

USB and 1394b EXTENDER

USB Models 1.1 and 2.0

Firewire Model 800

Product Manual



thinklogical™
The Future of Access and Control

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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 ThinklogicalTM 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 ThinklogicalTM 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 ThinklogicalTM 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 ThinklogicalTM:

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

LASER RADIATION
DO NOT VIEW DIRECTLY WITH OPTICAL
INSTRUMENTS

CAUTION: In order to avoid possible exposure to laser energy, it is good practice to attach the fiber optic cables prior to applying power to the USB EXTENDER. If the fiber optic cable should become disconnected, DO NOT attempt to look into the cable or the panel mounted connector.

2. System Features

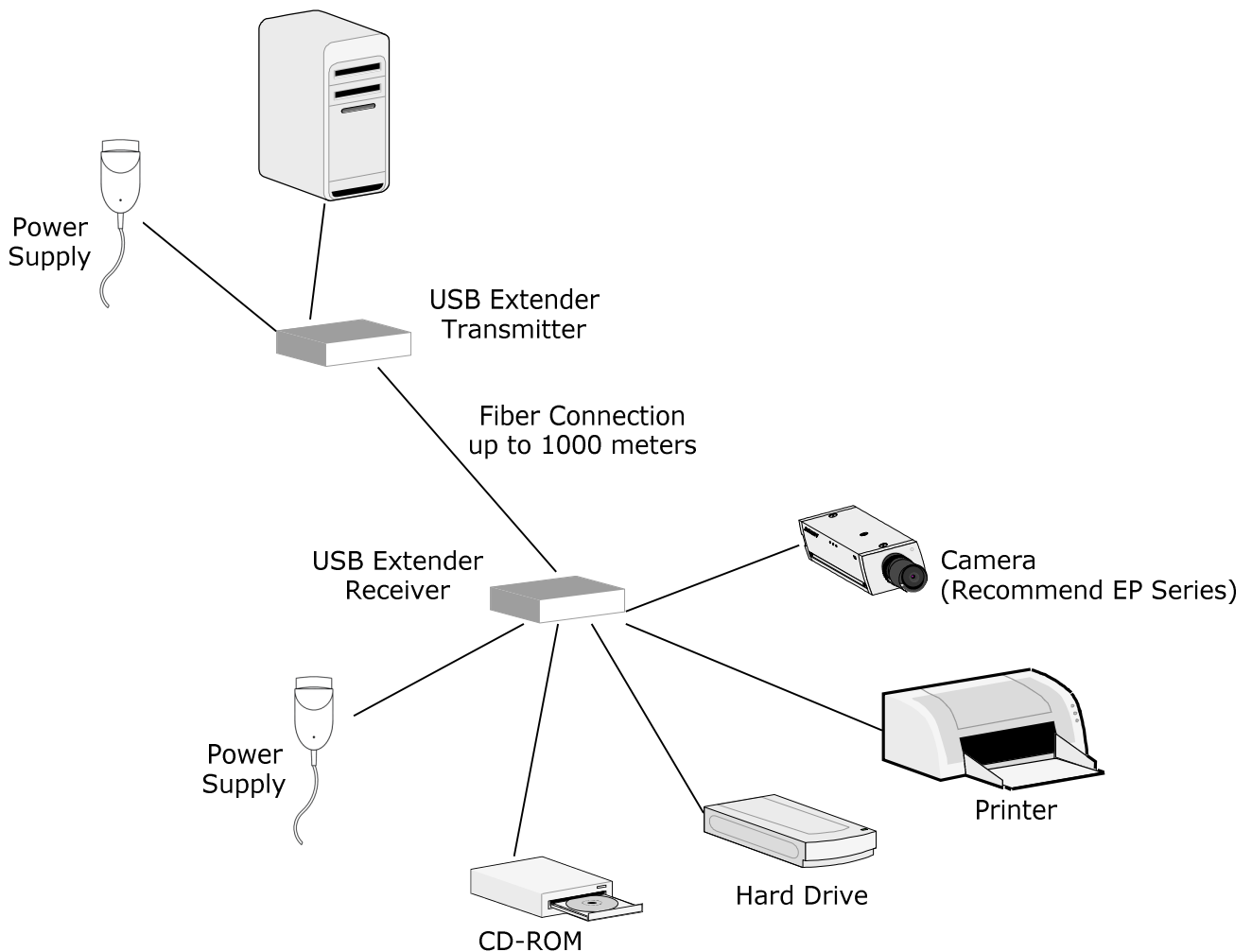
2.1. General System Features

- 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

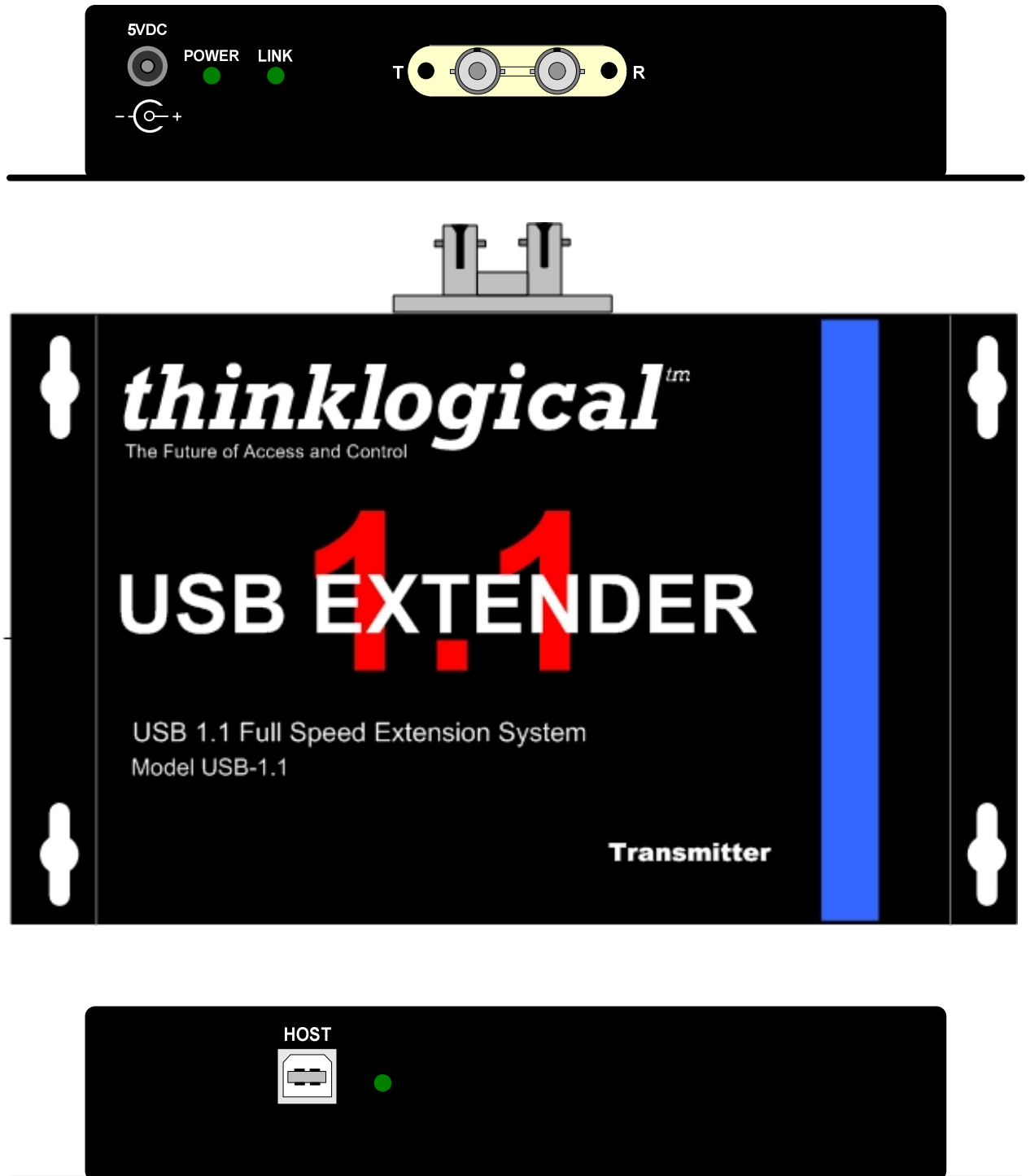
Storage Temperature	-20 to 85 °C (-4 to 185 °F)
Supply Voltage	5.0 VDC ±5%. Adapter has Universal AC Power Input Polarity: Positive Tip Part Number: PWR-000022-R
Power Consumption	5 Watts
Laser Output Specifications	Meets Laser Class 1M Specifications
Panel Connectors	Transmitter: (1) USB Type B connector (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 °C (32 to 122 °F); 10 to 95% RH, non-condensing
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

