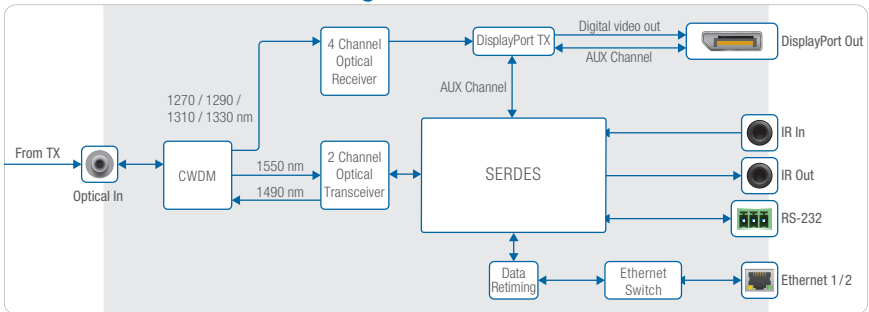
3.0 INTERNAL BLOCK DIAGRAMS

DVI-7380-TX Internal Block Diagram



The DVI-7380 utilizes advanced fiber optic technology to extend DisplayPort and other AV signals over a single optical fiber. The TX accepts a DisplayPort input signal, which is sent to a receiver chip and then to a 4-channel optical transmitter utilizing wavelengths of 1270nm / 1290nm / 1310nm / 1330nm. At the same time the IR, RS-232 and Ethernet signals are combined in a SERDES and sent to a 2-channel optical transceiver using a wavelength of 1550nm. All optical output channels are combined into a single optical output signal with their respective wavelengths using a CWDM module (Coarse Wave Division Multiplexing). These optical output signals are connected to the RX unit via a single optical cable, which can span distances of up to 5.0 miles (> 8,000 meters). In addition to the optical output signals, the TX also accepts an optical input signal from the RX for IR, RS-232, Ethernet and AUX Channel communications using a wavelength of 1490nm.

