



## 4-Port USB 2.0 Extender over LAN

Easily extend USB 2.0 signals over an IP network or directly over a CATx link.



### Customer Support Information

Order toll-free in the U.S.: Call 877-877-BBOX (outside U.S. call 724-746-5500)  
FREE technical support 24 hours a day, 7 days a week: Call 724-746-5500 or fax 724-746-0746  
Mailing address: Black Box Corporation, 1000 Park Drive, Lawrence, PA 15055-1018  
Web site: [www.blackbox.com](http://www.blackbox.com) • E-mail: [info@blackbox.com](mailto:info@blackbox.com)

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This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

## Instrucciones de Seguridad (Normas Oficiales Mexicanas Electrical Safety Statement)

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc.
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico debe ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.
12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
  - A: El cable de poder o el contacto ha sido dañado; u
  - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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## 1. Specifications

### Technical Specifications

<b>Approvals</b>	EMC: FCC Class B, CE Class B; Environmental: RoHS2 (CE); Standards: 100BASE-T, 1000BASE-T; Data traffic: Layer 2
<b>Current</b>	Remote unit: 600 mA available at each USB port concurrently
<b>Device</b>	Supports USB devices with: Throughput (Maximum): Up to 480* Mbps; Traffic Types: Interrupt and Bulk**; Human Interface Devices (HIDs): mouse and keyboard, hubs, storage devices <i>*NOTE: Maximum speed depends on network configuration, bandwidth, and performance.</i> <i>**NOTE: Isochronous devices such as Web cameras and audio devices are not supported.</i>
<b>Distance</b>	Direct Connect: Up to 330 ft. (100 m) over solid-core CAT5e or better; Network Connect: Up to 330 ft. (100 m) between switches over solid-core CAT5e
<b>Enclosure</b>	Black anodized aluminum
<b>Host</b>	USB host support: xHCI controllers (Intel®, AMD, Renesas [NEC], Fresco, AsMedia)
<b>Connectors</b>	Local Extender Unit: (1) USB 2.0 Type B, (1) RJ-45; Remote Extender Unit: (4) USB 2.0 Type A, (1) RJ-45
<b>Indicators</b>	Each unit (local or remote): (4) LEDs: Power, Link, Host, and Activity
<b>Temperature</b>	Operating: 32 to 122° F (0 to 50° C); Storage: +14 to +140° F (-10 to +60° C)
<b>Humidity</b>	Operating: 20 to 80%, noncondensing; Storage: 10 to 90%, noncondensing
<b>Power</b>	Input: 100–240 VAC, 50–60 Hz; Output: 24 VDC, 1 A
<b>Dimensions</b>	Each unit (local or remote): 1.0"H x 3.9"W x 3.0"D (2.5 x 9.9 x 7.6 cm)

### 2. Overview

#### 2.1 Introduction

Extend USB signals for up to four devices as far as 328 feet (100 m) over a non-networked CAT5e connection or over your Ethernet LAN. The 4-Port USB 2.0 Extender over LAN uses inexpensive UTP cable you may already have installed in your building or your existing LAN architecture for easy, cost-effective USB extension. It's ideal for USB keyboard and mouse extension and sensor/data acquisition applications. Plus, it's great for connecting to whiteboards in classrooms located beyond the maximum USB bus distance. Or use the extender to bridge the gap between a computer CPU or server and USB flash drives, scanners, and printers in other rooms, as well as for connecting USB monitoring cameras or USB touchscreens used for interactive digital signage.

The extender offers reliable operation with all USB 2.0 and 1.1 peripheral devices, including USB hubs. The local unit is powered from the USB interface. The remote unit receives its power from the included AC adapter, and supplies 600 mA to each port.

#### 2.2 Features

- Includes a local unit and remote unit with four USB 2.0 ports.
- Enables easy switching of local and remote extender pairs.
- Supports multiple 1:1 networked configurations.
- Extends USB signals up to 480 Mbps.
- Remote unit supplies 600 mA power to each port concurrently.
- Plug-and-play. No drivers to install on your computer.
- Works with Windows®, Mac® OS X®, and Linux® systems.

