TL-FO-USB2-01

USB 2.0 Over Fiber Optic Extender
User Guide

Thank you for purchasing the TechLogix TL-FO-USB2-01.

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 Networx, LLC, declare under our sole responsibility that the TechLogix TL-FO-USB2-01, 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.

Contents

Introduction

This guide provides product information for the TL-FO-USB2-01, 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.

CAUTION: Cautions provide important information about an operational requirement.

TL-FO-USB2-01 Product Contents

Your TL-FO-USB2-01 is packaged with:

- Host Extender
- Client Extender
- Locking AC power adapter
- USB 2.0 cable

About the TechLogix TL-FO-USB2-01

The TL-FO-USB2-01 incorporates Icron's patented ExtremeUSB® technology, enabling users to extend beyond the standard 5m cable limit for USB peripheral devices. With the TL-FO-USB2-01, USB devices can be located up to 500 meters from the computer. This extender system is composed of two individual units: the Host Extender unit and the Client Extender unit.

CAUTION: The TL-FO-USB2-01 supports only USB 3.0 devices. USB 2.0 and 1.1 devices will not function with this extender.
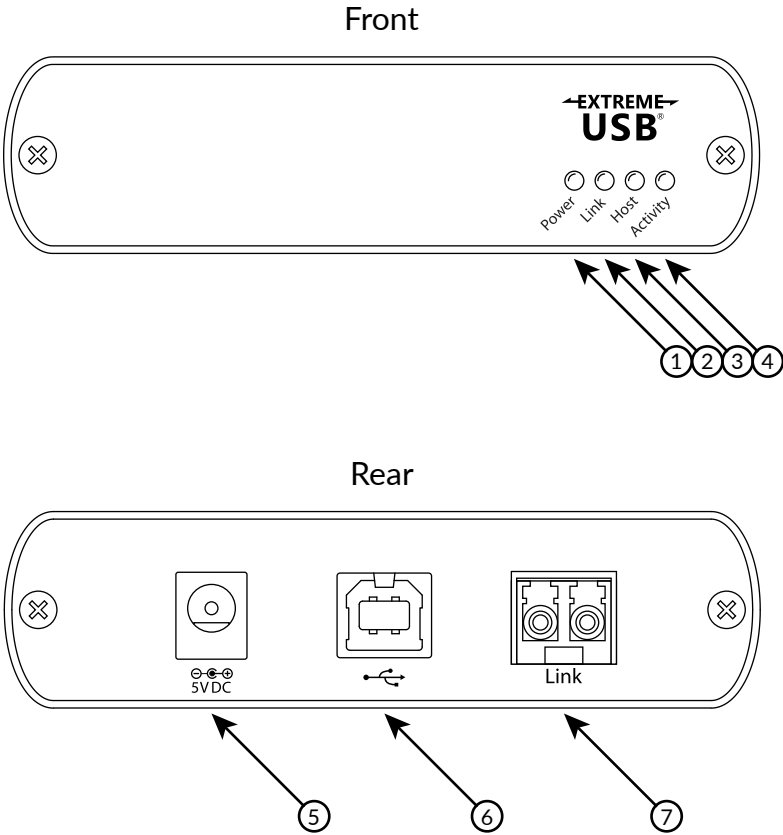
The TL-FO-USB2-01 includes the ExtremeUSB® suite of features:

- Transparent USB extension
- True plug and play; no software drivers required
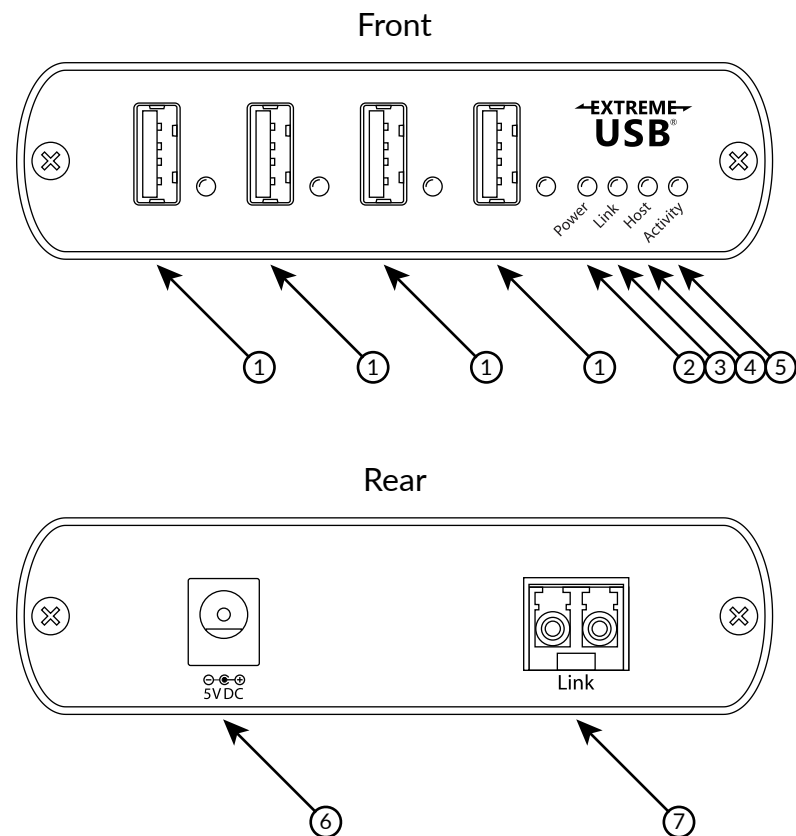- Works with all major operating systems: Windows®, OS X®, and Linux®

Device Overview

Host Extender

Front

Rear

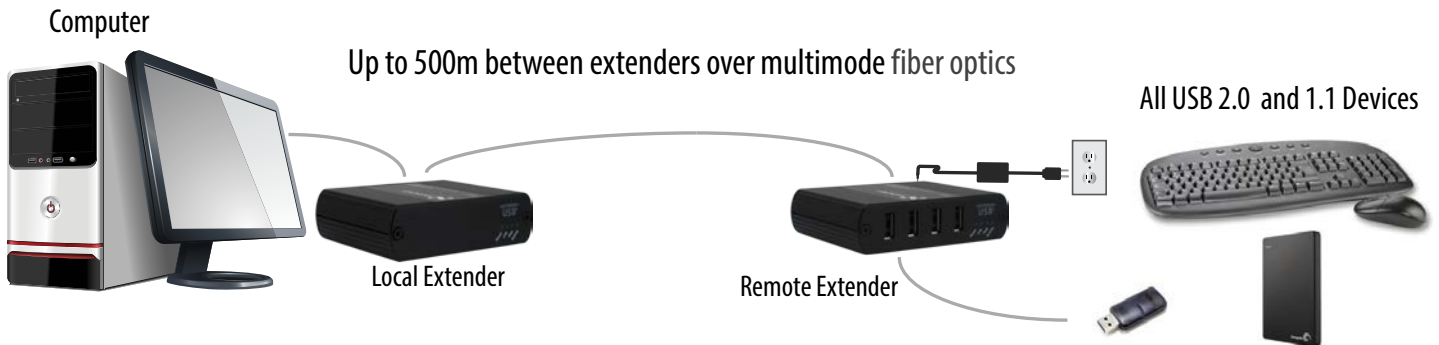| Item	Type	Description
1	Power LED (Blue)	LED turns on when power is supplied. The LED light is off when no power is supplied.
2	Link LED (Green)	Indicates a valid ExtremeUSB® link is established between the local and remote extenders.
3	Host LED (Green)	Indicates that the RG2224 system is properly enumerated on the host computer. LED blinks when in suspend state.
4	Activity LED (Amber)	Indicates activity when data transmission is active between the local and remote extenders. LED blinks intermittently with or without a USB device connected. When the local and remote extenders are in suspend mode, the LED is off.
5	Power Port (optional)	Not required in normal operation. An optional 5V power supply can be connected to the local extender to provide power if the USB port on the host computer is not capable of delivering 500mA to the unit.
6	USB Type B connector	Used to connect the local extender to the host computer.
7	Link Port (Duplex LC)	Extension link Duplex LC fiber optic transceiver port.

