

CrystalLink USB1.1 Extender

Mini USB1.1 Cat5e/6/7 Extender

Installation and Operation Manual



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LIMITED WARRANTY

Rose Electronics® warrants the CrystalLink USB1.1 Extender to be in good working order for one year from the date of purchase from Rose Electronics or an authorized dealer. Should this product fail to be in good working order at any time during this one-year warranty period, Rose Electronics will, at its option, repair or replace the Unit as set forth below. Repair parts and replacement units will be either reconditioned or new. All replaced parts become the property of Rose Electronics. This limited warranty does not include service to repair damage to the Unit resulting from accident, disaster, abuse, or unauthorized modification of the Unit, including static discharge and power surges.

Limited Warranty service may be obtained by delivering this unit during the one-year warranty period to Rose Electronics or an authorized repair center providing a proof of purchase date. If this Unit is delivered by mail, you agree to insure the Unit or assume the risk of loss or damage in transit, to prepay shipping charges to the warranty service location, and to use the original shipping container or its equivalent. You must call for a return authorization number first. Under no circumstances will a unit be accepted without a return authorization number. Contact an authorized repair center or Rose Electronics for further information.

ALL EXPRESS AND IMPLIED WARRANTIES FOR THIS PRODUCT INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO A PERIOD OF ONE YEAR FROM THE DATE OF PURCHASE, AND NO WARRANTIES, WHETHER EXPRESS OR IMPLIED, WILL APPLY AFTER THIS PERIOD. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

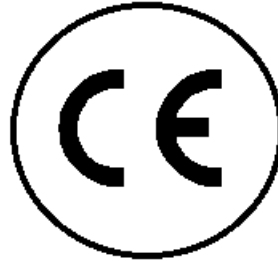
IF THIS PRODUCT IS NOT IN GOOD WORKING ORDER AS WARRANTIED ABOVE, YOUR SOLE REMEDY SHALL BE REPLACEMENT OR REPAIR AS PROVIDED ABOVE. IN NO EVENT WILL ROSE ELECTRONICS BE LIABLE TO YOU FOR ANY DAMAGES INCLUDING ANY LOST PROFITS, LOST SAVINGS OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF OR THE INABILITY TO USE SUCH PRODUCT, EVEN IF ROSE ELECTRONICS OR AN AUTHORIZED DEALER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY ANY OTHER PARTY.

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DECLARATIONS OF CONFORMITY

This is to certify that, when installed and used according to the instructions in this manual, the units listed and described here are shielded against the generation of radio interferences in accordance with the application of Council Directives 2014/30/EU and 2014/30/EU, as well as these standards:

- EN 55022: 2010/AC:2011 (Class B)
- EN 55024:2010 + A1:2015



This equipment has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

The product safety of the devices is proven by their compliance with the following standards:

- CAN/CSA-ICES-003

These devices comply with Directive 2011/65/EU of the European Parliament and of the council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2, RoHS II). The device labels carry a respective marking.

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INTRODUCTION

Disclaimer

While every precaution has been taken in the preparation of this manual, the manufacturer assumes no responsibility for errors or omissions. Neither does the manufacturer assume any liability for damages resulting from the use of the information contained herein. The manufacturer reserves the right to change the specifications, functions, circuitry of the product, and manual content at any time without notice.

The manufacturer cannot accept liability for damages due to misuse of the product or other circumstances outside the manufacturer's control. The manufacturer will not be responsible for any loss, damage, or injury arising directly or indirectly from the use of this product (See limited warranty).

System Introduction

Thank you for choosing the Rose Electronics CrystalLink USB1.1 CAT5e/6/7 Extender.

The CrystalLink USB1.1 extends USB1.1 devices (or USB2.0 at low/full speed) up to 130 feet (40 meters) over CAT5e/6/7 UTP cable. Individual USB devices such as a keyboard or mouse, USB thumb-drive, USB printer and USB joystick can be extended away from the host PC using the CrystalLink USB1.1 extender. Additional USB devices can be connected using a powered USB hub.

The extension system consists of two units, a transmitter and a receiver. The transmitter connects to your computer's USB port. The receiver normally connects directly to the transmitter using industry standard CAT5e/6/7 cable.

The instructions in this manual assume a general knowledge of computer installation procedures, familiarity with cabling requirements, and some understanding of USB device operation. No external power is required to operate this device.