#### 2.3 What's Included

Your package should include the following items. If anything is missing or damaged, contact Black Box Technical Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

- (1) Local Extender Unit
- (1) Remote Extender Unit
- (1) USB 2.0 cable
- (1) Remote Extender AC international power adapter
- (1) country-specific power cable
- Quick start guide

To download this user manual, go to [ftp://ftp.blackbox.com/anonymous/manuals/1/IC408A\\_rev1-USER.pdf](ftp://ftp.blackbox.com/anonymous/manuals/1/IC408A_rev1-USER.pdf) or visit the Black Box Web site ([www.blackbox.com](http://www.blackbox.com)) and enter **IC408A** in the search bar.

## 2.4 Hardware Description

Figure 2-1 shows the front and back panels of the Local Extender Unit. Table 2-1 describes the Local Extender components. Figure 2-2 shows the front and back panels of the Remote Extender Unit. Table 2-2 describes the Remote Extender components.

### 2.4.1 Local Extender

The Local Extender connects to the host computer using a standard USB 2.0 cable. Power for this unit is provided by the host computer.

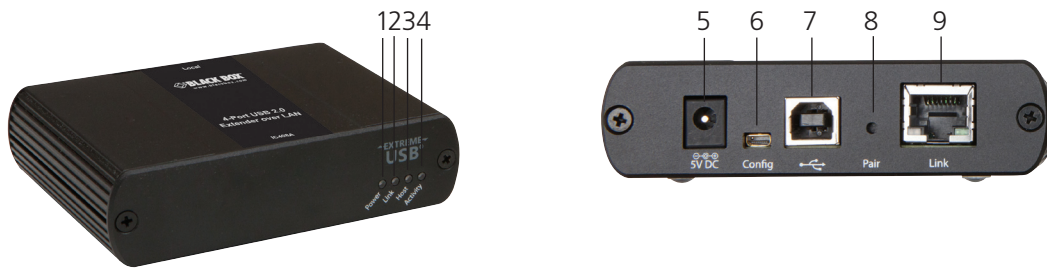


Figure 2-1. Front and back panels of the Local Extender.

Table 2-1. Local Extender components.

Item	Component	Description
1	Power LED (Blue)	ON when power is supplied. OFF when no power is supplied by the host computer.
2	Link LED (Green)	ON when valid link is established between the local and remote extenders. Blinking when the IC408A is in a suspended state. OFF when there is no link between local and remote extenders.
3	Host LED (Green)	ON when the IC408A system is properly enumerated on the host computer. Blinking when IC408A LAN is in a suspended state.
4	Activity LED (Amber)	ON when data is transmitted between the local and remote extender. Blinks intermittently with or without a USB device connected. OFF when the local and remote extender are in suspend mode.
5	Power connector (optional)	Optional 5-VDC power supply plugs in here.
6	Config	Reserved for manufacturer use.
7	USB host port	Used to connect the local extender to the host computer. Local extender port accepts USB 2.0 Type B connectors.
8	Pair	Used to establish a paired connection between local and remote extenders.
9	Link Port (RJ-45)	Local extender accepts an RJ-45 connector for CAT5e (or better) cable to connect the local extender to the remote extender.

### 2.4.2 Remote Extender

The Remote Extender provides four downstream Type A ports for USB 2.0 devices. It enables you to connect up to two USB 2.0 devices directly. The Remote Extender is powered by an external AC adapter and can supply up to 600 mA to each USB port.