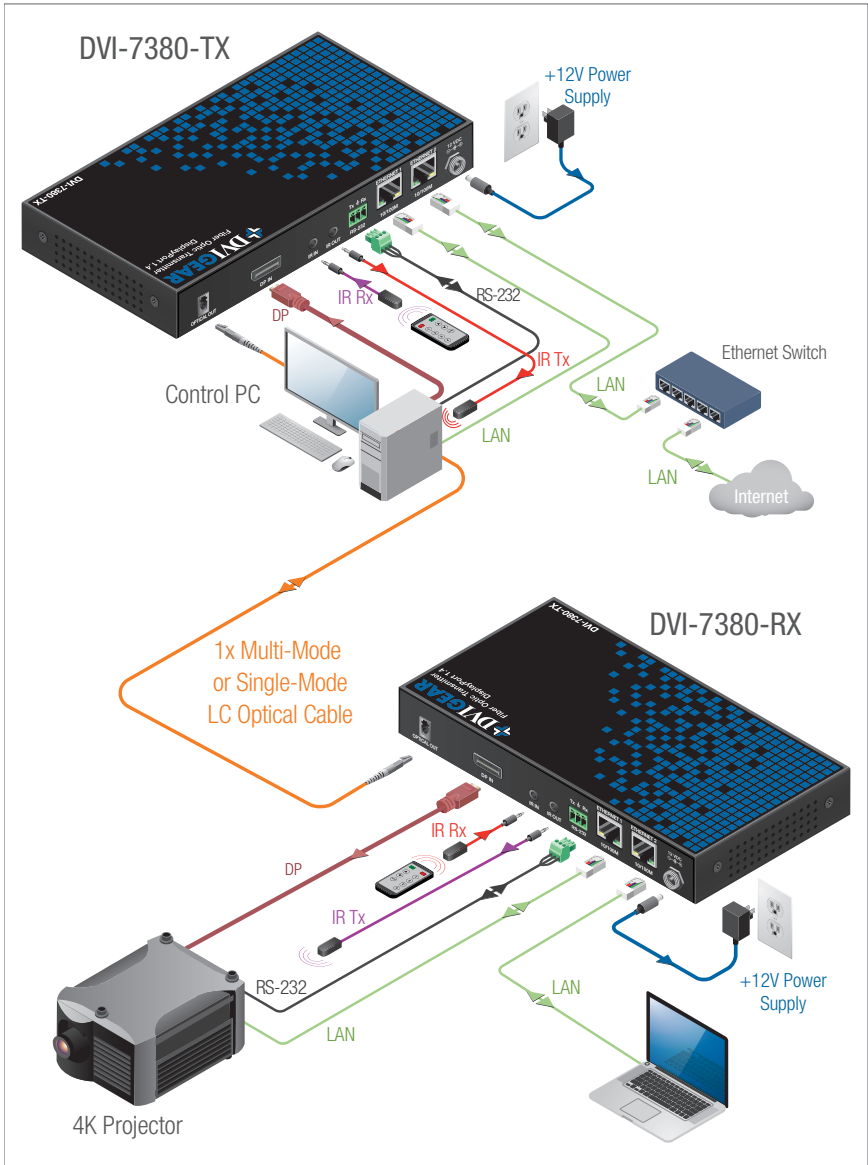
DVI-7380-RX Internal Block Diagram



The RX accepts optical signals from the TX using multiple wavelengths over a signal optical fiber. These signals are connected to a CWDM module (Coarse Wave Division Multiplexing), which provides discrete optical outputs to a 4-channel optical receiver utilizing wavelengths of 1270nm / 1290nm / 1310nm / 1330nm. Using a DisplayPort transmitter chip, these signals, together with the AUX Channel signals, are sent to the DisplayPort Output port. At the same time, the combined IR, RS-232 and Ethernet signals are sent to a 2-channel optical

transceiver using a wavelength of 1550nm. These signals are demultiplexed in a SERDES and sent to their respective output ports. In addition to the optical input signals, the unit also provides an optical output signal for the TX for IR, RS-232, Ethernet and AUX Channel communications using a wavelength of 1490nm.

4.0 APPLICATION DIAGRAM



5.0 PACKAGE CONTENTS

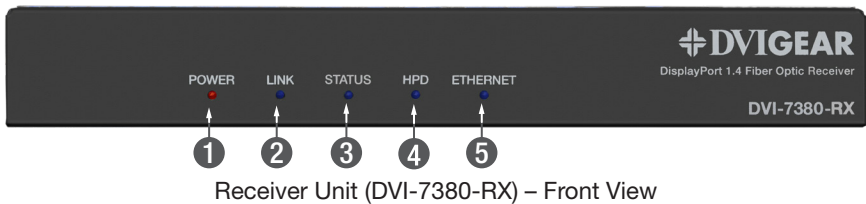
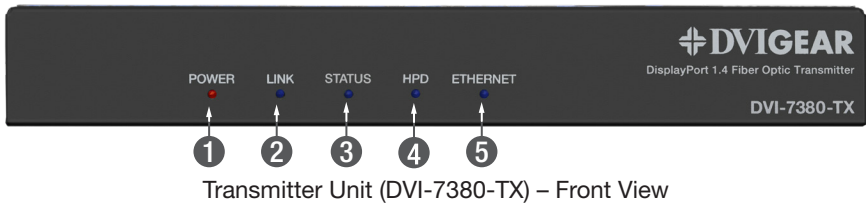
Before attempting to use this unit, please check the packaging and make certain the following items are contained in each shipping carton:⁽⁵⁻¹⁾

- 1x Transmitter (DVI-7380-TX) or Receiver (DVI-7380-RX) unit
- 1x User Guide
- 1x External AC Power Adapter (+12 VDC)
- 1x 3-pin 3.5mm Pitch Phoenix Connector (Phoenix p.n. 1840379)
- 1x IR Transmitter (with TX Unit) or IR Receiver (with RX Unit)
- 2x Mounting Brackets (attached to units)
- 4x Rack Mounting Screws