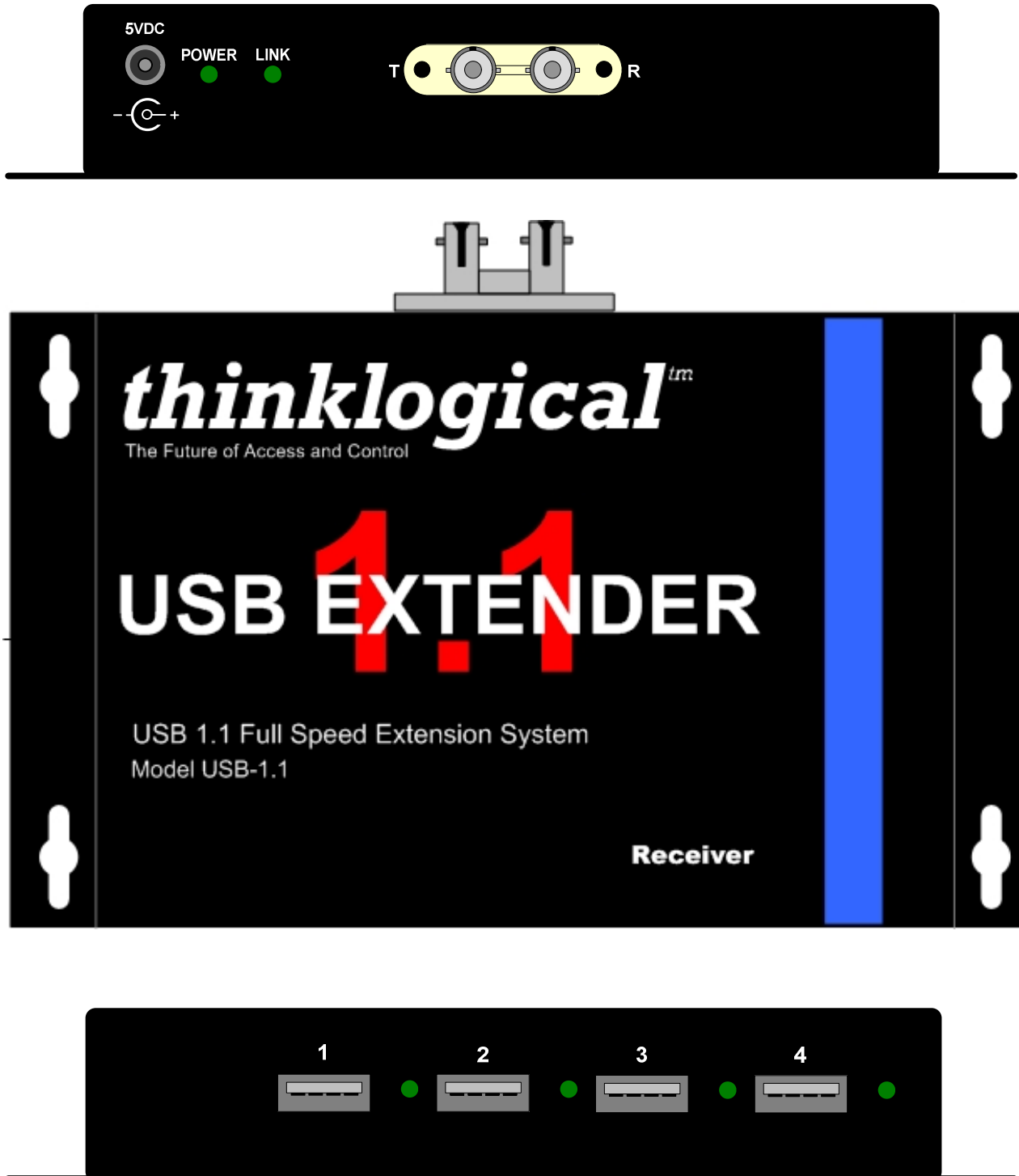


Ability to extend USB devices (USB printers, cameras, web cams, etc) to a host computer up to 1000 meters over standard duplex multi-mode fiber.

