



USB 2.0 Fiber Optic KVM Extender System

User Guide



VOYAGER
USB

Thank you for purchasing the Voyager USB 2.0 Fiber Optic KVM extender

Please read this guide thoroughly.

This document applies to Part Numbers: 2350101-01 and 2350201-01.

Regulatory Agency Acceptance

We hereby certify that the Voyager USB 2.0 Fiber Optic KVM Extender to which this declaration relates conforms to the protection requirements of the EMC Directive as determined by the following standards:

Applied and met EMC emission test standards:		
Emission	General Standard	Referenced Standard
Radiated Emissions, Class B	EN 55022:2010/AC:2011 FCC CFR 47, Part 15 Subpart B ICES-003 Issue 4	EN 55022:2010/AC:2011
Conducted emissions, Class B		EN 55022:2010/AC:2011
Harmonic Current Emissions, Class A		EN 61000-3-2:2006/ A2:2009
Flicker Emissions		EN 61000-3-3:2008

Applied and met EMC immunity test standards:		
Immunity	General Standard	Referenced Standard
Electrostatic discharge Immunity, Criterion B	EN 55024:2010	EN 61000-4-2:2009
Radiated RF Immunity, Criterion A		EN 61000-4-3:2006/ A2:2010
EFT Immunity, Criterion B		EN 61000-4-4:2004/ A1:2010
Surges Immunity, Criterion B		EN 61000-4-5:2006
Conducted RF Immunity, Criterion A		EN 61000-4-6:2009
Magnetic field Immunity		EN 61000-4-8:2010
Voltage Dips & Interruptions Immunity, Criterion B/C/C		EN 61000-4-11:1994

FCC Radio Frequency Interference Statement Warning

Class A Device: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide a 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 not installed and used in accordance with the Instruction Manual, may cause harmful interference to radio communications.

Caution: This equipment is intended for use in the manner prescribed in the Instruction Manual. Any user changes or modifications not expressly approved by TV One Multimedia Solutions could void the user's authority to operate the equipment. The Instruction Manual shows or describes the proper connection of this equipment for operation that insures FCC compliance

CE Statement

We declare under our sole responsibility that the USB 2.0 Voyager USB, to which this declaration relates, is in conformity with European Standard EN 55022 Class B, EN 61000 and EN 55024.

IC Statement

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

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Document # 90-01251-A01

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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:** Cautions provide important information about an operational requirement.

Voyager USB 2.0 Fiber Optic KVM extender Product Contents

Voyager USB Kit is packaged with:


- CPU Transceiver
- REMOTE Transceiver
- AC Power Adapter
Regionally specific power cord
- 2x Multimode SFPs (singlemode available)
- Quick Start Guide

 An additional AC power adapter may be purchased for the CPU Transceiver in the event that your USB port cannot supply the required 500mA current.

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)
- 2-strand fiber optic cable with Duplex LC connectors (if using surface cabling), or 2-strand fiber optic cabling with two information outlets and two 2-strand fiber optic patch cords with Duplex LC connectors (if using premise cabling)

 The maximum length of the multimode fiber optic cable (MMF) supported by the Voyager USB system, including patch cords is 500m over OM2 (or greater), or 275m over OM1. *Singlemode SFPs available for distances up to 10Km

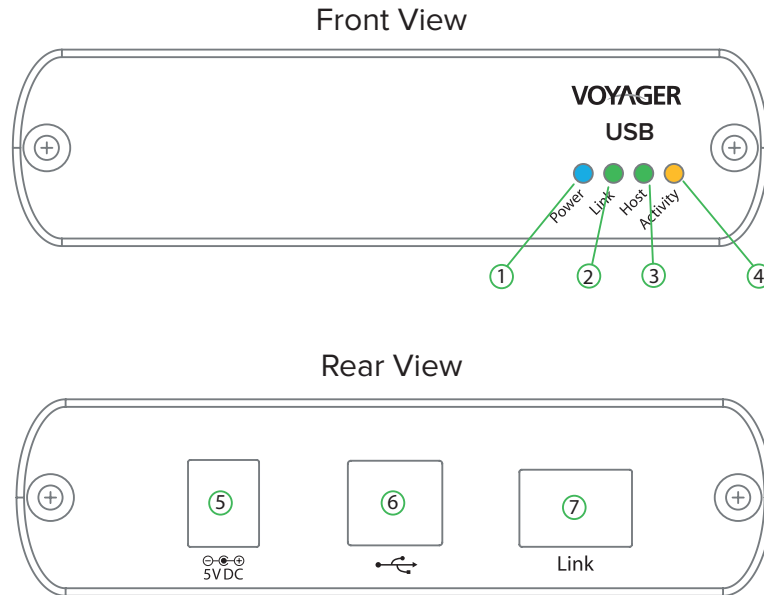
About the Voyager USB 2.0 Fiber Optic KVM extender Product Contents

The Voyager USB 2.0 Fiber Optic KVM extender enables users to extend beyond the standard 5m cable limit for USB peripheral devices. With the Voyager USB 2.0 Fiber Optic KVM extender, USB devices can be located up to 500 meters from the computer. The Voyager USB 2.0 Fiber Optic KVM extender is composed of two individual units: the CPU Transceiver and the REMOTE Transceiver. The Voyager USB 2.0 Fiber Optic KVM extender includes the Voyager USB suite of features:

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

CPU Transceiver Description

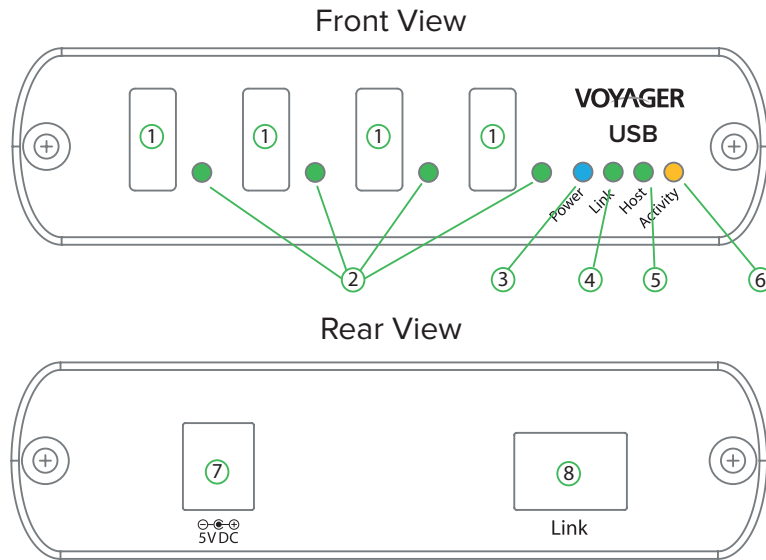
The CPU Transceiver connects to the computer using a standard USB cable. Power for this unit is provided by the USB on the host computer.



ITEM	TYPE	DESCRIPTION
1	Power LED (Blue)	LED turns on when power is supplied. The LED light is off when no power is supplied.
2	Link LED (Green)	Indicates a valid Link is established between the CPU and REMOTE transceivers.
3	Host LED (Green)	Indicates that the Voyager USB system is properly enumerated on the host computer. LED blinks when in suspend state.
4	Activity LED (Amber)	Indicates activity when data transmission is active between the CPU and REMOTE Transceivers. LED blinks intermittently with or without a USB device connected. When the CPU and REMOTE Transceivers are in suspend mode, the LED is off.
5	Power Port (optional)	Not required in normal operation. An optional 5V power supply can be connected to the CPU Transceiver to provide power if the USB port on the host computer is not capable of delivering 500mA to the unit.
6	USB Type B connector	Used to connect the CPU Transceiver to the host computer.
7	Link Port (Duplex LC)	Extension link Duplex LC fiber optic transceiver port. This is where a Multimode SFP is inserted (singlemode available).

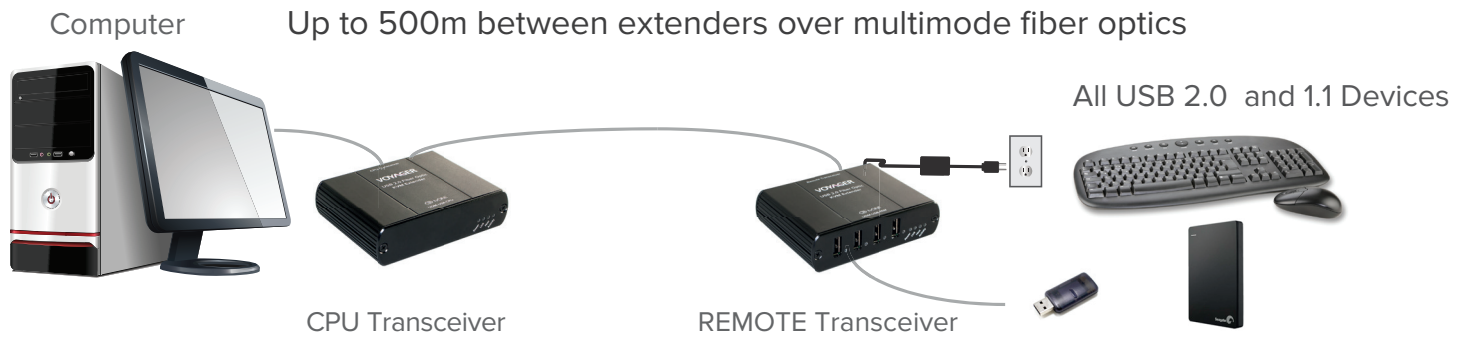
REMOTE Transceiver Description

The REMOTE Transceiver provides USB Type A ports for standard USB devices. The REMOTE Transceiver allows you to connect up to four USB devices directly. Additional devices may be connected by attaching USB hubs to the REMOTE Transceiver. The REMOTE Transceiver is powered by an external AC adapter and can supply up to 500mA to each USB port.



ITEM	TYPE	DESCRIPTION
1	Device Port (USB Type A)	Accepts USB device(s).
2	Device LED (Green/Orange)	Indicates when a USB device is connected to the Device Port. Solid green when device is plugged in and active. Off when device is in suspend mode or REMOTE Transceiver is powered off. Orange when the REMOTE Transceiver detects an overcurrent condition, and the attached USB device attempts to draw more than the 500mA current.
3	Power LED (Blue)	LED turns on when power is supplied. Off when no power is supplied.
4	Link LED (Green)	Indicates a valid Link is established between the CPU and REMOTE transceivers.
5	Host LED (Green)	Indicates that the Voyager USB system is properly enumerated on the host computer. LED blinks when in suspend mode.
6	Activity LED (Amber)	Indicates activity when data transmission is active between the CPU and REMOTE Transceivers. LED blinks intermittently with or without a USB device connected. When the CPU and REMOTE Transceivers are in suspend mode, the LED is off.
7	Power Port	Connects to the AC power supply. Required on REMOTE Transceiver for proper operation.
8	Link Port (Duplex LC)	Extension link Duplex LC fiber optic transceiver port. This is where a Multimode SFP is inserted (singlemode available)

Installation Guide



*Singlemode Fiber optics available

Fiber Optic Link Cabling

The CPU Transceiver and the REMOTE Transceiver are interconnected by up to 500 meters of fiber optic cabling. Two strands of 50/125 μ m (500m) MMF or 62.5/125 μ m (275m) MMF cabling are required. The cabling subsystem must provide a duplex connection with crossover, and must be terminated with Duplex LC connectors at both ends.

Installing the Voyager USB System

Before you can install the Voyager USB, 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 Voyager USB supports a maximum distance of 500m.

OR

If you are using premise cabling, ensure compatible fiber optic cabling is installed between the two locations, with fiber optic information outlets located near both the computer and the USB device(s), and the total length including patch cords is no more than 500m over MMF.

Installing the CPU Transceiver

1. Place the CPU Transceiver near the computer.
2. Install the supplied USB cable between the CPU Transceiver and USB port on the host computer.

Installing the REMOTE Transceiver

1. Place the REMOTE Transceiver near the USB device(s).
2. Plug the power adapter into a suitable AC outlet.
3. Connect the power adapter to the REMOTE Transceiver.

Connecting the CPU Transceiver to the REMOTE Transceiver



To ensure proper operation, the maximum length of the fiber optic cable, including patch cords, must not exceed 500 meters. The cabling must provide a duplex connection with crossover and must be terminated with Duplex LC connectors at both ends. *Singlemode optics available for distances up to 10Km via OS1 SMF cabling.

With Surface Cabling

1. Plug one end of the fiber optic cabling (not included) into the Link port on the CPU Transceiver.
2. Plug the other end of the fiber optic cabling into the Link port on the REMOTE Transceiver.

With Premise Cabling

1. Plug one end of a fiber optic patch cord (not included) into the Link port on the CPU Transceiver.
2. Plug the other end of the patch cord into the fiber optic information outlet near the host computer.
3. Plug one end of the second fiber optic patch cord (not included) into the Link port on the REMOTE Transceiver
4. Plug the other end of the second patch cord into the fiber optic information outlet near the USB device.

Checking the Installation

1. On the CPU Transceiver and the REMOTE Transceiver, check that the Power, Host, and Link LEDs are on and that the Activity LED is blinking. If the Link LED is permanently off, then the cabling between the CPU Transceiver and the REMOTE Transceiver is not installed properly or is defective.
2. For Windows users (2000, XP, Vista, Windows 7, Windows 8), open Device Manager to confirm that the Voyager USB has installed correctly. Expand the entry for Universal Serial Bus controllers by clicking the “+” sign. If the Voyager USB has been installed correctly, you should find it listed as a “Generic USB Hub”.
3. For Mac OS X users, open the System Profiler to confirm that the Voyager USB has installed correctly. In the left hand column under Hardware, select “USB” and inspect the right hand panel. If the Voyager USB has been installed correctly, you should find it listed as a “Hub” under the USB High-Speed Bus/USB Bus.
4. If the Voyager USB is not detected correctly or fails to detect, please consult the Troubleshooting section in this User Guide (page 8).



Check if the USB device is detected by your operating system.

To open System Profiler in Mac OS X:

Open the 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

To open Device Manager in Windows 8:

Right click on the lower left bottom corner of your screen, then select: 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 Transceiver.
3. Check that the device is detected and installed properly in the operating system.

Compatibility

The Voyager USB complies with USB1.1 and USB 2.0 specifications governing the design of USB devices. However, it is not possible to guarantee that all USB devices are compatible with the Voyager USB, as there are a number of different configurations 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
All LEDs on the CPU Transceiver are off.	<ul style="list-style-type: none">• The CPU Transceiver is not receiving power from the USB port or the (optional) CPU Transceiver AC adapter.	<ol style="list-style-type: none">1. Ensure that the USB connection between the CPU Transceiver and the host computer is properly installed.2. Move the USB connector to another USB port on the host computer.
All LEDs on REMOTE Transceiver are off.	<ul style="list-style-type: none">• The REMOTE Transceiver is not receiving power from the AC adapter.	<ol style="list-style-type: none">1. Ensure that the AC power adapter is properly connected to the REMOTE Transceiver.2. Check that the AC adapter is connected to a live source of electrical power. Check that the REMOTE Transceiver power LED is illuminated.
Link LEDs on CPU Transceiver and the REMOTE Transceiver are off.	<ul style="list-style-type: none">• There is no connection between the CPU Transceiver and the REMOTE Transceiver.	<ol style="list-style-type: none">1. Ensure that a multimode fiber optic cable with crossover is connected between the CPU Transceiver and the REMOTE Transceiver.2. Connect a fiber optic crossover patch cord between the CPU Transceiver and the REMOTE Transceiver. Recheck operation of the system.

PROBLEM	CAUSE	SOLUTION
<p>Link LED on CPU and REMOTE Transceivers are on, Host LED on CPU and REMOTE Transceivers are off.</p>	<ul style="list-style-type: none"> • The host computer is not powered on. • The CPU Transceiver is not connected to the computer (when used with the optional CPU Transceiver AC adapter). • The computer does not support USB hubs. • The Voyager USB is malfunctioning. 	<ol style="list-style-type: none"> 1. Disconnect all USB devices from the remote extender. 2. Disconnect the CPU Transceiver from the computer. 3. Disconnect the REMOTE Transceiver from the AC power adapter. 4. Reconnect the CPU Transceiver to the computer. 5. Reconnect the REMOTE Transceiver to the AC power adapter. 6. In the Universal Serial Bus controllers section of Device Manager, check that the Voyager USB is recognized as a “Generic USB Hub”.
<p>The system was working, but the Host LED on CPU/REMOTE Transceivers are suddenly blinking.</p>	<ul style="list-style-type: none"> • The REMOTE Transceiver is in suspend mode. The operating system may put the Voyager USB in suspend mode when the computer is put into a Suspend/Standby state or when no USB devices are attached. 	<ol style="list-style-type: none"> 1. Recover/Resume the operating system from Suspend/Standby mode (see your operating system’s documentation). 2. Attach a USB device to the Voyager USB.
<p>All LEDs on both the CPU and REMOTE Transceivers are on but the USB device does not operate correctly, or is detected as an “Unknown Device” in the operating system.</p>	<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 Voyager USB is malfunctioning. 	<ol style="list-style-type: none"> 1. Disconnect the Voyager USB 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 device. 4. Update your system BIOS, chipset, or USB Host controller drivers from your System/ Mother board manufacturer’s website. 5. If the device operates properly when directly connected to the computer, connect another device (of a different type) to the Voyager USB. Then connect the Voyager USB to the computer. 6. If the second device does not operate, the extender system may be malfunctioning. Contact technical support for assistance. 7. If the second device does operate properly, the first device may not be compatible with the Voyager USB.

<p>USB device is attached to REMOTE Transceiver USB port but the REMOTE Transceiver device LED is off.</p>	<ul style="list-style-type: none"> The USB device must have the appropriate driver installed on the computer operating system. 	<ol style="list-style-type: none"> 1. Install the required USB device driver on the computer operating system prior to attaching the USB device to the REMOTE Transceiver. Please see your USB device manufacturer's website for details. 2. Consult your USB device documentation and power your USB device with the additional, USB device manufacturer supplied, power supply (if available).
<p>Device LED is orange and CPU/REMOTE Transceivers are no longer functioning.</p>	<ul style="list-style-type: none"> Overcurrent condition has occurred because USB device draws more power than can be supplied per USB specification (500mA). 	<ol style="list-style-type: none"> 1. Power cycle the REMOTE Transceiver.
<p>LED Host and LINK LEDs on CPU and REMOTE Transceivers blink intermittently.</p>	<ul style="list-style-type: none"> Firmware mismatch between the CPU and REMOTE Transceiver. 	<ol style="list-style-type: none"> 1. Use a different CPU/REMOTE Transceiver pair which have the same firmware revision. 2. Upgrade the CPU and REMOTE Transceiver firmware, contact technical support for assistance.

NOTES

Specifications

Range	Up to 500m (1640 feet) over OM2 or greater Up to 275m (902 ft) over OM1 Up to 10Km (6.2 miles) over OS1 (singlemode SFPs required)
Speeds	USB 2.0: Up to 480 Mbps; USB 1.1: Up to 12 Mbps
USB Hub Support	Any single chain can include up to 3 USB hubs plus one Voyager USB
USB Host Support	xHCI (USB 3.0) at USB 2.0 speed, EHCI (USB 2.0) and OHCI/UHCI (USB 1.1)
Maximum USB devices supported	14 USB devices or 3 USB hubs with 11 USB devices.
AC Adapter	Input: 100/240 V AC, 50 – 60 Hz, 600mA maximum; Output: 5 V DC, 3 A
AC Adapter Connector	1.7 mm centre-positive jack
System Shipping Weight	2.0 lbs. (0.9 kg)
CPU Transceiver	
USB Connector	1 x USB Type B Receptacle
Link Connector	1 x SFP Duplex LC
Dimensions	100 mm x 76 mm x 26 mm (3.94" x 2.99" x 1.02")
Enclosure Material	Black Anodized Aluminum
REMOTE Transceiver	
USB Connector	4 x USB Type A Receptacles
Link Connector	1 x SFP Duplex LC
Dimensions	100 mm x 76 mm x 26 mm (3.94" x 2.99" x 1.02")
Enclosure Material	Black Anodized Aluminum
Available Current	500 mA to each USB port
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 B), IC (Class B), CE (Class B)
Environmental	RoHS2 (CE)
SUPPORT	
Voyager Matrix	CPU and REMOTE Transceivers require Simplex I/O cards when integrated with VG-Matrix
Warranty	2-year

Contacting Technical Support

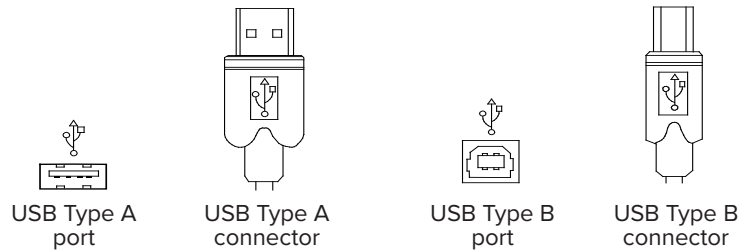
If you are experiencing problems not referenced in the Troubleshooting section of this Guide, then please contact tvONE Technical Support and provide them with the following information:

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

Technical Glossary

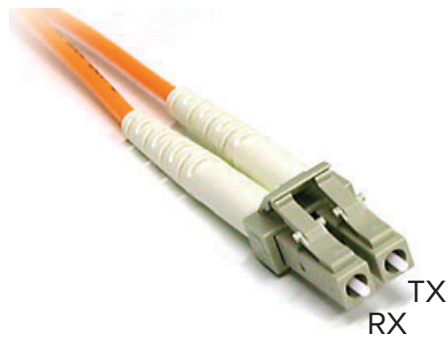
USB Cables

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.



Duplex LC Crossover

When a crossover fiber-optic cable is called for, the cable has the transmit signal on one end connected to the receive signal at the other end.



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