



USB 2.0 DIGI-USB2

1-Port USB 2.0 100m Category 5e/6/6a/7
Extender Set with Flexible Power

User Manual



Thank you for purchasing the USB 2.0 DIGI-USB2.

Please read this guide thoroughly.

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.

CE Statement

We, Liberty AV Solutions, declare under our sole responsibility that the USB 2.0 DIGI-USB2, to which this declaration relates, is in conformity with European Standard EN 55022, EN 61000, and EN 55024.

IC Statement

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

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. Please check with your LEX and state government guidelines for safe disposal and recycling or contact your national WEEE recycling agency for more information.

Product Operation and Storage

Please read and follow all instructions provided with this product, and operate for intended use only. Do not attempt to open the product casing as this may cause damage and will void warranty. Use only the power supply provided with this product. When not in use, product should be stored in a dry location between -20°C and 70°C.

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Introduction

The instructions in this guide assume a general knowledge of computer installation procedures, familiarity with cabling requirements, and some understanding of USB devices.

NOTE: Notes provide additional information that could be useful.



Caution Symbols are followed by very important information about an operational requirement

USB 2.0 DIGI-USB2 Product Contents

Your DIGI-USB2 is packaged with:

- LEX
- REX
- International AC Power Adapter
- US Power Cord [Other country power cards are available á la carte]
- USB 2.0 A-B cable
- Quick Start Guide

NOTE: The DIGI-USB2 features **Flexible Power**, allowing the installer to connect the supplied 24V, 1A power adapter to either the LEX or REX for normal extension system operation. Please note, when powering at the LEX, take care not to plug the remote side of the CAT 5e/6/7 link cable directly into equipment other than the REX to avoid possible damage as flexible power is different from Power over Ethernet (PoE) and will only properly power the REX.

Requirements

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)
- CAT 5e/6/7 solid core Unshielded Twisted Pair (UTP) cable with two RJ45 connectors (if using surface cabling), or CAT 5e/6/7 cabling with two information outlets and two CAT 5e/6/7 patch cords with RJ45 connectors (if using premise cabling)

Features

The USB 2.0 DIGI-USB2 enables users to extend beyond the standard 5m cable limit for USB peripheral devices. With the DIGI-USB2, USB device(s) can be located up to 100 meters (330 feet) from the computer. The DIGI-USB2 is composed of two individual units: the LEX (LEX Extender) and REX (Remote Extender).



The LEX and REX may be hot to the touch during operation.

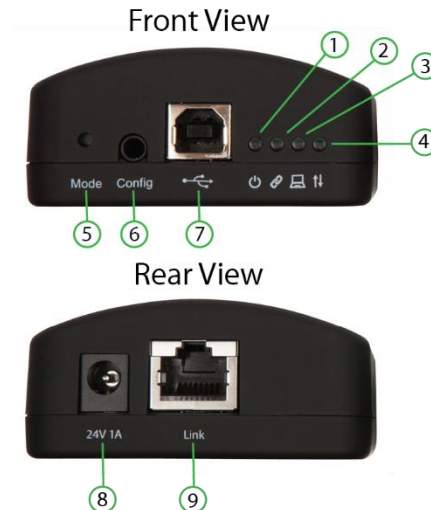
The DIGI-USB2 includes the ExtremeUSB® suite of features:



- Transparent USB extension
- True plug and play; no software drivers required
- Works with all major operating systems: Windows®, macOS™ and Linux®

The LEX (LEX)

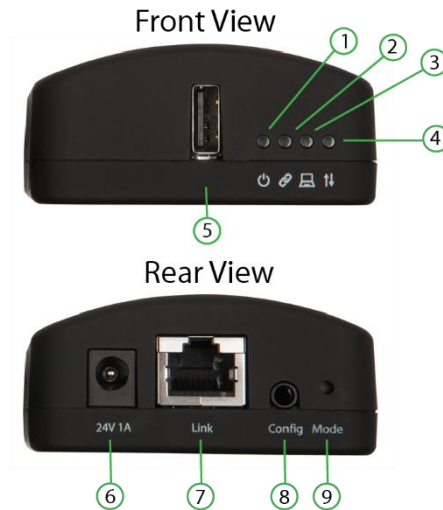
The LEX connects to the computer using a standard USB cable (included). Power for the LEX is provided by the host computer. Power for the REX is provided by the 24V AC adapter connected at **either** the LEX **or** REX. The LEX delivers power over the CAT 5e/6/7 extension link to the REX when the included power supply is connected to the LEX.