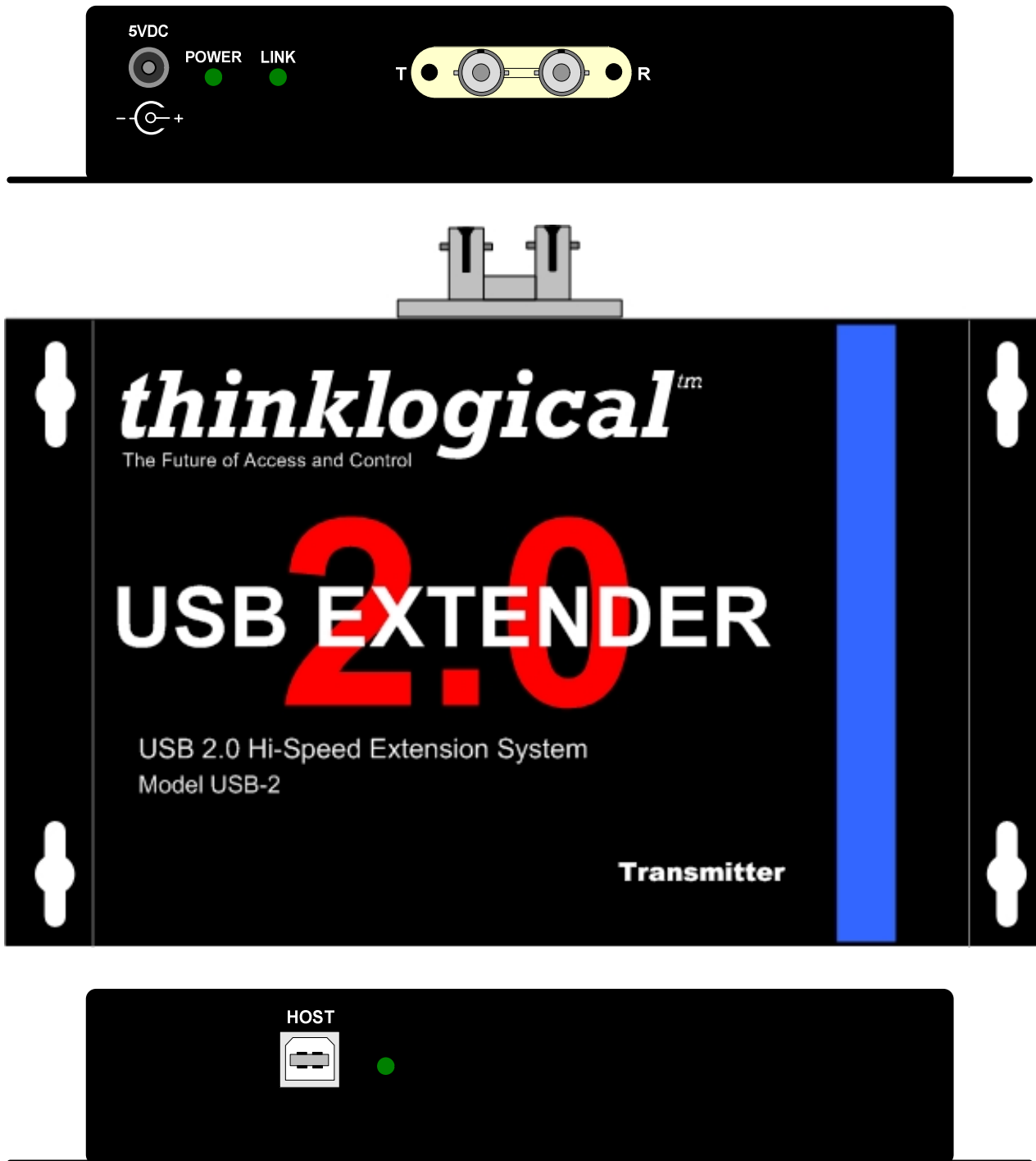
2.3.1. USB 1.1 Transmitter



2.3.2. USB 1.1 Receiver



2.3.3. USB 2.0 Transmitter



2.3.4. USB 2.0 Receiver



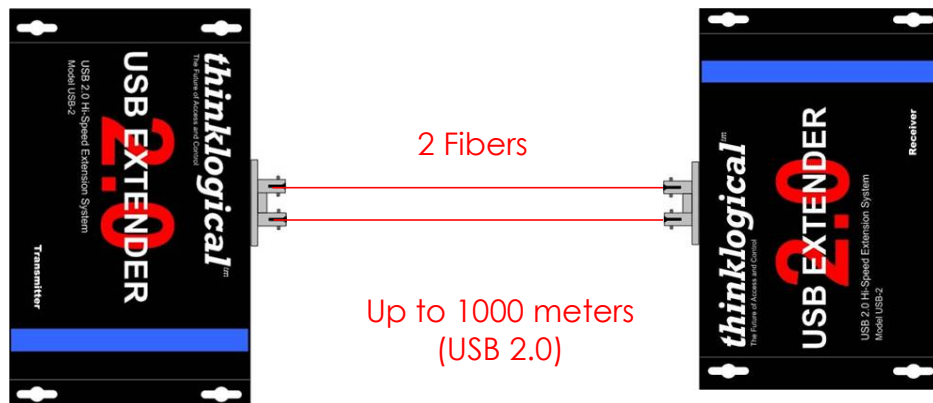
2.3.5. Cables

2.3.5.1. Fiber Optic Cables

Fiber Optic cables for the USB Extender system are not included, but are available for purchase. Please contact ThinklogicalTM 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**.

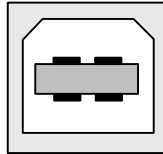
2.3.5.2. USB Type A – Receiver

- ✓ 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.



2.3.5.3. 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.



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

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



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

2.3.7. 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. The green power LED on the front of the units will light when the unit is receiving power.

- ✓ 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. Connect the power supply to the Transmitter and plug corresponding end into a suitable AC power source.
4. Connect the power supply to the Receiver and plug corresponding end into a suitable AC power source.
5. Connect your PC to the Host location (USB Type B Connector) labeled on the Transmitter unit.
6. Connect your devices(s) into the device port(s) (USB Type A Connector) labeled 1,2,3,4 on the Receiver unit.

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 PC (USB Type B Connector labeled Host) is properly connected
Link	Shows the status of the connection LED is ON (solid green) when the Power, Host has enumerated, and Fiber are properly connected LED is BLINKING (blinking green) when the Fiber are properly connected and until the Host enumerates

3.1.2. Receiver

LED Label	Status
Power	LED is ON (solid green) when power supply is properly connected
Device Ports labeled 1, 2, 3, 4	LED is ON (solid green) when the device(s) is (are) properly connected and once the unit enumerates
Link	Shows the status of the connection LED is ON (solid green) when the Power, device port(s), and Fiber are properly connected LED is BLINKING (blinking green) when the Fiber are properly connected and until the Host enumerates

Product: Firewire 800 Extender



1. Introduction

1.1. Contents

1.1.1. Firewire (1394b)

When you receive your ThinklogicalTM 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 ThinklogicalTM:

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

LASER RADIATION
DO NOT VIEW DIRECTLY WITH OPTICAL
INSTRUMENTS

CAUTION: In order to avoid possible exposure to laser energy, it is good practice to attach the fiber optic cables prior to applying power to the Firewire EXTENDER. If the fiber optic cable should become disconnected, DO NOT attempt to look into the cable or the panel mounted connector.