Note 5-1: *The Transmitter and the Receiver Units are sold individually. Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or DVIgear immediately. Please have the Model Number, Serial Number, and Invoice Number available for reference when you call.*

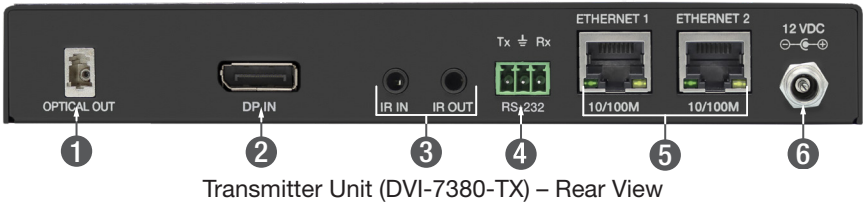
6.0 CONNECTING THE HARDWARE

An extension set consists of a Transmitter unit (TX) and a Receiver unit (RX). Please see the following photos for information on the connections and controls.

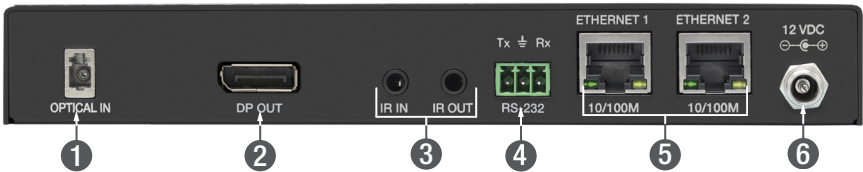


- 1 Power LED:** Lights red when power is applied.
- 2 Link LED (TX):** LED lights blue whenever the RX laser is ON and the TX photodiode detects optical power (TX unit detects the RX laser optical power).
- 2 Link LED (RX):** LED lights blue whenever the TX laser is ON and the RX photodiode detects optical power (RX unit detects the TX laser optical power).

- 3 **Status LED:** Lights blue on both the TX and RX to indicate the presence of an active DisplayPort signal connected to the TX unit.
- 4 **Hot Plug Detect (HPD) LED:** Lights blue on the RX unit when a DisplayPort Monitor is connected to the RX. Will also light blue on the TX unit at the same time, if a working fiber link is present.
- 5 **Ethernet LED:** Lights blue to indicate Ethernet traffic.



Transmitter Unit (DVI-7380-TX) – Rear View



Receiver Unit (DVI-7380-RX) – Rear View

- 1 **Optical Output Connector (TX):** Connect a Single-Mode or Multi-Mode Fiber Optic Cable. The DVI-7380-TX uses LC optical connectors.
- 1 **Optical Input Connector (RX):** Connect a Single-Mode or Multi-Mode Fiber Optic Cable. The DVI-7380-RX uses LC optical connectors.
- 2 **DP Input (TX):** Connect to a DisplayPort source.
- 2 **DP Output (RX):** Connect to a DisplayPort display.
- 3 **Infrared (IR) IN:** Connect the included IR receiver to accept IR signals for transmission over the fiber link. See Section 4.2 for further details.
- 3 **Infrared (IR) OUT:** Connect the included IR transmitter to accept IR signals over the fiber link and output them to a peripheral device. See Section 4.2 for further details.
- 4 **RS-232:** 3-pin female Phoenix Connector for serial data pass-through.
- 5 **LAN Ethernet Ports:** Extends 10/100Base-T network connectivity over the fiber link.
- 6 **+12 VDC Power Input:** Locking female connector for AC Power Adapter.



