USB and 1394b EXTENDER

USB Models 1.1 and 2.0
Firewire Model 800

Product Manual

thinklogical®
Extend • Distribute • Innovate

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Subject: USB and 1394b Extender Manual
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Products: USB Extenders

USB 1.1 Extender

and

USB 2.0 Extender

1. Introduction

1.1. Contents

1.1.1. USB Extender

When you receive your Thinklogical USB Extender (1.1 or 2.0 Model), you should find the following items:

- USB Extender – Transmitter
- USB Extender – Receiver
- AC Power Supply (PWR-000022-R) – Quantity 2
- USB Cable, 6 Feet (CBL000015-006FR)
- USB and 1394b Extender Product Manual

NOTE: The USB 2.0 Extender is recommended for video transfer applications; the USB 1.1 Extender is recommended for all other applications.

NOTE: For USB camera applications which limit power, we recommend the Thinklogical USB 2.0 **EP Series**. The EP Series is only available in the USB 2.0 Model.

1.2. Product Overview

1.2.1. USB Extender

The USB Extender (1.1 and 2.0 Models) is a fiber optic extender designed to extend USB 1.1 or 2.0 interface signals up to 1000 meters (3280 feet) over a standard duplex multimode fiber. With the USB Extender, all high speed USB 1.1 or 2.0 peripherals can be conveniently located while operating at optimal speed. The USB 2.0 Extender effectively supports not only USB 2.0 peripherals but USB 1.1 low speed and full speed devices as well.

The USB Extender transmitter connects to the host computer with a standard USB cable and the receiver provides four ports for connection of peripheral devices. External power is required for both the transmitter and receiver units and two universal power supplies are included. Plug-and-play with no adjustments makes setting up the USB Extender fast and easy. As an added bonus, LEDs provide link performance at a glance. The USB Extender successfully and effectively delivers USB peripherals when and where you need them.

1.2.2. USB Camera

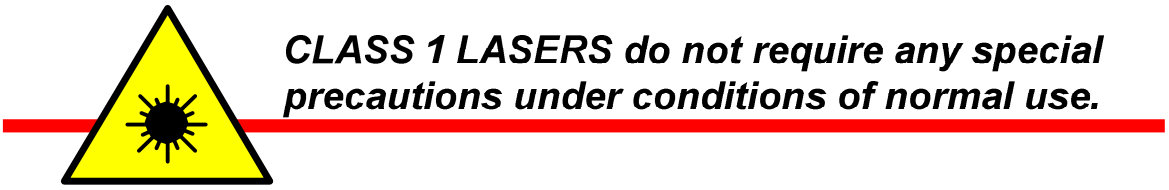
For USB camera applications which limit power, we recommend the Thinklogical™ USB 2.0 **EP Series**. The EP (Enhanced Power) Series is only available in the USB 2.0 Model. This optional feature can handle additional power that USB cameras require.

1.3. Ordering Information

All models listed are available from Thinklogical™:

USB-000001-SCTX	**USB 1.1 EXTENDER TRANSMITTER, SC**
USB-000001-SCRX	**USB 1.1 EXTENDER RECEIVER, SC**
USB-000001-STTX	**USB 1.1 EXTENDER TRANSMITTER, ST**
USB-000001-STRX	**USB 1.1 EXTENDER RECEIVER, ST**
USB-000002-SCTX	**USB 2.0 EXTENDER TRANSMITTER, SC**
USB-000002-SCRX	**USB 2.0 EXTENDER RECEIVER, SC**
USB-000002-STTX	**USB 2.0 EXTENDER TRANSMITTER, ST**
USB-000002-STRX	**USB 2.0 EXTENDER RECEIVER, ST**
USB-EP0002-SCTX	**USB 2.0 EXTENDER, ENHANCED POWER, TRANSMITTER, SC**
USB-EP0002-SCRX	**USB 2.0 EXTENDER, ENHANCED POWER, RECEIVER, SC**
USB-EP0002-STTX	**USB 2.0 EXTENDER, ENHANCED POWER, TRANSMITTER, ST**
USB-EP0002-STRX	**USB 2.0 EXTENDER, ENHANCED POWER, RECEIVER, ST**

1.4. Laser Information



CLASS 1 LASERS do not require any special precautions under conditions of normal use.

2. System Features

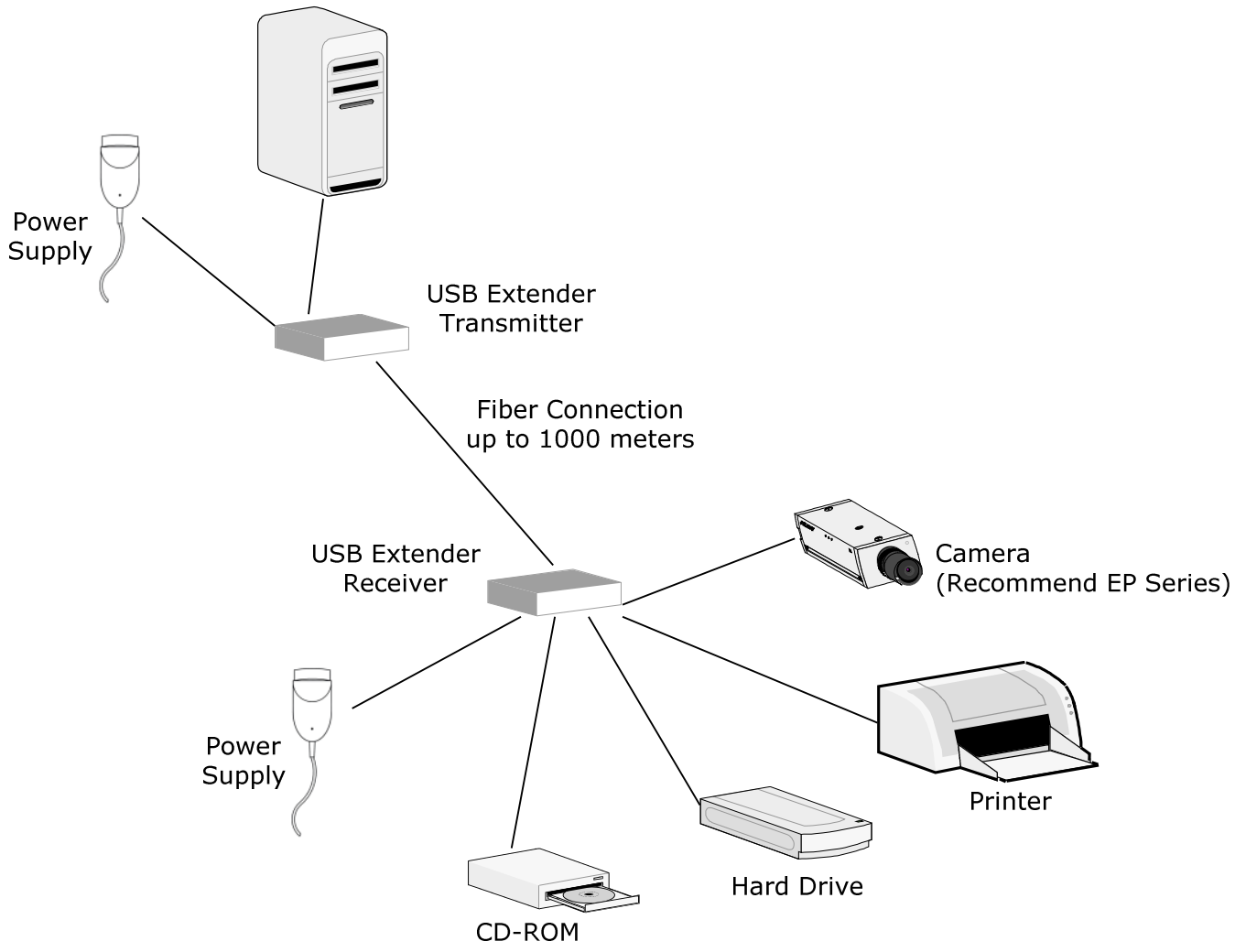
2.1. General System Features

- Extends Hi-Speed USB 1.1 or 2.0 connection up to 1000 meters (3280 feet)
- Four port Class A device
- Installation is Plug-and-Play, no adjustments are necessary
- Supports USB 1.1 low-speed /full-speed and USB 2.0 hi-speed devices
- Uses standard duplex multi-mode fiber optic cable
- LEDs provide link performance status
- Available with your choice of ST or SC fiber connectors

