

CAT5 USB 1.1 Single-Port Extender

Extend USB devices up to 40 meters (131 feet).

**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,
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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.

Normas Oficiales Mexicanas (NOM) Electrical Safety Statement INSTRUCCIONES DE SEGURIDAD

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.

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 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 deber 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

Approvals	FCC Part 15 Class A, CE Class A, CES-003 Class A, ESD (EN61000) Criteria A, EFT (EN61000) Criteria A
Current	Maximum current available to USB device at remote extender unit: 400 mA when Remote Extender is supplied with 600 mA
Distance	131 ft. (40 m) over solid-core CAT5e (or better) cable <i>NOTE: Up to 278 ft. (85 m) may be achieved with low-speed HIDs such as keyboard and mouse.</i>
Environmental	Operating Temperature: 32 to 122° F (0 to 50° C); Storage Temperature: -4 to +158° F (-20 to +70° C); Operating Humidity: 20 to 80% relative humidity, noncondensing; Storage Humidity: 10 to 90% relative humidity, noncondensing
USB Support	USB device: High-speed devices (USB 2.0) at full-speed (USB 1.1) rates, Full-speed devices (USB 2.0 and 1.1), Low-speed devices (USB 2.0 and 1.1); USB hub: Any single chain can include up to 3 USB hubs, depending on which USB devices are being extended. Extension distance will be reduced with each hub added to the system.; USB host: EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
Connectors	Local Extender: (1) USB Type A, (1) RJ-45; Remote Extender: (1) USB Type A, (1) RJ-45
Dimensions	Each unit (local or remote): 0.98"H x 3.34"W x 1.57"D (2.5 x 8.5 x 4 cm)
Weight	0.292 lb. (0.109 kg)

2. Overview

2.1 Introduction

The CAT5 USB 1.1 Single-Port Extender enables users to extend USB devices up to 131 feet (40 meters). Extension distances up to 278 feet (85 meters) may be achievable with low-speed HID devices such as keyboards and mice.

2.2 What's Included

- Local Extender
- Remote Extender
- This user's manual

2.3 Additional Items You Will Need

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

- USB 1.1 or 2.0 compatible computer (host computer) with a USB compliant operating system
- USB 1.1 or 2.0 compatible device(s)
- CAT5 Unshielded Twisted Pair (UTP) cable with two RJ-45 connectors (if using surface cabling),

OR

CAT5 cabling with two information outlets and two CAT5 patch cords with RJ-45 connectors (if using premise cabling)

NOTE: All references to CAT5 cable in this document refer to solid-core and represent the minimum requirement.

2.4 Hardware Description

2.4.1 Local Extender

The Local Extender connects to the computer using the upstream USB Type A connector.

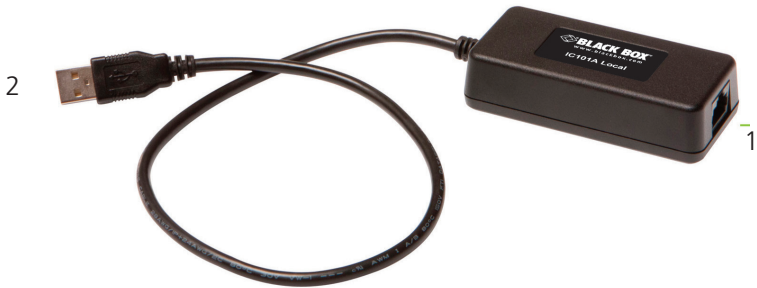


Figure 2-1. Local extender.

Table 2-1. Local Extender components.

Number in Figure 2-1	Type	Description
1	Link port (RJ-45)	Accepts RJ-45 connector for CAT5 (or better) cabling.
2	Device port (USB Type A)	Used to connect the Local Extender unit to the host computer.

2.4.2 Remote Extender

The Remote Extender provides one downstream USB Type A port for a standard USB device. Additional devices may be connected by attaching USB hubs.



Figure 2-2. Remote extender.

Table 2-2. Remote Extender components.

Number in Figure 2-2	Type	Description
1	Link port (RJ-45)	Accepts RJ-45 connector for CAT5 (or better) cabling.
2	Device port (USB Type A)	Accepts USB device(s).

3. Installation

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

1. Determine where the computer is to be located and set up the computer.
2. Determine where you want to locate the remote USB device(s).
3. If you are using surface cabling, the product supports a maximum distance of 131 feet (40 m).

OR

If you are using premise cabling, ensure CAT5 cabling is installed between the two locations, with CAT5 information outlets located near both the computer and the USB device(s), and the total length, including patch cords, is no more than 131 feet (40 m).