6.1 Installation Instructions

1. Mount the TX and RX units as needed using the provided Mounting Brackets. See section 6.3 for more information.
2. Connect the TX to the DisplayPort output port of the signal source (e.g. PC) using a high quality DisplayPort cable.
3. Connect the RX to the DisplayPort input port of a destination device (e.g. digital display) using a high quality DisplayPort cable.
4. Connect an LC fiber optic cable (single strand of either Multi-Mode Fiber or Single-Mode Fiber) between the Optical Output port on the TX unit and the Optical Input port on the RX unit.⁽⁶⁻¹⁾
5. Connect other peripheral devices to the units as needed (see section 4.2).
6. Connect the supplied External AC Power Adapters to the power input jack on the TX and RX units. Once the plug is inserted into the jack, rotate the locking nut on the plug clockwise until it is tight, to secure the cable. There is no power switch on these units. The units will turn ON as soon as the AC Power Adapter is connected to a live AC power receptacle. Use only the supplied power adapters to avoid the possibility of equipment damage.
7. Apply power to the display device, then apply power to the source device. A picture should appear on the display within a few seconds. Next apply power to any connected peripheral devices.

Note 6-1: *This product supports the use of both **Single-Mode Fiber (SMF)**, and **Multi-Mode Fiber (MMF)**. However, extra care is required when using SMF due to its smaller optical aperture (8.9 microns) versus 50-60 microns for MMF. This smaller aperture means that SMF optical cables have an increased risk of contamination due to dirt, dust, oils, etc. that can be caused by poor handling.*

6.2 Optional Connections

In addition to the video signal, the DVI-7380 supports extension of other signal types over the fiber link. These pass-through connections can be used to provide communications with other devices in the system. These connections include 10/100Base-T Ethernet, bidirectional IR, and RS-232.

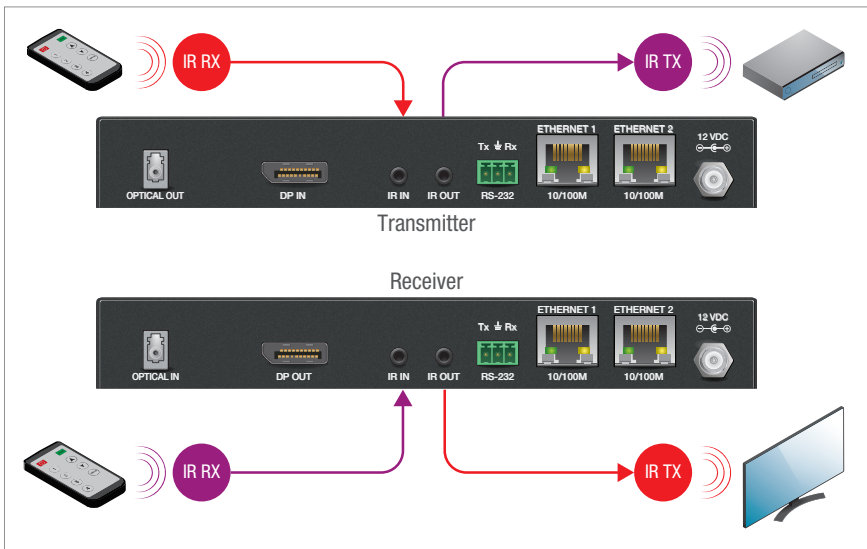
LAN Ethernet RJ45 port

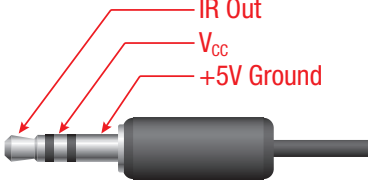
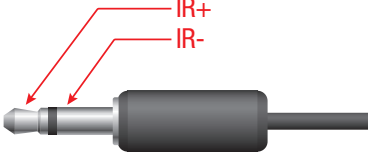
Connect to the LAN port of a peripheral device to provide a 10/100Base-T connection via the fiber link.

IR Connections

Each extender set supports bidirectional IR communications. The TX and RX units each have two IR ports on the rear panel, labeled “IR IN” and “IR OUT”. To set up the IR data pathway, connect an IR receiver device (1x is included) to an “IR IN” port on one unit. Next, connect an IR transmitter to the “IR OUT” port of the other unit.

Any IR communications directed to the IR receiver module on one end of the extender set will be sent out of the IR transmitter module at the other end. For bidirectional communication, an additional IR TX and RX (purchased separately) may be connected. This allows IR data to be sent upstream, downstream, or both.