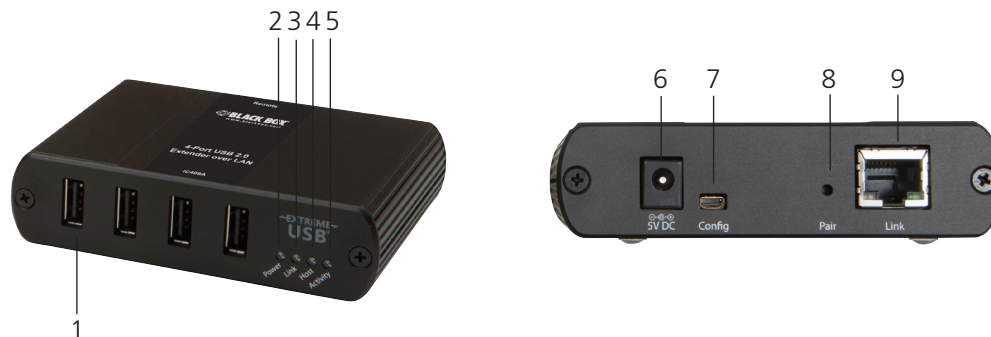


Figure 2-2. Front and back panels of the Remote Extender.

Table 2-2. Remote Extender components.

Item	Component	Description
1	USB device ports	Accepts USB device(s) using Type A connectors.
2	Power LED (Blue)	ON when the unit is powered. OFF when the unit is not powered.
3	Link LED (Green)	ON when local and remote extenders are linked. OFF when there is no link between the local and remote extenders. Fast blinking when the unit unit is attempting to establish a link.
4	Host LED (Green)	ON when the IC408A system is properly enumerated on the host computer. Blinking when the IC408A is in a suspended state.
5	Activity (Amber)	ON when data is transmitted between the local and remote extenders. Blinking intermittently with or without a USB device connected. OFF when the local and remote extender units are in suspend mode.
6	Power Port	Connects to the AC power supply. Required at the remote extender for proper operation.
7	Config	Reserved for manufacturer use.
8	Pair	Used to establish a paired connection between local and remote extenders.
9	Link Port (RJ-45)	Remote extender accepts an RJ-45 connector for CAT5e (or better) cabling to connect the local extender to the remote extender.



## 3. Installation

### 3.1 Installing the IC408A on a Local Area Network

#### 3.1.1 Requirements

To complete the installation, you will also need the following items that are not included with the product.

- USB compatible computer (host computer) with a USB-compliant operating system.
- USB compatible device(s).
- (2) CAT5e patch cables
- Preconfigured local area network.

