

TL-FO-USB3-02

USB 3.1, USB 2.0, and USB 1.1
Fiber Optic Extender

User Guide



Thank you for purchasing the TechLogix TL-FO-USB3-02.

Please read this guide thoroughly.

FCC Radio Frequency Interference Statement Warning

This device complies with Part 15 of the 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.

CE Statement

We, TechLogix Networkx, LLC, declare under our sole responsibility that the TechLogix TL-FO-USB3-02, to which this declaration relates, is in conformity with European Standard EN 55022, EN 61000 and EN 55024.

IC Statement

This Class B digital apparatus complies with Canadian ICES-003.

WEEE Statement

The European Union has established regulations for the collection and recycling of all waste electrical and electronic equipment (WEEE). Implementation of WEEE regulations may vary slightly by individual EU member states. Please check with your Host and state government guidelines for safe disposal and recycling or contact your national WEEE recycling agency for more information.

Product Operation and Storage

Please read and follow all instructions provided with this product, and operate for intended use only.

Do not attempt to open the product casing as this may cause damage and will void warranty. Use only the power supply provided with this product. When not in use, product should be stored in a dry location between -20°C and 70°C.

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Introduction

This guide provides product information for the TL-FO-USB3-02, installation instructions, and troubleshooting guidelines.

The instructions in this guide assume a general knowledge of computer installation procedures, familiarity with cabling requirements, and some understanding of USB devices.



NOTE: Notes provide additional information that could be useful.

TL-FO-USB3-02 Product Contents

Your TL-FO-USB3-02 is packaged with:

- Host Extender
- Host Extender Locking AC power adapter (24V 1A)
- Client Extender
- Client Extender Locking AC power adapter (24V 2.71A)
- USB 3.1 Gen 1 cable
- Country specific power cables
- QR Card

About the TechLogix TL-FO-USB3-02

The TL-FO-USB3-02 incorporates ExtremeUSB-C™ technology, enabling users to extend USB 3.1 beyond the standard 3m cable limit for USB 3.1 peripheral devices. This extender system is composed of two individual units, the Local Extender and the Remote Extender, and has the following key features:

- Up to 200m of extension when directly connected over OM3 multimode fiber
- Support for new USB 3.1 Gen 1/2 host controllers and devices (up to 5 Gbps)
- Support for all device USB types
- Backwards compatible to USB 2.0 devices



The TL-FO-USB3-02 includes the ExtremeUSB-C™ suite of features:

- Transparent USB extension supporting USB 3, 2 and 1
- True plug and play; no software drivers required
- Works with all major operating systems: Windows®, macOS™, Linux® and Chrome OS™



The TL-FO-USB3-02 only works with OM3 multimode fiber or higher grade.

Device Overview

Host Extender



Item	Type	Description
1	Power LED	LED is SOLID ON when DC is supplied to the extender unit. LED is OFF when no power is supplied by the AC Adapter
2	Mode	Reserved for manufacturer use.
3	Config	Reserved for manufacturer use.
4	Status LED	LED is SOLID ON when system is functioning normally. LED BLINKS when system is booting OR to indicate a temperature warning in unison with the LINK, USB 2, and USB 3 LEDs.
5	Link LED	LED is SOLID ON when Host Extender is linked to an opposite Client Extender. LED is OFF when there is no connection between the Host and Client Extenders.
6	USB 2 LED	LED is SOLID ON when an active USB 2 connection is established through the extender system. LED BLINKS when the USB 2 connection is suspended/asleep. LED is OFF when no USB 2 connection is detected.
7	USB 3 LED	LED is SOLID ON when an active USB 3 connection is established through the extender system. LED BLINKS when the USB 3 connection is suspended/asleep. LED is OFF when no USB 3 connection is detected.
8	LAN Port (100 Mbps)	Ethernet pass through channel connects to a network or Ethernet device.
9	Link Port	Extension link Duplex LC fiber optic transceiver port.
10	USB Host Port	USB 3 Type B receptacle used to connect Host Extender to USB 3 Host computer.
11	DC Power Port	Locking connector for the included power adapter – accepts 24VDC 1A.