2. System Features

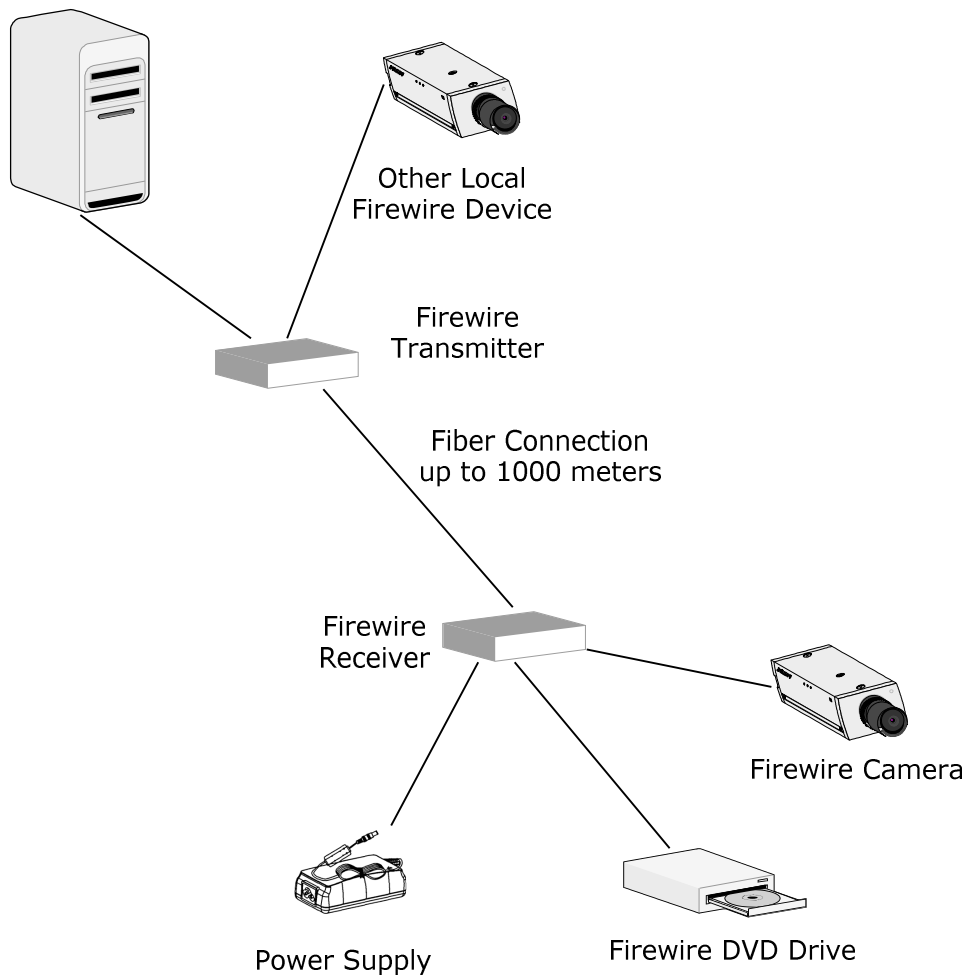
2.1. General System Features

- 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 °C (-4 to 185 °F)
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 <i>*Note: 1394b connectors are rated at 1.5A per connector</i>	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 °C (32 to 122 °F); 10 to 95% RH, non-condensing
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

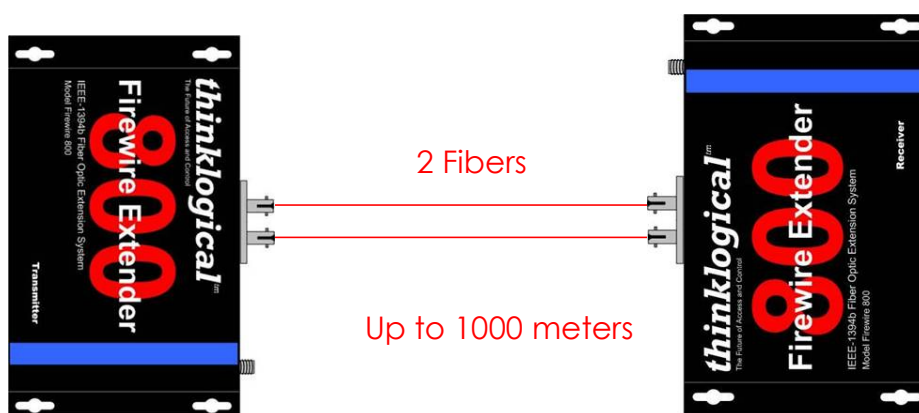


2.3.3. Cables

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.

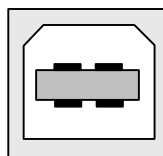


***Note:** Place Transmitter and Receiver units with the fiber panels facing each other. When you connect the fibers, **THE FIBER CABLE SHOULD NOT BE CROSSED.**

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 device(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.

Product Identification

1. Markings

1.1. 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.

1.2. Symbols Found on Product

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

Safety Standards

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

2. External Fiber Connector

- Flammability Rating UL94V0

3. USB 1.1 and 2.0 Power Supply

ThinklogicalTM Part Number: PWR-000022-R

UL File Number: E176177

4. Firewire 800 Power Supply

ThinklogicalTM Part Number: PWR-000033-R

UL File Number: E176177



How to Contact Us

1. Customer Support

Thank you to our customers for choosing a Thinklogical™ product for your application. We appreciate your business and are interested in helping you successfully use our product. Thinklogical™ is here to help you. To contact Thinklogical™, use the following telephone numbers and internet-based methods.

1.1. Website

Check out our website for current product offerings, support information and general information about all of the Thinklogical™ 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. We are constantly updating our website, so be sure to “refresh” your browser when visiting the Thinklogical™ website to see the most up-to-date information.

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.

1.2. Email

Thinklogical™ is staffed Monday through Friday from 8:30am to 5:30pm, 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.

1.3. Telephone

Telephone Sales: Contact our expert technically oriented sales staff via telephone in Milford, CT at (203) 647-8700 or if in the continental US, you may use our toll-free number (800) 291-3211. We are here Monday through Friday from 9:00am to 5:00pm, Eastern Time Zone. Ask for their direct dial phone number when you call.

Telephone Product Support: Contact Product Support via telephone in Milford, CT at (203) 647-8700. The support lines are manned Monday through Friday, 9am to 5pm, Eastern Time Zone.

International Sales: Please contact our US sales staff in Milford, CT at (203) 647-8700. We are here Monday through Friday, 8:30am to 5:30pm, Eastern Time Zone (same as New York City). If leaving a voice message, please provide a "best time to call back" so 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.

1.4. Fax

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



2. Product Support

Thinklogical's support personnel are available Monday through Friday from 8:30am to 5:30pm, Eastern Time Zone. If your application might require 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.

2.1. Warranty

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.

2.2. Return Authorization

If, for some reason you need to return your Thinklogical™ product to us, please get a Return Authorization Number (RA# or RMA#) from thinklogical's Product Support department before sending the unit in. Return Authorization must include contact information (phone preferred) in the event we have any questions.