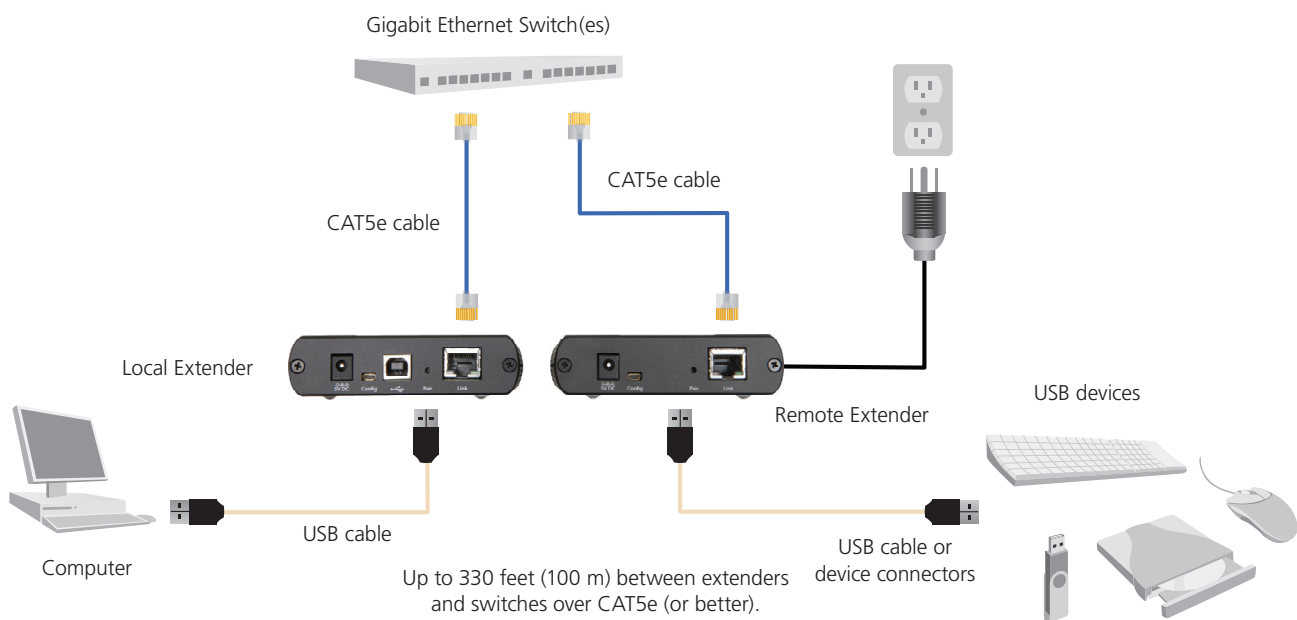


Figure 3-1. IC408A installed on a local area network.

#### 3.1.2 Preparing Your Network

Your network must be properly configured for full USB 2.0 throughput and for maximum stability and reliability of your devices. Consult with your network administrator before installation. Using the IC408A over a network requires:

- Local Extender and Remote Extender to be on the same subnet.
- RJ-45 information outlets to be near the computer and USB devices to be connected to the network switch(es).
- Pre-installed and configured Local Area Network.

*NOTE: USB 2.0 is capable of consuming up to 480 Mbps. The minimum requirement for using the IC408A is a Gigabit (1000BASE-T) network. The performance of the USB network extension will be limited to the slowest link between the Local and the Remote Extender.*

*NOTE: Some networks may be configured to block devices with unfamiliar MAC addresses. In this case, you will need to provide your network administrator the MAC addresses of the Local and Remote Extender units. The addresses are on the label on the bottom of each unit.*

## Chapter 3: Installation

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*NOTE: Some networks may be configured to block devices that consume a consistently high level of bandwidth. The IC408A may do this when high bandwidth devices are connected. Consult with your network administrator to resolve this.*

*NOTE: Units will be paired with each other if they were sold together in the same box. If they are not paired, follow the instructions provided in the section for pairing a Local and Remote Extender.*

*NOTE: Increasing the number of switches between the Local and Remote Extender may reduce the available bandwidth, preventing some devices from functioning properly.*

### 3.1.3 Preparing Your Site

Before you can install the IC408A, you need to prepare your site:

1. Place the computer where desired and set it up.
2. Make sure that where you want to locate the USB device(s) is within 330 feet (100 m) of CAT5e cabling of the switch.
3. Make sure that where you want to locate the computer is within 330 feet (100 m) of CAT5e cabling of the switch.

*NOTE: The cable distance between switches must be no greater than 330 feet (100 m) if CAT5e is used as the connection media.*

### 3.1.4 Installing the Local Extender

1. Place the Local Extender near the computer.
2. Connect the supplied USB cable between the Local Extender host port and a USB port on the host computer.
3. Connect a CAT5e patch cable (not provided) into the information outlet near the host computer.
4. Connect the patch cable into the Link port of the Local Extender.

### 3.1.5 Installing the Remote Extender

1. Connect a CAT5e patch cable (not provided) into the information outlet near the USB devices.
2. Connect the patch cable into the Link port of the Remote Extender.
3. Place the Remote Extender near the USB device(s).
4. Assemble the power adapter and country-specific power cord together and connect them into a suitable AC outlet.
5. Connect the power adapter to the Remote Extender.

## 3.2 Installing the IC408A System as Direct Connect

### 3.2.1 Requirements

To complete the installation, you will need the following items that are not included with the product:

- USB compatible computer (host computer) with a USB compliant operating system.
- USB compatible device(s).
- CAT5e Unshielded Twisted Pair (UTP) cable with two RJ-45 connectors (if using surface cabling), OR, CAT5e cabling with two information outlets and two CAT5e patch cords with RJ-45 connectors (if using premise cabling).

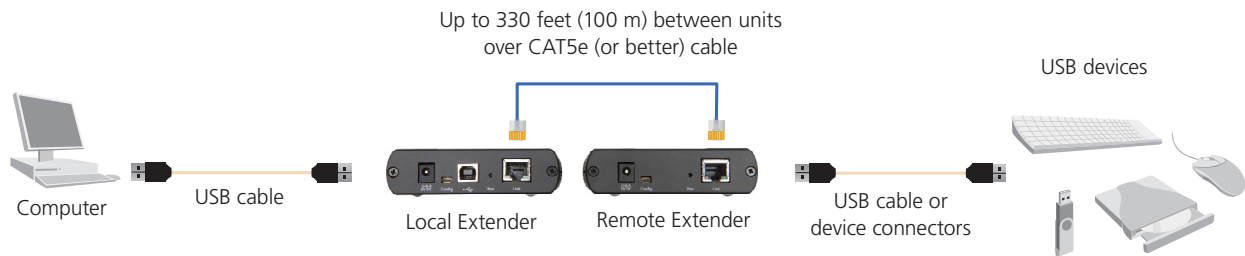


Figure 3-2. IC408A installed as direct connect.

### 3.2.2 Preparing Your Site

Before you can install the IC408A, you need to prepare your site:

1. Place the computer where desired and set it up.
2. Ensure that where you want to locate the USB device(s) is within 330 feet (100 m) cable-length of the computer. If not, adjust the location of the devices and/or computer accordingly.
3. If you are using surface cabling, install the CAT5e cabling as desired and terminate it with the appropriate RJ-45 ends.

If you are using premise cabling, make sure CAT5e cabling is installed between the two locations, and, if necessary, patched together. CAT5e information outlets should be located near the computer and the USB device(s), and the total length, including patch cords, must be less than 330 feet (100 m).

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

*NOTE: When terminating cables, make sure the matching RJ-45 connector is used for the cable type. For example, if CAT6 cable is used, then CAT6 compatible RJ-45 connectors must be used. If not, the benefits of higher grade cabling may not be achieved.*

### 3.2.3 Installing the Local Extender

1. Place the Local Extender near the computer.
2. Connect the supplied USB cable between the Local Extender host port and a USB port on the host computer.

### 3.2.4 Connecting the Local Extender to the Remote Extender

#### With Surface Cabling

1. Connect the CAT5e cable into the Link port of the Local Extender.
2. Connect the CAT5e cable into the Link port of the Remote Extender.

#### With Premise Cabling

1. Connect a CAT5e patch cable (not provided) into the information outlet near the host computer.
2. Connect the patch cable into the Link port of the Local Extender.
3. Connect a CAT5e patch cable (not provided) into the information outlet near the USB devices.
4. Connect the patch cable into the Link port of the Remote Extender.

### 3.2.5 Installing the Remote Extender

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

## Chapter 3: Installation

### 3.3 Checking the Installation

1. On the Local and Remote Extender, check that the Power, Link, and Host LEDs are on.
  - For direct connect, if the Host or Link LEDs are permanently off, then the cabling between the Local and Remote Extender may not be installed properly or is defective.
  - For network connect, if the Link LED is blinking, then the network connection between the Local and Remote Extender is not complete and there may be faulty cabling or network components, misconfigured network components, or the Local and Remote Extender may need to be re-paired together (see Section 3.5).
2. For Windows® users (XP, 7, 8), open Device Manager to confirm that the IC408A has installed correctly. To expand the entry for Universal Serial Bus controllers, click the “+” sign. If the IC408A has been installed correctly, you should find it listed as a “Generic USB Hub.”