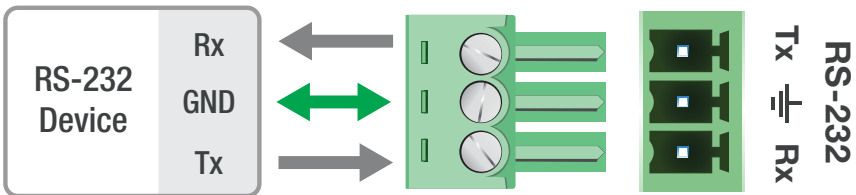


IR Receiver	IR Transmitter
<p style="text-align: center;">Pin Assignments</p> 	<p style="text-align: center;">Pin Assignments</p> 

Note 6-2: For best results, it is critical to carefully position the IR Transmitter and IR Receiver modules. The IR RX module should be placed where the user would typically aim the remote control. The IR TX module should be placed in close proximity to the IR window of the device being controlled. The IR TX module includes double-sided tape that can be used to adhere it in place.

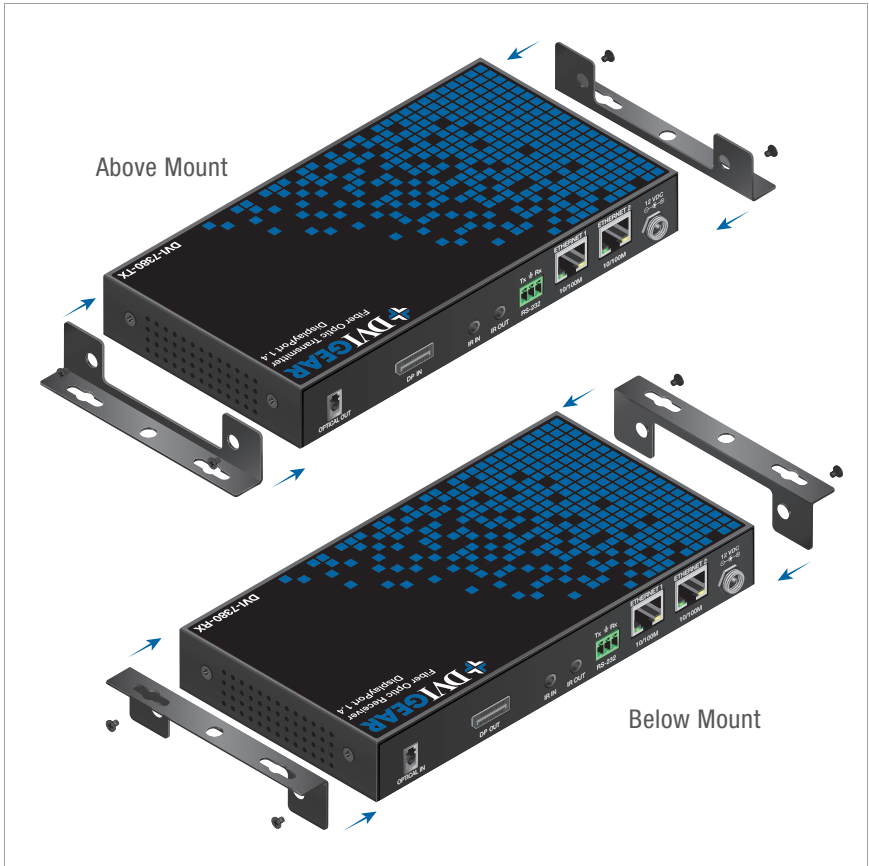
RS-232 Connections

Connect to an RS-232 device on both the TX and RX units to allow serial communication to pass-through via the optical link. Please refer to *Warning 6-3* regarding wiring recommendations.



Note 6-3 - WARNING: DVIgear recommends that only qualified technical personnel be permitted to wire the Phoenix connectors as improper wiring can cause equipment damage. For best results, it is important to use stranded wires and avoid tinning the wire ends as this can allow them to be removed too easily from the Phoenix receptacles.