After receiving your RA number, please ship the unit postpaid, with the RA# prominently displayed on the shipping container. We will contact you about your product once we determine its status.

Products received without Return Authorization and/or contact information may require additional attention on our part that may delay any desired service or support with your system.

2.3. Our Address

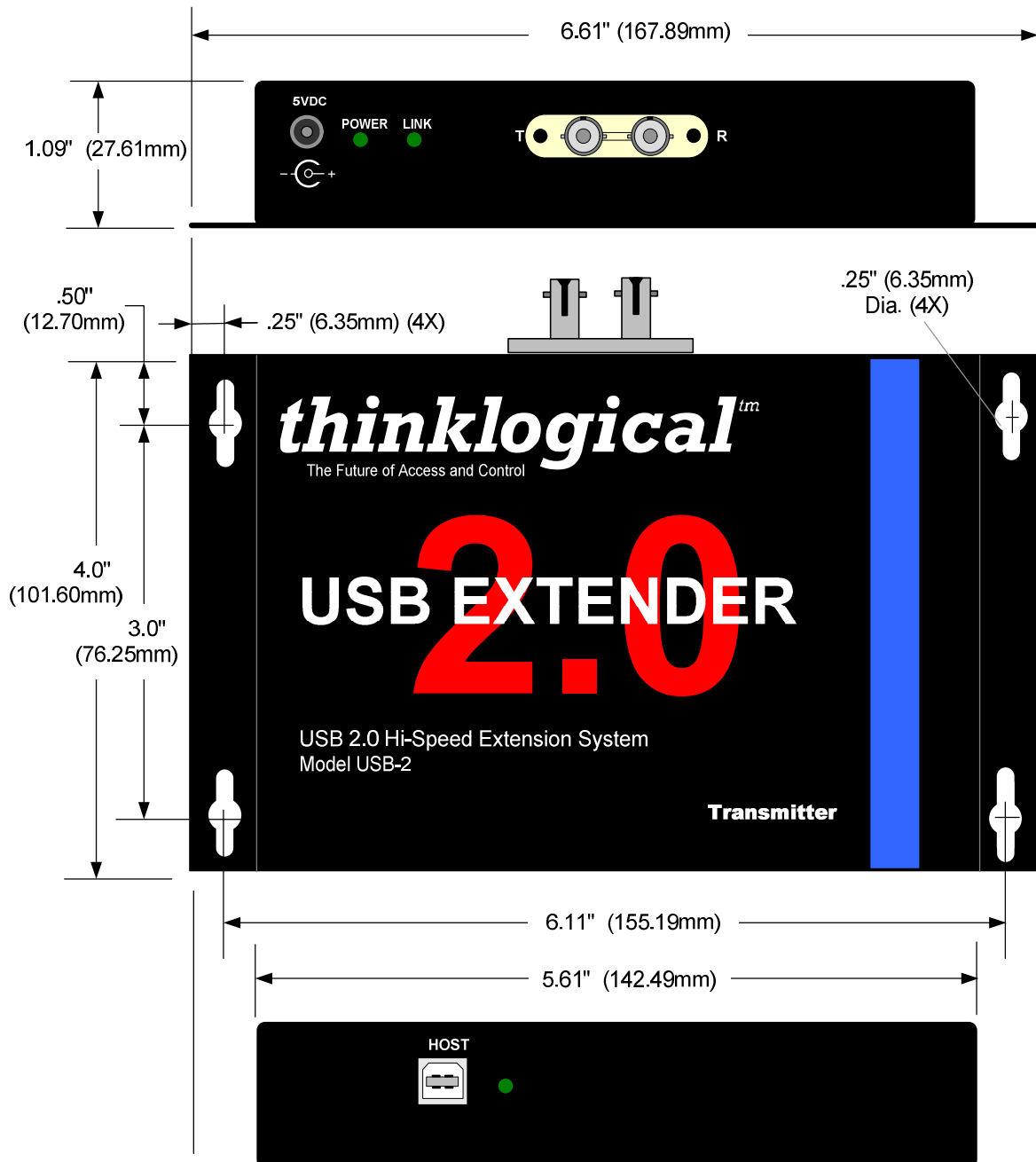
If you have any issue with the product, have product questions or need technical assistance with your USB or FIREWIRE EXTENDER system, please call us at (203) 647-8700 and let us help.

If shipping something with an RA # or if you'd like to write us, we are located at:

Thinklogical™ Inc.
100 Washington Street
Milford, CT 06460 USA

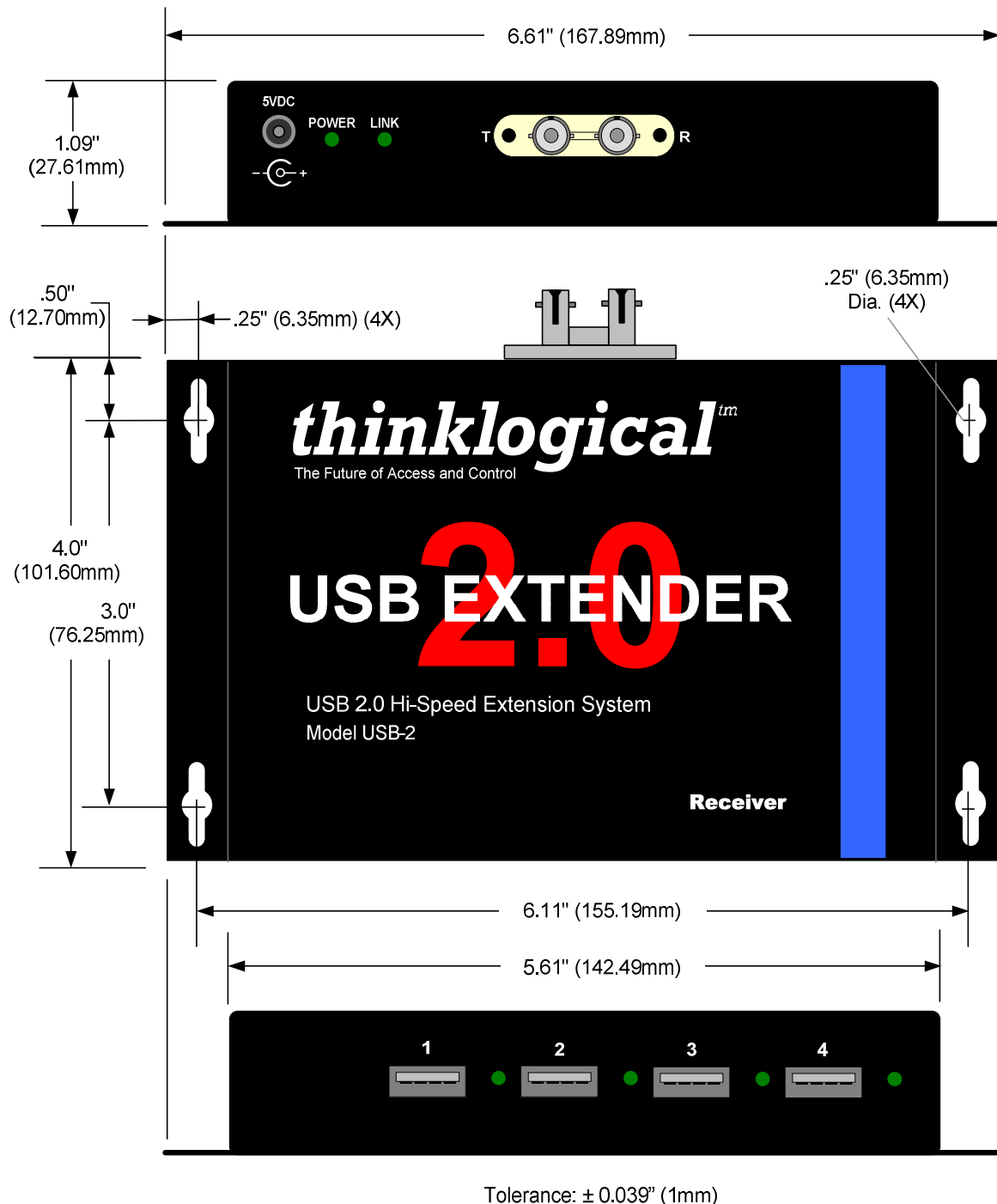
Appendix A - Dimensions

1. USB 1.1 and 2.0 Transmitter

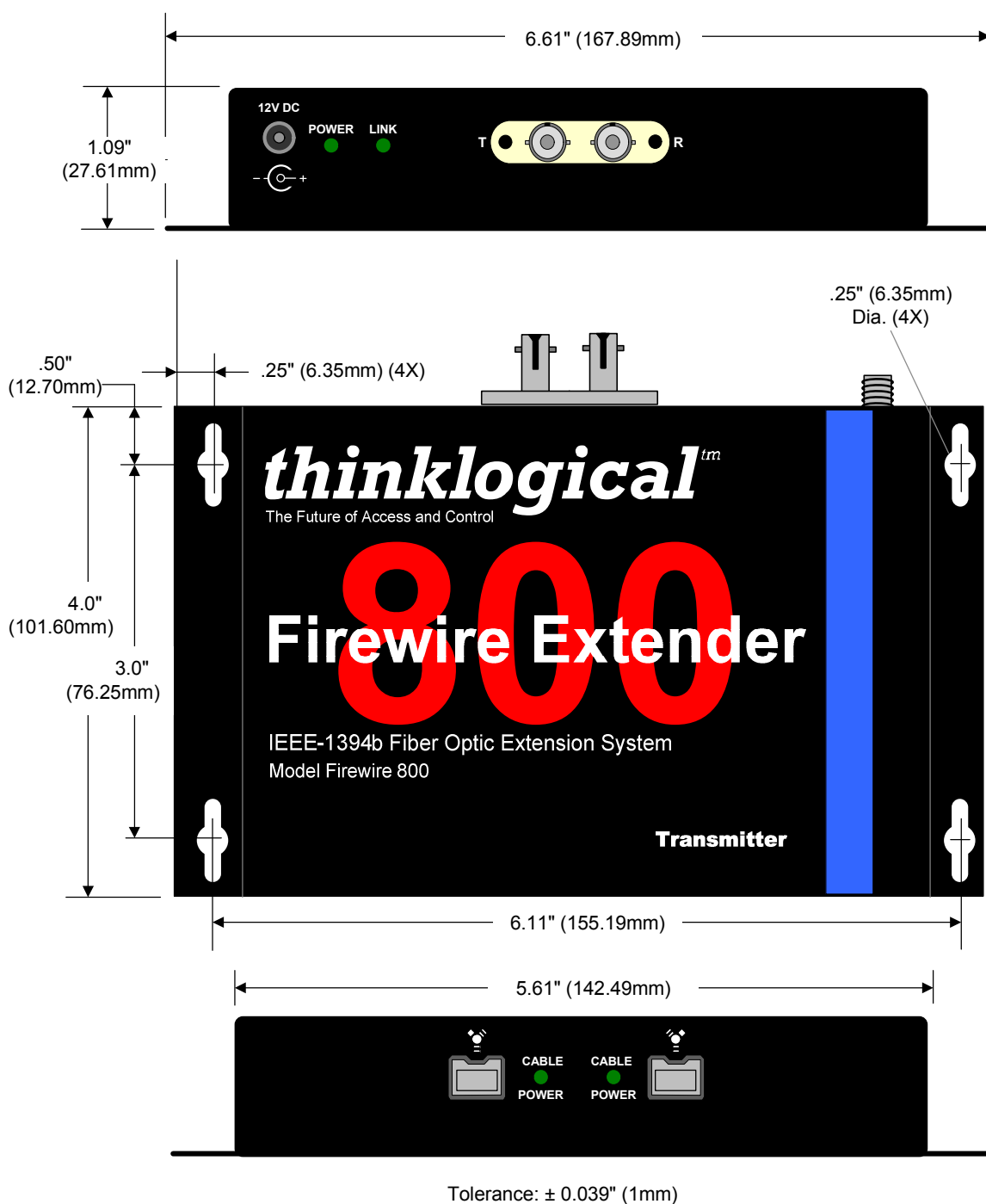