Client Extender

Front

Rear

Item	Type	Description
1	Device Port (USB Type A)	Accepts USB device(s).
2	Device LED (Green/Orange)	Indicates when a USB device is connected to the Device Port. Solid green when device is plugged in and active. Off when device is in suspend mode or remote extender is powered off. Orange when the remote extender detects an overcurrent condition, and the attached USB device attempts to draw more than the 500mA current.
3	Power LED (Blue)	LED turns on when power is supplied. Off when no power is supplied.
4	Link LED (Green)	Indicates a valid ExtremeUSB® link is established between the local and remote extenders.
5	Host LED (Green)	Indicates that the RG2224 system is properly enumerated on the host computer. LED blinks when in suspend mode.
6	Activity LED (Amber)	Indicates activity when data transmission is active between the local and remote extenders. LED blinks intermittently with or without a USB device connected. When the local and remote extenders are in suspend mode, the LED is off.
7	Power Port	Connects to the AC power supply. Required on REX for proper operation.
8	Link Port (Duplex LC)	Extension link Duplex LC fiber optic transceiver port.

Installation Guide

Example Application

Computer

Up to 500m between extenders over multimode fiber optics

All USB 2.0 and 1.1 Devices

Local Extender

Remote Extender

Fiber Optic Link Cabling

The host and client extenders are interconnected by up to 500 meters of fiber optic cabling. Two strands of 50/125µm (500m) MMF or 62.5/125µm (275m) MMF cabling are required. 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-USB2-01 System

Before you can install the TL-FO-USB2-01, you need to prepare your site:

1. Determine where the computer is to be located and set up the computer.
2. Determine where you want to locate the USB device(s).
3. If you are using surface cabling, the TL-FO-USB2-01 supports a maximum distance of 500m.

OR

If you are using premise cabling, ensure compatible fiber optic cabling is installed between the two locations, with fiber optic information outlets located near both the computer and the USB device(s), and the total length including patch cords is no more than 500m over MMF.

Installing the Host Extender

1. Place the host extender near the computer.
2. Install the supplied USB cable between the host extender and USB port on the host computer.

Installing the Client Extender

1. Place the client extender near the USB device(s).
2. Plug the power adapter into a suitable AC outlet.
3. Connect the power adapter to the client extender.

Connecting the Host Extender to the Client Extender

To ensure proper operation, the maximum length of the fiber optic cable, including patch cords, must not exceed 500 meters. The cabling must provide a duplex connection with crossover and must be terminated with Duplex LC connectors at both ends.

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 second fiber optic patch cord (not included) into the Link port on the client extender.
4. Plug the other end of the second patch cord into the fiber optic information outlet near the USB device.

Checking the Installation

1. On the host and client extenders, check that the Power, Host, and Link LEDs are on and that the Activity LED is blinking. If the Link LED is permanently off, then the cabling between the host and client extedners is not installed properly or is defective.
2. For Windows users (2000, XP, Vista, Windows 7, Windows 8), open Device Manager to confirm that the TL-FO-USB2-01 has installed correctly. Expand the entry for Universal Serial Bus controllers by clicking the "+" sign. If the TL-FO-USB2-01 has been installed correctly, you should find it listed as a "Generic USB Hub".
3. For Mac OS X users, open the System Profiler to confirm that the TL-FO-USB2-01 has installed correctly. In the left hand column under Hardware, select "USB" and inspect the right hand panel. If the TL-FO-USB2-01 has been installed correctly, you should find it listed as a "Hub" under the USB High-Speed Bus/USB Bus.
4. If the TL-FO-USB2-01 is not detected correctly or fails to detect, please consult the Troubleshooting section in this User Guide.

Connecting a USB Device

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

Check if the USB Device Is Detected by Your Operating System

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

To open Device Manager in Windows 2000 or Windows XP:
Right click "My Computer" then select: Properties >> Hardware tab >> Device Manager

To open Device Manager in Windows Vista or Windows 7:
Open the Start menu, right click on "Computer" then select: Manage >> Device Manager

To open Device Manager in Windows 8 or Windows 10:
Right click on the lower left bottom corner of your screen, then select: Device Manager

Compatibility

The TL-FO-USB2-01 complies with USB 1.1 and USB 2.0 specifications governing the design of USB devices. However, it is not possible to guarantee that all USB devices are compatible with the TL-FO-USB2-01, as there are a number of different configurations that may impact the operation of USB devices over extended distances.
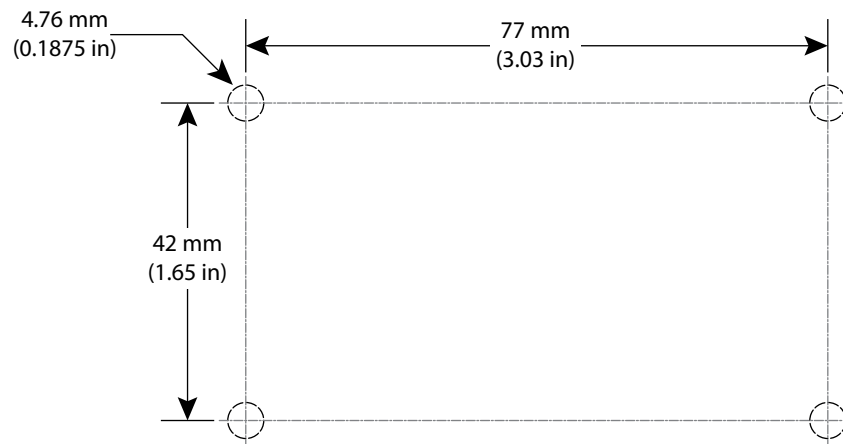
USB Extender Mounting

The bottom of the TL-FO-USB2-01 enclosures features four pre-drilled holes for optional surface mounting.
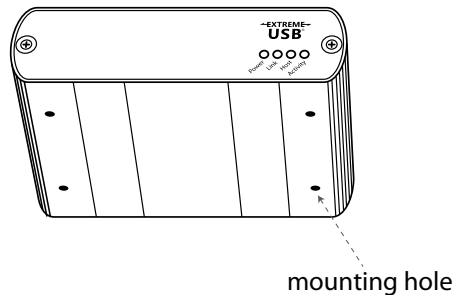
mounting hole

Distance between the enclosure mounting holes: 42.0 mm x 77.0 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 below.
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 4.7625mm (3/16") 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.

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

4.76 mm
(0.1875 in)

77 mm
(3.03 in)

42 mm
(1.65 in)

Troubleshooting

Problem	Cause	Solution
All LEDs on host extender are off.	• The host extender is not receiving power from the USB port or the (optional) host extender AC adapter.	• Ensure that the USB connection between the host extender and the host computer is properly installed. • Move the USB connector to another USB port on the host computer.
All LEDs on client extender are off.	• The client extender is not receiving power from the AC adapter.	• Ensure that the AC power adapter is properly connected to the Client Extender. • Check that the AC adapter is connected to a live source of electrical power.
Link LEDs on host and client extenders are off.	• There is no connection between the host and client extenders.	• Ensure that a multimode fiber optic cable with crossover is connected between the host and client extenders. • Connect a fiber optic crossover patch cord between the host and client extenders. Recheck operation of the system.
Link LED on host and client extenders are on AND Host LED on host and client extenders are off.	• The host computer is not powered on. • The host extender is not connected to the computer (when used with the optional host extender AC adapter). • The computer does not support USB hubs. • The TL-FO-USB2-01 is malfunctioning.	1. Disconnect all USB devices from the client extender. 2. Disconnect the host extender from the computer. 3. Disconnect the client extender from the AC power adapter. 4. Reconnect the host extender to the computer. 5. Reconnect the client extender to the AC power adapter. 6. In the Universal Serial Bus controllers section of Device Manager, check that the TL-FO-USB2-01 is recognized as a "Generic USB Hub".
The system was working, but the Host LED on host/client extenders are suddenly blinking.	• The client extender is in suspend mode. The operating system may put the TL-FO-USB2-01 in suspend mode when the computer is put into a Suspend/Standby state or when no USB devices are attached.	• Recover/Resume the operating system from Suspend/Standby mode (see your operating system's documentation). • Attach a USB device to the TL-FO-USB2-01.
All LEDs on both the Host and Client Extender units are on but the USB device does not operate correctly, or is detected as an "Unknown Device" in the operating system.	• The USB device is malfunctioning. • The computer does not recognize the USB device. • The application software for the device is not operating. • The TL-FO-USB2-01 is malfunctioning.	1. Disconnect the TL-FO-USB2-01 from the computer. 2. Connect the USB device directly to the USB port on the computer. 3. If the device does not operate properly, consult the user documentation for the device. 4. Update your system BIOS, chipset, or USB Host controller drivers from your System/ Motherboard manufacturer's website. 5. If the device operates properly when directly connected to the computer, connect another device (of a different type) to the TL-FO-USB2-01. Then connect the TL-FO-USB2-01 to the computer. 6. If the second device does operate properly, the first device may not be compatible with the TL-FO-USB2-01. 7. If the second device does not operate, the extender system may be malfunctioning.

| Problem	Cause	Solution
USB device is attached to client extender USB port but the client extender device LED is off.	• The USB device must have the appropriate driver installed on the computer operating system.	• Install the required USB device driver on the computer operating system prior to attaching the USB device to the client extender. Please see your USB device manufacturer's website for details. • Consult your USB device documentation and power your USB device with the additional, USB device manufacturer supplied, power supply (if available).
Device LED is orange and host/client extenders are no longer functioning.	• Overcurrent condition has occurred because USB device draws more power than can be supplied per USB specification (500mA).	• Power cycle the client extender.
LED Host and LINK LEDs on host and client extenders blink intermittently.	• Firmware mismatch between the host and client extender.	• Use a different host/client extender pair which have the same firmware revision. • Upgrade the host and client extender firmware, contact technical support for assistance.

Specifications

|	
Range	Up to 500m (1640 feet) over OM2 or greater Up to 275m (902 ft) over OM1
Speeds	USB 2.0: Up to 480 Mbps; USB 1.1: Up to 12 Mbps
USB Hub Support	Any single chain can include up to 3 USB hubs plus one RG2224
USB Host Support	xHCI (USB 3.0) at USB 2.0 speed, EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
Maximum USB devices supported	15 USB devices or 4 USB hubs with 11 USB devices.
AC Adapter	Input: 100/240 V AC, 50 – 60 Hz, 600mA maximum; Output: 5 V DC, 3 A
AC Adapter Connector	1.7 mm centre-positive jack
System Shipping Weight	2.0 lbs. (0.9 kg)
Host EXTENDER	
USB Connector	1 x USB Type B Receptacle
Link Connector	1 x SFP Duplex LC
Dimensions	100 mm x 76 mm x 26 mm (3.94" x 2.99" x 1.02")
Enclosure Material	Black Anodized Aluminum
Client EXTENDER	
USB Connector	4 x USB Type A Receptacles
Link Connector	1 x SFP Duplex LC
Dimensions	100 mm x 76 mm x 26 mm (3.94" x 2.99" x 1.02")
Enclosure Material	Black Anodized Aluminum
Available Current	500 mA to each USB port
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.
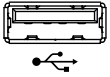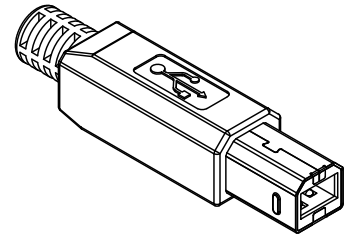
USB
Type A
Jack
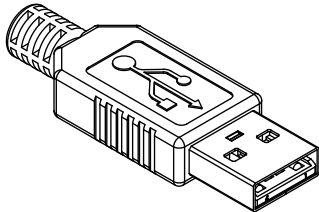
USB
Type A
Plug

USB
Type B
Jack

USB
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.

TX

RX