Features

- Supports CAT5e/6/7 cable distances up to 130 feet (40 meters) for full-speed USB1.1
- Can extend one USB low-speed HID devices such as a keyboard or mouse up to 275 feet (85 meters)
- Will also extend USB2.0 devices, but at USB1.1 speeds
- Supports full-speed (12Mbps) or low-speed (1.5Mbps) USB devices
- Interface powered transmitter unit, and self-powered receiver unit
- Plug and Play. No software drivers required
- Supports all major Operating Systems: Windows, MAC OS X, Linux
- Remote extender provides up to 400mA power to the attached USB device
- Attach up to 3 powered USB hubs for additional remote USB device support
- Robust ESD and EFT immunity for industrial environments
- Made in North America

Package Contents

The package contents consist of the following items:

- Transmitter unit
- Receiver unit
- One USB-AB cable, 6ft (2.0m)
- Installation & Operation Manual

Additional Items required

- 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) for remote-end connection
- CAT5e/6/7 Unshielded Twisted Pair (UTP) cable with two RJ45 connectors (if using surface cabling), or CAT5e/6/7 cabling with two information outlets and two CAT5e/6/7 patch cords with RJ45 connectors (if using premise cabling).
- For optimum performance, the CAT5e/6/7 cable should be run straight and not coiled, and not routed close to electrical cables. Pin cables according to T568A/T568B.

Application Examples

The CrystalLink USB1.1 is ideal for use in office or industrial environments, or in computer room environments where USB devices need to be connected at short distances away from a host PC.

- Industrial control
- Interactive whiteboard
- Boardroom presentations
- Keyboard or mouse extension
- Computer room – server management
- Office device extension. printer or scanner

All references to CAT5e/6/7 cable in this document refer to solid-core cable and represent the minimum CAT5e/6/7 specification requirements. Use of CAT5e/6/7 patch-cables will reduce the recommended cable extension distances

CrystalLink USB1.1 Model



CrystalLink USB1.1 Transmitter and Receiver Units	
<p>Transmitter unit</p>  <p>The transmitter unit is a black rectangular device with a USB Type-A male connector on the left side, labeled '1' with an upward arrow. On the right side, there is an RJ45 port labeled '2' with an upward arrow. A black cable is attached to the USB connector.</p>	<p>The Transmitter Unit connects to the computer using the upstream USB Type-A connector.</p> <p>1 = Host Port (USB Type A male) connect this Type A USB to the host computer</p> <p>2 = Link Port RJ45, accepts RJ45 connector for CAT5e/6/7 cable</p>
<p>Receiver unit</p>  <p>The receiver unit is a black rectangular device with an RJ45 port on the left side, labeled '1' with an upward arrow. On the right side, there is a USB Type-A female port labeled '2' with an upward arrow. A black cable is attached to the USB port.</p>	<p>The Receiver Unit provides one downstream USB Type-A port for a standard USB device connection. Additional devices may be connected by attaching USB hubs.</p> <p>1 = Link Port RJ45, accepts RJ45 connector for CAT5e/6/7 cable</p> <p>2 = Device Port (USB Type A female) accepts a USB device</p>

Figure 1. CrystalLink USB1.1 models, transmitter and receiver

INSTALLATION

Installation Procedure

Before beginning an installation, ensure you have all products and components ready for the installation

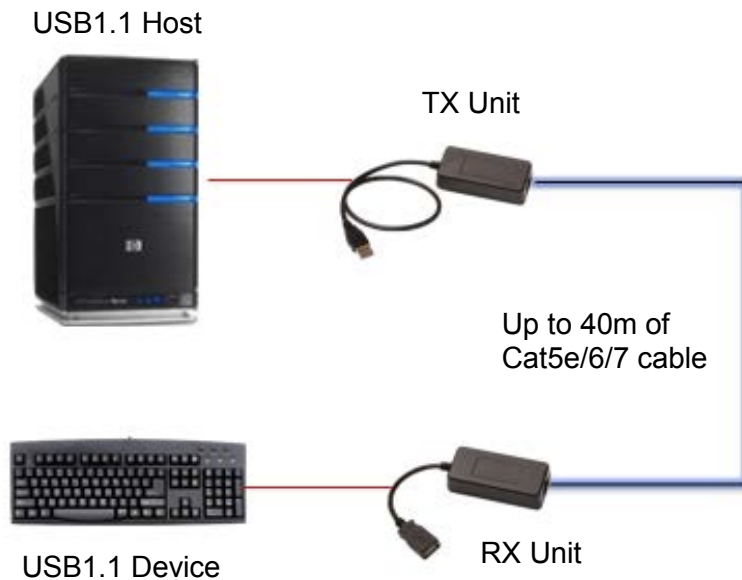


Figure 2. CrystalLink USB1.1 standard installation

- Determine where the computer is to be located and set up the computer.
- Determine where you want to locate the remote USB device(s).
- Remember the product supports a maximum distance of 130ft (40m) for transparent USB and 275ft (85m) for USB-HID devices. If using patch (stranded) cables or premise wiring, the achievable extension distance may be less.