2.2. Technical Specifications

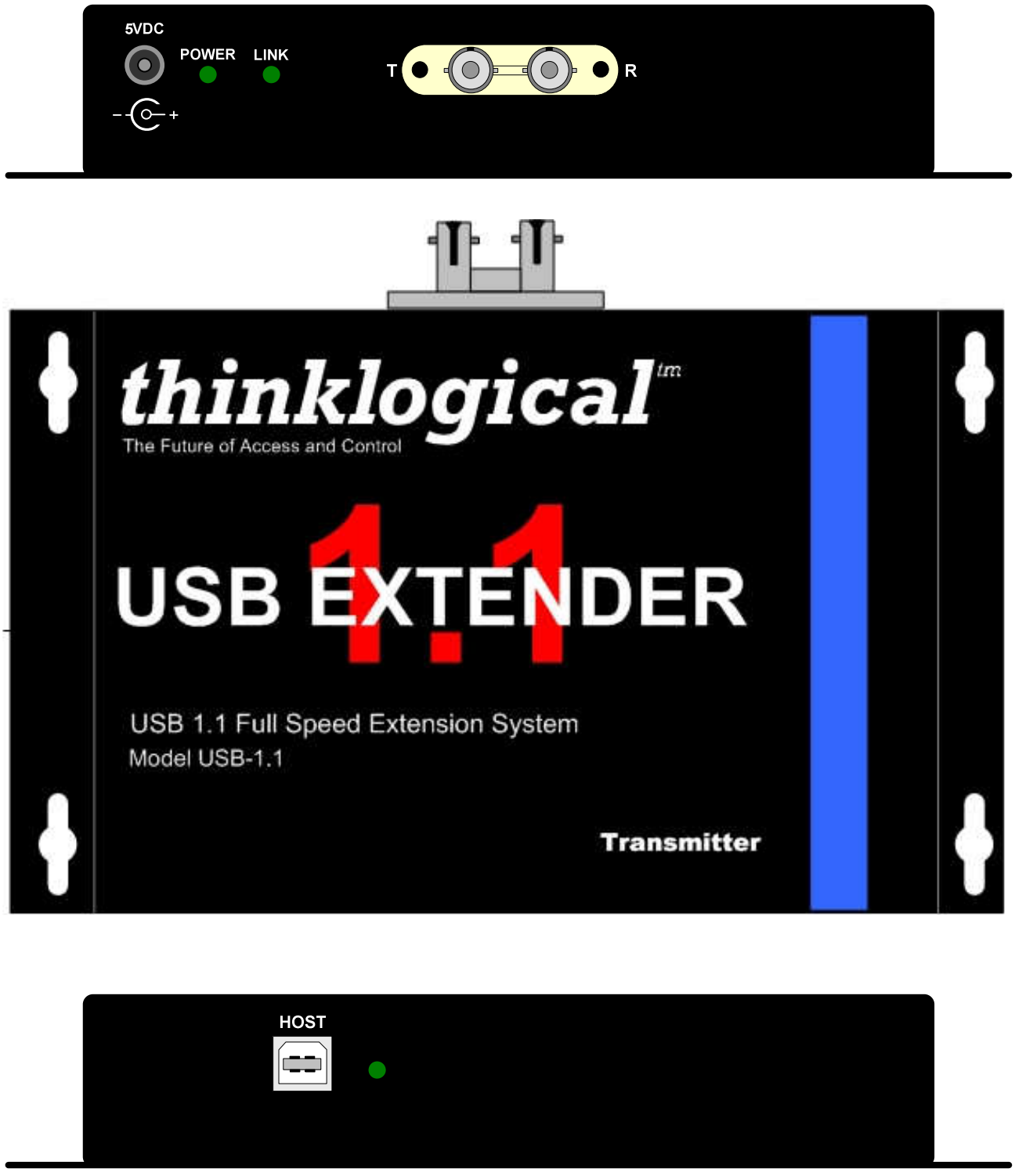
Storage Temperature	**-20 to 85 ℃ (-4 to 185 ℉)**
Supply Voltage	**5.0 VDC ±5%. Adapter has Universal AC Power Input Polarity: Positive Tip Part Number: PWR-000022-R**
Power Consumption	**5 Watts**
Laser Output Specifications	**Meets Laser Class 1M Specifications**
Panel Connectors	**Transmitter: (1) USB Type B connector (1) Dual Fiber connector (SC or ST) (1) 2.5mm power connector Receiver: (4) USB Type A connectors (1) Dual Fiber connector (SC or ST) (1) 2.5mm power connector**
Optical Cable	**Duplex Fiber, multi-mode, 50 micron or 62.5 micron. (Fiber Cable is either customer-supplied or can be ordered from Thinklogical.)**
Operating Temperature and Humidity	**0 to 50 ℃ (32 to 122 ℉); 10 to 95% RH, non-conden sing**
Enclosure Dimensions	**6.61in x 4.00in x 1.09in (167.89mm x 101.60mm x 27.61mm) Tolerance: ± 0.039in (1mm)**
Weight	**1lb (0.45kg) each**
Shipping Weight	**Transmitter and Receiver: 4lbs (1.81kg)**
Copper Cables	**(1) USB Type A to USB Type B Cable, 6 Feet Part Number: CBL000015-006FR**