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

*NOTE: To open Device Manager in Windows 7 or 8: Open the Start menu, right-click on “Computer,” then select: “Manage >> Device Manager.”*

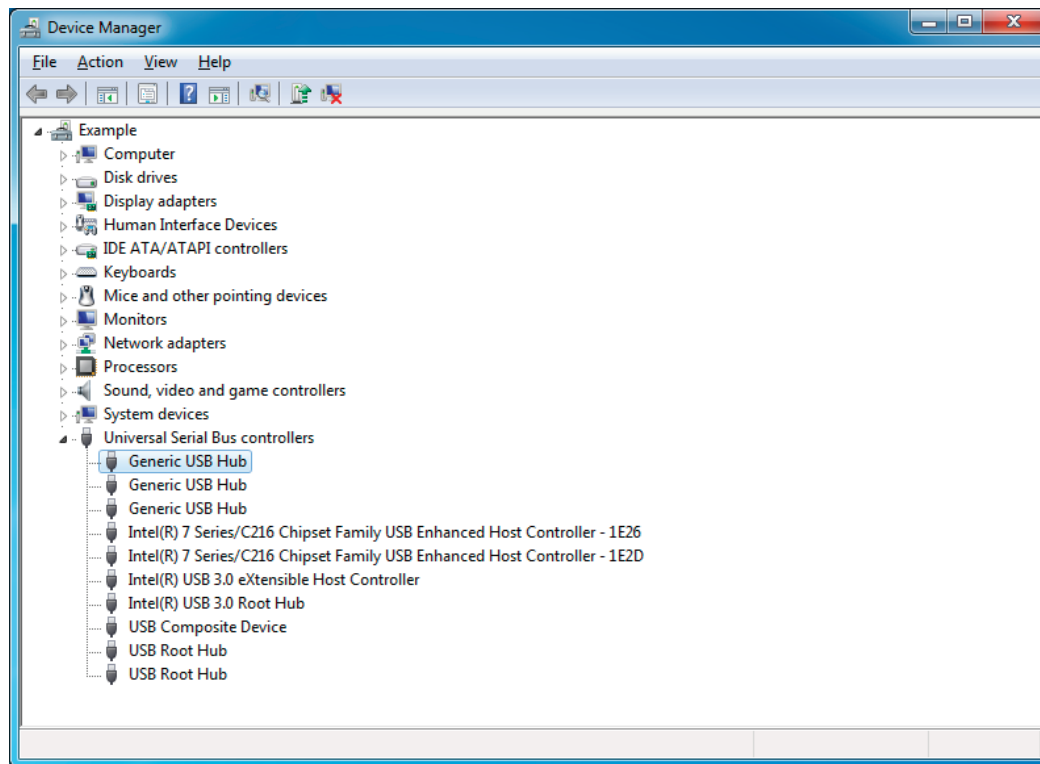


Figure 3-3. Device Manager screen.

3. For Mac OS X users, open the System Profiler to confirm that the IC408A has installed correctly. In the left-hand column under Hardware, select “USB” and inspect the right-hand panel. If the IC408A has been installed correctly, you should find it listed as a “Hub” under the USB High-Speed Bus/USB Bus.

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

4. If the IC408A is not detected correctly or fails to detect, consult Section 4, Troubleshooting.

### 3.4 Connecting a USB Device

1. Install any software required to operate the USB device(s). Refer to the documentation for the USB device(s).
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.

### 3.5 Pairing the Local and Remote Extender

The Local Extender and a Remote Extender will be paired with each other out of the box, so no pairing action should be required. However, if individual extenders have been installed, or you simply wish to change the Local and Remote Extender pairings across a network, then follow these steps (they apply to both direct connect and network configurations for the IC408A):

1. Make sure the Local and Remote Extenders are either directly connected to each other, or are connected to the same subnet on your network.
2. Press and hold the "Pair" button on the back of the Local Extender. Release the button within 10 seconds. The Link LED will start flashing.
3. Within 10 minutes of activating the pair mode on the Local Extender, press and hold the "Pair" button on the back of the Remote Extender. Release the button within 10 seconds. The Link LED will start flashing.
4. The Link LED on both units may start flashing more slowly before finally turning on. Once the Link LEDs are solid, the link is established between both extenders.