Installing the Transmitter Unit

- Place the Transmitter unit near the computer
- Plug the USB cable from the transmitter into an available USB1.1/2.0 Type A port on the computer.

Installing the Receiver Unit

- Place the remote extender unit near the USB device(s) in the desired remote location.
- Plug in your USB device.

Connecting the Transmitter to the Receiver

The effective cable extension length is reduced for each USB Hub added to the system.

There is an approximate 43ft (13 meter) reduction in extension distance for each USB Hub added. This includes Hubs added to the local or the remote side.

The CrystalLink USB1.1 extender cannot be daisy-chained to another extender to increase extension distance. A system can have only one transmitter and one receiver unit.

Using CAT5e/6/7 Solid Core Cabling

- Plug one end of the CAT5e/6/7 cabling (not included) into the Link port (RJ45) on the transmitter unit.
- Plug the other end of the CAT5e/6/7 cabling into the Link port (RJ45) on the receiver unit.

Using Premise Cabling

- Plug one end of a CAT5e/6/7 patch cord (not included) into the Link port (RJ45) on the transmitter unit.
- Plug the other end of the patch cord into the CAT5e/6/7 information outlet near the host computer.
- Plug one end of the second CAT5e/6/7 patch cord (not included) into the Link port (RJ45) on the receiver unit.
- Plug the other end of the second patch cord into the CAT5e/6/7 information outlet near the USB device.

Connecting a USB Device

1. Install on the host computer, 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.

Checking the Installation (check USB device detection)

Check if the USB device is detected by your Operating System. (Note: If your computer does not correctly detect the USB device when it is attached to your computer, then it may not function correctly)

To open the System Profiler in MAC 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/XP:

Right click on "My Computer", then select Properties >>Hardware Tab>>Device Manager

To open Device Manager in Windows 7 and later:

Open the Start Menu, right click on "Computer", then select Manage>>Device Manage

CAT5e/6/7 Cable Termination

Use either T568A or T568B termination for your CAT5e/6/7 cable.

Use CAT5e or better, solid-core, either UTP or STP cable. STP is recommended for improved EMI protection.

Table 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

Table 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

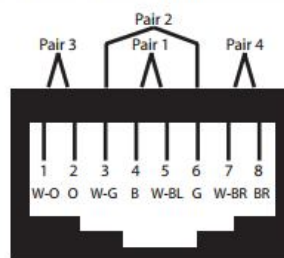
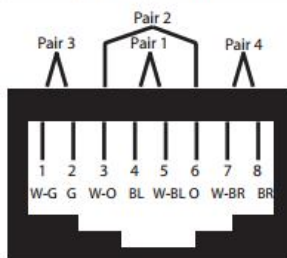


Figure 3. CAT5e/6/7 cable termination pinning

TROUBLESHOOTING

Troubleshooting

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, please contact Technical Support for further assistance.

PROBLEM	CAUSE	SOLUTION
The USB device does not operate correctly.	<ul style="list-style-type: none">• 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.	<ul style="list-style-type: none">• Un-install and re-install the driver for the USB device.• Update the driver for the USB device.• Directly connect the USB device to the Host to verify the USB device operates correctly.• Contact Technical Support.
The USB device is detected as an "Unknown Device" in the Operating System.	<ul style="list-style-type: none">• The USB device's timing is outside of the USB 1.1 specification.• The Extender is malfunctioning.	<ul style="list-style-type: none">• Connect the Receiver Unit to the Transmitter Unit using a short CAT5e/6/7 cable.• Unplug the Transmitter Unit from the host and wait 15 seconds. Then plug the Transmitter back into the host.• Contact Technical Support.
The USB devices is detected as using too much power in the operating system or that a power surge has occurred.	<ul style="list-style-type: none">• The USB device needs more power than the Extender can support.• The Host is not providing enough power to the Extender	<ul style="list-style-type: none">• Connect the Transmitter to a different USB port on the Host.• Connect a powered USB hub between the Receiver Unit and the USB device.

Figure 4. Troubleshooting procedures

PRODUCT SAFETY

Safety

The CrystalLink USB1.1, like all electronic equipment, should be used with care. To protect yourself from possible injury and to minimize the risk of damage to the Unit, read and follow these safety instructions.

- Follow all instructions and warnings marked on this Unit.
- Except where explained in this manual, do not attempt to service this Unit yourself.
- Do not use this Unit near water.
- Assure that the placement of this Unit is on a stable surface.
- Provide proper ventilation and air circulation.
- Keep connection cables clear of obstructions that might cause damage to them.
- Use only power cords, power adapter and connection cables designed for this Unit.
- Keep objects that might damage this Unit and liquids that may spill, clear from this Unit. Liquids and foreign objects might come in contact with voltage points that could create a risk of fire or electrical shock.
- Do not use liquid or aerosol cleaners to clean this Unit. Always unplug this Unit from the power source before cleaning.

Remove power from the unit and refer servicing to a qualified service center if any of the following conditions occur:

- The connection cables are damaged or frayed.
- The Unit has been exposed to any liquids.
- The Unit does not operate normally when all operating instructions have been followed.
- The Unit has been dropped or the case has been damaged.
- The Unit exhibits a distinct change in performance, indicating a need for service.

SERVICE AND MAINTENANCE

Maintenance and Repair

This Unit does not contain any internal user-serviceable parts. In the event a Unit needs repair or maintenance, you must first obtain a Return Authorization (RA) number from Rose Electronics or an authorized repair center. This Return Authorization number must appear on the outside of the shipping container.

See Limited Warranty for more information.

When returning a Unit, it should be double-packed in the original container or equivalent, insured and shipped to:

Rose Electronics

Attn: RA _____

10707 Stancliff Road

Houston, Texas 77099 USA

Technical Support

If you are experiencing problems, or need assistance installing your product, consult the appropriate section of this manual. If, however, you require additional information or assistance, please contact the Rose Electronics Technical Support Department at:

Phone: (281) 933-7673

E-mail: TechSupport@rose.com

Web: www.rose.com

Technical Support hours are from: 8:00 am to 6:00 pm CST (USA), Monday through Friday.

Please report any malfunctions in the operation of this Unit or any discrepancies in this manual to the Rose Electronics Technical Support Department.

APPENDICES

Appendix A – Specifications

Part Numbers		Description
CLK-1U1TP-40M		CrystalLink USB1.1 CAT5e/6/7 Extender
CAB-USBAB006		USB-AB cable, 6ft (2.0m)
CAB-USBAB010		USB-AB cable, 10ft (3.0m)
Chassis Dimensions (W x D x H)		
Transmitter and receiver chassis	1.57" x 3.34" x 0.98" (40 x 85 x 25 mm)	
Power Requirements		
Power source	The transmitter unit is powered by the host computer using the USB cable	
Maximum current for USB device	400mA when the transmitter is supplied with 700mA	
Interconnect Cable Requirements		
CAT5e/6/7 RJ45	CAT5e/6/75e/6/7 solid core, UTP or STP, terminated as EIA/TIA 568-B	
Cable Distances		
CAT5e/6/7 cable	130 feet (40 meters) over solid core CAT5a (or better) cable. Up to 275 feet (85meters) may be achieved with low-speed HID devices such as keyboard and mouse.	
USB Support		
USB Device Support	High-speed devices (USB 2.0) at full-speed (USB 1.1) rates, 12Mbps Full-speed devices (USB 2.0 & 1.1), 12Mbps Low-speed devices (USB 2.0 & 1.1), 1.5Mbps	
USB Hub Support	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 Support	EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)	
Connectors		
	Transmitter unit	Receiver unit
USB connector	1 x USB Type A male	1 x USB Type A female
Link cable connector	1 x RJ45	1 x RJ45
Environmental		
Operating Temp	32°F to 122°F (0°C to 50°C)	
Storage Temp	-4°F to 158°F (-20°C to 70°C)	
Operating Humidity	20% to 80% relative, non-condensing	
Storage Humidity	10% to 90% relative, non-condensing	
Approvals	FCC Part 15 Class A, CE Class A, ICES-003 Class A, EMC EN55022 Class A, EN55024, CPSIA, Flammability V-1	

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