2.3. Product Overview - USB Extender

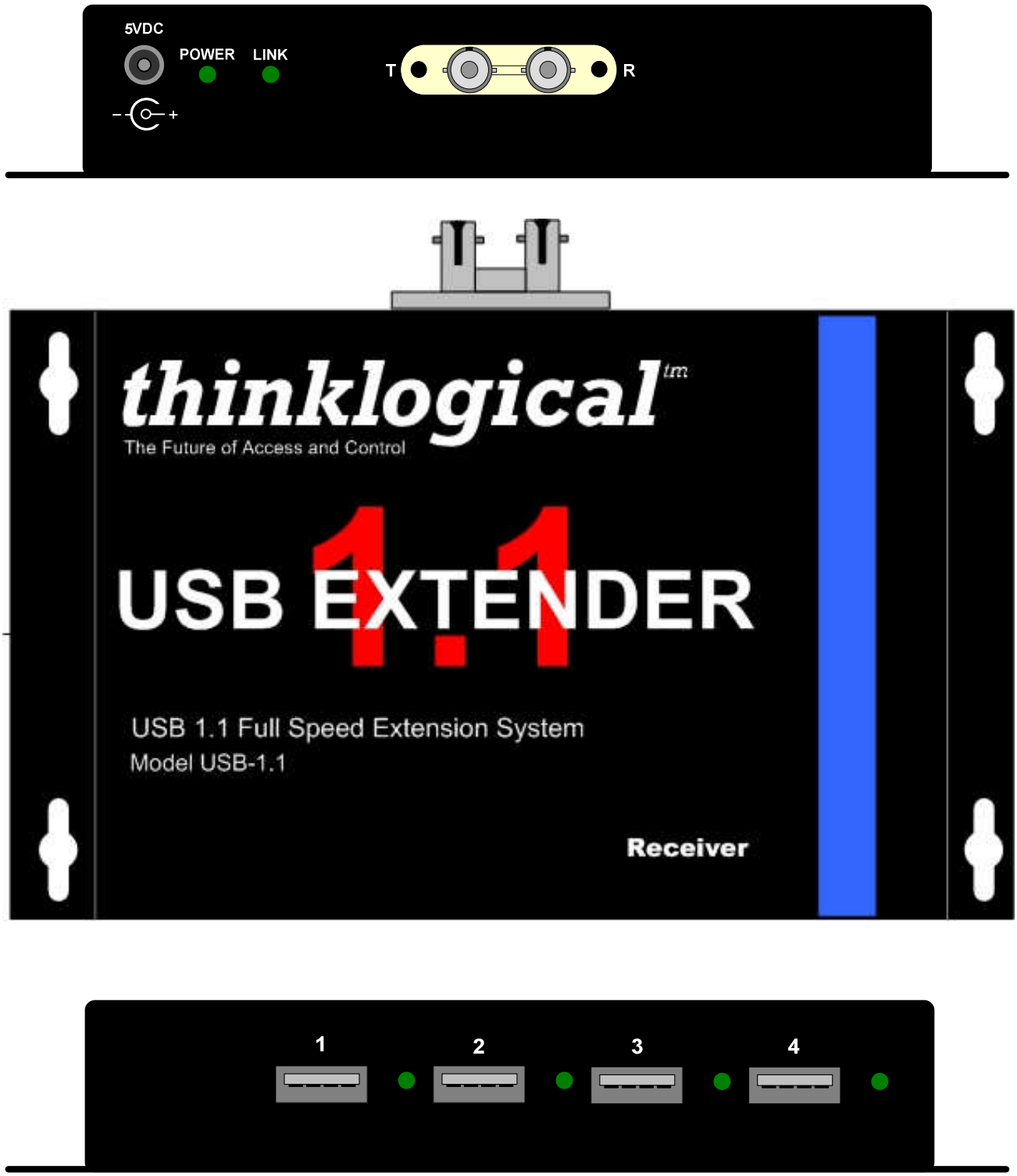


Ability to extend USB devices (USB printers, cameras, web cams, etc) to a host computer up to 1000 meters over standard duplex multi-mode fiber.

2.3.1. USB 1.1 Transmitter

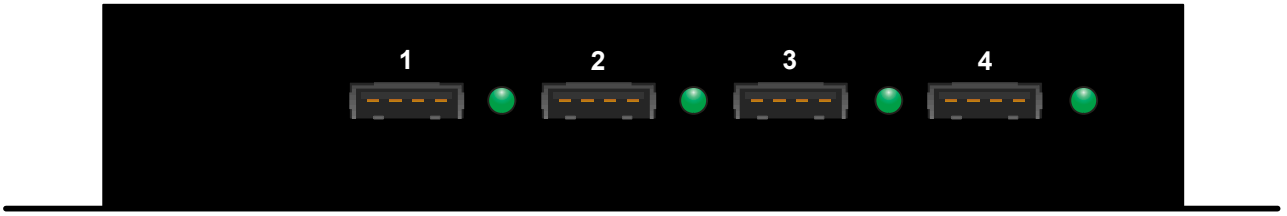


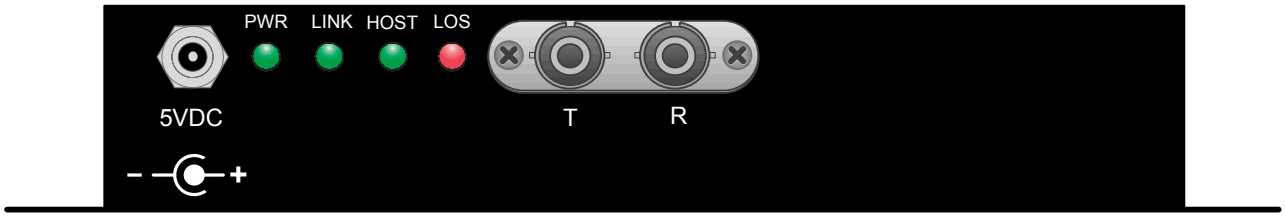
2.3.2. USB 1.1 Receiver



USB 2.0 Transmitter

USB 2.0 Receiver





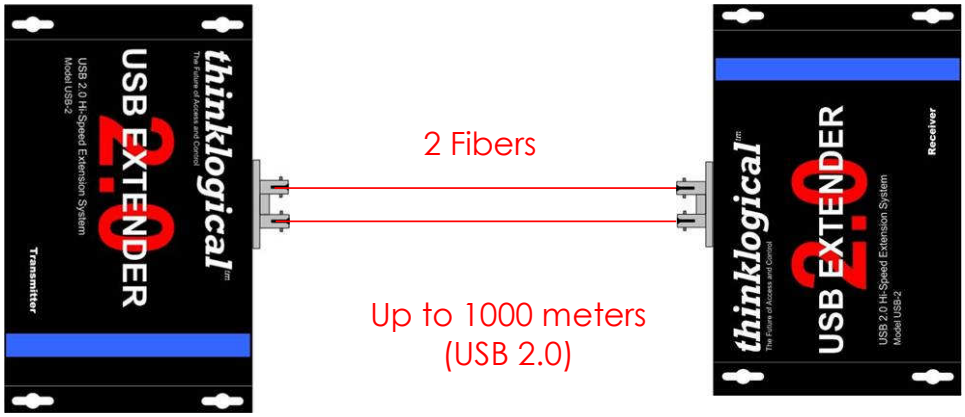
2.3.3. Cables

2.3.3.1. Fiber Optic Cables

Fiber Optic cables for the USB Extender system are not included, but are available for purchase. Please contact Thinklogical™ for a quotation on your required cable length.

When connecting the fiber optic cables, you must be sure to:

- ✓ Connect the fiber connector labeled 'T' on the Transmitter to the fiber connector labeled 'R' on the Receiver.
- ✓ Connect the fiber connector labeled 'R' on the Transmitter to the fiber connector labeled 'T' on the Receiver.



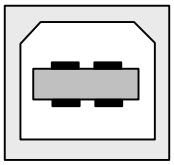
***Note:** Place Transmitter and Receiver units with the fiber panels facing each other. When you connect the fibers, **THE FIBER CABLE SHOULD NOT BE CROSSED**.

2.3.3.2. USB Type A – Receiver

- ✓ Connect up to four devices(s) into any of the device port(s) labeled 1,2,3,4 on the Receiver unit. The cable that was provided with your USB device should be able to connect to the USB Type A ports on the Receiver.

2.3.3.3. USB Type B – Transmitter

- ✓ Connect your PC to the location labeled Host on the Transmitter unit using the USB Type A to USB Type B Cable (CBL000015-006FR) that was provided with your USB Extender system.



2.3.4. Power Supply –PWR-000022-R (Quantity 2)

- ✓ Universal Input: 100 – 240 VAC 50/60Hz Nominal
- ✓ Continuous Short Circuit Protection
- ✓ Over Voltage Protection
- ✓ Conductive EMI Meets CISPR/FCC Class B high efficiency, 75% Typical
- ✓ AC Plug Can Be Changed

AC Power Supply (PN: PWR-000022-R) shown with optional AC plugs

2.3.5. Power Supply – PWR-000047-R (Quantity 2)

NOTE: PWR-000047-R is supplied for the EP (enhanced power).

Separate wall-pack AC/DC adapters (part number PWR-000022-R) are included. A single power jack accepts the 5VDC input.