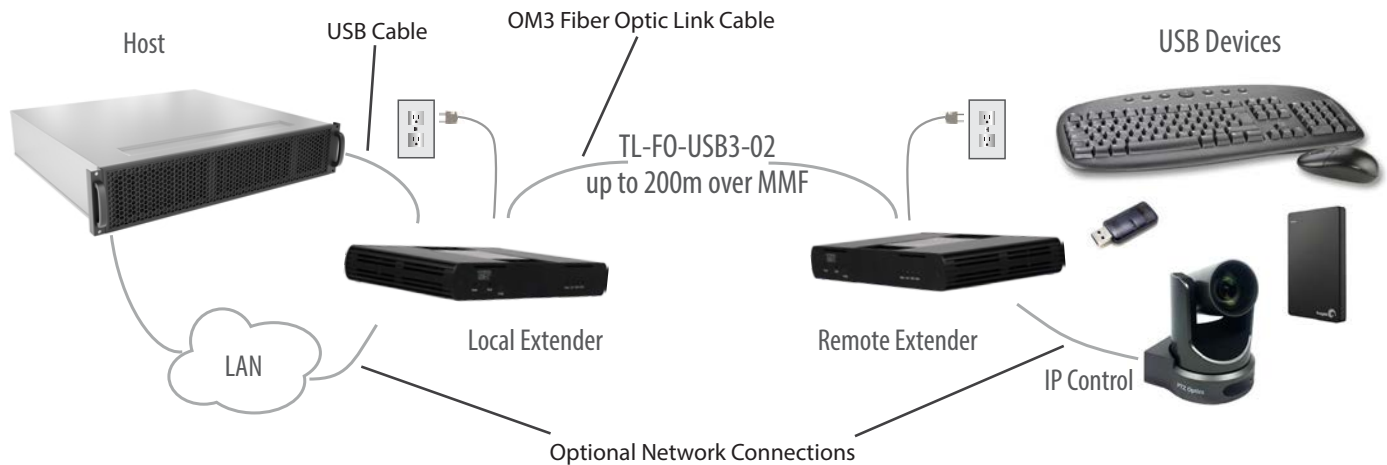
Client Extender



Item	Type	Description
1	Power LED	LED is SOLID ON when DC is supplied to the extender unit. LED is OFF when no power is supplied by the AC Adapter.
2	Mode	Reserved for manufacturer use.
3	Config	Reserved for manufacturer use.
4	Status LED	LED is SOLID ON when system is functioning normally. LED BLINKS when system is booting OR to indicate a temperature warning in unison with the LINK, USB 2, and USB 3 LEDs.
5	Link LED	LED is SOLID ON when Host Extender is linked to an opposite Client Extender. LED is OFF when there is no connection between the Host and Client Extenders.
6	USB 2 LED	LED is SOLID ON when an active USB 2 connection is established through the extender system. LED BLINKS when the USB 2 connection is suspended/asleep. LED is OFF when no USB 2 connection is detected.
7	USB 3 LED	LED is SOLID ON when an active USB 3 connection is established through the extender system. LED BLINKS when the USB 3 connection is suspended/asleep. LED is OFF when no USB 3 connection is detected.
8	LAN Port (100 Mbps)	Ethernet pass through channel connects to a network or Ethernet device.
9	Link Port	Extension link Duplex LC fiber optic transceiver port.
10	Device Ports (Type A)	Accepts all USB devices.
11	DC Power Port	Locking connector for the included power adapter – accepts 24VDC 2.71A.

Installation Guide

Example Application



Requirements

To complete installation of the TL-FO-USB3-02, you will also require the following items that are not included with the product:

- USB compatible computer (host computer) with a USB compliant operating system
- USB compatible device
- 2-strand 50/125µm multimode (MMF) OM3 fiber optic cable with Duplex LC connectors

Fiber Optic Link Cabling

The Host and Client Extenders are interconnected by fiber optic cabling. Duplex multimode fiber cabling is required for the TL-FO-USB3-02 for extending up to 200m using 50/125µm OM3 grade cable. The cabling subsystem must provide a duplex connection with crossover, and must be terminated with Duplex LC connectors at both ends.

Installing the TL-FO-USB3-02 System

Preparing Your Site

Before you can install the TL-FO-USB3-02, you need to prepare your site:

1. Place the computer where desired and set it up.
2. Ensure to locate the USB device(s) within the cable-length of the computer. If not, adjust the location of the device(s) and/or computer accordingly.
3. If you are using surface cabling, the TL-FO-USB3-2 supports a maximum distance of 200m over OM3 multimode fiber.
4. If using premise cabling, ensure compatible fiber optic cabling is installed between the two locations and does not to exceed the specified distance.

Install the Host Extender Unit

1. Place the Host Extender near the computer.
2. Assemble the power adapter and country specific power cord together and connect them into a suitable AC outlet.
3. Connect the supplied USB 3.1 Gen cable between the Host Extender host port and a USB 3 port on the host computer.

Connecting the Host Extender to the Client Extender

With Surface Cabling

1. Plug one end of the fiber optic cabling (not included) into the Link port on the Host Extender.
2. Plug the other end of the fiber optic cabling into the Link port on the Client Extender.

With Premise Cabling

1. Plug one end of a fiber optic patch cord (not included) into the Link port on the Host Extender.
2. Plug the other end of the patch cord into the fiber optic information outlet near the host computer.
3. Plug one end of the 2nd fiber optic patch cord (not included) into the Link port on the Client Extender.
4. Plug the other end of the 2nd patch cord into the fiber optic information outlet near the USB device.

Install the Client Extender Unit

1. Place the Client Extender near the USB device(s).
2. Plug the power adapter into a suitable AC outlet.

Checking the Installation

On the Host and Client Extender units, check that the Power, Status, and Host LEDs are on and solid. If the Host or Status LEDs are permanently off, then the cabling between the Host and Client Extender units may not be installed properly or is defective.

Windows (XP/7/8/8.1/10)

1. Open *Device Manager* to confirm that the TL-FO-USB3-02 has installed correctly.
2. Expand the entry for *Universal Serial Bus controllers* by clicking the “+” sign. If the TL-FO-USB3-02 has been installed correctly, you should find it listed as two separate instances of “Generic SuperSpeed Hub” or “3.0 Hubs”.



To open *Device Manager* in Windows XP:
Right click “My Computer” then select: Properties >> Hardware tab >> Device Manager



To open *Device Manager* in Windows 7:
Open the Start Menu, right click on “Computer” then select: Manage >> Device Manager



To open *Device Manager* in Windows 8, 8.1 or 10:
Right click the Start Menu and then select: Device Manager

OS X/macOS

1. Open the *System Profiler* to confirm that the TL-FO-USB3-02 has installed correctly.
2. In the left hand column under Hardware, select “USB” and inspect the right hand panel. If the TL-FO-USB3-02 has been installed correctly, you should find it listed as two separate instances of “Hub” under the USB SuperSpeed Bus.



NOTE: To open *System Profiler* in OS X: Open the *Finder*, select *Applications*, then open the *Utilities* folder and double click on the *System Profiler* icon.

Connecting a USB Device

1. Install any software required to operate the USB device. Refer to the documentation for the USB device, as required.
2. Connect the USB device to the device port on the Client Extender.
3. Check that the device is detected and installed properly in the operating system.

Compatibility

The TL-FO-USB3-02 complies with USB 2.0 and USB 3.1 Gen 1 specifications governing the design of USB devices. However, there is no guarantee that all USB devices or hosts will be compatible as there are a number of different characteristics that may impact the operation of USB devices over extended distances.

Optional Ethernet Pass Through Connection

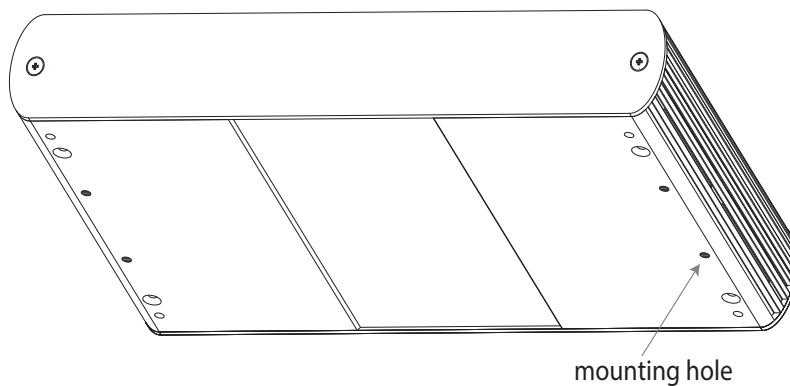
The TL-FO-USB3-02 offers a 100 Mbps Ethernet pass through connection that can be used for a variety of purposes including:

- Connecting network devices
- Providing Client network access to the same location as the Client Extender
- Leveraging existing cabling to provide USB 3-2-1 connectivity without losing network connectivity

Connect any network device or access port into the RJ45 socket label “LAN” using up to 100 meters of standard CAT 5e, 6 or 7 cabling.

USB Extender Mounting

The bottom of the TL-FO-USB3-02 enclosures features four pre-drilled holes for optional surface mounting.



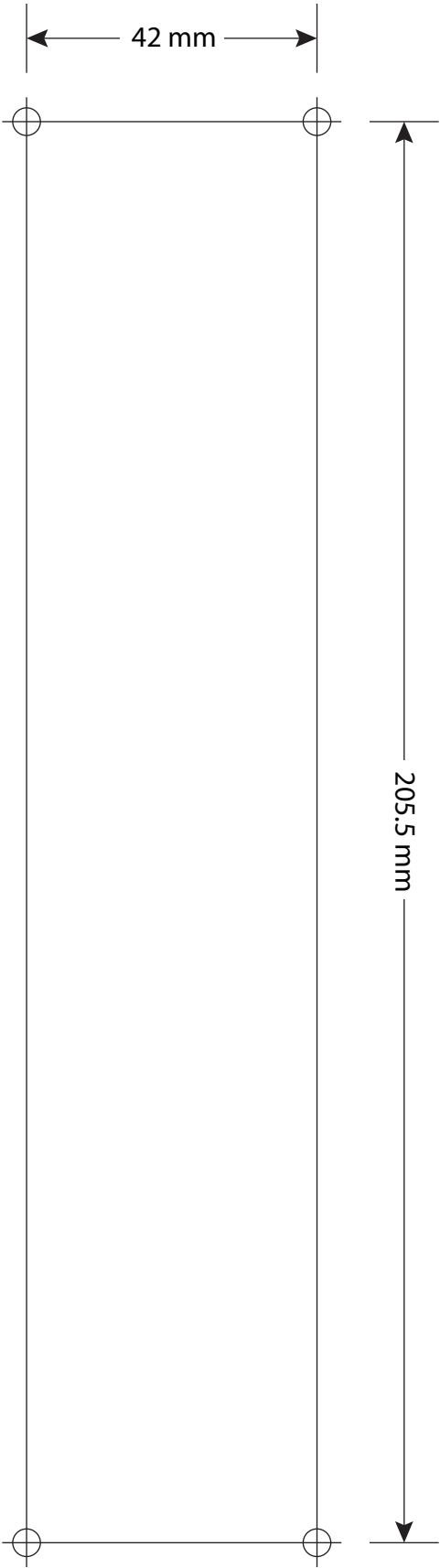
Distance between the enclosure mounting holes: 42.0 mm x 205.5 mm

1. Mark the center point of each of the four holes on your mounting surface either by directly measuring or using a print out of the stencil on the following page.
2. Hardware recommendation: M3.0 locking washers and M3.0 screws (4 of each per extender) noting screw length will depend upon thickness of mounting surface.
3. Drill through each of the four hole markings on the mounting surface using a 3.97mm (5/32") drill bit.
4. Align the bottom enclosure holes to the newly drilled out holes on the mounting surface.
5. Place a locking washer on each of the four screws and using a screwdriver, fasten the extender into place.



Do not exceed a screw depth of 10mm (0.4") into the unit or damage may occur.

To ensure the stencil below prints to scale be sure to set the page scaling setting to “none”.



