

USER MANUAL

ICU504A

USB 3.1 CAT6A/7 EXTENDER

24/7 TECHNICAL SUPPORT AT 1.877.877.2269 OR VISIT BLACKBOX.COM



BLACK BOX®

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PRODUCT OPERATION AND STORAGE

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

Do not attempt to open the product casing as this may cause damage and will void the warranty. Use only the power supply provided with this product. When not in use, the product should be stored in a dry location between -4 to +158° F (-20 to +70° C).



CHAPTER 1: SPECIFICATIONS

TABLE 1-1. SPECIFICATIONS

SPECIFICATION	DESCRIPTION
Range	
Point-to-Point	Up to 328 ft. (100 m) over CAT6a/7 cable
USB Device Support	
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
Local Extender	
USB Connector	(1) USB 3.1 Gen 1 Type B
Link Connector	(1) RJ-45 Link
Network Passthrough	(1) RJ-45 LAN
Dimensions	1.3"H x 9.1"W x 5.4"D (3.3 x 23.2 x 13.7 cm)
Enclosure Material	Black Anodized Aluminum
Power Supply	Input: 100–240 VAC; Output: 24-VDC, 1 A
Remote Extender	
USB Connector	(4) USB 3.1 Gen 1 Type A
Link Connector	(1) RJ-45 Link
Network Passthrough	(1) RJ-45 LAN
Dimensions	1.3"H x 9.1"W x 5.4"D (3.3 x 23.2 x 13.7 cm)
Enclosure Material	Black Anodized Aluminum
Available Current	Up to 1.2 A (6 W) to each USB port
Power Supply	Input: 100–240 VAC; Output: 24-VDC, 2.71 A
Environmental	
Operating Temperature Range	32 to 122° F (0 to 50° C)
Storage Temperature Range	-4 to +158° F (-20 to +70° C)
Operating Humidity	20 to 80% relative humidity, noncondensing
Storage Humidity	10 to 90% relative humidity, noncondensing
Compliance	
EMC	FCC Class B, CE Class B
Environmental	RoHS2 (CE)



CHAPTER 2: OVERVIEW

2.1 INTRODUCTION

This guide provides product information for the USB 3.1 CAT6a/7 Extender 4-Port (ICU504A), 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.

The ICU504A enables users to extend beyond the standard 16-foot (5-meter) cable limit for USB peripheral devices. With the Extender, USB device(s) can be located up to 328 feet (100 meters) from the computer. The Extender is composed of two individual units: the local extender and remote extender.

CAUTION: The local and remote extenders may be hot to the touch during operation.

2.2 FEATURES

The USB 3.1 Extender incorporates ExtremeUSB-C™ technology, enabling users to extend USB 3.1 beyond the standard 9.8-foot (3-meter) 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 328 feet (100 meters) of extension when directly connected over CAT 6a/7 cable
- ◆ 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

NOTE: The USB 3.1 Extender 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™

NOTE: For best performance, install the USB 3.1 Extender using Shielded or Foiled CAT 6a/7 cable.

2.3 WHAT'S INCLUDED

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com.

- ◆ (1) Local Extender
- ◆ (1) Remote Extender
- ◆ (1) USB 3.1 Gen. 1 Cable
- ◆ (1) Local Extender 24-VDC, 1-A International Power Adapter
- ◆ (1) Remote Extender, 24-VDC, 2.71-A International Power Adapter
- ◆ (2) Country-Specific Power Cords
- ◆ (1) Quick Start Guide

CHAPTER 2: OVERVIEW

2.4 HARDWARE DESCRIPTION

2.4.1 LOCAL EXTENDER

The local extender connects to the computer using a standard USB 3.1 Gen. 1 cable (included). Power for the local extender is provided by the included 24-V, 1-A adapter.

Figures 2-1 and 2-2 show the front and back of the Local Extender. Table 2-1 describes its components.