- ✓ Universal Input: 100 – 240 VAC 50/60Hz Nominal
- ✓ Continuous Short Circuit Protection
- ✓ Over Voltage Protection
- ✓ Conductive EMI Meets CISPR/FCC Class B high efficiency, 75% Typical
- ✓ AC Plug Can Be Changed

3. Installation

1. Plug fiber into T location labeled on the Transmitter unit. Plug that corresponding end of fiber into R location labeled on the Receiver unit.
2. Plug fiber into R location labeled on the Transmitter unit. Plug that corresponding end of fiber into T location labeled on the Receiver unit.
3. Power ON the Tx unit.
4. Connect the USB A-B cable between the Tx and CPU.
5. Power ON the Rx unit.
6. Connect the USB devices to the Rx unit.
7. Power ON the CPU.

Your USB (1.1 or 2.0) Extender System is now properly connected.

3.1. LED Status

3.1.1. Transmitter

LED Label	Status
Power	LED is ON (solid green) when power supply is properly connected
Host	LED is ON (solid green) when the system is operational. LED is OFF when either: 1. Fiber is disconnected 2. Rx unit is OFF 3. USB A-B cable from Tx to CPU is disconnected or PC is OFF.
Link	Shows the status of the connection LED is ON (solid green) when the system is operational. LED is OFF when either Host condition 1 or 2 above exists.
LOS	LED is ON (solid red) when either Host condition 1 or 2 above exists. LED is OFF when system is operational.

3.1.2. Receiver

LED Label	Status
Power	LED is ON (solid green) when power supply is properly connected
Link	Shows the status of the connection LED is ON (solid green) when the system is operational. LED is OFF when: 1. Fiber is disconnected 2. Tx unit is OFF
HOST	LED is ON when system is operational. LED is OFF when USB A-B cable from Tx to CPU is disconnected or PC is OFF.
LOS	LED is ON (red) when Link condition 1 or 2 above exists. LED is OFF when system is operational.
Device LEDs	LED is ON (green) when the device has enumerated properly. LED is OFF when no device is connected or the device has failed to enumerate.

Product: Firewire 800 Extender

1. Introduction

1.1. Contents

1.1.1. Firewire (1394b)

When you receive your Thinklogical 1394b Extender, you should find the following items:

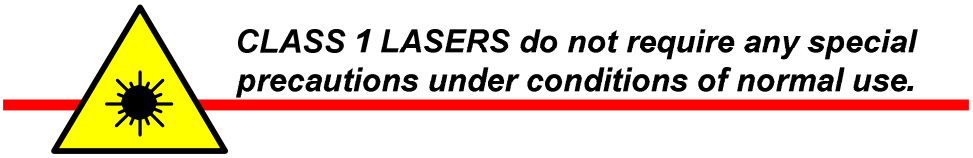
- 1394b Extender – Transmitter
- 1394b Extender – Receiver
- AC Power Supply (PWR-000033-R) – Quantity 2
- AC Power Cord (PWR-000008-R) – Quantity 2
- 1394 Bilingual to 6 Pin 1394, 6 Feet (CBL000100-006FR) – Quantity 2
- 1394 Beta to Beta 9 Pin, 6 Feet (CBL000101-006FR) – Quantity 2
- USB and 1394b Extender Product Manual

1.1.2. Firewire (1394b) Extender

All models listed are available from Thinklogical:

FIR-000001-SCTX	**1394b EXTENDER TRANSMITTER WITH SC**
FIR-000001-SCRX	**1394b EXTENDER RECEIVER WITH SC**
FIR-000001-STTX	**1394b EXTENDER TRANSMITTER WITH ST**
FIR-000001-STRX	**1394b EXTENDER RECEIVER WITH ST**

1.2. Laser Information



CLASS 1 LASERS do not require any special precautions under conditions of normal use.

2. System Features

2.1. General System Features

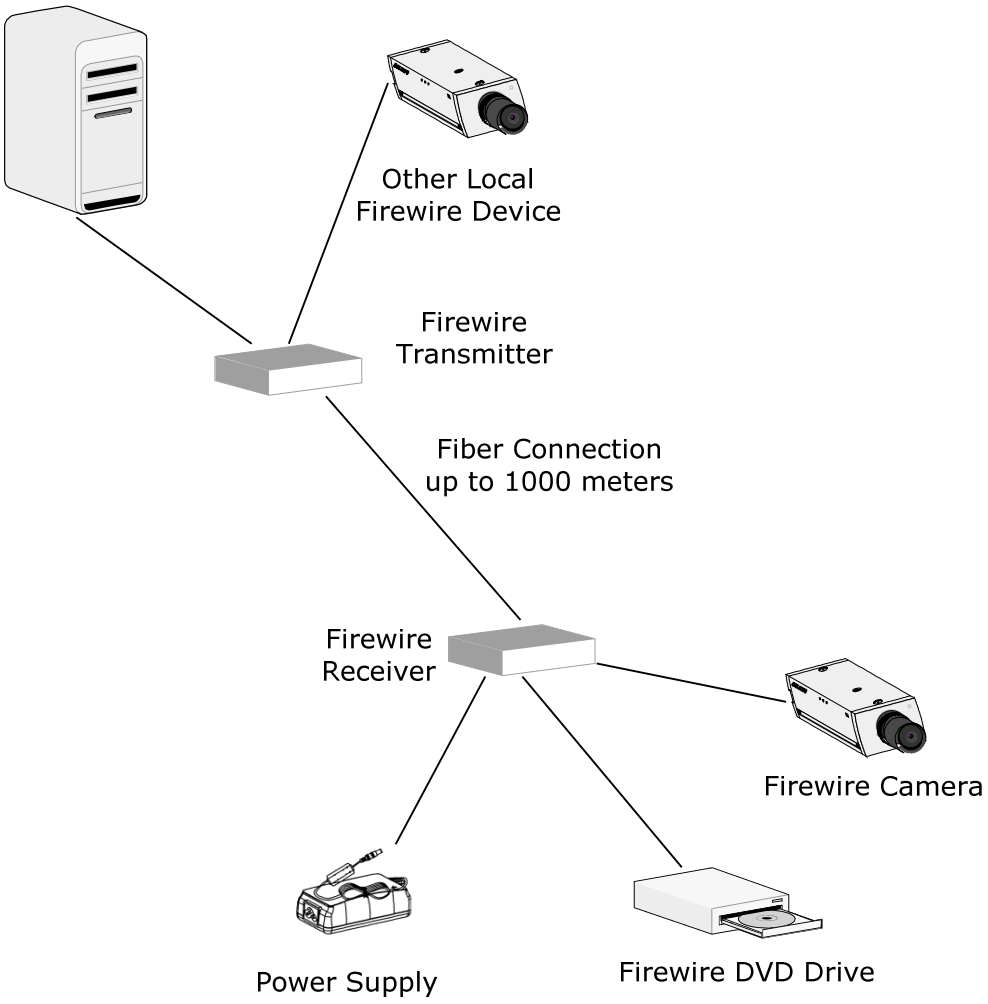
- Extends Firewire 800 (1394b) connection up to 1000 meters (3280 feet)
- Compliant with IEEE 1394a (400) & IEEE 1394b (800)
- Installation is Plug-and-Play, no adjustments are necessary
- Uses standard duplex multi-mode fiber optic cable
- LEDs provide link performance status

- Available with your choice of ST or SC fiber connectors

2.2. Technical Specifications

Storage Temperature	**-20 to 85 ℃ (-4 to 185 ℉)**
Supply Voltage	**12 VDC ±5%. Adapter has Universal AC Power Input Polarity: Positive Tip**
Power Consumption	**P/N: PWR-000033-R (12V 5.5A Desktop Power Supply) 6 Watt Minimum; 36 Watt Maximum**
Laser Output Specifications	**Meets Laser Class 1M Specifications**
Panel Connectors ***Note:** 1394b connectors are rated at 1.5A per connector*	**Transmitter: (2) 1394b connectors (1) Dual Fiber connector (SC or ST) (1) 2.5mm power connector Receiver: (2) 1394b connectors (1) Dual Fiber connector (SC or ST) (1) 2.0mm power connector**
Optical Cable	**Duplex Fiber, multi-mode, 50 micron or 62.5 micron. (Fiber Cable is either customer-supplied or can be ordered from Thinklogical.)**
Operating Temperature and Humidity	**0 to 50 ℃ (32 to 122 ℉); 10 to 95% RH, non-conden sing**
Enclosure Dimensions	**6.61in x 4.00in x 1.09in (167.89mm x 101.60mm x 27.61mm) Tolerance: ± 0.039in (1mm)**
Weight	**1lb (0.45kg) each**
Shipping Weight	**Transmitter and Receiver: 4lbs (1.81kg)**
Copper Cables	**(2) 1394 Bilingual to 6 Pin 1394, 6 Feet Part Number: CBL000100-006FR (2) 1394 Beta to Beta, 6 Feet Part Number: CBL000101-006FR**

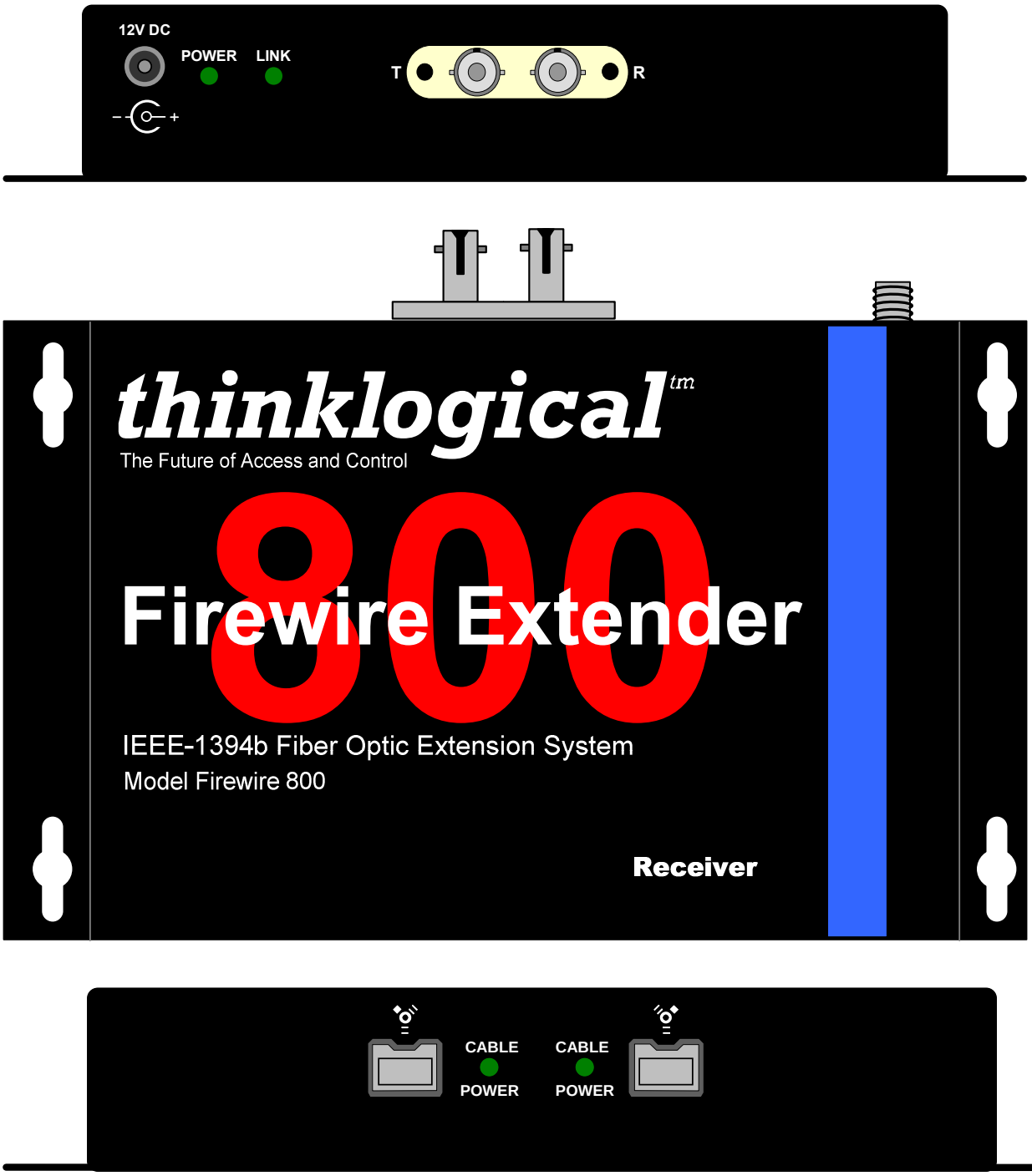
2.3. Product Overview – Firewire 800 Extender



Ability to extend a Firewire device (cameras, DVD Drives, etc) to a host computer up to 1000 meters over standard duplex multi-mode fiber.

2.3.1. Firewire 800 Transmitter

2.3.2. Firewire 800 Receiver

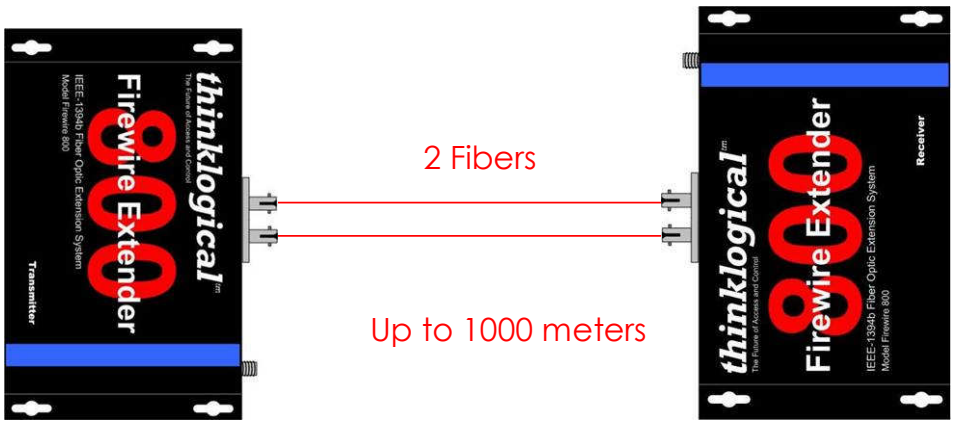


2.3.3. Cables

2.3.3.1. Fiber Optic Cables

When connecting the fiber optic cables, you must be sure to:

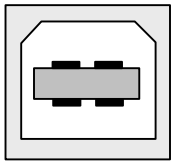
- ✓ Connect the fiber connector labeled 'T' on the Transmitter to the fiber connector labeled 'R' on the Receiver.
- ✓ Connect the fiber connector labeled 'R' on the Transmitter to the fiber connector labeled 'T' on the Receiver.



***Note:** Place Transmitter and Receiver units with the fiber panels facing each other. When you connect the fibers, **THE FIBER CABLE SHOULD NOT BE CROSSED**.

2.3.3.2. USB Type A – Receiver

2.3.3.3. USB Type B – Transmitter



2.3.4. Power Supply – PWR-000033-R (Quantity 2)

- ✓ Universal Input: 90 – 264 VAC
- ✓ Continuous Short Circuit Protection
- ✓ Meets EN55022 Class “B”, Conducted
- ✓ High Efficiency, 85% Typical

3. Installation

1. Plug fiber into T location labeled on the Transmitter unit. Plug that corresponding end of fiber into R location labeled on the Receiver unit.

2. Plug fiber into R location labeled on the Transmitter unit. Plug that corresponding end of fiber into T location labeled on the Receiver unit.

3. Connect the power supply to the Receiver and plug corresponding end into a suitable AC power source.

4. Connect your PC to one of the Firewire locations on the Transmitter unit.

    a. Connect your local Firewire device (if applicable) to the other Cable Link location (Firewire Connector) labeled on the Transmitter unit.

5. Connect the power supply to the Transmitter and plug corresponding end into a suitable AC power source **(OPTIONAL, depending on your power consumption)**

6. Connect your devices(s) into the device port(s) (Firewire Connectors) on the Receiver unit.

Note: *Please allow up to one minute for the CPU to recognize the Firewire system.*

Your Firewire 800 Extender System is now properly connected.

3.1. LED Status

3.1.1. Transmitter

LED Label	Status
Power	LED is ON (solid green) when power supply is properly connected and sufficient power is provided. LED is OFF when power consumption is too high and the supplied power supply is necessary.
Link	Shows the status of the connection. LED is ON (solid green) when fiber are properly connected.
Cable Power	LED is ON (solid green) when enough power is supplied. LED is OFF when power consumption is too high and the supplied power supply is necessary.

3.1.2. Receiver

LED Label	Status
Power	LED is ON (solid green) when power supply is properly connected and sufficient power is provided.
Link	Shows the status of the connection. LED is ON (solid green) when fiber are properly connected.
Cable Power	LED is ON (solid green) when power is properly connected.

4. Product Identification

4.1 Markings

Product Serial Number

The USB and FIREWIRE EXTENDER products have a unique serial number, imprinted on a small silver label that is placed on the bottom of the chassis. The serial number includes a date-code. The format for the date-code is two digits for the month; two digits for the day and four digits for the year and two or three digits for a unique unit number. This serial number is also found on the original shipping carton.

Symbols Found on Product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with requirements.

4.2 Safety Standards

4.2.1 Laser Module

Approval standard and any approvals it carries:

- Class 1 Laser Safety per FDA/CDRH and EN60825-1
- Electrical Safety per EN60950
- Certified by TUV and CSA

4.2.2 External Fiber Connector

- Flammability Rating UL94V0

4.2.3 USB 1.1 and 2.0 Power Supply

Thinklogical Part Number: PWR-000022-R

UL File Number: E176177

4.2.4 Firewire 800 Power Supply

Thinklogical Part Number: PWR-000033-R

UL File Number: E176177

5 How to Contact Us

5.1 Customer Support

Thinklogical is an engineering company and you will receive the information you require directly from our most knowledgeable engineers. We believe that the first line of support is the design engineer that developed the product. Therefore, your questions will be handled promptly by our in-house engineers who are most familiar with your products.

Thank you for choosing Thinklogical® products for your application.

We appreciate your business and are dedicated to helping you successfully use our products.

thinklogical® is always here to help you.

To contact us, please use the following telephone numbers and internet-based methods:

Website

Check out our website for current product offerings, support information and general information about all of the products we offer.

Our internet website offers product information on all current systems, including technical specification sheets and installation guides (for viewing online or for download), product diagrams showing physical connections and other information you might need.

Internet: **www.thinklogical.com**

Note: Most online documents are stored as Adobe Acrobat "PDF" files. If you do not have the Adobe Acrobat reader needed to view PDF files, visit www.adobe.com for a download.

Email

Thinklogical is staffed **Monday through Friday from 8:30am to 5:00pm**, Eastern Time Zone. We will try to respond to your email inquiries promptly, use the following email addresses for your different needs:

info@thinklogical.com – Information on Thinklogical and our products.

sales@thinklogical.com – Sales Department - orders, questions or issues.

support@thinklogical.com – Product support, technical issues or questions, product repairs and request for Return Authorization.

Telephone

Telephone Sales: Contact our expert sales staff via telephone in Milford, CT at **1-203-647-8700** or if in the continental US, you may use our **toll-free number 1-800-291-3211**. We are here Monday through

Friday from 8:30am to 5:00pm, Eastern Time Zone. Ask for your representative's direct dial phone number when you call.

Telephone Product Support: Contact Product Support via telephone in Milford, CT at **1-203-647-8700**. The support lines are manned Monday through Friday, 8:30am to 5:00pm, Eastern Time Zone.

International Sales: Please contact our US sales staff in Milford, CT at **1-203-647-8700**. We are here Monday through Friday, 8:30am to 5:00pm, Eastern Time Zone (same as New York City). If leaving a voice message, please let us know when you'd prefer for us to call back, so that we may reach you at your convenience.

Our switchboard attendant will direct your call during regular business hours. We have an automated attendant answering our main telephone switchboard after regular business hours and holidays. You can leave voice messages for individuals at any time. Our Sales Representatives have direct numbers to speed up your next call to us.

Fax

Our company facsimile number is **1-203-783-9949**. Please indicate the nature of the fax on your cover sheet and provide return contact information.

5.2 Product Support

Thinklogical's support personnel are available **Monday through Friday from 8:30am to 5:00pm**, Eastern Time Zone. If your application requires assistance at some time outside of our normal business hours, please contact us beforehand and we will do our best to make arrangements to help you with your Thinklogical products.

5.2.1 Warranty

Thinklogical warrants this product against defects in materials and workmanship for a period of one year from the date of delivery. Thinklogical and its suppliers disclaim any and all other warranties.

Note: Thinklogical Inc. products carry a one year warranty, with longer term available at time of purchase on most products. Please refer to your product invoice for your products Warranty Terms & Conditions.

Defect remedy shall be the repair or replacement of the product, provided that the defective product is returned to the authorized dealer within a year from the date of delivery.

If you wish to return your device, contact the Thinklogical authorized dealer where you purchased the device, or if you purchased directly, call Thinklogical at **1-800-291-3211** (USA).

5.2.2 Return Authorization

In the event you must return a product to Thinklogical directly, please contact **Customer Support** at **1-800-291-3211** or **1-203-647-8700**. Customer Support will ask you to describe the problem and will issue

you a **R**eturn **M**erchandise **A**uthorization number (RMA#). Pack the device in its original box, if possible, and return it with the RMA# printed on the outside of the box.

Note: DO NOT return a product to Thinklogical without a *Return Material Authorization*.

Return address for products with Return Material Authorization:

Thinklogical, LLC
Attn: RMA#
100 Washington Street
Milford, CT 06460 USA

PH: 1-800-291-3211 (USA only)

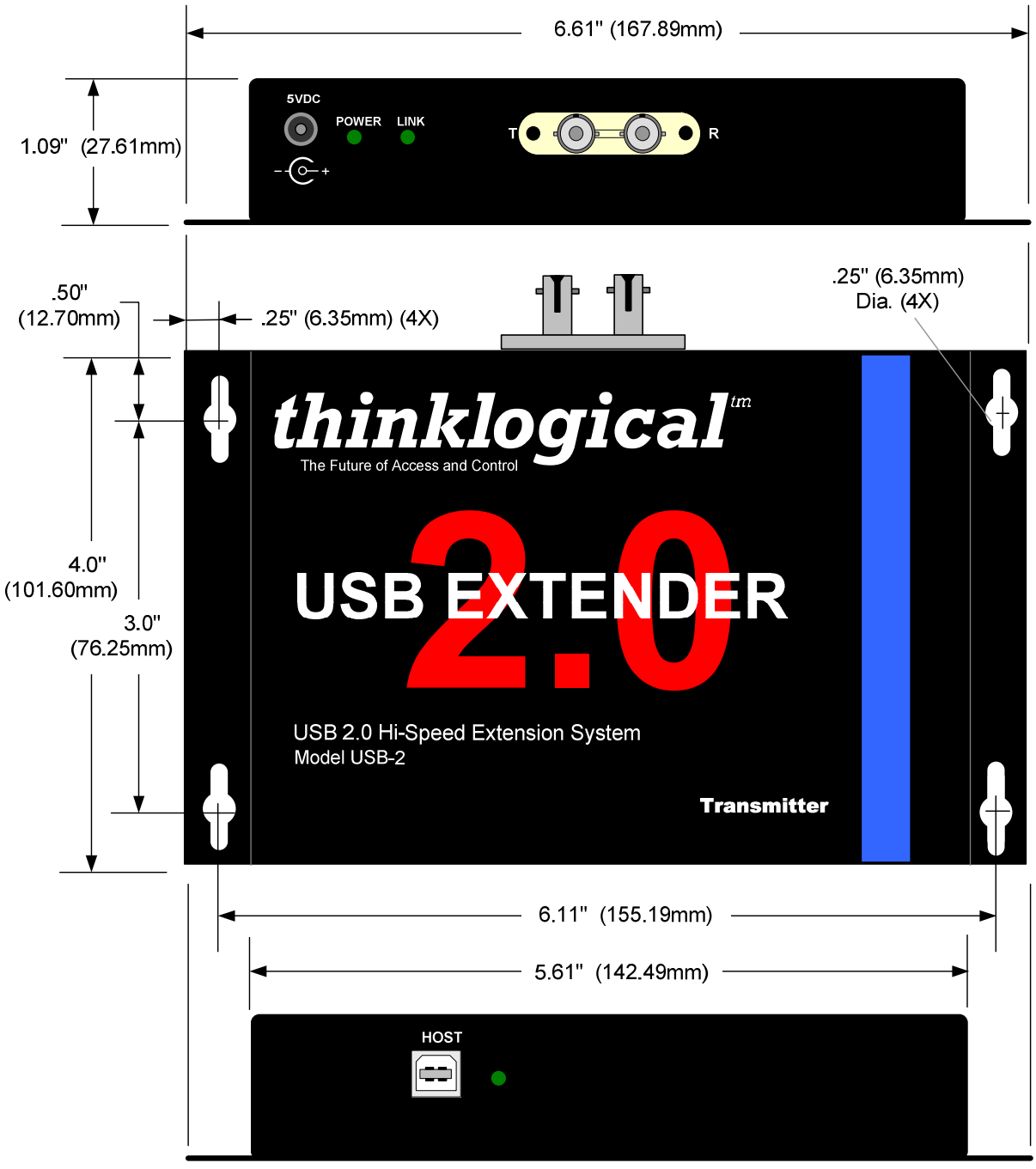
Our Address

If you have any issue with a product, have product questions or need technical assistance with your Thinklogical system, please call us at **1-800-291-3211 (USA only)** or **1-203-647-8700** and let us help. If you'd like to write us, our mailing address is:

Thinklogical® LLC.
100 Washington Street
Milford, CT 06460 USA

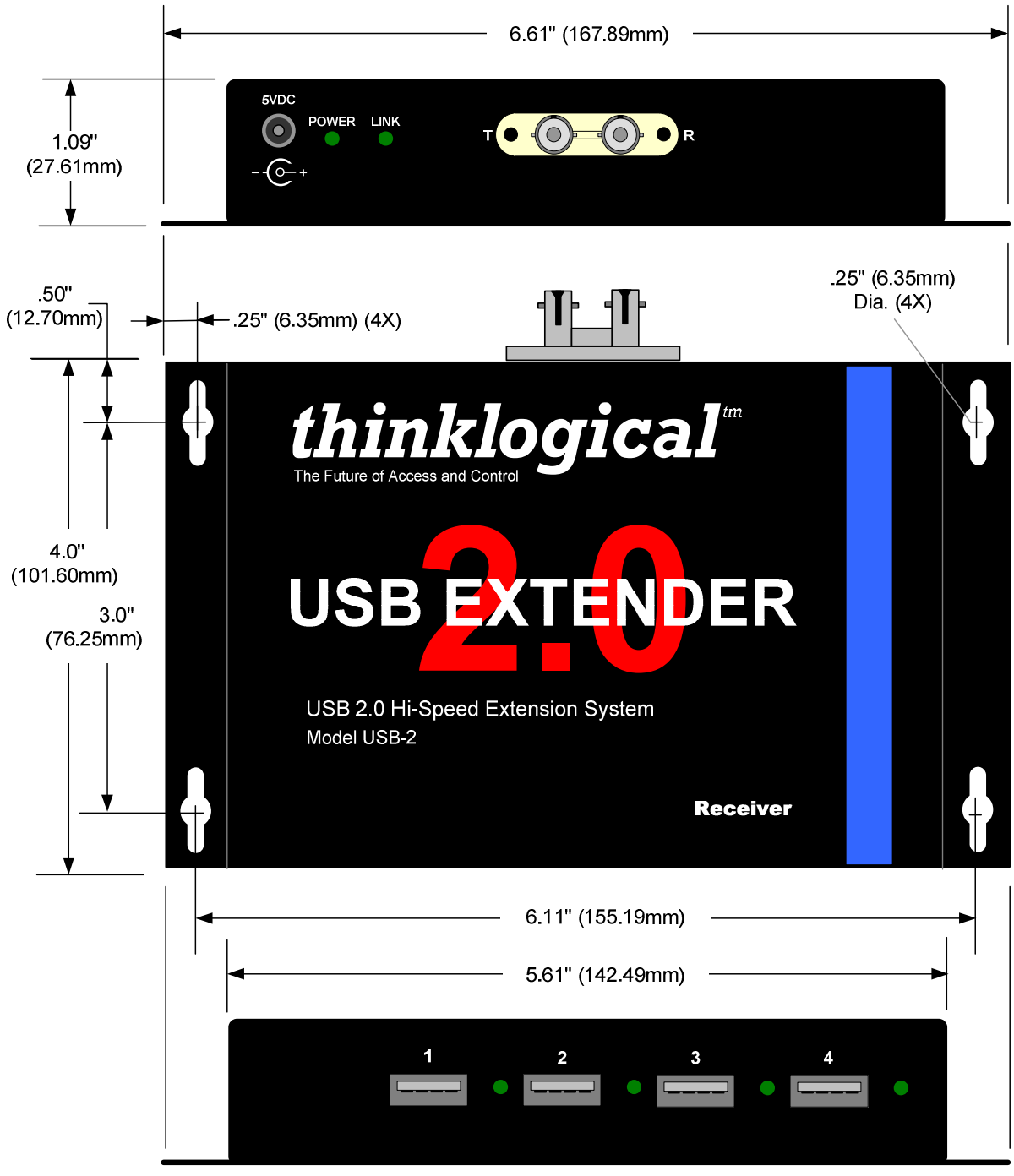
Appendix A - Dimensions

1. USB 1.1 and 2.0 Transmitter



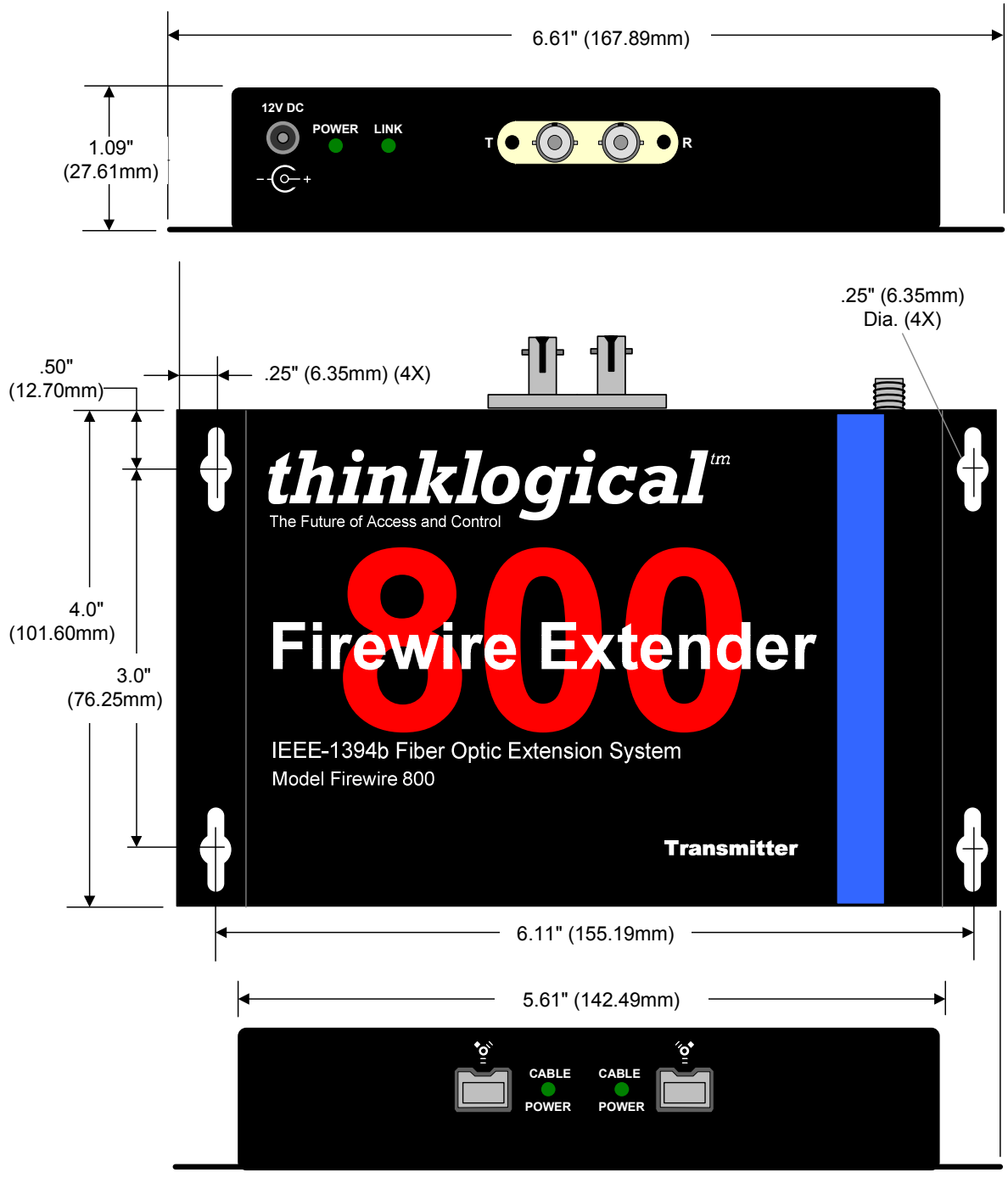
Tolerance: ± 0.039" (1mm)

2. USB 1.1 and 2.0 Receiver



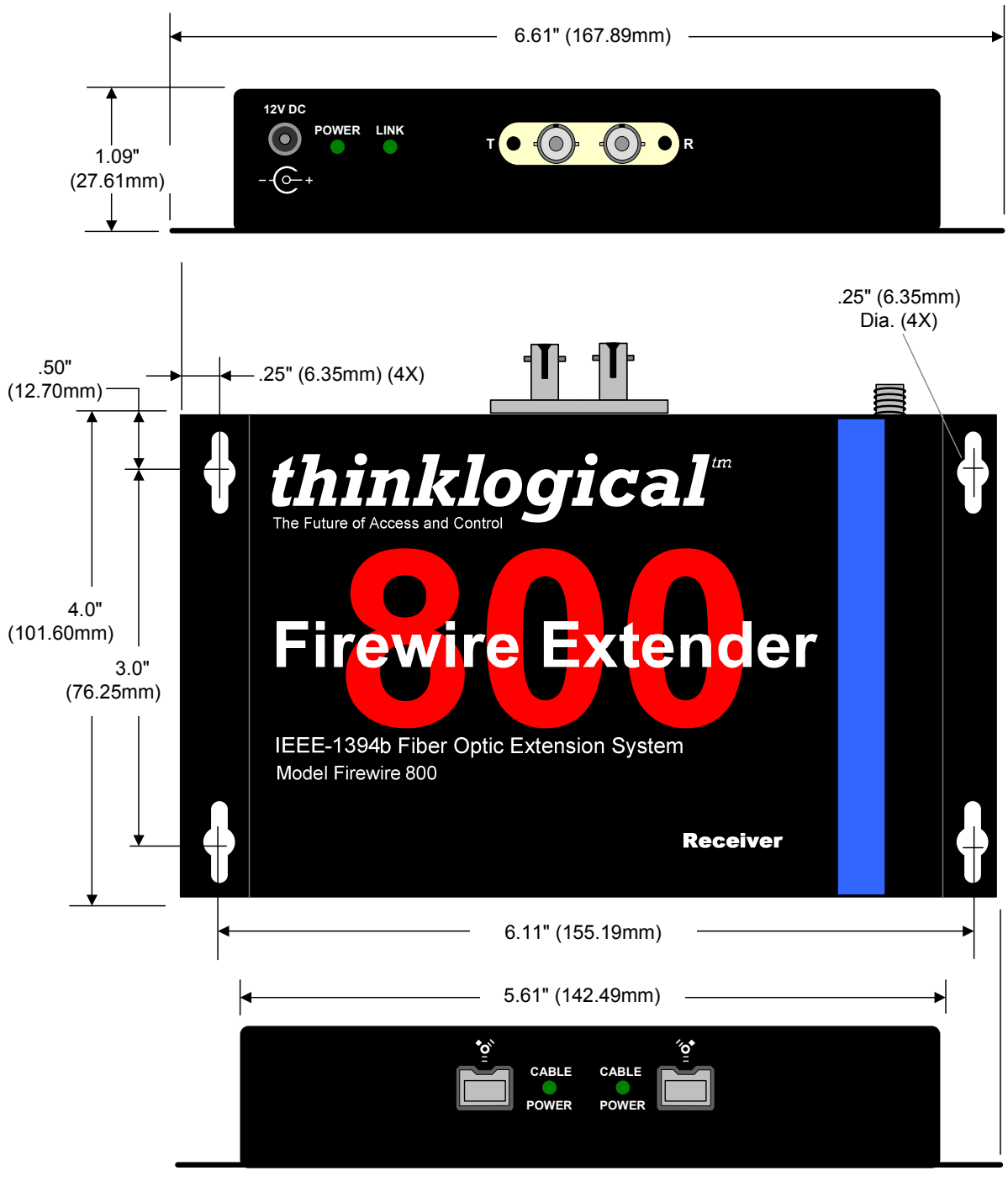
Tolerance: ± 0.039" (1mm)

3. Firewire 800 Transmitter



Tolerance: ± 0.039" (1mm)

4. Firewire 800 Receiver



Tolerance: ± 0.039" (1mm)

For Your Notes: