HALL RESEARCH

User's Manual

U3CAT6

USB 3.0 (USB 3.1 Gen 1) over CAT6 Extender

Extends USB and Gigabit LAN to
100m on a single CAT6A cable

Part Number	Function
U3CAT6-L	Local (Host) Extender
U3CAT6-R	Remote (Device) Extender

UMA1282 Rev NC

CUSTOMER SUPPORT INFORMATION

Order toll-free in the U.S. 800-959-6439
FREE technical support: 714-641-6607 or support@hallresearch.com
Hall Research, 1163 Warner Ave. Tustin, CA 92780
www.hallresearch.com

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FCC Notice

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference even if it causes undesired operation.

This equipment has been tested to comply with the limits for a Class B 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 it is not installed and used in accordance with the instruction manual, it 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.

1.0 Introduction

The U3CAT6 is an extender system composed of two units – U3CAT6-L and U3CAT6-R – used to extend USB 3.1 Gen 1 and Gigabit LAN at a distance of up to 100m on a single CAT6a or CAT7 cable. This allows users to extend high speed USB peripherals far beyond the 3m cable limit specification for USB 3.1.

Typical Connection Diagram

Features

- Up to 100m extension when directly connected via CAT6a/7 cable
- Support for new USB 3.1 Gen 1 / 2 host controllers and devices
- Up to 5 Gbps transfer speed
- Transparent USB extension supporting USB 3, 2, and 1
- Plug-and-Play; no software drivers required
- Support for all types of USB peripherals
- Works with all major operating systems: Windows®, macOS™, Linux®, and Chrome OS™

2.0 Package Contents

(x1) U3CAT6-L Local Extender
(x1) U3CAT6-R Remote Extender
(x1) USB 3.1 Gen 1 Cable
(x1) 24V DC 1A Universal Power Supply (Local)
(x1) 24V DC 2.71A Universal Power Supply (Remote)
(x2) AC Power Cords
(x1) User manual download card

3.0 Setup

Cabling Guidelines

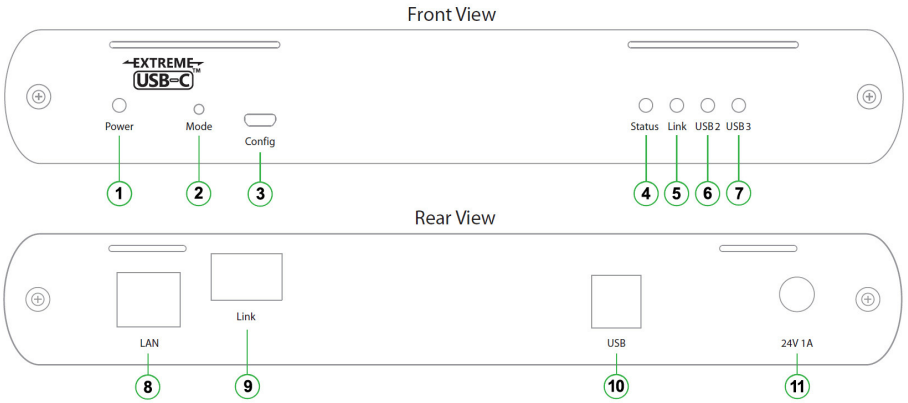
- The U3CAT6 requires a minimum grade of Category 6a cabling to be used in order to reach 100m (328 ft) of extension distance. This also includes the length of patch cable, should it be required. Up to 10m of patch cable can be used, although the remaining 90m distance must consist of solid core cabling.
- Unshielded (UTP) cabling may be used 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
- Foiled (FTP) or Shielded (STP) cabling must be used if the cable run installation requires the following:
    - The cable is bundled with other cables
    - The cable is run tights against other Category cables
    - The cable is placed near sources of interference like power lines and radios
    - The cable is looped or coiled

Installation

- Connect the U3CAT6-L to the PC using the supplied USB 3.1 cable.
- *Optionally*, connect the U3CAT6-L to a network switch using a CAT5e or better patch cord
- Connect the U3CAT6-L and U3CAT6-R together using CAT6a/7 cable, up to 100m
- Connect USB peripherals to the U3CAT6-R.
- *Optionally*, connect the U3CAT6-R to a remote network-enabled device using a CAT5e or better patch cord
- Connect the 24V 1A power supply to the U3CAT6-L Local unit.
- Connect the 24V 2.71A power supply to the U3CAT6-R Remote unit.

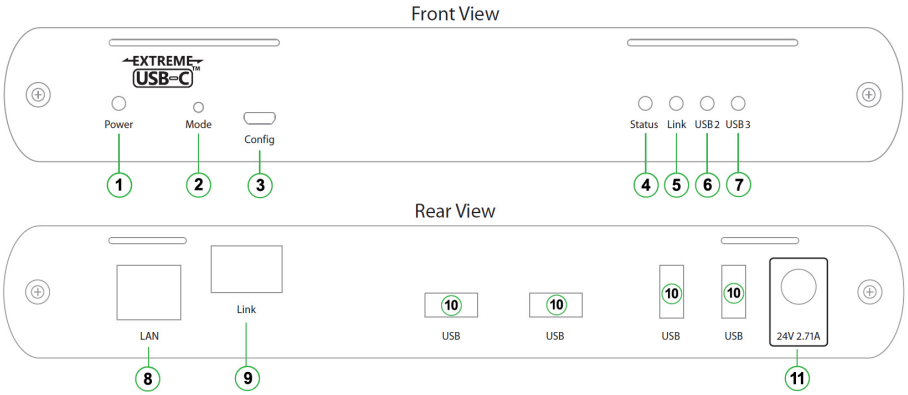
4.0 Connector and Indicator Functions

Model U3CAT6-L



1) Power LED: LED is SOLID ON when DC power is supplied. LED OFF when no power is supplied.
2) Mode LED: Reserved for manufacturer use.
3) Config: Reserved for manufacturer use.
4) Status LED: LED is SOLID ON when system is functioning normally. LED BLINKS during boot OR to indicate a temperature warning in unison with LINK, USB2, and USB 3 LEDs.
5) Link LED: LED is SOLID ON when the Local extender is linked to a Remote extender. LED is OFF when there is no connection.
6) USB 2 LED: LED is SOLID ON when an active USB 2 connection is established. LED BLINKS when USB 2 connection is suspended/asleep. LED is OFF when no USB 2 connection is detected.
7) LED is SOLID ON when an active USB 3 connection is established. LED BLINKS when USB 3 connection is suspended/asleep. LED is OFF when no USB 3 connection is detected.
8) LAN Port (100/1000 Mbps): Ethernet pass-through channel connects to network or ethernet device.
9) Link Port (RJ45): Accepts RJ45 connector for CAT 6a/7 cabling to connect Local to Remote.
10) USB Host Port: USB 3 Type B receptacle used to connect Local to USB 3 Host computer.
11) DC Power Port: Locking connector for the included power adapter – accepts 24V DC 1A.

Model U3CAT6-R



1) Power LED: LED is SOLID ON when DC power is supplied. LED OFF when no power is supplied.
2) Mode LED: Reserved for manufacturer use.
3) Config: Reserved for manufacturer use.
4) Status LED: LED is SOLID ON when system is functioning normally. LED BLINKS during boot OR to indicate a temperature warning in unison with LINK, USB2, and USB 3 LEDs.
5) Link LED: LED is SOLID ON when the Remote extender is linked to a Local extender. LED is OFF when there is no connection.
6) USB 2 LED: LED is SOLID ON when an active USB 2 connection is established. LED BLINKS when USB 2 connection is suspended/asleep. LED is OFF when no USB 2 connection is detected.
7) LED is SOLID ON when an active USB 3 connection is established. LED BLINKS when USB 3 connection is suspended/asleep. LED is OFF when no USB 3 connection is detected.
8) LAN Port (100/1000 Mbps): Ethernet pass-through channel connects to network or ethernet device.
9) Link Port (RJ45): Accepts RJ45 connector for CAT 6a/7 cabling to connect Remote to Local.
10) USB Device Ports (Type A): USB 3 Type A receptacle accepts all USB devices.
11) DC Power Port: Locking connector for the included power adapter – accepts 24V DC 2.71A.