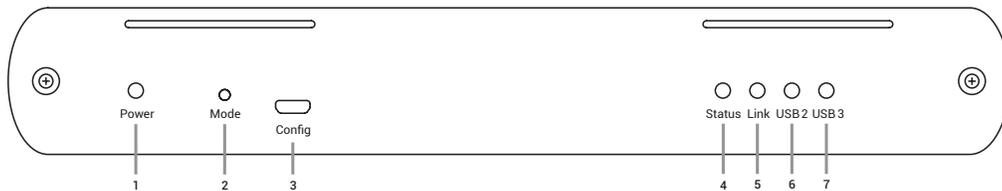


FIGURE 2-1. LOCAL EXTENDER, FRONT VIEW



FIGURE 2-2. LOCAL EXTENDER, BACK VIEW

TABLE 2-1. LOCAL EXTENDER COMPONENTS

NUMBER IN FIGURE 2-1 OR 2-2	COMPONENT	DESCRIPTION
1	Power LED (Green)	LED turns on when DC power is supplied to the unit. LED is off when no power is supplied by the AC adapter.
2	Mode button	Reserved for manufacturer use.
3	Config port	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 (Green)	LED is SOLID ON when Local Extender is linked to an opposite Remote Extender. LED is OFF when there is no connection between the Local and Remote 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 (100/1000 Mbps)	Ethernet passthrough channel connects to a network or Ethernet device.
9	Link Port (RJ-45)	Accepts RJ-45 connector for CAT 6a/7 cabling to connect the Local Extender to the Remote Extender.
10	USB Host Port	USB 3 Type B receptacle used to connect Local Extender to USB 3 Host computer.
11	DC Power Port	Locking connector for the included power adapter – accepts 24-VDC, 1-A.

CHAPTER 2: OVERVIEW

2.4.2 REMOTE EXTENDER

The Remote Extender provides USB 3.1 Type A ports for standard USB devices and allows you to connect up to four USB devices directly. Additional devices may be connected by attaching up to three USB hubs to the Remote Extender. The Remote Extender is powered by an external 24-VAC, 2.71-A adapter, supplying up to 1.2 Amp per USB port.

Figures 2-3 and 2-4 show the front and back of the Remote Extender. Table 2-2 describes its components.



FIGURE 2-3. REMOTE EXTENDER, FRONT VIEW

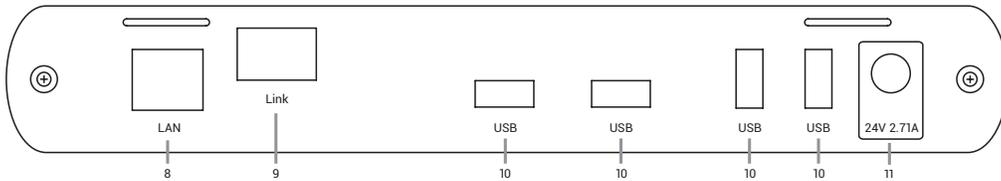


FIGURE 2-4. REMOTE EXTENDER, BACK VIEW

TABLE 2-2. REMOTE EXTENDER COMPONENTS

NUMBER IN FIGURE 2-3 OR 2-4	COMPONENT	DESCRIPTION
1	Power LED (Green)	LED turns on when DC power is supplied to the unit. LED is off when no power is supplied by the AC adapter.
2	Mode button	Reserved for manufacturer use.
3	Config port	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 (Green)	LED is SOLID ON when Remote Extender is linked to an opposite Local Extender. LED is OFF when there is no connection between the Local and Remote 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 (100/1000 Mbps)	Ethernet passthrough channel connects to a network or Ethernet device.
9	Link Port (RJ-45)	Accepts RJ-45 connector for CAT 6a/7 cabling to connect the Remote Extender to the Local Extender.
10	(4) USB Device Ports	Accepts all USB devices.
11	DC Power Port	Locking connector for the included power adapter – accepts 24-VDC, 2.71-A.

CHAPTER 3: INSTALLATION

3.1 CABLING GUIDELINES

The USB 3.1 Extender requires a minimum grade of Category 6a cabling to be used in order to reach 328 feet (100 meters) of extension distance.

NOTE: The total distance of 328 feet (100 meters) also includes the length of the patch cable if one is required. Up to 32.8 feet (10 meters) of patch cable can be used, although the remaining 295 feet (90 meters) distance must consist of solid-core premise cabling.

Depending upon specific application requirements, we recommend that installers keep in mind how they intend to pull/route the link cable and whether to use Shielded or Foiled cable where appropriate.

When installing this product, it is appropriate to use Unshielded (UTP) cabling if the cable run installation meets the following requirements:

- ◆ The cable is not bundled with other cables
- ◆ The cable is run loosely with other Category cables
- ◆ The cable is not placed close to sources of interference such as power lines and radios
- ◆ The cable is not looped or coiled

When installing this product, Foiled (FTP) or Shielded (STP) cabling must be used if the cable run installation requires the following cable run installation:

- ◆ The cable is bundled with other cables
- ◆ The cable is run tight against other Category cables
- ◆ The cable is placed near sources of interference like power lines and radios
- ◆ The cable is looped or coiled

NOTE: For best performance, install the USB 3.1 Extender using Shielded or Foiled CAT6a/7 cable.

3.2 REQUIREMENTS FOR INSTALLING THE EXTENDER

To complete the installation, you will also require the following items that are not included with this system:

- ◆ USB compatible computer (host computer) with a USB compliant operating system
- ◆ USB compatible device(s)
- ◆ CAT6a/7 Unshielded Twisted Pair (UTP) cable with two RJ-45 connectors (if using surface cabling), or CAT6a/7 cabling with two information outlets and two CAT6a/7 patch cords with RJ-45 connectors (if using premise cabling), ensuring the total cable length does not exceed 328 feet (100 meters).



FIGURE 3-1. TYPICAL INSTALLATION

CHAPTER 3: INSTALLATION

3.3 PREPARING YOUR SITE

Before installing the USB 3.1 Extender, you will need to prepare your site:

1. Place the computer where desired and set it up.
2. Locate your USB device(s) within the cable-length of the computer. If not, adjust the location of your device(s) and/or computer accordingly.

NOTE: If you are using surface cabling, the USB 3.1 Extender supports a maximum distance of 328 feet (100 meters). Install the CAT6a/7 cabling as desired and terminate it with the appropriate RJ-45 ends. If using premise cabling, (in-building network infrastructure), ensure your cabling is installed between the two locations and does not exceed 328 feet (100 meters) and that it meets the CAT6a/7 specification.

Cable installation is important, particularly if high throughput applications are used. When installing, ensure the cable is installed away from, or isolated from potential sources of interference such as electrical wiring, fluorescent lighting, etc.

NOTE: When terminating cables, ensure the matching RJ-45 connector is used for the cable type. For example, if CAT6a cable is used, then CAT6a compatible RJ-45 connectors must be used. Otherwise, the benefits of using higher-grade cabling may not be realized.

3.4 INSTALLING THE LOCAL EXTENDER

1. Place the Local 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 Local Extender host port and a USB 3 port on the host computer.

3.5 CONNECTING THE LOCAL EXTENDER TO THE REMOTE EXTENDER

With Surface Cabling:

1. Plug one end of the CAT 6a/7 cable (not included) into the Link port on the Local Extender.
2. Plug the other end of the CAT 6a/7 cable into the Link port on the Remote Extender.

With Premise Cabling:

1. Plug one end of a CAT 6a/7 patch cord (not included) into the Link port on the Local Extender.
2. Plug the other end of the patch cord into the CAT 6a/7 information outlet near the host computer.
3. Plug one end of the second CAT 6a/7 patch cord (not included) into the Link port on the Remote Extender.
4. Plug the other end of the patch cord into the CAT 6a/7 information outlet near the USB device.

NOTE: Do not exceed more than 32.8 feet (10 meters) total of patch cable when using premise cabling.

3.6 INSTALLING THE REMOTE EXTENDER

1. Place the Remote Extender near the USB device(s).
2. Assemble the power adapter and country-specific power cord together and connect them into a suitable AC outlet.
3. Connect the power adapter to the Remote Extender.

CHAPTER 3: INSTALLATION

3.7 CHECKING THE INSTALLATION

1. On the Local and Remote Extenders, check that the Power, Status, Link, USB 2 and USB 3 LEDs are on. If the Link LEDs are permanently off, then the cabling between the Local and Remote Extender may not be installed properly or is defective.
2. For Windows users (XP, 7, 8, 8.1, 10), open Device Manager to confirm that the extender system has been installed correctly. Expand the entry for Universal Serial Bus controllers by clicking the "+" sign. If the extender system has been installed correctly, you should find two separate instances of "Generic SuperSpeed USB Hub" listed.

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

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

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

3. For macOS users, open the System Profiler to confirm that the extender system has installed correctly. In the left-hand column under Hardware, select "USB" and inspect the right hand panel. If the extender 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 macOS: Open the Finder, select Applications, then open the Utilities folder and double click on the System Profiler icon.

4. If the extender system is not detected correctly or fails to detect, please consult the Troubleshooting section in this guide.

3.8 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 Remote Extender.
3. Check that the device is detected and installed properly in the operating system.

3.9 COMPATIBILITY

The USB 3.1 Extender 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.



3.10 OPTIONAL ETHERNET PASSTHROUGH CONNECTION

The Extender offers a 100/1000 Mbps Ethernet pass through connection that can be used for a variety of purposes including:

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

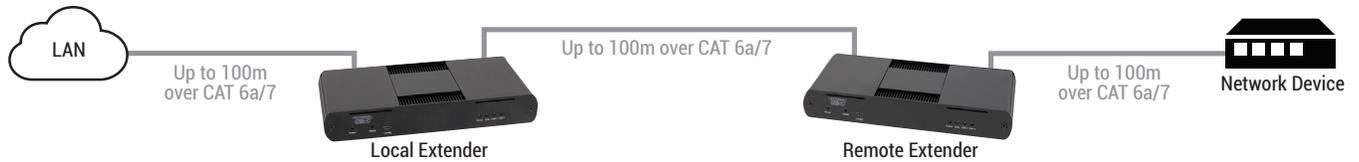


FIGURE 3-2. ETHERNET PASSTHROUGH APPLICATION

Connect any network device or access port into the RJ-45 socket label “LAN” using up to 328 feet (100 meters) of standard CAT5e, 6 or 7 cabling.

CHAPTER 4: MOUNTING OPTIONS

The bottom of the enclosure features four convenient pre-drilled holes for optional mounting. Based on your requirements, choose from two available mounting options:

1. USB Extender Mounting Kit (Purchased separately order USB Mounting Kit - Black (part number IC400MK)
2. USB Extender Direct Surface Mounting (Using your own hardware, stencil provided)

4.1 OPTION 1: USB EXTENDER MOUNTING KIT

Contents:

- ♦ (2) mounting brackets
- ♦ (4) M3 locking washers
- ♦ (4) M3 x 10-mm Phillips screws
- ♦ (1) Mounting bracket installation guide (see diagram)

NOTE: One kit is required to mount per Local Extender or Remote Extender

Using a Phillips screwdriver, in the order as illustrated below, fasten and secure the provided screws, locking washers and brackets into place.

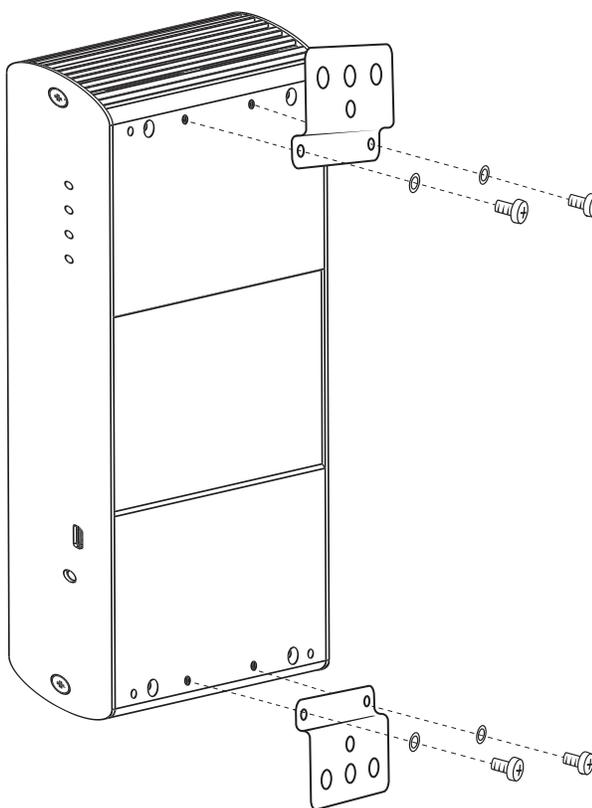


FIGURE 4-1. MOUNTING KIT

Once the bracket mounting is secured onto the extender, it is ready for mounting onto a surface.

NOTE: You will need to provide your own screws to secure the extender using the available slots on each bracket.

CHAPTER 4: MOUNTING OPTIONS

4.2 OPTION 2: USB EXTENDER DIRECT SURFACE MOUNTING (USING YOUR OWN HARDWARE)

The bottom of the enclosure features four pre-drilled holes for optional surface mounting.

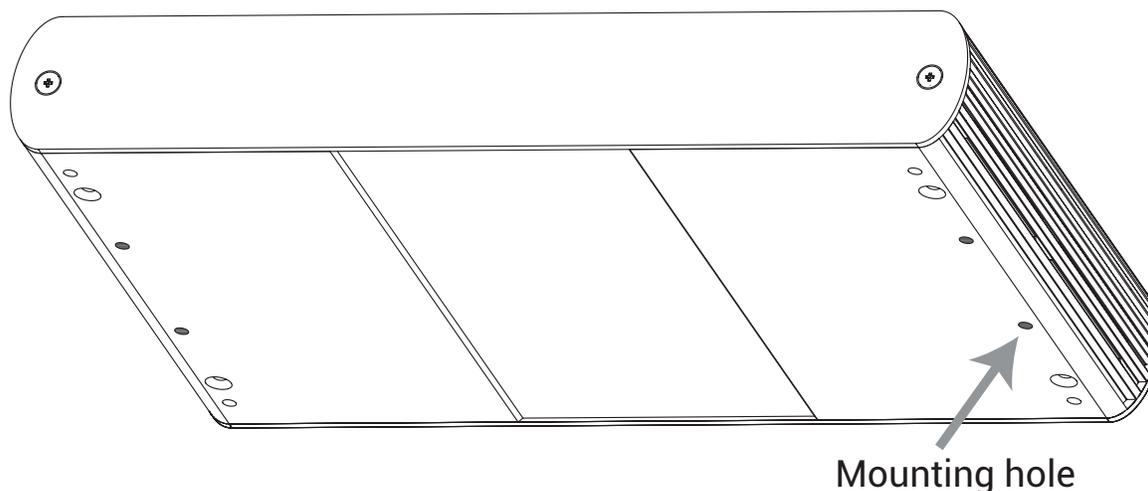


FIGURE 4-2. DIRECT SURFACE MOUNTING

1. Mark the center point of each of the four holes on your mounting surface by directly measuring.
2. Hardware recommendation: M3 locking washers and M3 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 3.97-mm (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, and fasten the extender into place.

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



FIGURE 4-3. DIRECT SURFACE MOUNTING MEASUREMENT STENCIL

CHAPTER 5: TROUBLESHOOTING

5.1 TROUBLESHOOTING TIPS

The following table provides troubleshooting tips. The topics are arranged in the order in which they should be executed in most situations. If you are unable to resolve the problem after following these instructions, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for further assistance.