Troubleshooting

<i>Problem</i>	<i>Cause</i>	<i>Solution</i>
ALL LEDs are OFF on the Host and/or Client Extender.	<ul style="list-style-type: none"> The Host Extender and/or Client Extender is not receiving power from the AC power adapter. 	<ul style="list-style-type: none"> Ensure that the AC power adapter is properly connected to the Host Extender and/or Client Extender. Check that the AC adapter is connected to a live source of AC power. Check that the Host and/or Client Extender's Power LED is illuminated.
POWER LED is ON, STATUS LED is OFF.	<ul style="list-style-type: none"> The unit has malfunctioned and requires re-programming. 	<ul style="list-style-type: none"> Contact Technical Support for assistance.
Link LEDs on the Host and Client Extenders are OFF.	<ul style="list-style-type: none"> There is no connection between the Host and Client Extenders. 	<ul style="list-style-type: none"> Ensure that a crossover OM3 multimode fiber optic cable of no more than 200m is connected between the Host and Client Extenders. Connect a short fiber optic patch cable between the Host and Client Extenders. Recheck the link status. If the LINK LED is now SOLID ON, the previous cable is defective or not capable of supporting the link.
LINK LEDs on the Host and Client Extenders are SOLID ON, but the USB 2 and USB 3 LEDs are OFF.	<ul style="list-style-type: none"> The host computer is not powered on. The Host Extender is not connected to a computer. The host computer does not support USB Hubs. The unit is malfunctioning. 	<ul style="list-style-type: none"> Disconnect all USB devices from the Client Extender. Disconnect Host Extender from the host computer. Disconnect AC adapters from the Host and Client Extenders. Reconnect the Host Extender to the host computer. Reconnect the AC adapters to the Host and Client Extenders. Check that the Host and Client Extenders have enumerated as USB hubs in Windows Device Manager, macOS System Profiler or using "lsusb" command in a Linux Terminal. If the problem is not resolved, contact Technical Support.
The USB 2 LED is SOLID ON, but the USB 3 LED is OFF.	<ul style="list-style-type: none"> The Host Extender is not connected to a USB 3 port. The Host Extender is connected to the host using a USB 2 cable. The USB 3 cable connecting the Host Extender to the host computer is defective. The host computer's USB 3 controller has malfunctioned. 	<ul style="list-style-type: none"> Ensure that the Host Extender is connected to a USB 3 port on the host computer. Ensure that the included USB 3.1 Gen 1 cable is being used between the host computer and Host Extender. Disconnect the Client Extender from the AC power adapter. Cold boot the host computer. Replace the USB 3.1 Gen 1 cable with a different cable. If the problem is not resolved, contact Technical Support.
The USB 3 LED is SOLID ON, but the USB 2 LED is OFF.	<ul style="list-style-type: none"> The USB cable connecting the Host Extender to the host computer is defective. The host computer's USB 2.0 controller has malfunctioned. The host computer does not support USB 2. 	<ul style="list-style-type: none"> Ensure that the included USB 3.1 Gen 1 cable is being used between the host computer and Host Extender. Cold boot the host computer. Replace the USB 3.1 Gen 1 cable with a different cable. If the problem is not resolved, contact Technical Support.
There are issues with the Microsoft Kinect.	<ul style="list-style-type: none"> This extender is not fully compatible with the Kinect. 	<ul style="list-style-type: none"> For Microsoft Kinect applications, please use an active extension cable.

<i>Problem</i>	<i>Cause</i>	<i>Solution</i>
Both Host and Client Extenders are working, but the USB 2 or USB 3 LEDs on the Host and Client Extenders are blinking.	<ul style="list-style-type: none"> The Host and/or Client Extender is in suspend mode. For a variety of reasons, the host computer may place the Host/Client Extender into suspend mode. Typically, it is because there are no USB devices attached, the USB device is asleep, or the host computer is in a sleep state or hibernating. 	<ul style="list-style-type: none"> Recover/resume the operating system from sleep or hibernate modes (refer to your operating system's documentation). Connect a USB device to the Client Extender. Use the connected device. If the problem persists, contact Technical Support.
ALL LEDs on both Host and Client Extenders are SOLID ON, but the USB device is not operating correctly, or is detected as an "Unknown Device" in the operating system.	<ul style="list-style-type: none"> The USB device is malfunctioning. The computer does not recognize the USB device. The application software for the USB device is not operating. The USB extender is malfunctioning. 	<ul style="list-style-type: none"> Disconnect the extender from the computer. Connect the USB device directly to the host computer. If the device does not operate as expected, consult the user documentation for the device. Update the host computer BIOS, chipset or USB controller drivers from the manufacturer's website. If the device operates as expected when directly connected to the computer, connect another device to the extender and reconnect it to the host computer. If the second device does not operate, the extender may be malfunctioning. Contact Technical Support for assistance. If the second device operates as expected, then the first device may not be compatible with this extender. Contact Technical Support.
A USB 3 device is not enumerating as USB 3, or the operating system is notifying the user that the device can "Perform Faster if connected to a USB 3 port".	<ul style="list-style-type: none"> The USB device is malfunctioning. The computer does not recognize the USB device. The application software for the USB device is not operating. The USB 3 port on the computer is malfunctioning. The USB extender is malfunctioning. 	<ul style="list-style-type: none"> Disconnect the extender from the computer. Connect the USB 3 device directly to the host computer. If the device does not operate as expected as a USB 3 device, consult the user documentation for that device or try a different USB port on the host computer. Update the host computer BIOS, chipset or USB controller drivers from the manufacturer's website. If the device operates as USB 3 device when directly connected to the computer, connect another USB 3 device to the extender and reconnect it to the host computer. If the second device does not operate as a USB 3 device, the extender may be malfunctioning. Contact Technical Support for assistance. If the second device operates as a USB 3 device as expected, the first device may not be compatible with this extender. Contact Technical Support.
All LEDs are flashing and the system is operational.	<ul style="list-style-type: none"> Unit is or was operating at an unsafe temperature. 	<ul style="list-style-type: none"> Check ambient temperature. Ensure temperature does not exceed 50°C (122°F). Power cycle the unit to return to operation.
LEDs are scrolling LEFT to RIGHT, starting with STATUS.	<ul style="list-style-type: none"> Unit is programming. 	<ul style="list-style-type: none"> Wait for the unit to finish programming.