6.3 Mounting Hardware



Each TX and RX unit comes with a pair of Mounting Brackets to facilitate installation on furniture or other surfaces. These Mounting Brackets are reversible, so the unit may be installed above or below the mounting surface. The units are shipped with the brackets installed in the “above mount” configuration. To change the orientation of the mounting brackets, first remove the two screws on the sides of each bracket and set them aside. Next, flip the mounting brackets into the desired position and screw them into the two mounting holes located on each side of the extender units.



7.0 OPERATING THE UNIT

Once all connections have been made and power has been applied to all components, this extension system should function immediately. This product has no adjustments and does not require configuration.

8.0 TROUBLESHOOTING

If the system fails to display a signal, power OFF all devices and verify that the following connections are properly installed:

- Ensure the TX unit is connected to the source and the RX unit is connected to the Display using short, high quality DisplayPort cables.
- The fiber optic cable must be connected on both the TX Unit and the RX unit. Check to ensure that the optical cable is fully inserted into the ports. Note that slight pressure on the fiber optic cable and/or connector should NOT have any influence on the image quality of the signal.
- The supplied External AC Power Adapters should be connected to both the TX and RX units.

Once all connections have been verified, power ON the display first, and then the DisplayPort signal source.

If there is no picture or if there are intermittent picture issues, please determine whether the Fiber Link LEDs are lit. If the Fiber Link LEDs are not lit, then it may be necessary to check the quality and/or condition of the fiber optic cable being used. Fiber optic ports and cables are very sensitive to dust, dirt and oil from handling. Even minute amounts of obstructive material can interfere with or disrupt the optical transmission of the video signals. If erratic performance or disruption is noted, it may be necessary to have qualified technical personnel clean the optical ports and/or optical cable using appropriate procedures and cleaning materials. ⁽⁸⁻¹⁾

Note 8-1: *This product supports the use of both **Single-Mode Fiber (SMF)**, and **Multi-Mode Fiber (MMF)**. However, extra care is required when using SMF due to its smaller optical aperture (8.9 microns) versus 50-60 microns for MMF. This smaller aperture means that SMF optical cables have an increased risk of contamination due to dirt, dust, oils, etc. that can be caused by poor handling.*

If the system still fails to display an image, ensure that the DisplayPort signal source is compatible with the display by making a direct connection between the two, bypassing the Fiber Optic Extender. If there is still no image, then there is a compatibility issue between the source and the display that must be resolved.



If the problem persists after trying the above suggestions, please contact your dealer for additional assistance. If the dealer's technical personnel are unable to assist you, please contact DVIgear via telephone at 1.888.463.9927 (toll-free for United States and Canada) or +1.770.421.6699. You may contact DVIgear by e-mail at support@dvigear.com.

9.0 LIMITED WARRANTY

LIMITED WARRANTY – Subject to the limitations stated below, DVIgear warrants that this product will be free from defects in materials and workmanship for a period of three (3) years from the date of purchase.

Should the product, in DVIgear's opinion, prove defective within the warranty period stated above, DVIgear, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of DVIgear. This warranty does not apply to products that have been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not intended.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from DVIgear and return the product freight prepaid to a location designated by DVIgear. After repairs are complete, the product will be returned, freight prepaid.