*NOTE: If more than 10 minutes passes before the units are paired, then the extenders will switch back to regular mode and re-establish the previous links they had, if any.*

*NOTE: To cancel pair mode, press and hold the "Pair" button a second time. Release it within 10 seconds.*

### 3.6 Unpairing an Extender

If an extender needs to have its pairing removed, press and hold the "Pair" button for longer than 10 seconds. Once you do this, the unit will not be paired to any other extender.

### 3.7 Compatibility

The IC408A complies with USB 1.1 and USB 2.0 specifications governing the design of USB devices. However, there is no guarantee that all USB devices or hosts will be compatible with the IC408A, as there are a number of different characteristics that may impact the operation of USB devices over extended distances.

# Chapter 4: Troubleshooting

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## 4. Troubleshooting

### 4.1 Troubleshooting Tips

The following troubleshooting tips 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 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

**Problem:** All LEDs on the Local Extender are off.

**Cause:** The Local Extender is not receiving power from the USB port.

**Solution(s):**

1. Make sure that the USB connection between the Local Extender and host computer is properly installed.
2. Move the USB connector to another USB port on the host computer.

**Problem:** All LEDs on the Remote Extender are off.

**Cause:** The Remote Extender is not receiving power from the AC adapter.

**Solution(s):**

1. Make sure that the AC power adapter is properly connected to the Remote Extender.
2. Check that the AC adapter is connected to a live source of electrical power. Check that the remote power LED is illuminated.

**Problem:** Link LEDs on Local and the Remote Extenders are off.

**Cause(s):** There is no connection between the Local and Remote Extenders.

**Solution(s):**

1. Make sure that CAT5e cable is connected between the Local and Remote Extenders. Use CAT5e or better cable, UTP with a straight-through connector and no crossovers, and 8-conductor RJ-45 connectors at both ends.
2. Connect a short CAT5e patch cord between the Local and Remote Extenders to determine if the original CAT5e cable is defective.

**Problem:** Link LEDs are blinking.

**Cause(s):**

1. There is no connection between the Local and Remote Extenders.
2. Units may not be paired to each other.
3. Network switches exist on different subnets.
4. Network switch(es) are blocking traffic from the extenders.

**Solution(s):**

1. Make sure both the Local and Remote Extenders are connected together directly or are connected to active network switches.
2. Re-pair the units together.
3. Make sure the network switches can communicate with each other and are on the same subnet.

4. Make sure the network switches are not blocking traffic from the extenders, either based on MAC address or because of traffic patterns.
5. Consult with your network administrator.

**Problem:** Link LEDs on the Local and Remote Extenders are blinking slowly.

**Cause:** The extenders are paired with each other, but have not yet established a link.

**Solution(s):**

1. Wait for a few minutes for the LEDs to go solid.
2. If LEDs do not go solid, contact your network administrator to determine if any traffic is being blocked between the extenders.

**Problem:** Link LED on the Local Extender is on, Host LED on the Local Extender is off.

**Cause:**

1. The host computer is not powered on.
2. The Local Extender is not connected to the computer.
3. The host computer is not recognizing the Local Extender.
4. The computer does not support USB hubs.
5. The IC408A is malfunctioning.

**Solution(s):**

1. Disconnect all USB devices from the Remote Extender.
2. Disconnect the Local Extender from the computer.
3. Disconnect the Remote Extender from the AC power adapter.
4. Reconnect the Local Extender to the computer.
5. Reconnect the Remote Extender to the computer.
6. In the Universal Serial Bus (USB) controllers section of Device Manager, check that the IC408A is recognized as "Generic USB Hub."