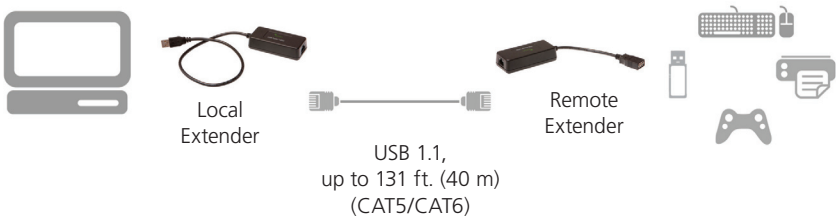


Figure 3-1. Typical installation.

3.1 Installing the Local Extender Unit

1. Place the Local Extender unit near the computer.
2. Plug the USB cable from the Local Extender into an available USB 2.0/1.1 Type A Port on the computer.

3.2 Installing the Remote Extender Unit

1. Place the Remote Extender unit near the USB device(s) in the desired remote location.
2. Plug in your USB Device.

Chapter 3: Installation

3.3 Connecting the Local Extender to the Remote Extender

NOTE: Extension length is reduced for each USB hub added to the system. There is a 43.3-foot (13.2-meter) reduction in extension distance for each USB hub added to the system. This includes hubs added on the Local Extender or Remote Extender side.

NOTE: The Extender cannot be daisy-chained together. A system can have only one Local Extender and one Remote Extender.

3.3.1 With Surface Cabling

1. Plug one end of the CAT5 cabling (not included) into the Link port (RJ-45) on the Local Extender unit.
2. Plug the other end of the CAT5 cabling into the Link port (RJ-45) on the Remote Extender unit.

3.3.2 With Premise Cabling

1. Plug one end of a CAT5 patch cord (not included) into the Link port (RJ-45) on the Local Extender unit.
2. Plug the other end of the patch cord into the CAT5 information outlet near the host computer.
3. Plug one end of the second CAT5 patch cord (not included) into the Link port (RJ-45) on the Remote Extender unit.
4. Plug the other end of the second patch cord into the CAT5 information outlet near the USB device.

3.4 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 unit.

3.5 Checking the Installation

NOTE: Check if the USB device is detected by your operating system.

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

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

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

4. Troubleshooting

4.1 Problems/Solutions

This section 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, please contact Technical Support for further assistance.

Problem: The USB device does not operate correctly.

Possible Cause:

- The USB device is malfunctioning.
- The computer does not recognize the USB device.
- The application software for the device is not operating.
- The Extender is malfunctioning.

Solution:

1. Un-install and re-install the driver for the USB device.
2. Update the driver for the USB device.
3. Directly connect the USB device to the Host to verify the USB device operates correctly.
4. Contact Technical Support.

Problem: The USB device is detected as an “Unknown Device” in the Operating System.

Possible Cause:

- The USB device’s timing is outside of the USB 1.1 specification.
- The Extender is malfunctioning.

Solution:

1. Connect the Remote Extender to the Local Extender using a patch cable.
2. Unplug the Local Extender from the host and wait 15 seconds. Then plug the Local Extender back into the host.
3. Contact Technical Support.

Problem:

The USB device is detected as using too much power in the Operating System.

Possible Cause:

- The USB device needs more power than the Extender can support.
- The Host is not providing enough power to the Extender.

Solution:

1. Connect the Local Extender to a different USB port on the Host.
2. Connect a self-powered USB hub between the Remote Extender and the USB device.

4.2 Contacting Black Box

If you determine that your CAT5 USB 1.1 Single-Port Extender 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.

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 CAT5 USB 1.1 Single-Port Extender:

- 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.

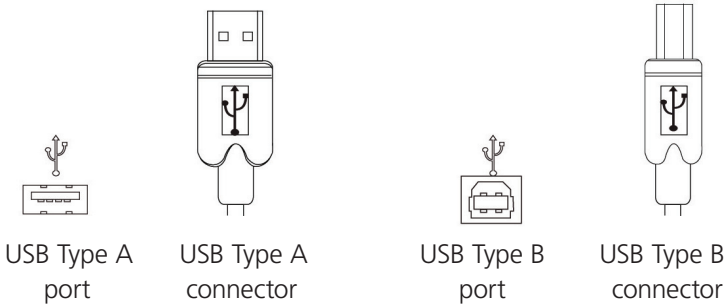


Figure 5-1. USB cables.

Chapter 5: Technical Glossary

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

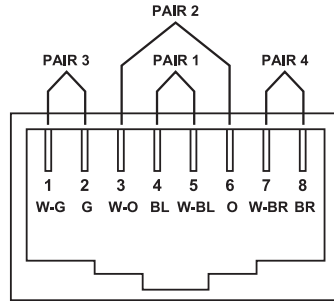


Figure 5-2. T568A connector pinout.

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

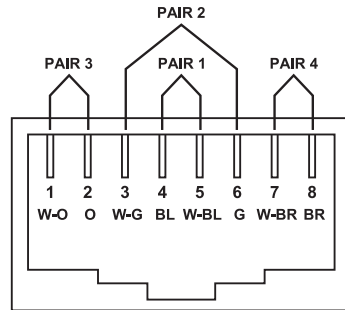


Figure 5-3. T568B connector pinout.

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