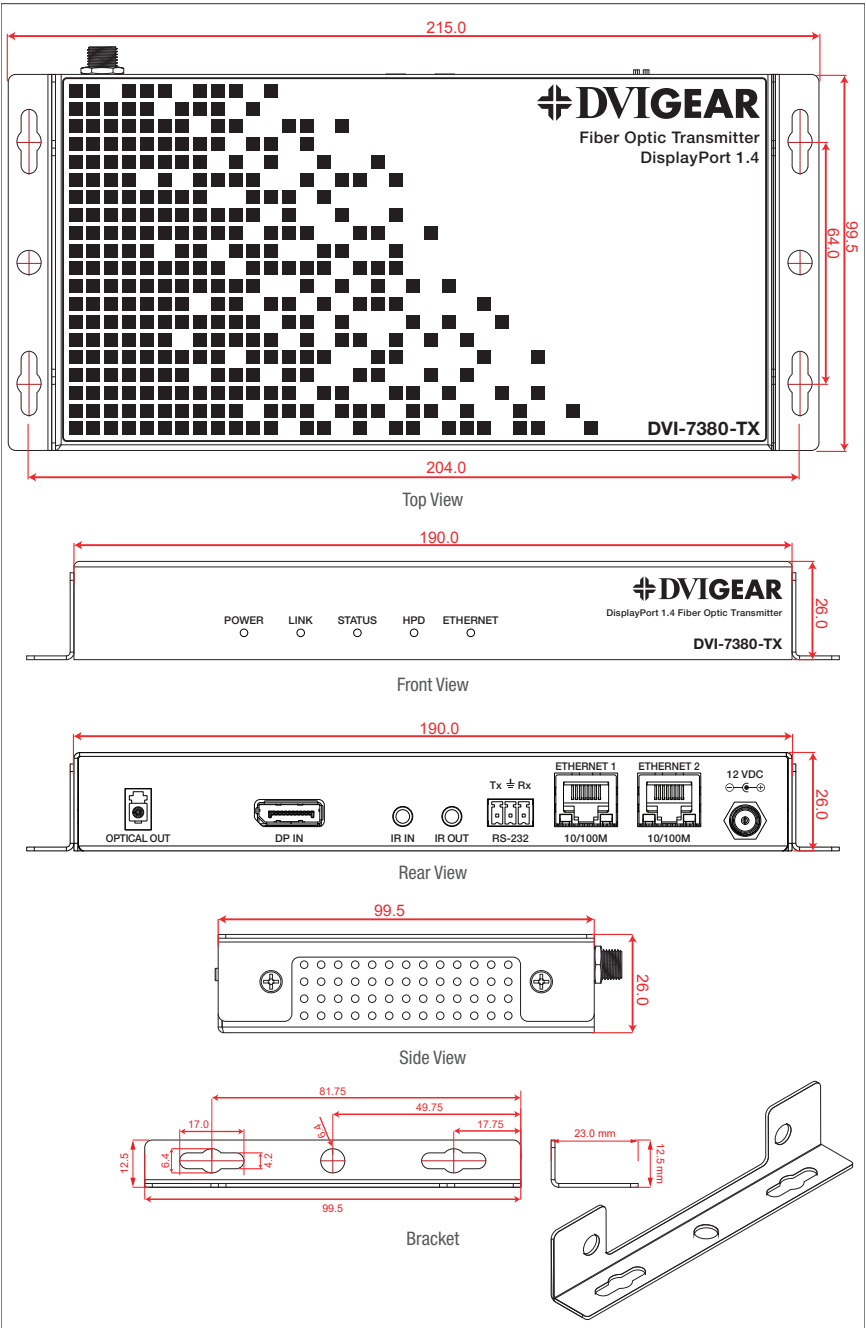
The foregoing warranty is the sole and exclusive warranty given by DVIgear, express or implied, and DVIgear disclaims all implied warranties, including but not limited to implied warranties of merchantability or fitness for a particular use.

LIMITATIONS – The liability of DVIgear with respect to any defective products will be limited to the repair or replacement of such products. In no event shall DVIgear be responsible or liable for any damage arising from the use of such defective products, including but not limited to loss of use, revenue or profit, whether such damages are direct, indirect, consequential or otherwise and whether such damages are incurred by the reseller, end user, or any third party.

10.0 REGULATORY COMPLIANCE

This product is compliant with appropriate FCC Class B, CE, RoHS rules and regulations. The supplied AC Power Adapters are compliant with FCC, CE, UL, C-UL, BSMI, CB, CCC, LVD, LPS, PSE, RCM, RoHS, and WEEE rules and regulations.

11.0 TECHNICAL DIAGRAMS





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