ITEM	TYPE	DESCRIPTION
1	Power LED (Green) ⏻	LED turns on when power is supplied. LED is off when no power is supplied by the host computer.
2	Link LED (Green) 🔗	Indicates a valid ExtremeUSB link is established between the LEX and REX. LED turns on when link between the LEX and REX is established. LED is off when there is no link between the LEX and REX. LED is slow blinking when the unit is attempting to establish a link.
3	Host LED (Green) 💻	Indicates that the extender system is properly enumerated on the host computer. LED blinks when the extender system is in a suspended state.
4	Activity LED (Green) ↕	Indicates data transmission is occurring between the LEX and REX. LED blinks intermittently with or without a USB device connected. When the LEX and REX are in suspend mode, the LED is off.
5	Mode	Reserved for manufacturer use.
6	Config Port	Reserved for manufacturer use.
7	USB Port 🔌	Used to connect the LEX to the host computer. Accepts USB Type B connector.
8	Power Port	Connects to the AC power supply.
9	Link Port (RJ45)	Accepts RJ45 connector for CAT 5e/6/7 cabling to connect the LEX to the REX.

The REX

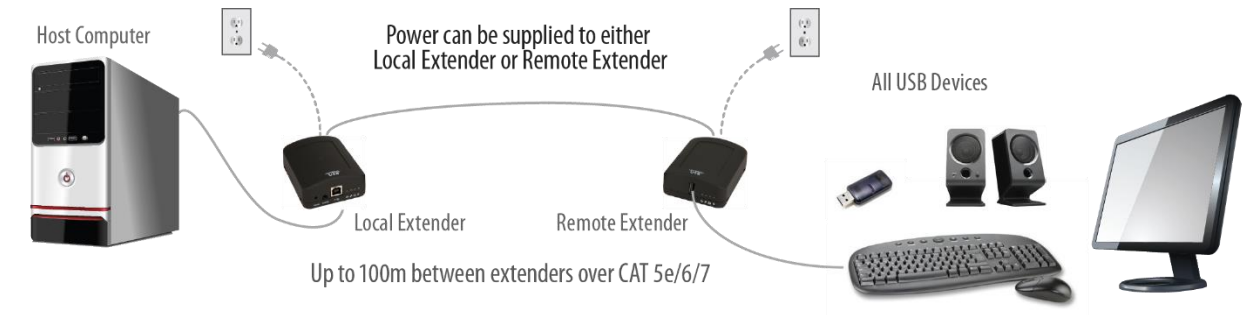
The REX provides a USB Type A port for connecting standard USB devices. The REX allows you to connect one USB device directly. Additional devices may be connected by attaching USB hubs to the REX. The REX is powered **either** directly by the included power supply, or via the CAT 5e/6/7 link extension cable from the LEX. The USB port delivers up to 1 Amp of current to the attached USB device.



ITEM	TYPE	DESCRIPTION
1	Power LED (Green) ⏻	LED turns on when power is supplied.
2	Link LED (Green) 🔗	Indicates a valid ExtremeUSB link is established between the LEX and REX. LED turns on when link between LEX and REX is established. LED is off when there is no link between the LEX and REX. LED is slow blinking when the unit is attempting to establish a link.
3	Host LED (Green) 💻	Indicates that the extender system is properly enumerated on the host computer. LED blinks when the extender system is in a suspended state.
4	Activity LED (Green) ↕	Indicates data transmission is occurring between the LEX and REX. LED blinks intermittently with or without a USB device connected. When the LEX and REX are in suspend mode, the LED is off.
5	USB Device Port	Accepts USB device using Type A connector.
6	Power Port	Connects to the AC Power Supply
7	Link Port (RJ45)	Accepts RJ45 connector for CAT 5e/6/7 cabling to connect the LEX to the REX.
8	Config Port	Reserved for Manufacturer use.
9	Mode	Reserved for Manufacturer use.

Installation Guide

Connect the provided power adapter to **either** the LEX or the REX.



Mounting the LEX or REX

If mounting is required, the LEX and REX have two mounting slots on each side for use with cable tie/zap straps (not included).



Preparing for Installation

Before you can install the DIGI-USB2, 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 USB device(s).
- (3) If you are using surface cabling, the DIGI-USB2 supports a maximum distance of 100m.

OR

If you are using premise cabling, ensure CAT 5e/6/7 cable is installed between the two locations, with CAT 5e/6/7 information outlets located near both the computer and the USB device(s), and the total length, including patch cords is no more than 100m.

Installing the LEX

- (1) Place the LEX near the computer.
- (2) Install the supplied USB cable between the LEX and USB port on the host computer.

Installing the REX

- (1) Place the REX near the USB device(s) in the desired remote location.

Installing Flexible Power

- (1) Connect 24V 1A supplied AC power adapter to the LEX **or** REX, based on installation requirement.

NOTE: The DIGI-USB2 features flexible power, allowing the installer to connect the supplied 24V, 1A power adapter to either the LEX or REX unit for normal extension system operation. Please note, when powering at the LEX, take care not to plug the remote side of the CAT 5e/6/7 link cable directly into equipment other than the REX to avoid possible damage as flexible power is different from Power over Ethernet (PoE) and will only properly power the REX.

Connecting the LEX to the REX

To ensure proper operation, it is recommended that only solid core CAT 5e/6/7, Unshielded Twisted Pair (UTP) cabling be used to connect the LEX to the REX. The cabling must have a straight-through conductor configuration with no crossovers and must be terminated with 8 conductor RJ45 connectors at both ends. The combined length of any patch cords using stranded conductors must not exceed 100m.

With Surface Cabling:

- (1) Plug one end of the CAT 5e/6/7 cabling (not included) into the Link port (RJ45) on the LEX.
- (2) Plug the other end of the CAT 5e/6/7 cabling into the Link port (RJ45) on the REX.

With Premise Cabling:

- (1) Plug one end of a CAT 5e/6/7 patch cord (not included) into the Link port (RJ45) on the LEX.
- (2) Plug the other end of the patch cord into the CAT 5e/6/7 information outlet near the host computer.
- (3) Plug one end of the second CAT 5e/6/7 patch cord (not included) into the Link port (RJ45) on the REX.
- (4) Plug the other end of the second patch cord into the CAT 5e/6/7 information outlet near the USB device.

Connecting a USB Device

- (1) Install any software required to operate the USB device(s). Refer to the documentation for the USB device(s), as required.
- (2) Connect the USB device to the device port on the REX.
- (3) Check that the device is detected and installed properly in the operating system.

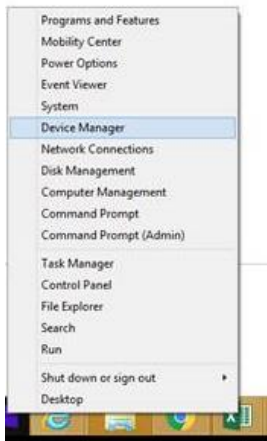
Checking the Installation

- (1) On the LEX and REX, check that the Power, Activity, Link and Host LEDs are on. If the Host or Link LEDs are permanently off, then the cabling between the LEX and REX 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 DIGI-USB2 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 it listed as a “Generic USB Hub”.

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 DIGI-USB2 Series 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 a “Hub” under the USB High-Speed Bus/USB 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 DIGI-USB2 Series extender system is not detected correctly or fails to detect, please consult the Troubleshooting section in this guide.

Compatibility

The DIGI-USB2 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 will be compatible, as there are a number of different factors that may impact the operation of USB devices over extended distances.

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
USB device is attached but not functioning.	<ul style="list-style-type: none"> • The USB device requires drivers that were not installed. • The USB device does not support USB hubs. • The USB device has malfunctioned. 	<ol style="list-style-type: none"> 1. Install the required USB device driver on the computer operating system prior to attaching the USB device into the REX. Please see your USB device manufacturer’s website for details. 2. In the Universal Serial Bus controllers section of Device Manager, check that the USB device has enumerated. 3. Contact Technical Support for assistance.
USB device is attached but not functioning.	Overcurrent condition has occurred because the USB device has drawn more current than can be supplied per USB specification (1A). Operating system may generate a status bubble indicating an issue.	<ol style="list-style-type: none"> 1. Power cycle REX by unplugging the power adapter from the extender. Wait approximately 30 seconds and then plug the power adapter back into the REX. 2. If overcurrent continues to occur, either: (a) the USB device may use more power than the USB specification, or (b) the USB device may be damaged. 3. Consult your USB device documentation and power your USB device with the required power supply.
Link LED on the LEX and REX blink intermittently.	The CAT 5e/6/7 cable connecting the LEX and REX is faulty.	<ol style="list-style-type: none"> 1. Ensure the CAT 5e/6/7 cable is of decent quality. 2. Test the Link with a Gigabit Ethernet tester. 2. Contact Technical Support for assistance.
Link LED on the LEX and REX is off.	<ul style="list-style-type: none"> • The REX is not receiving power. • The LEX is not receiving power. • The link cable is malfunctioning. • The extender system is malfunctioning. 	<ol style="list-style-type: none"> 1. Confirm the host computer is on and providing power to LEX. 2. Ensure the supplied AC power adapter is properly connected to either the LEX or the REX. 3. Ensure the CAT 5e/6/7 cabling between the LEX and REX is properly installed or replace the link cable. 4. Check that the AC adapter is connected to a live source of electrical power. 5. Contact Technical Support for assistance.