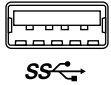
Specifications

Distance	Up to 200m (656 ft) over OM3 or better multimode fiber
Maximum Throughput	5 Gbps
Traffic Types	All Traffic Types
Device Types	All Device Types
Maximum Number of Devices and/or Hubs	Up to 30 devices
Host EXTENDER	
USB Connector	1 x USB 3.1 Gen 1 Type B Receptacle
Link Connector	1 x Duplex LC
Network Pass Through:	1 x RJ45
Dimensions	137.3mm x 232.1mm x 33.0mm (5.4" x 9.1" x 1.3")
Enclosure Material	Black Anodized Aluminum
Power Supply	100-240V AC Input, 24V 1A DC Output
Client EXTENDER	
USB Connector	4 x USB 3.1 Gen 1 Type A Receptacles
Link Connector	1 x Duplex LC
Network Pass Through:	1 x RJ45
Dimensions	137.3mm x 232.1mm x 33.0mm (5.4" x 9.1" x 1.3")
Enclosure Material	Black Anodized Aluminum
Available Current	Up to 1.2 Amp (6W) to each USB port
Power Supply	100-240V AC Input, 24V 2.71A DC Output
ENVIRONMENTAL	
Operating Temperature Range	0°C to 50°C (32°F to 122°F)
Storage Temperature Range	-20°C to 70°C (-4°F to 158°F)
Operating Humidity	20% to 80% relative humidity, non-condensing
Storage Humidity	10% to 90% relative humidity, non-condensing
COMPLIANCE	
EMC	FCC (Class B), CE (Class B)
Environmental	RoHS2 (CE)
SUPPORT	
Warranty	3-year

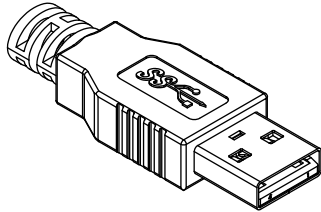
Technical Glossary

USB Cables

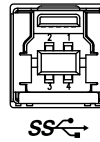
USB cables have two distinct connectors. The Type A connector is used to connect the cable from a USB device to the Type A port on a computer or hub. The Type B connector is used to attach the USB cable to a USB device.



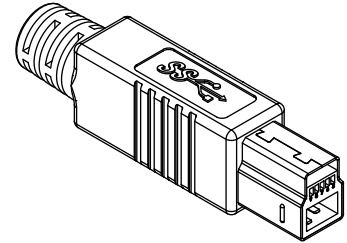
USB 3.0
Type A
Jack



USB 3.0
Type A
Plug



USB 3.0
Type B
Jack



USB 3.0
Type B
Plug

Duplex LC Crossover

When a crossover fiber optic cable is called for, the cable has the transmit signal on one end connected to the receive signal at the other end.