**Problem:** My USB device does not work properly.

**Cause:** Insufficient bandwidth is available on the network to support the device.

**Solution:** Connect the Local and Remote Extenders directly to each other and try the USB device again.

## Chapter 4: Troubleshooting

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**Problem:** My USB device does not work at all.

**Cause(s):**

1. Insufficient bandwidth is available on the network to support the device.
2. The Local Extender is paired to the wrong Remote Extender.

**Solution(s):**

1. Connect the Local and Remote Extenders directly to each other and try the USB device again.
2. Follow the instructions in Section 3.5 and pair the Local to the Remote Extender that is connected to the device you wish to use.

### 4.2 Contacting Black Box

If you determine that your 4-Port USB 2.0 Extender over LAN is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box Technical Support at 724-746-5500 or [info@blackbox.com](mailto:info@blackbox.com).

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

### 4.3 Shipping and Packaging

If you need to transport or ship your 4-Port USB 2.0 Extender over LAN:

- Package it carefully. We recommend that you use the original container.
- If you are returning the unit, make sure you include everything you received with it. Before you ship for return or repair, contact Black Box to get a Return Authorization (RA) number.



5. Technical Glossary

**Category 5 (CAT5) Network Cabling** — Category 5 cable is commonly also referred to as CAT5. This cabling is available in either solid or stranded twisted pair copper wire variants and as UTP (Unshielded Twisted Pair) or STP (Shielded Twisted Pair). UTP cables are not surrounded by any shielding, making them more susceptible to electromagnetic interference (EMI). STP cables include shielding over each individual pair of copper wires that provides better protection against EMI. Category 5 has been superseded by CAT5e cabling, which includes improved data integrity to support high-speed communications.

**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.

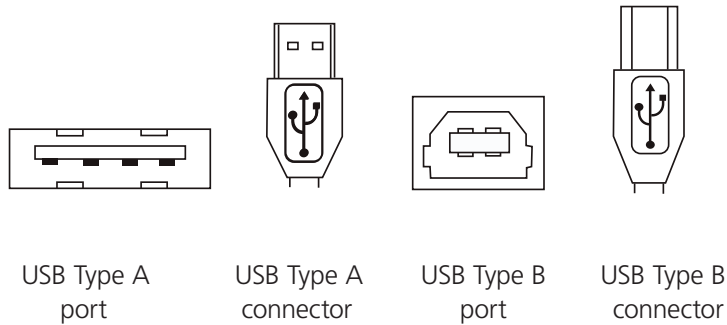


Figure 5-1. USB cables.

**RJ-45** — The Registered Jack (RJ) physical interface is what connects the network cabling (CAT5) to the local extender and remote extender. You may use either the T568A scheme (Table 5-1) or the T568B scheme (Table 5-2) for cable termination because the extender uses all four pairs of the cable. RJ-45 connectors are sometimes also referred to as 8P8C connectors.

**RJ-45 Pin Positioning** —

Table 5-1. 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

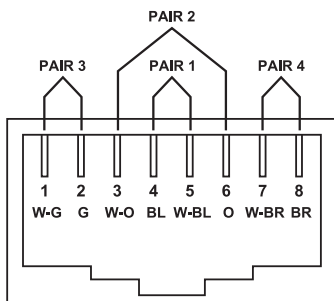


Figure 5-2. T568A connector pinout.

Table 5-2. 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

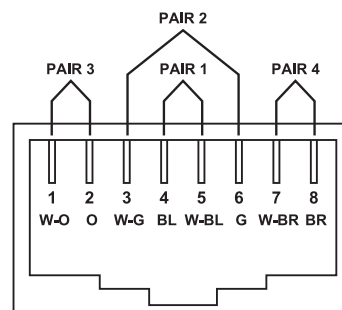


Figure 5-3. T568B connector pinout.





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