



KVM - DVI, USB 2.0, Cat 5 Extender

330 feet (100 meters)

EL5100 User Guide



Powered by
**EXTREME
LINK™**

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Thank you for purchasing the KVM - DVI, USB 2.0, Cat 5 Extender
330 feet (100 meters)

Please read this guide thoroughly.

FCC Radio Frequency Interference Statement Warning

This device complies with FCC Part 15 Subpart B.

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. Document #90-00900-A02

Contents

Introduction	4
Product Contents.....	4
Requirements.....	4
About KVM Extender.....	4
Compatibility and Recommended Setup	5
Local Extender Description and Markings	6
Remote Extender Description and Markings	7
 Installation Guide	 8
Installing the Local Extender Unit.....	8
Installing the Remote Extender Unit.....	8
Connecting the Local Extender to the Remote Extender	9
Checking Installation	9
Connecting a USB device	10
 Troubleshooting	 10
Specifications.....	13
Contacting Technical Support	14
Warranty Information	14
Technical Glossary	15

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
- 5V DC power adapter (2)
- USB Cable (6 ft)
- DVI Cable (5 ft)
- Quick Start Guide and Warranty Information



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

Requirements

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

- A computer with a DVI-D/DVI-I output
- 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 5 Unshielded Twisted Pair (UTP) cable with two RJ45 connectors (if using surface cabling), OR, Cat 5 cabling with two information outlets and two Cat 5 patch cords with RJ45 connectors (if using premise cabling)

All references to Cat 5 cable in this document refer to solid core and represent the minimum requirements. Solid core category 6 STP cable is recommended for best performance.



About the EL5100 | KVM - DVI, USB 2.0, Cat 5 Extender

The product incorporates ExtremeLink™ technology, enabling users to extend their video and USB up to 330 feet or 100 meters. The product is designed as a remote desktop or KVM (keyboard, video, mouse) extender.

Compatibility and Recommended Setup

The product is compatible with many graphics cards, Operating Systems, and monitors supporting up to a 1920 x 1200 resolution. However, there is no guarantee that all devices are compatible with the product as there are a number of different factors that may impact the operation of the KVM Extender.

The product complies with USB 1.1 and USB 2.0 specifications governing the design of USB devices. However, the product supports USB 1.1 and low bandwidth USB 2.0 devices. These devices include: keyboards, mice, flash drives, microphones, speakers, printers, and USB 1.1 web cameras. Please contact Technical Support to determine if your USB 2.0 device(s) can be supported.

DVI Cables

- ! Ensure DVI cables used with the extender have connection between each connector's shield. If not, it is possible the extender can be damaged.



Cabling

Solid core category 6 STP cable is recommended for best performance and extension distance may be reduced if not using category 6 STP cable. Cables must be terminated with category 6 connectors to qualify as category 6.

Cable Type	Installation Type	Maximum Distance
Solid Core Cat 5e	Uncoiled	330 ft (100m)
Solid Core Cat 5e UTP	Coiled	229 ft (70m)
Solid Core Cat 5e STP	Uncoiled	330 ft (100m)
Solid Core Cat 5e STP	Coiled	262 ft (80m)
Solid Core Cat 6 UTP	Uncoiled	330 ft (100m)
Solid Core Cat 6 UTP	Coiled	330 ft (100m)
Solid Core Cat 6 STP	Uncoiled	330 ft (100m)
Solid Core Cat 6 STP	Coiled	330 ft (100m)

Host Operating Systems

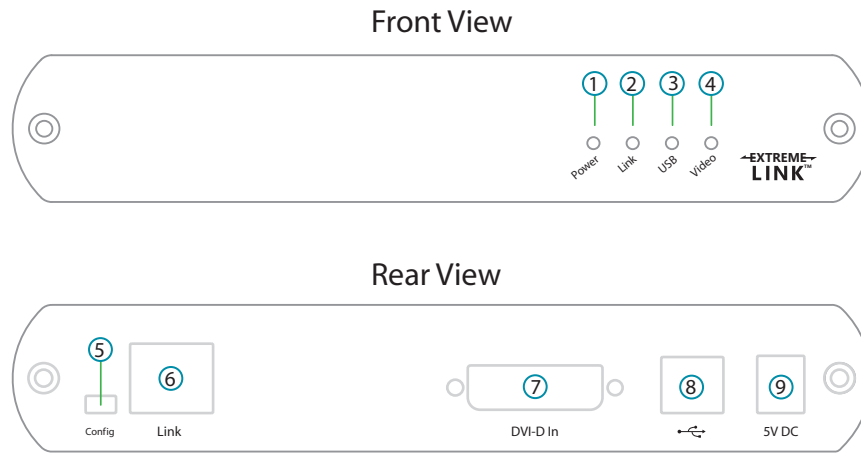
- Windows 7 (32 bit & 64 bit)
- Windows Vista (32 bit & 64 bit)
- Mac OS X
- Windows XP (32 bit & 64 bit)
- Linux

Peripherals

- Keyboard
- Mass Storage Devices
- USB 1.1 Web Cameras
- Mice
- Speakers
- Microphones

Local Extender Description and Markings

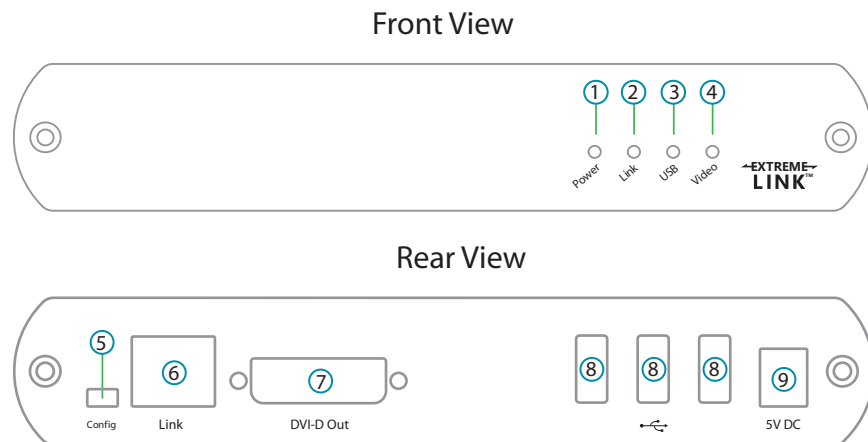
The Local Extender connects to the computer using the supplied DVI and USB cable.



ITEM	TYPE	DESCRIPTION
1	Power LED (Green)	LED green indicates the system is ready. Off indicates there is no power applied to the unit.
2	Link LED (Green)	LED green indicates a valid link is established between the Local and Remote Extender. Off indicates there is no link.
3	USB LED (Green)	LED green indicates the system is properly enumerated on the host computer. Blinking green indicates the host is in suspend mode. No green light (off) indicates the system is not enumerated.
4	Video LED (Green)	Blinking LED green indicates normal video activity. Solid Green light indicates HDCP video activity. No green light (Off) indicates no video activity.
5	Config	Reserved for company use only.
6	Link Port (RJ45)	Accepts RJ45 connector for Cat 5 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 Local Extender unit to the host computer.
9	Power Port	Connects to the 5V, 3A power adapter.

Remote Extender Description and Markings

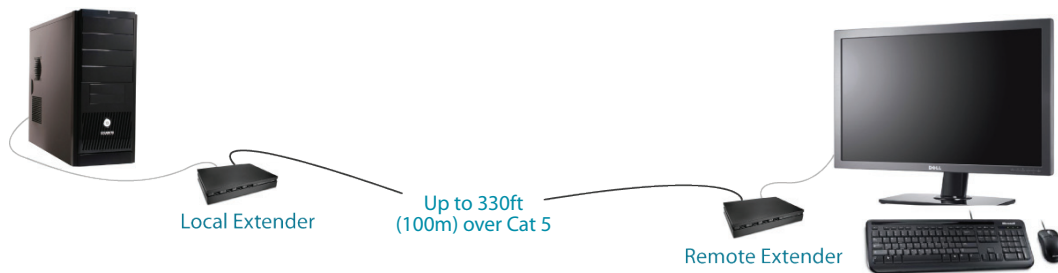
The Remote Extender provides DVI output to a monitor and three USB Type A ports for standard USB devices. Additional devices may be connected by attaching USB hubs.



ITEM	TYPE	DESCRIPTION
1	Power LED (Green)	LED green indicates the system is ready. Off when no power is applied to the unit.
2	Link LED (Green)	LED green indicates a valid link is established between the Local and Remote Extender. Off indicates there is no link.
3	USB LED (Green)	LED green indicates the system is properly enumerated on the host computer. Blinking Green indicates the host is in suspend mode. No green light (Off) indicates the system is not enumerated.
4	Video LED (Green)	Blinking LED green indicates normal video activity. Solid green light indicates HDCP video activity. No green light (Off) indicates no video activity.
5	Config	Reserved for company use only.
6	Link Port (RJ45)	Accepts RJ45 connector for Cat 5 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.

OR

If you are using premise cabling, ensure Cat 5 cabling is installed between the two locations, with Cat 5 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 Local Extender (Type B Port), 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 DVI cable.
3. Plug in your USB Device(s).

Connecting the Local Extender to the Remote Extender



To ensure proper operation, it is recommended that solid core Cat 6 STP cabling be used to connect the Local Extender unit to the Remote Extender unit. 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 5 cabling (not included) into the Link port (RJ45) on the Local Extender unit.
2. Plug the other end of the Cat 5 cabling into the Link port (RJ45) on the Remote Extender unit.

With Premise Cabling

1. Plug one end of a Cat 5 patch cord (not included) into the Link port (RJ45) on the Local Extender unit.
2. Plug the other end of the patch cord into the Cat 5 information outlet near the host computer.
3. Plug one end of the second Cat 5 patch cord (not included) into the Link port (RJ45) on the Remote Extender unit.
4. Plug the other end of the second patch cord into the Cat 5 information outlet near the USB device.

Connecting Power to the Local Extender and Remote Extender

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 Extender 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 Extender and Remote Extender unit 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 Guide.



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

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 unit.
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 unit are off.	<ul style="list-style-type: none">• The Local Extender unit is not receiving power from the Local Extender DC adapter.	<ol style="list-style-type: none">1. Ensure that the DC power adapter is properly connected to the Local Extender unit.2. Check that the DC adapter is connected to a live source of electrical power.

PROBLEM	CAUSE	SOLUTION
All LEDs on Remote Extender unit are off.	<ul style="list-style-type: none"> The Remote Extender unit is not receiving power from the Remote Extender DC adapter. 	<ol style="list-style-type: none"> 1. Ensure that the DC power adapter is properly connected to the Remote Extender unit. 2. Check that the DC adapter is connected to a live source of electrical power.
Link LEDs on Local Extender unit and Remote Extender unit are off.	<ul style="list-style-type: none"> There is no connection between the Local Extender unit and Remote Extender unit. 	<ol style="list-style-type: none"> 1. Ensure a Cat 5 cable is connected between the Local Extender unit and Remote Extender unit. Use a Cat 5 or better cable, UTP with a straight through connector and no crossovers, and conductor RJ45 connectors are used at both ends. 2. Connect a short Cat 5 patch cord between the Local Extender unit and Remote Extender unit to determine if the original Cat 5 cable is defective. 3. Ensure the Cat 5 cable has a minimum amount of coiling (as straight as possible).
Link LED on Local Extender unit is on, USB LED on Local Extender unit is off.	<ul style="list-style-type: none"> The host computer is not powered on. The Local Extender unit is not connected to the computer. The computer does not support USB hubs. The unit is malfunctioning. The USB cable is defective. 	<ol style="list-style-type: none"> 1. Disconnect all USB devices from the Remote Extender unit. 2. Disconnect the Local Extender unit from the computer. 3. Disconnect the Local Extender and Remote Extender units from the DC power adapters. 4. Reconnect the Local Extender unit to the DC power adapter. 5. Reconnect the Remote Extender unit to the DC power adapter. 6. Reconnect the USB devices to the Remote Extender unit. 7. Reconnect the Local Extender unit to the computer. 8. If the USB LED continues to be off, contact Technical Support.

PROBLEM	CAUSE	SOLUTION
All LEDs on both the Local Extender unit and Remote Extender unit are on, but the USB device does not operate correctly or is detected as an "Unknown Device" in the Operating System.	<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 KVM extender product is malfunctioning. 	<ol style="list-style-type: none"> 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 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 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.
Blinking Video on the Sink (Monitor).	<ul style="list-style-type: none"> • A high quality Cat 5 cable is not being used or is coiled. 	<ol style="list-style-type: none"> 1. Remove all loops in the Cat 5 cable. 2. Confirm extender operation with a Cat 5 patch cable.
Video frames are being dropped.	<ul style="list-style-type: none"> • The extender is not compatible with the HDCP source and/or sink device. 	<ol style="list-style-type: none"> 3. Contact Technical Support.
Video LED is off.	<ul style="list-style-type: none"> • 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. 	<ol style="list-style-type: none"> 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 5 patch cable. 3. Contact Technical Support.

Specifications

Range	330 feet (100 meters) over solid core Cat 5e (or better) cable. Solid core Cat 6 STP recommended for best performance.
USB device support	High-speed devices (USB 2.0) at reduced bandwidth Full-speed devices (USB 2.0 & 1.1) Low-speed devices (USB 2.0 & 1.1)
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)
Maximum USB devices supported	13 USB devices
AC adapters	Input: 100/240 V AC, 50 – 60 Hz Output: 5V DC, 3A (15 W)
Power available to USB device at REX unit	500 mA each port
Local Extender	
Video Connector	DVI-D In (24-pin connector)
USB connector	1 x USB Type B
Link connector	1 x RJ45
Dimensions	4.4" x 6.9" x 1.18" (112 mm x 175 mm x 30 mm)
Remote Extender	
Video Connector	DVI-D Out (24-pin connector)
Link connector	1 x RJ45
USB connector	3 x USB Type A
Dimensions	4.4" x 6.9" x 1.18" (112 mm x 175 mm x 30 mm)
Operating temperature range	32°F to 104°F (0°C to 40°C)
Storage temperature range	-4°F to 158°F (-20°C to 70°C)
Operating humidity	20% to 80% relative humidity, non-condensing
Storage humidity	10% to 90% relative humidity, non-condensing
Regulatory testing	FCC Part 15 Class A, CE Class A, ICES-003 Class A

Contacting Technical Support

If you are experiencing problems not referenced in Trouble Shooting, you may contact **Technical Support** (techsupport@icron.com) and send the following information:

- Host computer make and model
- Type of Operating System installed (e.g. Windows XP, Mac OS X, Windows 7 etc.)
- Part number and serial number for both the Local Extender unit and Remote Extender unit
- Make and model of any USB device(s) attached to the product
- Description of the installation
- Description of the problem

Warranty Information

Limited Hardware Warranty

Icron Technologies Corporation warrants that any hardware products accompanying this documentation shall be free from significant defects in material and workmanship for a period of one year from the date of purchase. Icron Technologies Corporation's hardware warranty extends to Licensee, its customers, and end users.

The Warranty does not include repair of failures caused by: misuse, neglect, accident, modification, operation outside a normal operating environment, failure caused by service of the device by non-authorized servicers, or failure caused by a product for which Icron Technologies Corporation is not responsible.

Hardware Remedies

Icron Technologies Corporation's entire liability and the Licensee's exclusive remedy for any breach of warranty, shall be, at Icron Technologies Corporation's option, either (a) return of the price paid or (b) repair or replacement of hardware, which will be warranted for the remainder of the original warranty period or 30 days, whichever is longer. These remedies are void if failure of the hardware has resulted from accident, abuse, or misapplication.

Limitation of Liability

The hardware warranty set forth in this agreement replaces all other warranties. Icron Technologies Corporation expressly disclaims all other merchantability and fitness for a particular purpose and noninfringement of third-party rights with respect to the hardware.

Icron Technologies Corporation dealer, agent, or employee is authorized to make any modification extension, or addition to this warranty. Under no circumstances will Icron Technologies Corporation, its suppliers or licensors be liable for any costs of procurement or substitute products or services, lost profits, loss of information or data, or any other special, indirect, consequential, or incidental damages arising in any way out of the sale of, use of, or inability to use Icron Technologies Corporation product or service, even if Icron Technologies Corporation, its suppliers or licensors have been advised of the possibility of such damages. In no case shall Icron Technologies Corporation, its suppliers and licensors' liability exceed the actual money paid for the products at issue.

Since some jurisdictions do not allow the limitation of implied warranties of liability for incidental, consequential, special or indirect damages, the above limitation may not always apply. The above limitation will not apply in case of personal injury where and to the extent that applicable law requires such liability.

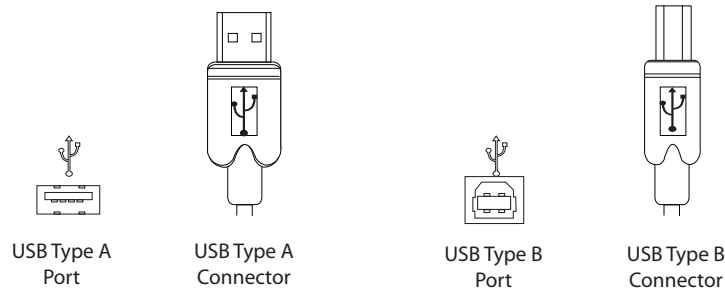
Technical Glossary

Category 5 (Cat 5) Network Cabling

Category 5 cable is commonly also referred to as Cat 5. 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. Category 5 has been superseded by Cat 5e 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.



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

