VU5100 DVI + USB 2.0 Extender

DVI and USB 2.0 100m Cat 5e KVM Extender System

User Guide



EXTREME USB®

Thank you for purchasing the VU5100 KVM Extender.

Please read this guide thoroughly.

This document applies to Part Numbers: 00-00283, 00-00284, 00-00285, 00-00286

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

The product meets European Standard EMC EN 55022 Class A, EN 61000, and EN 55024.

IC Statement

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

Information contained herein is subject to change without notice.

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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 provide additional information that could be useful.

! CAUTIONS provide important information about an operational requirement.

Product Contents

Packaged with:

- Local Extender
- Remote Extender
- (2) 5V DC power adapter
- USB Cable
- DVI Cable
- Quick Start Guide

The product requires two power adapters, one for the local extender and one for the remote extender.

Requirements

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

- A computer that is USB compatible (with USB compliant operating system) and has a DVI-D/DVI-I output
- USB 1.1 or 2.0 compatible device(s)
- A minimum Cat 5e Shielded Twisted Pair (STP) cable with two Cat 5e RJ45 connectors (if using surface cabling),
  OR
- A minimum of Cat 5e cabling with two information outlets and two Cat 5e patch cords with Cat 5e RJ45 connectors (if using premise cabling)

While Cat 5e STP is the minimum category of twisted pair cabling, for the best experience, and to minimize interference and cross-talk, **Cat 6 STP or better is strongly recommended.** When using Cat 5e cabling, the layout and quality of your cable runs and connections becomes extremely important. Please **refer to the Cabling section on page 5** for more detailed information.

About the VU5100 KVM Extender

The VU5100 KVM Extender system incorporates ExtremeUSB® and HD Video technology, which enables users to extend both DVI and USB 2.0 up to 100 meters (330 feet). The following ExtremeUSB features are included:

- Transparent USB extension
- True plug and play; no software required
- Works with all major operating systems: Windows®, Mac OS X®, and Linux®

Compatibility and Recommended Setup

The product is compatible with many graphics cards, Operating Systems, and monitors supporting up to a 1900 x 1200 resolution. However, there is no guarantee that all devices will be compatible with the product as there are a number of different factors that may impact the operation of this KVM Extender.

This product supports both USB 1.1 and USB 2.0 devices. These devices include: keyboards, mice, flash drives, printers, and USB 1.1 web cameras. Please note, USB audio devices such as speakers and microphones are not recommended for use with this product. If uncertain whether your USB 2.0 device(s) can be supported, please contact Technical Support.

DVI Cables

Ensure high quality, undamaged DVI cables are used with this product. Low quality or damaged cables may impact product performance and/or result in damage to units.

Cabling

Solid core Category 6 STP cable with Category 6 RJ45 connectors is recommended for best performance. Using Cat 5e or unshielded Cat 6 cabling may leave your signal more susceptible to interference and noise which may result in poor video performance or reduced extension distance.

Cable Type	Maximum Distance		Notes
	Uncoiled	Coiled	
Solid Core Cat 5e UTP	100m (330 ft)	70m (229 ft)	High susceptibility to electrical interference
Solid Core Cat 5e STP	100m (330 ft)	80m (262 ft)	Moderate susceptibility to electrical interference
Solid Core Cat 6 UTP	100m (330 ft)	100m (330 ft)	High susceptibility to electrical interference
Solid Core Cat 6 STP	100m (330 ft)	100m (330 ft)	**Recommended**
Solid Core Cat 7 STP	100m (330 ft)	100m (330 ft)	**Recommended**

Host Operating Systems

- Windows®
- Mac OS X®
- Linux®

USB Peripherals

- Keyboards & Mice
- Mass Storage Devices
- USB 1.1 Web Cameras
- Printers

note USB audio devices such as speakers and microphones are not recommended for use with this product.

Local Extender Description and Markings

The local extender connects to the computer **using the supplied DVI and USB cable.**

! It's important to use the DVI cable supplied with the product when connecting the local extender to the host computer to ensure proper operation.

Front View



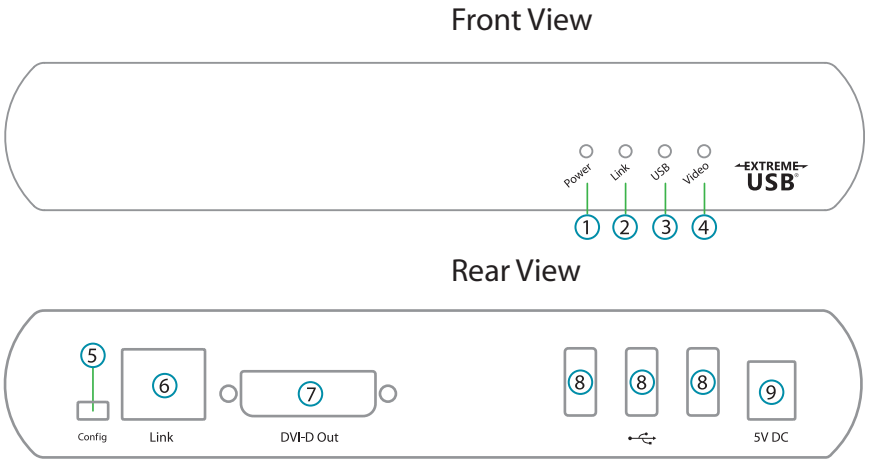
Rear View



ITEM	TYPE	DESCRIPTION
1	Power LED (Green)	Green Light: The system is powered and ready to use. No Light: The system does not have power.
2	Link LED (Green)	Green Light: The local and remote extenders are able to communicate with each other across the link. No Light: There is no communication between the local and remote extenders.
3	USB LED (Green)	Green Light: The local extender and the host computer are communicating with each other and working. Blinking Green Light: The host has suspended communication with the local extender. No Light: The host and the local extender are not communicating or not connected.
4	Video LED (Green)	Solid Green Light: HDCP (digital rights management) content is being transmitted. Blinking Green Light: Video (non-HDCP) content is being transmitted. No Light: There is no video being transmitted.
5	Config	Reserved.
6	Link Port (RJ45)	Accepts RJ45 connector for Cat 5e cabling (or better).
7	DVI-D In	Accepts DVI-D connector for video input from the host computer.
8	Device Port (USB Type B)	Used to connect the LEX unit to the host computer.
9	Power Port	Connects to the 5V, 3A power adapter.

Remote Extender Description and Markings

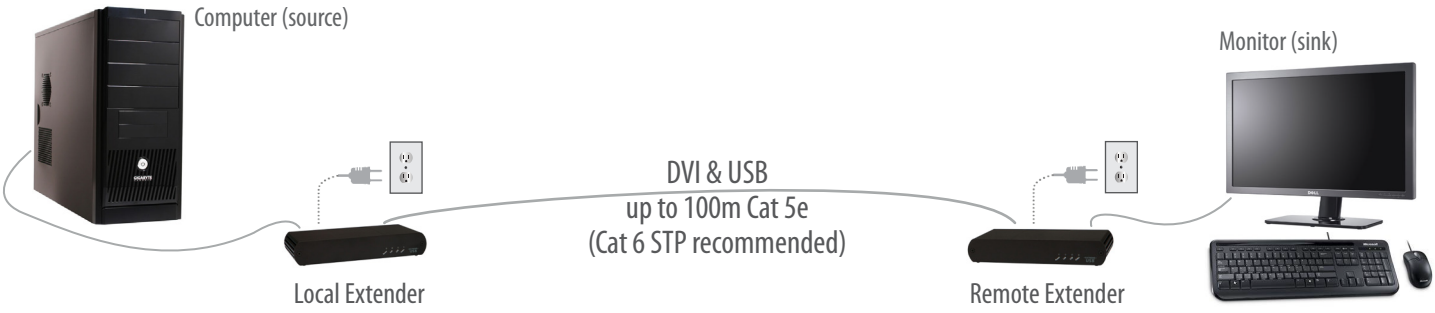
The remote extender provides DVI output to a monitor and three USB Type A ports for standard USB devices. Additional devices may be connected by attaching USB hubs.



ITEM	TYPE	DESCRIPTION
1	Power LED (Green)	Green Light: The system is powered and ready to use. No Light: The system does not have power.
2	Link LED (Green)	Green Light: The local and remote extenders are able to communicate with each other across the link. No Light: There is no communication between the local and remote extenders.
3	USB LED (Green)	Green Light: The local extender and the host computer are communicating with each other and working. Blinking Green Light: The host has suspended communication with the local extender. No Light: The host and the local extender are not communicating or not connected.
4	Video LED (Green)	Solid Green Light: HDCP (digital rights management) content is being transmitted. Blinking Green Light: Video (non-HDCP) content is being transmitted. No Light: There is no video being transmitted.
5	Config	Reserved.
6	Link Port (RJ45)	Accepts RJ45 connector for Cat 5e cabling (or better).
7	DVI-D Out	Accepts DVI-D connector to the remote monitor.
8	Device Port (USB Type A)	Accepts USB device(s).
9	Power Port	Connects to the 5V, 3A power adapter.

Installation Guide

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 desktop including the monitor, keyboard, mouse and any other USB device(s).
3. If you are using surface cabling, the product supports a maximum distance of 100m (330 ft).

   OR

   If you are using premise cabling, ensure Cat 5e (or better) cabling is installed between the two locations,with Cat 5e 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 Local Extender Unit

1. Place the local extender unit near the computer.
2. Install the supplied USB cable to the USB port on the local extender, and an available USB 2.0/1.1 Type A Port on the computer.
3. Install the **supplied DVI cable to the local extender** (DVI-D In), and an available DVI Port on the computer.

Installing the Remote Extender Unit

1. Place the remote extender unit near the monitor and USB device(s) in the desired remote location.
2. Connect the remote extender DVI-D Out to the monitor with **a high quality DVI cable**.
3. Plug in your USB device(s) into the USB ports on the remote extender.

Connecting the Local Extender to the Remote Extender

note While Cat 5e cabling may be used, to ensure proper operation, it is recommended that solid core Cat 6 STP (or Cat 7 STP) cabling be used to connect the local extender to the remote extender. The cabling must have a straight-through conductor configuration with no crossovers and must be terminated with Cat 6 connectors to qualify as Cat 6.

With Surface Cabling

1. Plug one end of the Cat 5e (or better) cabling (not included) into the Link port (RJ45) on the local extender.
2. Plug the other end of the Cat 5e cabling into the Link port (RJ45) on the remote extender.

With Premise Cabling

1. Plug one end of a Cat 5e patch cord (not included) into the Link port (RJ45) on the local extender.
2. Plug the other end of the patch cord into the Cat 5e information outlet near the host computer.
3. Plug one end of the second Cat 5e patch cord (not included) into the Link port (RJ45) on the remote extender.
4. Plug the other end of the second patch cord into the Cat 5e information outlet near the USB device(s).

Connecting Power to the Local and Remote Extenders

1. Plug the 5V, 3A power adapter into a suitable AC outlet near the local extender.
2. Connect the power adapter to the local extender.
3. Plug the 5V, 3A power adapter into a suitable AC outlet near the remote extender.
4. Connect the power adapter to the remote extender.

! **Use only the power adapters supplied with the product. Use of substitute adapters may cause permanent damage to the system and will void the warranty.**

Checking the Installation

1. On the local and remote extender units, check that the Power, Link, USB, and Video LEDs are on. If the Link LED is off, then the cabling between the local and remote extenders is not installed properly or is defective.
2. Check to see if the USB LED is on and the Video LED is blinking or on; if they are not this indicates there is no USB data or video data. Check the DVI and USB connections to the host computer, and the DVI connection to the monitor. Check to see if any USB devices are connected to the remote extender.
3. If the product is not displaying video or your USB device fails to be detected by your operating system, please consult the Troubleshooting section in this guide.

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 remote extender.
3. Check that the device is detected and installed properly in the operating system.

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
All LEDs on local extender are off.	• The local extender is not receiving power from the power adapter.	1. Ensure that the power adapter is properly connected to the local extender. 2. Check that the power adapter is connected to a live source of electrical power.
All LEDs on remote extender are off.	• The remote extender is not receiving power from the power adapter.	1. Ensure that the power adapter is properly connected to the remote extender. 2. Check that the power adapter is connected to a live source of electrical power.
Link LEDs on local extender and remote extender are off.	• There is no connection between the local and remote extenders.	1. Ensure a Cat 5e cable is connected between the local and remote extenders. Ensure Cat 5e STP or better cabling with conductor RJ45 connectors is used. 2. Connect a short Cat 5e patch cord between the local and remote extenders to determine if the original Cat 5e cable is defective. 3. Ensure the Cat 5e cable is as straight as possible (i.e. not coiled).

PROBLEM	CAUSE	SOLUTION
Link LED on local extender is on, USB LED on local extender is off.	• The host computer is not powered on. • The local extender is not connected to the computer. • The computer does not support USB hubs. • The unit is malfunctioning. • The USB cable is defective.	1. Disconnect all USB devices from the remote extender. 2. Disconnect the local extender from the computer. 3. Disconnect the local and remote extenders from the power adapters. 4. Reconnect the local extender to the power adapter. 5. Reconnect the remote extender to the power adapter. 6. Reconnect the USB device(s) to the remote extender. 7. Reconnect the local extender to the computer. 8. If the USB LED continues to stay off, contact Technical Support.
All LEDs on both the local and remote extenders are on, but the USB device does not operate correctly or is detected as an "Unknown Device" in the operating system.	• The USB device is malfunctioning. • The computer does not recognize the USB device. • The application software for the device is not operating. • The KVM extender product is malfunctioning.	1. Disconnect the KVM extender product from the computer. 2. Connect the USB device directly to the USB port on the computer. 3. If the device does not operate properly, consult the user documentation for the USB device. 4. Update your system BIOS, chipset or USB Host controller drivers from your System/ Motherboard manufacturer's website. 5. Make sure the operating system has all the latest updates installed. 6. If the USB device operates properly when directly connected to the computer, connect another device (of a different type) to the KVM extender product. Connect the KVM extender product to the computer. 7. If the second USB device does not operate, the KVM extender product may be malfunctioning. Contact Technical Support for assistance. 8. If the second device does operate properly, the first device may not be compatible with the KVM extender product.

PROBLEM	CAUSE	SOLUTION
Blinking Video on the Sink (Monitor).	• A poor quality or damaged Cat 5e cable is being used. • The cabling is coiled.	1. Remove all loops in the Cat 5e cable. 2. Confirm extender operation with a Cat 5e patch cable.
Video frames are being dropped.	• The extender is not compatible with the HDCP source and/or sink device.	1. Contact Technical Support.
Video LED is off.	• One or both of the DVI cables are not connected, are of poor quality or are malfunctioning. • The sink or source is not supported. • The KVM extender product is malfunctioning.	1. Confirm extender operation with DVI cables that are less than 78" (2m) in length and have connection between each connectors shield. 2. Confirm extender operation with a Cat 5e patch cable. 3. Contact Technical Support.

Specifications

Range	330 feet (100 meters) over solid core Cat 5e STP (or better) cable. Solid core Cat 6 STP recommended for best performance.
Video Resolution & Depth	1900 x 1200, 24-bit color depth
Latency	Less than 1ms
USB Device Support & Throughputs	High-Speed devices (USB 2.0) - up to 30Mbps Full-Speed devices (USB 2.0 & 1.1) - up to 12Mbps Low-Speed devices (USB 2.0 & 1.1) - up to 1.5Mbps
USB Hub Support	Any single chain can include up to 4 USB hubs
USB Host Support	EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
AC Adapters	Input: 100-240 V AC, 50 – 60 Hz | Output: 5V DC, 3A (15 W)
Power Available to USB Device at REX	500 mA each port
Maximum USB Devices Supported	13 USB devices
Enclosure Material	Black anodized aluminum
Enclosure Dimensions	112 mm x 175 mm x 30 mm (4.4" x 6.9" x 1.18")
LOCAL EXTENDER	
Video Connector	1 x DVI-D In (24-pin connector)
USB Connector	1 x USB Type B Receptacle
Link Connector	1 x RJ45
REMOTE EXTENDER	
Video Connector	1 x DVI-D Out (24-pin connector)
Link Connector	1 x RJ45
USB Connector	3 x USB Type A Receptacles
ENVIRONMENTAL	
Operating Temperature Range	0°C to 40°C (32°F to 104°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	
Emissions	FCC Part 15 Class A, CE Class A, ICES-003 Class A
Immunity	CE EN 55024
Environmental	RoHS2 (CE)

Contacting Technical Support

If you are experiencing problems not referenced in Troubleshooting section, contact Technical Support at the company where you purchased this product and provide them with the following information:

- Host computer make and model
- Type of Operating System installed (e.g. Windows 8, Mac OS X etc.)
- Part number and serial number for both the local and remote extender
- Make and model of any USB device(s) attached to the product
- Description of the installation
- Description of the problem

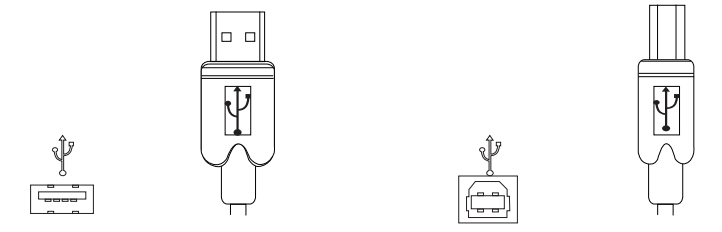
Technical Glossary

Category 5e (Cat 5e) Network Cabling

Category 5e cable is commonly also referred to as Cat 5e. 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 and provides better protection against EMI. **For best performance of this product, solid core Category 6 STP cable with Category 6 RJ45 connectors is recommended.**

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.



RJ45

The Registered Jack (RJ) physical interface is what connects the network cabling (Cat 5) to the Local Extender Unit and Remote Extender unit. You may use either the T568A scheme (Table 1) or the T568B scheme (Table 2) for cable termination as the extender uses all four pairs of the cable. RJ45 connectors are sometimes also referred to as 8P8C connectors.

RJ45 Pin Positioning

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