Contacting Technical Support

If you are experiencing problems not referenced in the Troubleshooting Guide, contact Technical Support 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 LEX and REX unit
- Make and model of any USB device(s) attached to the product
- Description of the installation
- Description of the problem

Liberty AV Solutions Technical Support

E-Mail: Supportlibav@libav.com

Phone: 800-530-8998 x 2185

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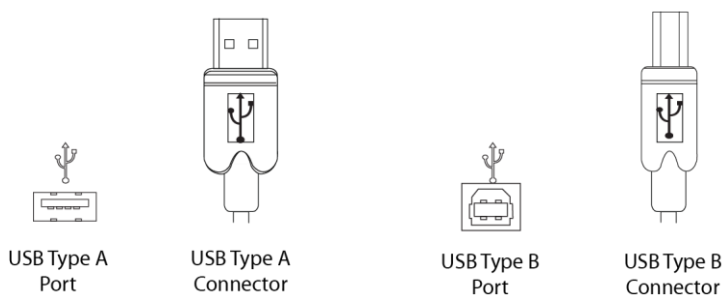
Technical Glossary

Category 5e/6/7 (CAT 5e/6/7) Network Cabling

Category 5e/6/7 cable is commonly also referred to as CAT 5e or CAT 6 or CAT 7. 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 the copper wires and provide better protection against EMI.

USB 2.0 Cables

USB 2.0 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.



RJ45

The Registered Jack (RJ) physical interface is what connects the network cabling (CAT 5e/6/7) to the LEX and REX. You may use either the T568A scheme (Table 1) or the T568B scheme (Table 2) for cable termination as the DIGI-USB2 requires all four pairs of the cable. RJ45 connectors are sometimes also referred to as 8P8C connectors. Note that any give cable must be terminated using the same T568 scheme on both ends to operate correctly.

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

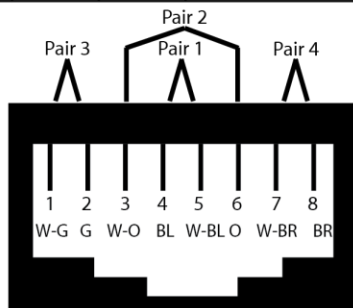
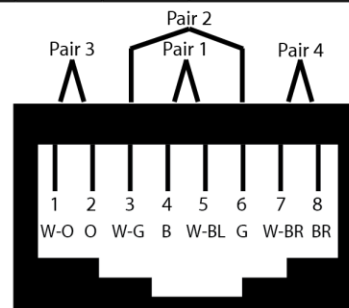


Table 2 - T568B Wiring

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



Specifications

Range	Up to 100m (330ft) over Cat 5e/6/7 cable
USB Device Support	High-speed devices (480 Mbps) (USB 2.0) Full-speed devices (12 Mbps) (USB 1.1) Low-speed devices (1.5 Mbps) (USB 1.1)
Maximum USB Devices Supported	30 USB devices or 4 USB hubs with 26 USB devices.
Power Supply	100-240 V AC input, 24V 1A DC output
AC Adapter Connector	2.1 mm centre-positive jack
Current Available to USB Device at Remote Extender	Up to 1 Amp
Mounting	Slots for Cable Ties
Enclosure Material	Black ABS with Rubberized Coating
System Shipping Weight	0.642 kg (1.416 lbs.)
LOCAL EXTENDER	
USB Connector	1 x USB 2.0 Type B
Link Connector	1 x RJ45
Dimensions	65.0mm x 87.5mm x 30.0mm (2.6" x 3.4" x 1.2")
REMOTE EXTENDER	
USB Connector	1 x USB Type A
Link Connector	1 x RJ45
Dimensions	65.0mm x 87.5mm x 30.0mm (2.6" x 3.4" x 1.2")
ENVIRONMENTAL	
Operating Temperature Range	0°C to 50°C (32°F to 122°F)
Storage Temperature Range	-20°C to 70°C (-4°F to 158°F)
Operating Humidity	20% to 80% relative humidity, non-condensing
Storage Humidity	10% to 90% relative humidity, non-condensing
COMPLIANCE	
EMC	FCC (Class A), CE (Class A)
Environmental	RoHS2 (CE)
Safety	Flammability V-0
SUPPORT	
Warranty	2-year