# KRAMER

# Installation Instructions

⚠ **SAFETY WARNING**
Disconnect the unit from the power supply before opening and servicing

For the latest information on our products and a list of Kramer distributors, visit our Web site where updates to this user manual may be found.

We welcome your questions, comments, and feedback.

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## 612T, 612R 4K60 4:4:4 DP Tx/Rx over Extended-Reach Multi-Mode Fiber Optic Cable

Congratulations on purchasing your Kramer **612T** and **612R** Plug and Play active 4K60 4:4:4 DP Tx/Rx over Extended-Reach Multi-Mode (MM) Fiber Optic cable. **612T** and **612R** extend signals of up to 4096x2160 @60Hz, over a distance of up to 200m (656ft) without signal scaling or data compression, providing a maximum data rate of 21.6Gbps (5.4Gbps per lane). **612T** and **612R** are easily and securely connected via a 2LC fiber connector and can be powered either from the USB connector or from the DisplayPort interface (pin #20).



Figure 1: 612T Transmitter and 612R Receiver

## Safety

**Caution:** There are no operator serviceable parts inside the unit.
**Warning:** Disconnect the power and unplug the unit from the wall before installing.
**Warning:** Avoid direct eye exposure into the optic connectors when powered, although this product is regulated strictly enough to operate under the Laser Class 3R for eye safety.

See www.KramerAV.com for updated safety information.

## Installation

**To install 612T and 612R:**

1. Unpack the contents of the package with care.
   We recommend that you save the original box and packaging materials for possible future shipment.

2. Turn on the power to the DisplayPort source (for example, a laptop) and acceptor (for example, a display).

3. Power the **612T** and **612R**:

   - Connect the micro USB connector on each device to a USB cable (supplied).

   - Connect the USB cable either to the wall-mount power adapter (supplied) and to the mains, or to a USB port.

   The POWER LED lights and the STATUS LED flashes three times.

   Although the transmitter and receiver can be powered via pin #20 on the DisplayPort interface, we recommend that you use the USB power adapters on both sides.

4. Connect the two LC optical fibers between **612T** and **612R**.
   Connect (A) to (A) and (B) to (B). Make sure that the duplex connectors are connected properly.
   The STATUS LED flashes.

   > ⚠ Do not look directly into the LC connectors on the **612T** (the transmitter side) when it's powered.
   >
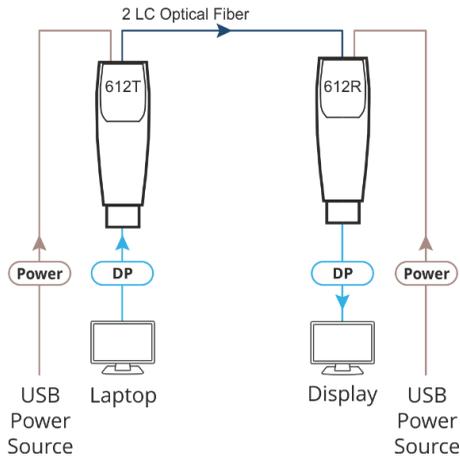   > This product operates under LASER Class I, classified by CDRH/FDA for eye safety.

   > ⓘ We recommend that you avoid using intermediate cables or adapters. Using them may affect the transmission quality.

5. Connect **612T** to the DisplayPort on the source side and **612R** on the acceptor side.

   > ⓘ Make sure that the **612T** is always connected to the source side and the **612R** is connected to the acceptor side.



   > ⓘ If you cannot connect the **612R** directly to the display, we recommend that you use the DisplayPort (M) to-(F) extension cable supplied with the package.

Once the system is connected the Status LEDs on both **612T** and **612R** flash.

## Troubleshooting

**If the display appears black:**

- Check that the source and display devices are both switched on.
- Check that the power source adapters are properly connected on both sides.
- Make sure that both DisplayPort connector heads are fully plugged into the devices.
- Reset the system by disconnecting and then reconnecting the **612T** or **612R**, or by disconnecting and then reconnecting the power adapters.
- Reboot the system.

**If the image appears distorted and/or there is background noise:**

- Go to the display properties and check the settings. Make sure that the resolution is set below 4096x2160 at a 60Hz refresh ratio to check if the graphic resolution is properly defined.

- Reset the system by disconnecting and then reconnecting the **612T** or **612R**, or by disconnecting and then reconnecting the power adapters.

> It is important to connect the devices correctly as marked: **612T** to the source side and **612R** to the acceptor side.

## Specifications

| | | |
|---|---|---|
| Video | Max. Resolution | 4K @60Hz 4:4:4 (4096x2160) |
| | Data Rate | Maximum 21.6 Gbps (HBR2) |
| | Compliance | Supports HDCP 2.2, EDID and DPCP |
| | DisplayPort Support | Dual-mode DP (DP++) |
| Ports | **612T** (source end) | Male DisplayPort gold plated |
| | **612R** (display end) | Male DisplayPort gold plated |
| | **612T** (source end) | Micro USB (for power supply) |
| | **612R** (display end) | Micro USB (for power supply) |
| Power | 5V | Via USB source |
| | | Via external source |
| | | From DisplayPort PIN #20 |
| Recommended Cable | Structure | Dual Multi-mode OM3 (50/125um) glass fiber |
| | Optical Connectors | Duplex LC connectors |
| | Max. Fiber Cable Attenuation (λ=850nm) | 2.5dB/KM |
| | Max. Skew | 0.4ns |
| | Max. Insertion Attenuation | 0.5dB |
| | Total Optical Attenuation | 1dB max @ 656ft/200m extension |
| | Maximum Length | 200m (656ft) |
| Environmental Conditions | Operating Temperature | 0° to +50°C (32° to 122°F) |
| | Storage Temperature | -30° to +70°C (-22° to 158°F) |
| | Operating Humidity | 0 to 85% |
| Standard Compliance | CE | EN 55032:2012/AC: 2013 (Class A), EN 61000-3-2:2014, EN 61000-3-3:2013, EN 55024:2010, EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013 |
| | FCC | CFR 47 part 15 SUBPART B, Section 15.101 |
| | Environmental | RoHS (2011/65/ EU) |
| General | Net Dimensions (W, D, H), each | 2.6cm x 7.2cm x 1.5cm (1" x 2.8" x 0.6") |
| | Shipping Dimensions (W, D, H) | 19.3cm x 25.3cm x 62cm (7.6" x 10" x 24.4") |
| | Net Weight, each | 0.12kg (0.3bs) approx. |
| | Shipping Weight | 1.48kg (3.3lbs) approx. |
| Accessories | Included | 2 Micro USB to USB type-A cables, 2 Wall-mount power adaptors, 1 20cm DisplayPort (M) to (F) copper extension cable |