TABLE 5-1. TROUBLESHOOTING TIPS

PROBLEM	CAUSE	SOLUTION
ALL LEDs are OFF on the Local and/or Remote Extender.	The Local Extender and/or Remote Extender is not receiving power from the AC power adapter.	<ol style="list-style-type: none"> 1. Ensure that the AC power adapter is properly connected to the Local Extender and/or Remote Extender. 2. Check that the AC adapter is connected to a live source of AC power. Check that the Local and/or Remote Extender's Power LED is illuminated.
POWER LED is ON, STATUS LED is OFF.	The unit has malfunctioned and requires re-programming.	Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance.
The Link LEDs on the Local and Remote Extenders are OFF.	There is no connection between the Local and Remote Extenders.	<ol style="list-style-type: none"> 1. Ensure that no more than 328 ft. (100 m) of CAT6a/7 cabling is connected between the Local and Remote Extenders. 2. Connect a short patch cable between the Local and Remote 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.
The LINK LEDs on the Local and Remote Extenders are SOLID ON, but the USB 2 and USB 3 LEDs are OFF.	<ol style="list-style-type: none"> 1. The host computer is not powered on. 2. The Local Extender is not connected to a computer. 3. The host computer does not support USB Hubs. 4. The unit is malfunctioning. 	<ol style="list-style-type: none"> 1. Disconnect all USB devices from the Remote Extender. 2. Disconnect the Local Extender from the host computer. 3. Disconnect the AC adapters from the Local and Remote Extenders. 4. Reconnect the Local Extender to the host computer. 5. Reconnect the AC adapters to the Local and Remote Extenders. 6. Check that the Local and Remote Extenders have enumerated as USB hubs in Windows Device Manager, macOS System Profiler or using "lsusb" command in a Linux Terminal. 7. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance.
The USB 2 LED is SOLID ON, but the USB 3 LED is OFF.	<ol style="list-style-type: none"> 1. The Local Extender is not connected to a USB 3 port. 2. The Local Extender is connected to the host using a USB 2 cable. 3. The USB 3 cable connecting the Local Extender to the host computer is defective. 4. The host computer's USB 3 controller has malfunctioned. 	<ol style="list-style-type: none"> 1. Ensure that the Local Extender is connected to a USB 3 port on the host computer. 2. Ensure that the included USB 3.1 Gen 1 cable is being used between the host computer and Local Extender. 3. Cold boot the host computer. 4. Replace the USB 3.1 Gen 1 cable with a different cable. 5. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance.

CHAPTER 5: TROUBLESHOOTING**TABLE 5-1 (CONTINUED). TROUBLESHOOTING TIPS**

PROBLEM	CAUSE	SOLUTION
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".	<ol style="list-style-type: none"> 1. The USB device is malfunctioning. 2. The computer does not recognize the USB device. 3. The application software for the USB device is not operating. 4. The USB 3 port on the computer is malfunctioning. 5. The USB extender is malfunctioning. 	<ol style="list-style-type: none"> 1. Disconnect the extender from the computer. 2. Connect the USB 3 device directly to the host computer. 3. 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. 4. Update the host computer BIOS, chipset or USB controller drivers from the manufacturer's website. 5. 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. 6. If the second device does not operate as a USB 3 device, the extender may be malfunctioning. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance. 7. If the second device operates as a USB 3 device as expected, the first device may not be compatible with this extender. Contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance.
All LEDs are flashing and the system is operational.	Unit is or was operating at an unsafe temperature.	<ol style="list-style-type: none"> 1. Check ambient temperature. Ensure temperature does not exceed 122° F (50° C). 2. Power cycle the unit to remove LED status.
All LEDs are flashing and the system is NOT operational.	Unit has exceeded a safe operating temperature.	<ol style="list-style-type: none"> 1. Remove external sources of heat or change location of the unit. 2. Power cycle the unit to return to operation.
LEDs are scrolling LEFT to RIGHT, starting with STATUS.	Unit is programming.	Wait for the unit to finish programming.



5.2 CONTACTING TECHNICAL SUPPORT

If you are experiencing problems not referenced in the Troubleshooting Guide, contact Black Box Technical Support at 877-877-2269 or info@blackbox.com for assistance and provide them with the following information:

- ◆ Host computer make and mode
- ◆ Type of operating system installed (e.g. Windows 10, macOS 10.12, etc.)
- ◆ Part number and serial number of both the Local Extender and Remote Extender unit
- ◆ Make and model of any USB device(s) attached to the product
- ◆ Description of the installation
- ◆ Description of the problem

APPENDIX A: REGULATORY INFORMATION

A.1 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.

A.2 CE STATEMENT

We, Black Box Corporation, declare under our sole responsibility that the USB 2.0 ICU504A, to which this declaration relates, is in conformity with European Standard EN 55022, EN 55024, EN55032 and EN 61000.