5.0 Troubleshooting

If you are experiencing problems getting the U3CAT6 to work properly, please use the following troubleshooting suggestions.

PROBLEM	CAUSE	SOLUTION
ALL LEDs are OFF on the Local and/or Remote Extender.	1. The Local Extender and/or Remote Extender is not receiving power from the AC power adapter.	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.	1. The unit has malfunctioned and requires re-programming.	1. Contact Technical Support for assistance.
Link LEDs on the Local and Remote Extenders are OFF.	1. There is no connection between the Local and Remote Extenders.	1. Ensure that no more than 100m of CAT 6a/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.
LINK LEDs on the Local and Remote Extenders are SOLID ON, but the USB 2 and USB 3 LEDs are OFF.	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.	1. Disconnect all USB devices from the Remote Extender. 2. Disconnect Local Extender from the host computer. 3. Disconnect AC adapters from 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. If the problem is not resolved, contact Technical Support.

PROBLEM	CAUSE	SOLUTION
The USB 2 LED is SOLID ON, but the USB 3 LED is OFF.	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.	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. If the problem is not resolved, contact Technical Support.
ALL LEDs are OFF on the Local and/or Remote Extender.	1. The Local Extender and/or Remote Extender is not receiving power from the AC power adapter.	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.	1. The unit has malfunctioned and requires re-programming.	1. Contact Technical Support for assistance.
Link LEDs on the Local and Remote Extenders are OFF.	1. There is no connection between the Local and Remote Extenders.	1. Ensure that no more than 100m of CAT 6a/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.

PROBLEM	CAUSE	SOLUTION
LINK LEDs on the Local and Remote Extenders are SOLID ON, but the USB 2 and USB 3 LEDs are OFF.	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.	1. Disconnect all USB devices from the Remote Extender. 2. Disconnect Local Extender from the host computer. 3. Disconnect AC adapters from 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. If the problem is not resolved, contact Technical Support.
The USB 2 LED is SOLID ON, but the USB 3 LED is OFF.	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.	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. If the problem is not resolved, contact Technical Support.

Contacting Hall Research

If you determine that your U3CAT6 is malfunctioning, do not attempt to repair the unit. Instead, contact Hall Research Technical Support at 714-641-6607. To return the unit to Hall Research you must first get a Return Authorization (RMA) number. Package the unit carefully, if returning. We recommend that you use the original container.

6.0 Specifications

RANGE	
Point-to-Point	Up to 100m (328 ft) 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 x USB 3.1 Gen 1 Type B Receptacle
Link Connector	1 x RJ45 “LINK”
Network Pass Through:	1 x RJ45 “LAN”
Dimensions	137.3mm x 232.1mm x 33.0mm (5.4” x 9.1” x 1.3”)
Enclosure Material	Black Anodized Aluminum
Power Supply	100-240V AC Input, 24V 1A DC Output
REMOTE EXTENDER	
USB Connector	4 x USB 3.1 Gen 1 Type A Receptacles
Link Connector	1 x RJ45 “LINK”
Network Pass Through:	1 x RJ45 “LAN”
Dimensions	137.3mm x 232.1mm x 33.0mm (5.4” x 9.1” x 1.3”)
Enclosure Material	Black Anodized Aluminum
Available Current	Up to 1.2 Amp (6W) to each USB port
Power Supply	100-240V AC Input, 24V 2.71A DC Output
ENVIRONMENTAL	
Operating Temperature Range	0°C – 50°C (32°F – 122°F)
Storage Temperature Range	-20°C – 70°C (-4°F – 158°F)
Operating Humidity	20% to 80% relative humidity, non-condensing
Storage Humidity	10% to 90% relative humidity, non-condensing
COMPLIANCE	
EMC	FCC (Class B), CE (Class B)
Environmental	RoHS2 (CE)
SUPPORT	
Warranty	2-year

Specifications are subject to change without notice

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