USB Isolator
USB Isolator Extender

User's Manual

USB-ISO101/USB-ISO101E

USB-ISO101

USB-ISO101E

1. Introduction

USB Isolator protects PC or Laptop while connecting USB peripherals which is wired to high voltage. This small, industrial - grade isolator is very easy to use and provides a high-voltage barrier protection against surges, noise and ground loop errors. It is suitable for use in sensitive applications like automotive measurements.

USB isolator provides a high - voltage isolation barrier between computer and it's connected USB device. The isolation protects equipment from electrical over-voltages and transient voltage spikes, by eliminating ground loop currents flowing between the PC and USB device which can cause damage and inaccurate measurements. Additionally, isolation minimizes conducted noise from static discharge, magnetic fields and radio frequency interference.

USB isolator is USB bus powered and can provide 5V 300mA to your USB device with built-in isolated DC-DC converter. This is possible only when the isolator is connected to a high power USB host port.

The USB Isolator Extender can help remove the distance barrier between PC and USB-enabled peripheral devices which are located at a distance over 50 meters away and protect your PC or Laptop connecting USB peripherals which are wired to high voltages. It provides a high - voltage isolation barrier between your computer and it's connected USB device. The isolation protects the equipment from electrical over-voltages and transient voltage spikes. It also eliminates ground loop currents flowing between the PC and USB device which can cause damage and inaccurate measurements. Additionally, isolation minimizes conducted noise from static discharge, magnetic fields and radio frequency interference.

The receiver unit can provide 5V 200mA (or 5V 1.05A connecting with external power), supplying your USB device with built-in isolated DC to DC converter. This is possible only when the isolator is connected to a high power USB host port.

2. Features of USB Isolator

- USB isolation 5000V DC between USB host and USB device
- USB 2.0 compatible, 1.5Mbps low speed and 12Mbps full speed Bi-directional communication.
- Short circuit protected for x D+ and x D- lines.
- Isolated power supply in device through a DC-to-DC converter
- Class 3A contact ESD performance per ANSI / ESD STM5.1-2007
- High common-mode transient immunity :>25 kV/us
- Supports Windows 98SE / ME / 2000 / XP / Vista / 7 / 8 / 8.1 / 10 / 11; Mac OS 8.6 or higher; no driver installation required

3. Specifications of USB Isolator

Model No.		USB-ISO101
Isolation	D+ & D-	5000V DC
	Power	3000V DC
Transfer Rate		1.5 / 12 Mbps
Connector	Host	USB Type A Male
	Device	USB Type A Female
Cable Length		0.15 m
Operating Temperature		0°C to 50°C
LED		1
Downstream Power		Up to 300mA
Power Mode		Bus powered
Housing		Plastic
Dimension (L x W x H)		66 x 39 x 20 mm

4. Features of USB Isolator Extender

- Extend USB peripherals up to 100 meters for low-speed devices and 50 meters for full-speed devices.
- USB isolation 5000V DC between USB host and USB device
- USB 2.0 compatible, 1.5Mbps low speed and 12Mbps full speed Bi-directional communication.
- Short circuit protected for x D+ and x D- lines.
- Isolated power supply in device through a DC-to-DC converter
- Class 3A contact ESD performance per ANSI / ESD STM5.1-2007
- High common-mode transient immunity :>25 kV/us
- Supports Windows 98SE / ME / 2000 / XP / Vista / 7 / 8 / 8.1 /10 / 11; Mac OS-8.6 or higher

5. Specifications of USB Isolator Extender

Model No.			USB-ISO101E
Transmitter & Receiver Isolation	D+ & D-		5000V DC
	Power		3000V DC
Transfer Rate			1.5 / 12 Mbps
Connectors	Transmitter	Upstream	USB Type A Male
		Output	8P8C RJ-45 Female
	Receiver	Input	8P8C RJ-45 Female
		Downstream	USB Type A Female
Operating Temperature			0°C to 50°C
Transmitter Cable Length			0.15 m
LED			Transmitter & Receive each one
Downstream Power			Up to 200mA / 1.05A
Power Mode			Bus Powered / 5VDC 1A
Housing			Plastic
Dimension (L x W x H)			66 x 39 x 20 mm

6. Connecting
Typical Application

6.1 USB Isolator

Power LED (Orange)

Fig 1. The USB Isolator unit is installed in-line between the PC and a connected USB device.

6.2 USB Isolator Extender

Rx Power LED (Orange)   Tx Power LED (Orange)
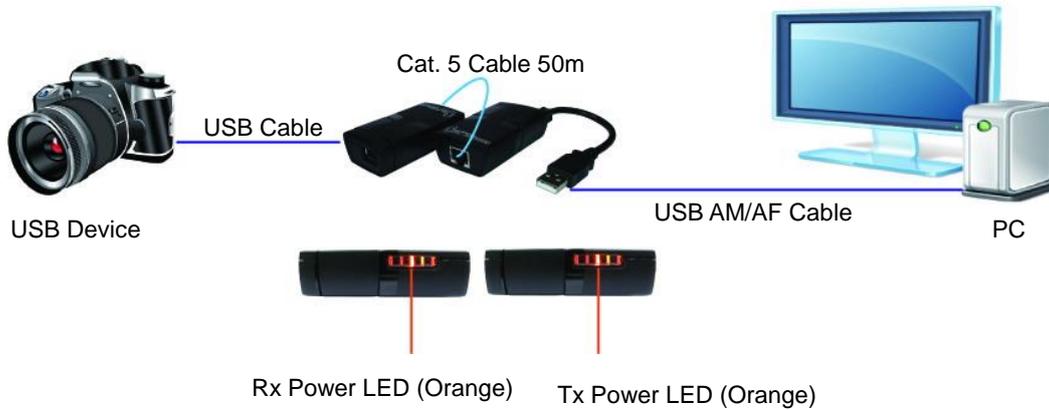
Fig 2. The USB Isolator Extender is installed over Cat.5 cable between the PC and a connected USB device.

7. Installation

7.1 USB Isolator

1. Plug the unit's molded USB A male cable into the host computer or USB hub
2. The Power LED will light on, indicating power is being received from the host and the isolator is ready.
 3. Plug the downstream device into the unit (Type A female connector). This USB cable is not included.
4. The USB Isolator is transparent to the host operating system and does not require configuration or software installation.

Note: The isolators are USB bus powered. When the USB Isolator is connected to a high power USB host port, it can provide power current up to 300mA to the attached downstream device.

7.2 USB Isolator Extender
7.2.1 Installing the Transmitter (Local Unit)

1. Plug the unit's molded USB A male cable into an available USB port of host computer.
2. Plug one end of the Cat. 5 cable into the Link port (RJ-45) on the transmitter. (Please see **Category cable wiring**)
3. Power LED indicator lights on.

7.2.2 Installing the Receiver (Remote Unit)

1. Plug the other end of the Cat. 5 cable into the Link port (RJ-45) on the receiver.
2. Plug the 5VDC power adapter into the receiver, and AC plug into the power receptacle.
3. Connect the USB device through USB cable into the USB port of receiver.
4. Power LED indicator lights on

7.2.3 Checking the Installation

1. For Windows users (2000, XP, Vista, 7, 8, 8.1, 10, 11), open Device Manager to confirm the extender has been installed correctly. Expand the Entry and check the USB controllers. If the extender is installed correctly, it should be listed as a "Generic USB Hub."
2. For Mac OS X users, open the System Profiler to confirm that the extender has been installed correctly. In the left column under Hardware, select "USB" and check the right panel. If the extender has been installed correctly, you should find it listed as a "Hub" under the USB High-Speed Bus/USB Bus.
3. If the extender is not detected correctly or fails to detect, go to the page of Troubleshooting.
4. The USB Isolator is transparent to the host operating system and does not require configuration or software installation.

Note: The isolators are USB bus powered. When the USB Isolator is connected to a high power USB host port, it can provide power current up to 200mA (or 5V 1.05A connecting with external power), to the attached downstream device.

Additional info:

The extender complies with USB 1.1 and USB 2.0 specifications governing the design of USB devices. However, we do not guarantee that all USB devices are compatible with the extender, as there are a number of different factors that may impact the operation of USB devices over extended distances.

8. Category cable wiring

Take precaution selecting the Cat. 5 wires before connecting; use a cable tester to check the wires are correctly terminated. (Incorrect Termination may cause damage to the receiver unit). Recommend to use T568B wiring as shown below

9. Troubleshooting

Table -1 provides troubleshooting tips. The solutions 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, contact your distributor for further support.

Table -1 Troubleshooting tips

Problem	Cause	Solution
The USB device is attached but not functioning.	• The USB device requires drivers that were not installed. • The USB device does not support USB hubs. • The USB device might be failed.	1. Install the required USB device driver on the computer operating system before plug in the USB device to the receiver. Access your USB device's manufacturer's Web site for detail info. 2. In the Universal Serial Bus (USB) controllers section of Device Manager, check if the USB device is listed.
The USB device is attached but not functioning.	• An over current condition has occurred because the USB device is drew more current than it can be supplied per USB specification (500mA). Operating systems may pop up to indicate an issue.	1. Unplug the power adapter from the receiver, wait approximately 30 seconds; plug the power adapter into receiver again. 2. If over current keeps occurring, either the USB device may use more power than the USB specification, or the USB device may be damaged. 3. Consult your USB device documentation and plug into your USB device with the required power adapter.

Regulatory Compliance

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CE/FCC & Recycling Information

CE Certification

This equipment complies with the requirements relating to Electromagnetic Compatibility Standards EN55022/EN55024 and the further Standards cited therein. It must be used with shielded cables only.
It has been manufactured under the scope of RoHS compliance.

FCC Certification

This equipment has been tested and found 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 in a residential installation.
You are cautioned that changes or modification not expressly approved by the party responsible for compliance could void your authority to operate the equipment.
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

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.
Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products. More details can be obtained from your national WEEE recycling agency.