A.3 IC STATEMENT

This Class A digital apparatus complies with Canadian ICES-003 Issue 6.

A.4 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. Check with your local and state government guidelines for safe disposal and recycling or contact your national WEEE recycling agency for more information.



APPENDIX B: TECHNICAL GLOSSARY

Category 6a/7 (CAT6a/7) Network Cabling: Category 6a/7 cable is commonly also referred to as CAT 6a or CAT 7. This cabling is available in either solid or stranded twisted pair copper wire variants and as UTP (Unshielded Twisted Pair), FTP (Foiled Twisted Pair) or STP (Shielded Twisted Pair). UTP cables are not surrounded by any shielding making them more susceptible to Electromagnetic Interference (EMI). FTP/STP cables include shielding the copper wires and provide better protection against EMI.

USB 3 and USB 2.0 Cables: USB cables have two distinct full-sized 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.

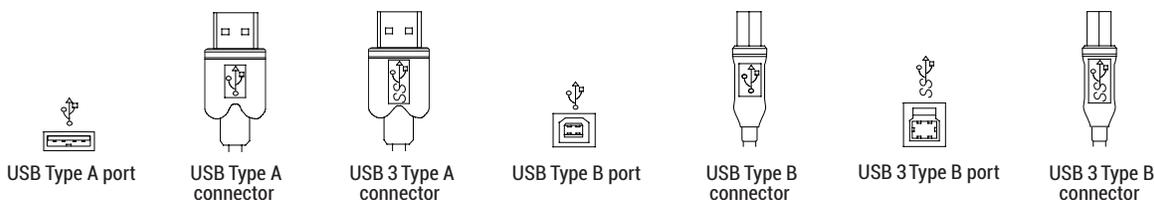


FIGURE B-1. USB TYPE A AND TYPE B CABLE CONNECTORS

RJ-45: The Registered Jack (RJ) physical interface is what connects the network cabling (CAT6a/7) to the local unit and the remote unit. You may use either the T568A scheme (see Table B-1 and Figure B-2) or the T568B scheme (see Table B-2 and Figure B-3) for cable termination. RJ-45 connectors are sometimes also referred to as 8P8C connectors.

NOTE: Any given cable must be terminated using the same T568 scheme on both ends to operate correctly.

RJ-45 Pin Positioning:

TABLE B-1. T568A WIRING

PIN	PAIR	WIRE	CABLE COLOR
1	3	1	White/Green
2	3	2	Green
3	2	1	White/Orange
4	1	2	Blue
5	1	1	White/Blue
6	2	2	Orange
7	4	1	White/Brown
8	4	2	Brown

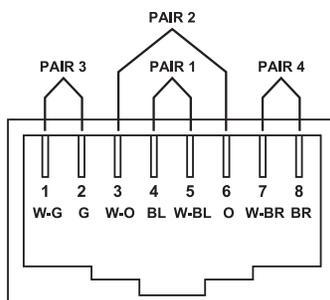


FIGURE B-2. T568A WIRING

APPENDIX B: TECHNICAL GLOSSARY

TABLE B-2. T568B WIRING

PIN	PAIR	WIRE	CABLE COLOR
1	2	1	White/Orange
2	2	2	Orange
3	3	1	White/Green
4	1	2	Blue
5	1	1	White/Blue
6	3	2	Green
7	4	1	White/Brown
8	4	2	Brown

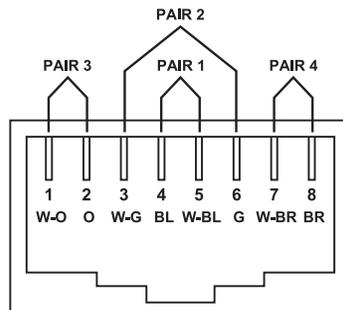


FIGURE B-3. T568B WIRING

APPENDIX C: DISCLAIMER/TRADEMARKS

C.1 DISCLAIMER

Black Box Corporation shall not be liable for damages of any kind, including, but not limited to, punitive, consequential or cost of cover damages, resulting from any errors in the product information or specifications set forth in this document and Black Box Corporation may revise this document at any time without notice.

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