Tolerance: $\pm 0.039"$ (1mm)

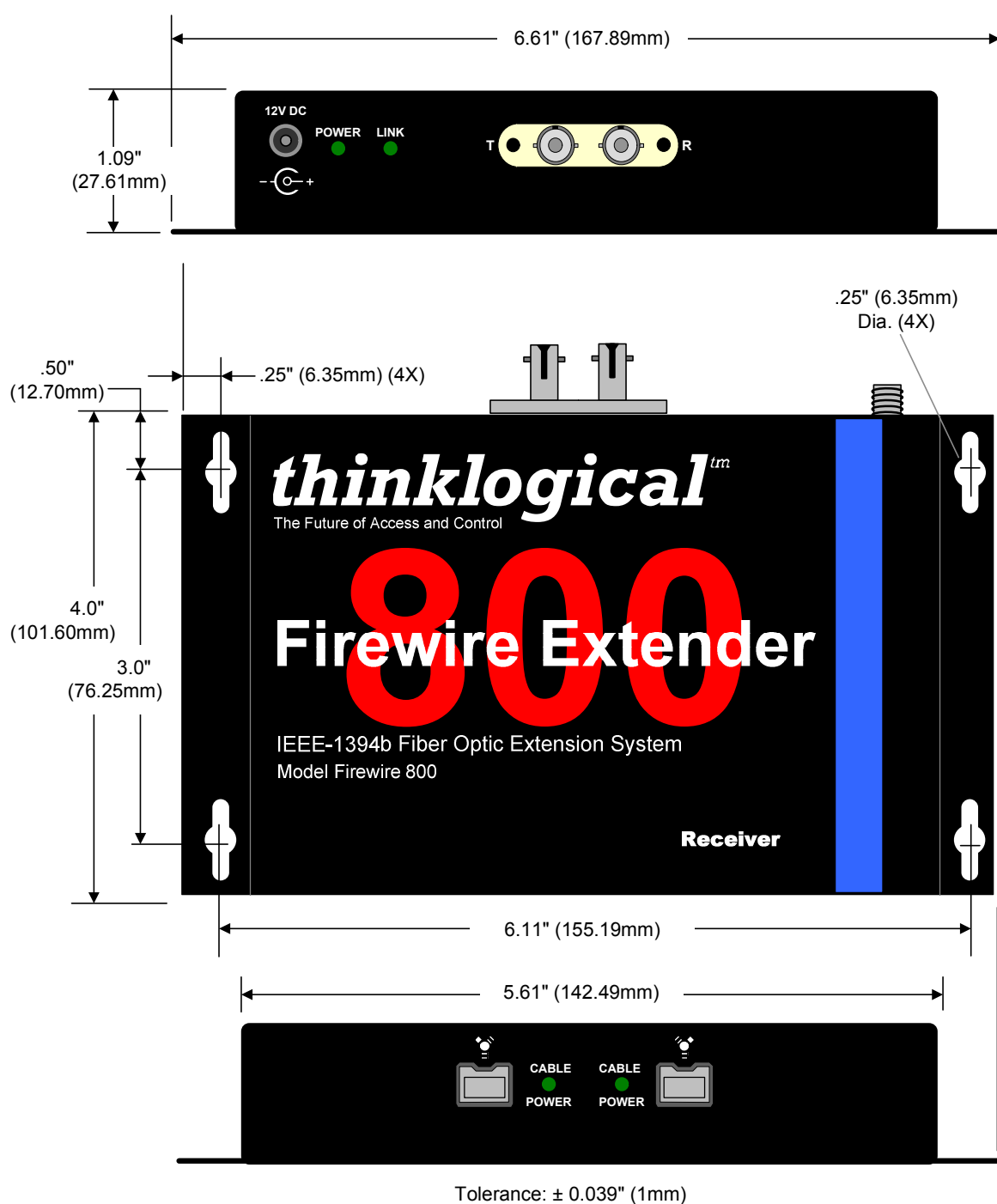
2. USB 1.1 and 2.0 Receiver



3. Firewire 800 Transmitter



4. Firewire 800 Receiver



For Your Notes:

