

Velocity[⚡]kvm T-Series

High Reliability, Rack-Space Saving,
Video and Audio Extension Solutions

T-Series Modular KVM Extension Solutions

For use in the VTM-004200 and VTM-Q04200 Chassis



VelocityKVM T-Series DVI Modules

PRODUCT MANUAL

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Subject: VelocityKVM T-Series DVI Modules Product Manual
Revision: G, October 2016



thinklogical®



T-Series Chassis
& Modules



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PREFACE

Conventions Used in this Manual

Throughout this manual you will notice certain symbols that bring your attention to important information. These are **Notes** and **Warnings**. Examples are shown below.



Note: Important Notes appear in blue text preceded by a yellow exclamation point symbol, as shown here.

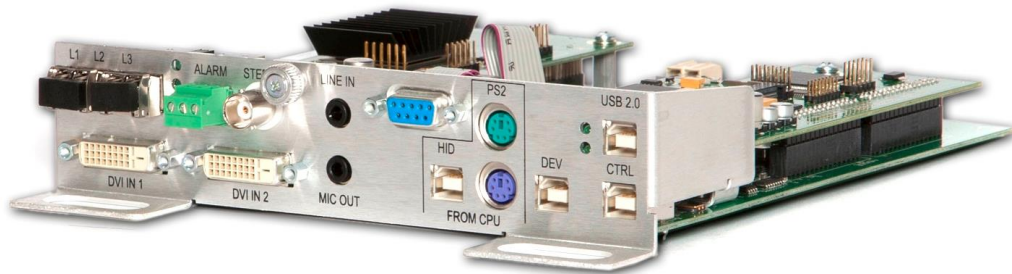
A note is meant to call the reader's attention to **helpful information** at a point in the text that is relevant to the subject being discussed.



Warning! All Warnings appear in red text, followed by blue text, and preceded by a red stop sign, as shown here.

A warning is meant to call the reader's attention to **critical information** at a point in the text that is relevant to the subject being discussed.

BEFORE STARTING ANY PROCEDURE, IT IS RECOMMENDED THAT YOU READ THE INSTRUCTIONS THOROUGHLY!



The VelocityKVM T-Series VTM-24 Transmitter Module: VTM-U00024-LCTX

*Powered by Thinklogical's cutting edge **MRTS Technology** (Multi Rate Transmission System), each module seamlessly transports every frame of a DVI, SDI or RGB video stream with no compression or dropped frames.*

**Powered by
MRTS Technology**

1. T-Series DVI Modules

The Logical Solution: *Modular KVM Extension/DVI and SDI Support in One Unit*

The VelocityKVM line of extenders continues to evolve and add value with exciting new capabilities. The **VelocityKVM T-4200** is housed in a high reliability, rack-space-saving chassis that includes all of the same capabilities in a 1U device that used to require 2U. Featuring a dual interface and current sharing power supplies, each 1U chassis supports two separate interface modules, allowing users to combine module options within one chassis.

Each T-Series module (VTM- prefix) is also available in a Desktop version (VDM- prefix) that fits into our **Velocity Desktop Chassis**, which features a single power supply housed in a 1U chassis designed to accommodate any one module from our Desktop line.

Available modules support a variety of video display options and **all modules support PS2, full duplex stereo audio (unbalanced), stereo emitter, serial (RS-232), USB 2.0 (up to 480 Mbps) and/or USB 1.0 HID.** Modules that support **Multi Video Paths, Separate Audio Paths and Separate Data Paths** are also available. (See Appendixes C and D on pages 22 and 23.)


Using multi-mode or single-mode fiber, the system allows users to securely locate a display device and peripherals up to 40 kilometers away from the controlling computer without loss of resolution.

In addition, all high speed peripherals function with no latency, making it ideally suited for a wide range of applications in the broadcast and post-production field, command and control centers, universities, air traffic control, energy production and exploration, and most other commercial KVM applications.

1.1 T-Series Module Features

VelocityKVM T-Series Modules include the following features:

- Two hot-swappable interface modules are supported (Features include):
 - one single-link DVI display
 - one single-link DVI or RGB display
 - one dual-link DVI display
 - two single-link DVI displays
 - four SD/HDMI/SDI signals
 - two 3G/SDI/dual-link signals
- A dry contact annunciator alarm provides a warning for power failure/over-temperature
- All models are available with standard LC type fiber connectors.
- All modules use single-mode or multi-mode fiber optics.
- Fully compatible with all of Thinklogical's VXRouter line of products.
- Simple plug and play
- DVI modules support PS2, full duplex stereo audio, 3D stereo emitter, serial (RS-232), USB 2.0 and USB 1.0 HID




1.2 Contents

When you receive your Thinklogical® VelocityKVM T-Series or Desktop Series Extender System, you should find the following items:

- VelocityKVM T-4200 Modular Chassis w/ dual Power Supply Modules
-OR-
- VelocityKVM Desktop Modular Chassis w/ single Power Supply Module

VelocityKVM Desktop
Modular Chassis
VED-000001



- VelocityKVM T-Series or Desktop Extender Module(s): Transmitter/Receiver/Transceiver
- AC power cord(s), PWR-000006-R (International connections may differ) – Qty 1 or 2
- VelocityKVM Extender Cables:
 - Video Cable, 2 Meters – See *Technical Specifications*, pg. 12
 - Audio Cable Kit (8 pcs., para. 1.2.2 below), 6 Feet, KIT-000005-R – Qty 1
- VelocityKVM T-4200 or Desktop Extender Product Manual CD
- Product Quick Start Guide

Video Cables

Single-link: DVI-D Male Cable, 2 Meters (CBL000009-002MR)



Peripheral Cables

KIT-000005-R Audio Cable Kit (8 pcs.)– Qty 1



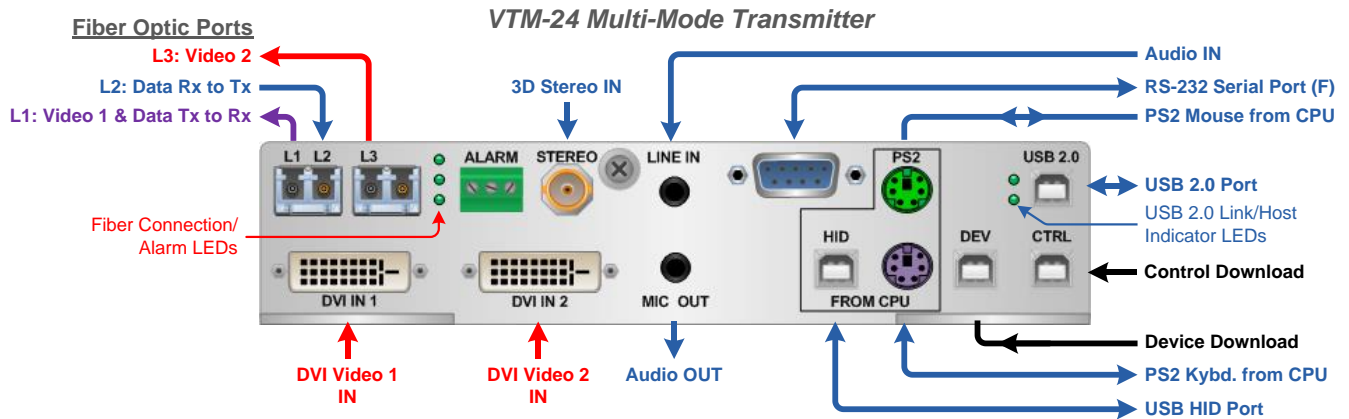
- 2 each – 6 pin mini din (6')
- 2 each – USB A-B (6')
- 2 each – 3.5mm to 3.5mm plug (6')
- 1 each – DB9M to DB9F (6')
- 1 each – BNC male to male, 50 Ω (6')

2. Connecting VelocityKVM T-Series Extenders

All physical connections to the product use industry-standard connectors. Non-supplied cables are commercially available. All connections are found on the rear of the unit.

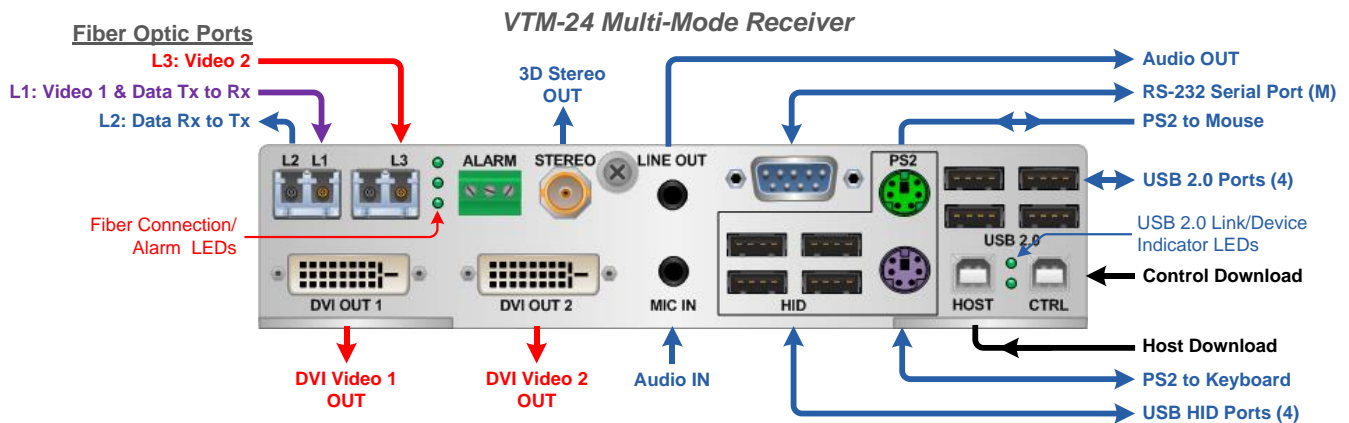
2.1 Transmitter Modules

The Transmitter Module connects to the CPU (or other sources) using the supplied cables listed above. The Transmitter then connects to the Receiver via multi-mode or single-mode fiber-optic cables. (See paragraph 2.8 *Technical Specifications* on page 12, for details about specific optical distances using various fiber types.)



2.2 Receiver Modules

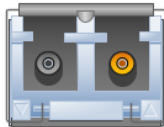

The Receiver Module receives video and KVM data from the Transmitter via multi-mode or single-mode fiber-optic cables. The Receiver's output ports connect to the destination peripheral devices with their own standard cables.



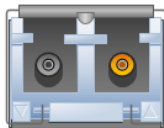

2.3 Module LEDs

Both the Transmitter and Receiver Modules feature five LEDs. Their functions are as follows:

DVI Transmitter LEDs

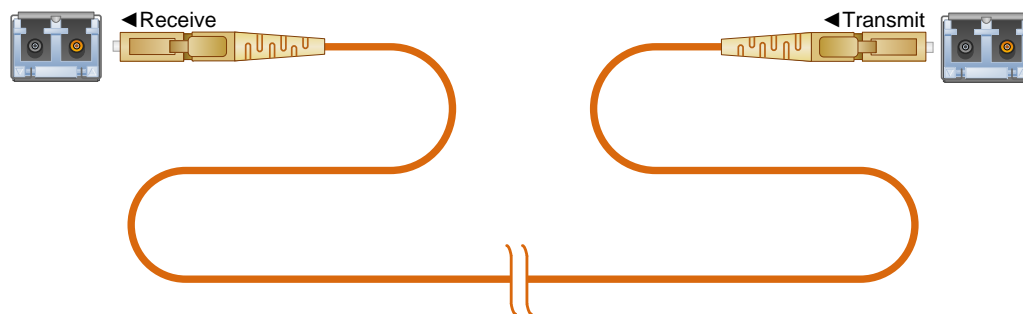
 <p>L3</p>	● L2 Fiber Connected	USB 2.0 Link Established ●	 <p>USB 2.0</p>
	● Non-functioning	Host Communication established ●	
	● Alarm Condition (flashing)		

DVI Receiver LEDs

 <p>L3</p>	● L1 Fiber Connected	 <p>USB 2.0</p>
	● L3 Fiber Connected	
	● Alarm Condition (flashing)	
	USB 2.0 Link Established ●	
	Device Communication established ●	

2.4 Fiber Optic Cable

Fiber optic cables connect the Transmitters to the Receivers. Standard multi-mode fiber optic cables must be 50 or 62.5 microns, terminated with LC type fiber optic connectors. **Be careful not to kink or pinch the fiber optic cable as it is being installed and keep all bend diameters to no less than 3 inches (76.2mm).**



Standard multi-mode fiber optic cable (up to 1000 meters),
50 or 62.5 microns, terminated with LC-type connectors

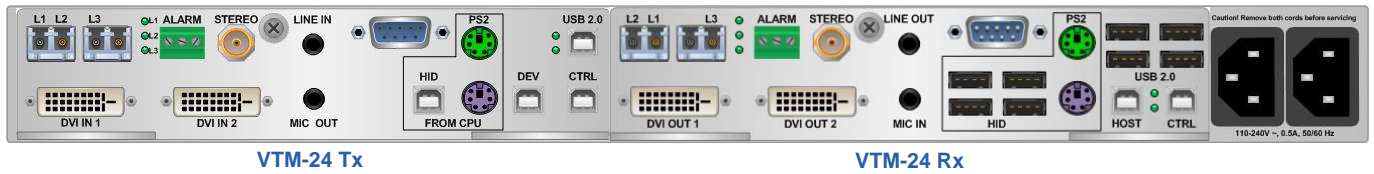
With two fibers connected (in models with one SFP) or with three fibers connected (in models with two SFPs) video information is transmitted from the TX to the RX over fiber L1 (and L3 in models with two SFPs). Fiber L2 is used as a data return path from the RX to the TX, allowing full duplex, bi-directional RS-232 data transfer.

2.5 Installation

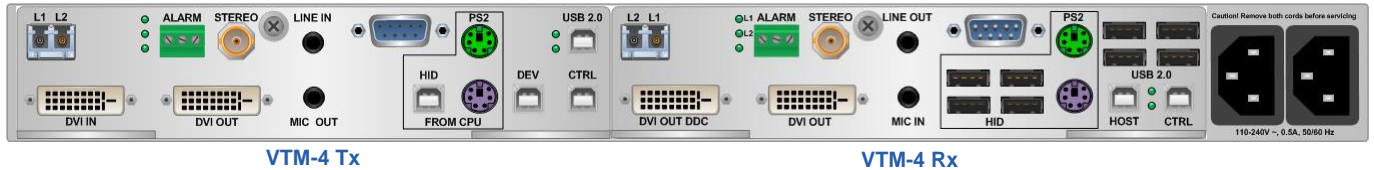
All physical connections to the product use industry-standard connectors. Non-supplied cables are commercially available. All connections are found on the rear of the unit.

Rear Panel Views

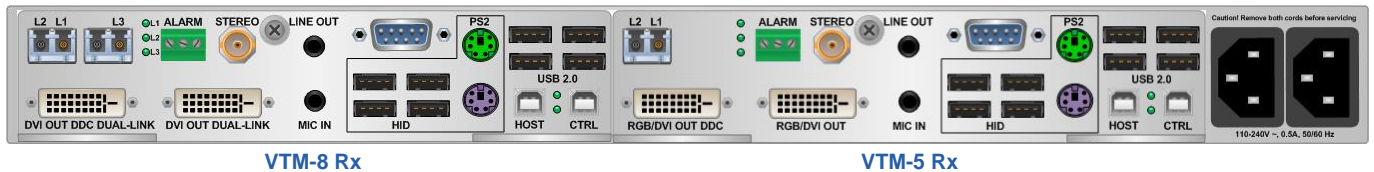
T-4200 as a Transceiver (Single-Link, 2 DVI Displays)



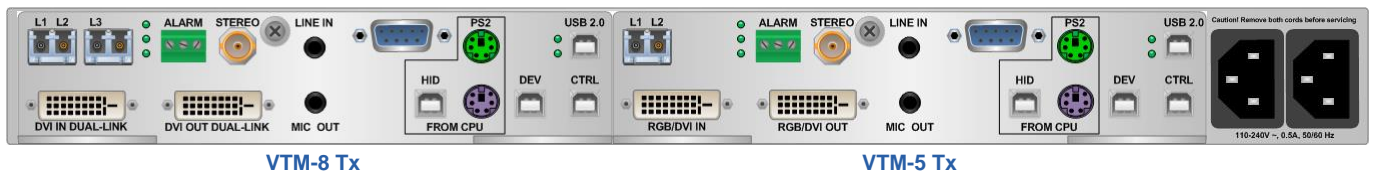
T-4200 as a Transceiver (Single-Link, 1 DVI Display)



T-4200 as 2 Receivers (Dual-Link DVI & Single-Link RGB Displays)



T-4200 as 2 Transmitters (Dual-Link DVI & Single-Link RGB Displays)

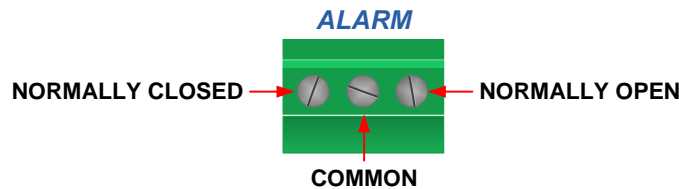


A selection of Velocity T-4200 Rear Panels in Transceiver, Receiver & Transmitter Configurations

2.6 Set-Up

Dry Contact Alarm

Dry contact alarms are located on the transmitter and receiver units. When there is an alarm condition the relay is energized. An example of possible alarm causes might be over-temperature or a power supply issue.

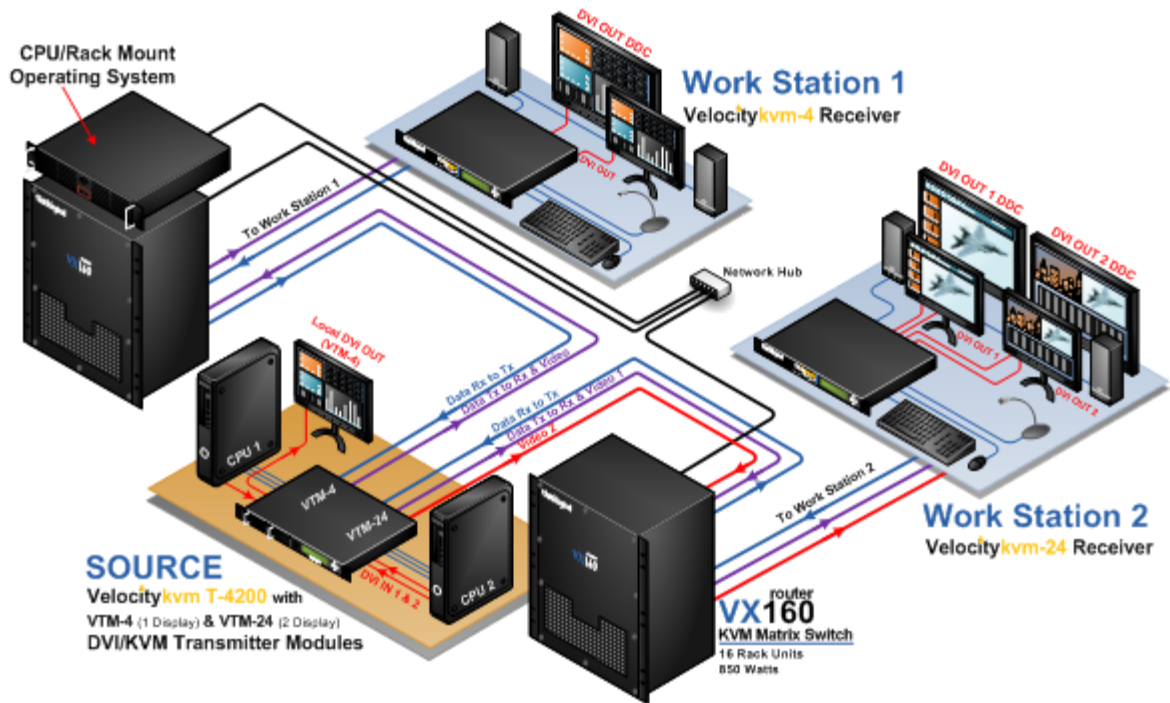


The dry contact alarm is a **Form C** contact with the following ratings:
Nominal Switching Capacity: 1 A 30 VDC
Max. Switching Power: 30 W DC

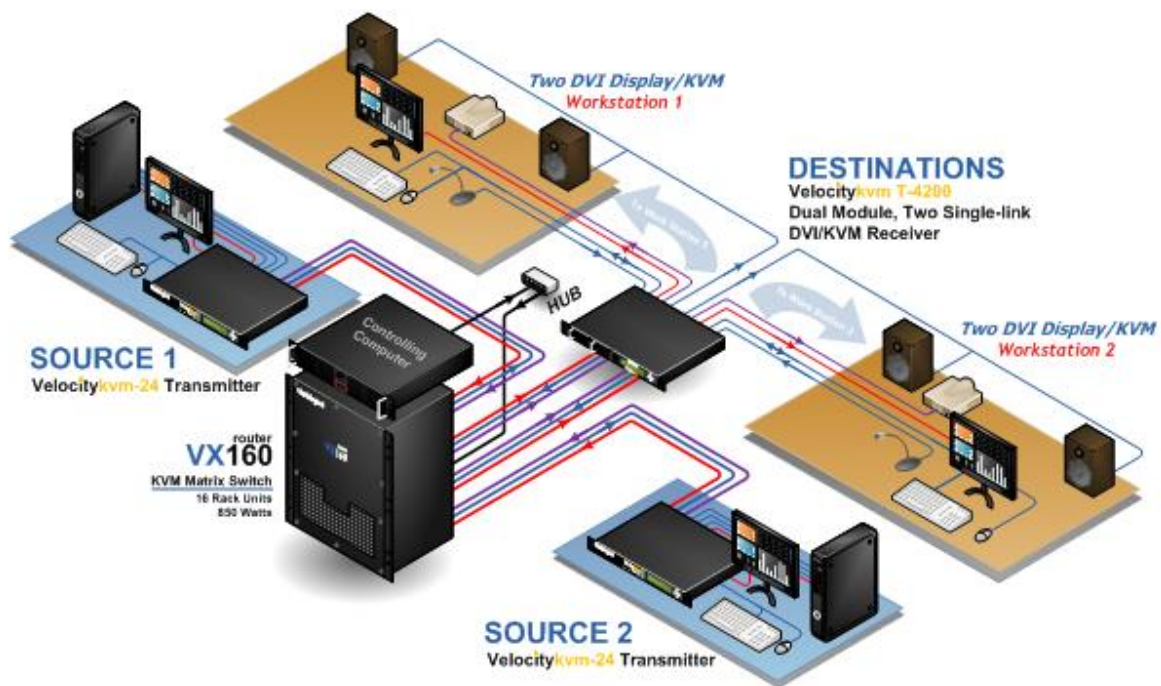
Firmware Upgrades

Firmware upgrades are available through Thinklogical. Please call **1-203-647-8700** for assistance.

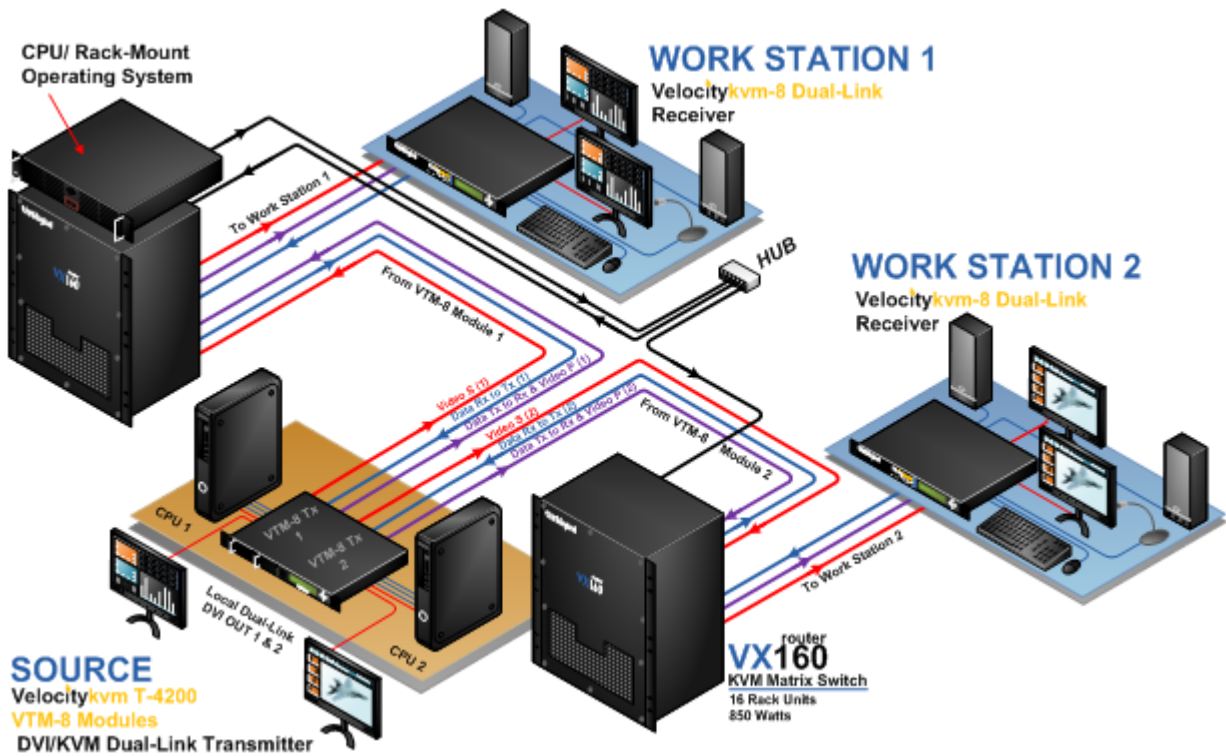
2.7 T-Series Application Diagrams



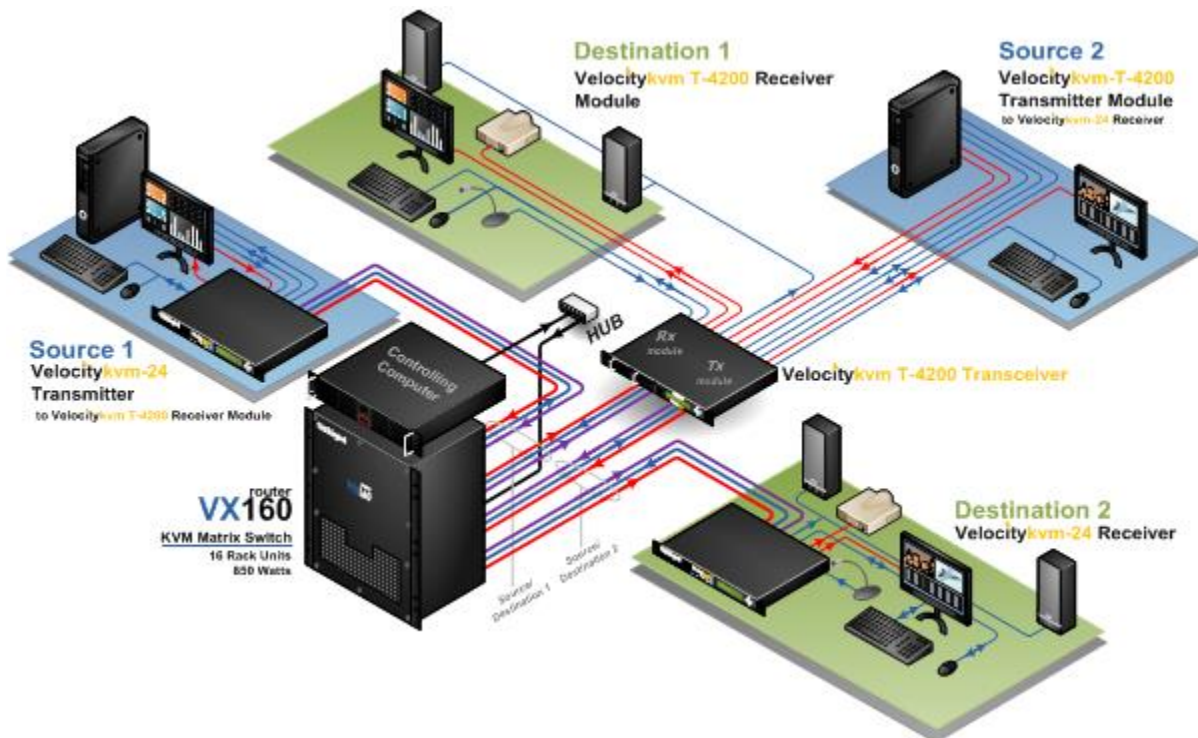
2.7.1 Two Source Computers connected to one **VelocityKVM T-4200 Chassis** equipped with one **VTM-4 TX** and one **VTM-24 TX**, which extends video and peripheral signals to two separate **VelocityKVM (stand alone) Receivers** (VelocityKVM-4 and VelocityKVM-24) at two separate workstations. Signals are routed through two Thinklogical **VX160 Routers**



2.7.2 Two Source Computers, each connected to a **VelocityKVM-24 (stand alone) Transmitter** extending video and peripheral signals to one **VelocityKVM T-4200 Chassis** equipped with two **VTM-24 RX Modules**. The VTM-24s extend to two separate workstations. Signals are routed through a Thinklogical **VX160 Router**.



2.7.3 Two Source Computers, each connected to a VTM-8 Dual-Link DVI Transmitter extending dual-link video and peripheral signals to two VelocityKVM-8 Dual-Link DVI Receiver workstations. Signals are routed through two Thinklogical VX160 Routers.



2.7.4 Two Source Computers, located at separate workstations, connected to one VelocityKVM T-4200 Transceiver Chassis equipped with dual VTM-24 Modules (one TX and one RX), which extends video and peripheral signals to two separate VelocityKVM-24 (stand alone) destinations (one TX and one RX) at separate workstations. Signals are routed through a Thinklogical VX160 Router.

2.8 Technical Specifications

Each Thinklogical VelocityKVM T-Series Module is designed to the following specifications:

<p>Copper Connectors</p>	<p>Transmitter: Video (2) DVI-D Audio MIC/Line 3.5mm Jack Serial Port DB9 Female USB 2.0 USB B PS2 Keyboard MiniDIN 6 Female PS2 Mouse MiniDIN 6 Female Firmware Updates USB B (3) Fiber Connectors LC</p> <p>Receiver: Video (2) DVI-D Audio MIC/Line 3.5mm Jack Serial Port DB9 Male USB 1.1 USB A (4) USB 2.0 USB A (4) PS2 Keyboard MiniDIN 6 Female PS2 Mouse MiniDIN 6 Female Firmware Updates USB B Fiber Connectors LC</p>
<p>Optical Cable</p>	<p>Fiber Type: 50 or 62.5 micron, Multi-mode Required (per module): 2 or 3, depending upon application. (Not supplied)</p>
<p>Optical Distance</p>	<p>Up to 65 meters with Type OM1 Up to 350 meters with Type OM2 Up to 650 meters with Type OM3 Up to 1000 meters with Type OM4</p>
<p>Operating Temp and Humidity</p>	<p>0° to 50°C (32° to 122 °F), 5% to 95% RH, non-condensing</p>
<p>Dimensions</p>	<p>Height: 1.65" (41.91 mm) ± .039"; .1 mm Depth: 6.366" (161.70 mm)* ± .039"; .1 mm Width: 7.226" (183.54 mm) ± .039"; .1 mm</p>
<p>Supply Voltage</p>	<p>100-240 VAC, 47-63 Hz, Universal AC power supply</p>
<p>Power Consumption</p>	<p>10 Watts per module</p>
<p>Compliance</p>	<p>Approvals for US, Canada, and European Union</p>
<p>Warranty</p>	<p>Twelve months from date of shipment. Extended warranties available.</p>

2.9 Velocity Unbalanced Audio Specifications

VELOCITY UNBALANCED AUDIO SPECIFICATIONS

AUDIO SAMPLING RATE: 46.875kHz

TRANSMITTER:

Line In Impedance: 10kΩ

Line In (max): 2.5V p/p (0.884Vrms, 1.15dBu)

Mic Out Impedance: 300Ω

Mic Out (max): 0.45V p/p (0.159Vrms, -13.75dBu)

RECEIVER:

Line Out Impedance: 560Ω

Line Out (max) into 1K ohms: 3V p/p (1.06Vrms, 2.72dBu)

Mic In Impedance: 5kΩ

Mic In (max) : 0.24V p/p (0.085Vrms, -19.2dBu)

3. Regulatory & Safety Compliance

3.1. Safety Requirements

Symbols found on the product

Markings and labels on the product follow industry-standard conventions. Regulatory markings found on the products comply with domestic and many international requirements.

Regulatory Compliance

Thinklogical's® products are designed and made in the U.S.A. These products have been tested by a certified testing laboratory and found to be compliant with the following standards (both domestic USA and many international locations):

North America

Safety

ANSI/UL60950-1: 1st Edition (2003)

CAN/CSA C22.2 No. 60950-1-03

CENELEC EN 60950-1, 1st Edition (2001)

LASER Safety

CDRH 21CFR 1040.10

Class 1 LASER Product

IEC60825:2001 Parts 1 and 2

Class 1 LASER Product

Electromagnetic Interference

FCC CFR47, Part 15, Class A

Industry Canada ICES-003 Issue 2, Revision 1



Australia & New Zealand

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

European Union

Declaration of Conformity

Manufacturer's Name & Address:

Thinklogical, LLC®

100 Washington Street

Milford, Connecticut 06460 USA

These products comply with the requirements of the Low Voltage Directive 72/23/EEC and the EMC Directive 89/336/EEC.

Standards with Which Our Products Comply

Safety

CENELEC IEC 600950-1 2nd Ed. 2005

Electromagnetic Emissions

EN55022: 1994 (IEC/CSP1R22: 1993)

EN61000-3-2/A14: 2000

EN61000-3-3: 1994

Electromagnetic Immunity

EN55024: 1998 Information Technology Equipment-Immunity Characteristics

EN61000-4-2: 1995 Electro-Static Discharge Test

EN61000-4-3: 1996 Radiated Immunity Field Test

EN61000-4-4: 1995 Electrical Fast Transient Test

EN61000-4-5: 1995 Power Supply Surge Test

EN61000-4-6: 1996 Conducted Immunity Test

EN61000-4-8: 1993 Magnetic Field Test

EN61000-4-11: 1994 Voltage Dips & Interrupts Test

3.2. Supplementary Information

The following statements may be appropriate for certain geographical regions and might not apply to your location.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.



Warning! This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take corrective measures.



Note: 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 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 in which case the user may be required to take adequate corrective measures at their own expense.



Note: This Class A digital apparatus complies with Canadian ICES-003 and has been verified as being compliant within the Class A limits of the FCC Radio Frequency Device Rules (FCC Title 47, Part 15, Subpart B CLASS A), measured to CISPR 22: 1993 limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment.



Note: The user may notice degraded audio performance in the presence of electro-magnetic fields.

Product Serial Number

Thinklogical products have a unique serial number, which includes a date-code, printed on an adhesive label that is affixed to the unit. The format for the date-code is *2 digits for the month*, dash, *2 digits for the year*, plus *at least four digits for a unique unit number*. For example:

05-160127 indicates the unit was built in the **5th** month of **2016**, and is unit number **127**.

Connection to the Product

Connections and installation hardware for our products use industry-standard devices and methods. All wiring connections to the customer equipment are designed to minimize proprietary or customized connectors and cabling. Power connections are made with regionally appropriate power cords and approved methods.

4. How to Contact Us

4.1. Customer Support

Thinklogical® is an engineering company and we will always do our best to ensure that you receive any assistance you need directly from our most knowledgeable engineers.

We believe that the first line of support comes from the design engineers that developed each particular product.

Therefore, your questions or issues will be handled promptly by our in-house engineers who are most familiar with your products. **We won't be satisfied until you are satisfied.**

Thank you for choosing Thinklogical® products for your application.

We appreciate your business and are dedicated to helping you successfully use our products.

thinklogical® is always here to help you.

To contact us, please use the following telephone numbers and internet-based methods:

Website

Check out our website for current product offerings, support information and general information about all of the products we offer.

Our internet website offers product information on all current systems, including technical specification sheets and installation guides (for viewing online or for download), product diagrams showing physical connections and other information you might need.

Internet: **www.thinklogical.com**



Note: Most online documents are stored as Adobe Acrobat “PDF” files. If you do not have the Adobe Acrobat reader needed to view PDF files, visit www.adobe.com for a download.

Email

Thinklogical® is staffed **Monday through Friday from 8:30am to 5:00pm**, Eastern Time Zone. We will do our best to respond to your email inquiries promptly. Please use the following email addresses:

info@thinklogical.com – Information on Thinklogical® and our products.

sales@thinklogical.com – Sales Department - orders, questions or issues.

support@thinklogical.com – Product support, technical issues or questions, product repairs and request for Return Authorization.

Telephone

Thinklogical Operator	1-203-647-8700
Product & Customer Support:	1-203-647-8798
US Commercial & Canada Sales:	1-203-647-8715
US Federal Government Sales:	1-203-647-8716
Toll Free in the Continental US:	1-800-291-3211
International Sales (Europe, Middle East, Africa):	1-203-647-8704
International Sales (Asia Pacific, Central & Latin America):	1-203-647-8734

Please contact our expert sales staff in Milford, CT. We are here Monday through Friday from 8:30am to 5:00pm, Eastern Time Zone. We'll provide a representative's direct dial phone number when you call.

If leaving a voice message, please provide a preferred time to call back so we may reach you at your convenience.

Our switchboard attendant will direct your call during regular business hours. We have an automated attendant answering our main telephone switchboard after regular business hours and holidays. Please leave voice messages for individuals at any time.

Fax

Our company facsimile number is **1-203-783-9949**. Please indicate the nature of the fax on your cover sheet and provide return contact information.

4.2. Product Support

Thinklogical's® support personnel are available **Monday through Friday from 8:30am to 5:00pm**, Eastern Time Zone. If your application requires assistance at some time outside of our normal business hours, please contact us beforehand and we will do our best to make arrangements to help you with your Thinklogical® products.

Warranty

Thinklogical, LLC® warrants this product against defects in materials and workmanship for a period of one year from the date of delivery. Thinklogical, LLC® and its suppliers disclaim any and all other warranties.



Note: Thinklogical, LLC® products carry a one year warranty, with longer term available at time of purchase on most products. Please refer to your product invoice for your products Warranty Terms & Conditions.

Defect remedy shall be the repair or replacement of the product, provided that the defective product is returned to the authorized dealer within a year from the date of delivery.

If you wish to return your device, contact the Thinklogical, LLC® authorized dealer where you purchased the device, or if you purchased directly, call Thinklogical, LLC® at **1-800-291-3211** (USA).

Return Authorization

If you need to return your Thinklogical® product to us for any reason, please get a **Return Merchandise Authorization Number (RMA#)** from Thinklogical's **Product Support Department (1-203-647-8700)** before sending the unit in.

In the event you must return a product to Thinklogical® directly, please contact **Customer Support** at **1-800-291-3211** or **1-203-647-8700**. Customer Support will ask you to describe the problem and will issue you a **Return Merchandise Authorization** number (RMA#). Pack the device in its original box, if possible, and return it with the RMA# printed on the outside of the box.



Note: DO NOT return a product to Thinklogical® without a *Return Merchandise Authorization*.

Our Addresses

If you have any product issues or questions or need technical assistance with your Thinklogical® system, please call us at **1-800-291-3211 (USA only)** or **1-203-647-8700** and let us help. If you need to write us or return a product, please use the following address: Return address for products with Return Merchandise Authorization: **Thinklogical, LLC®**

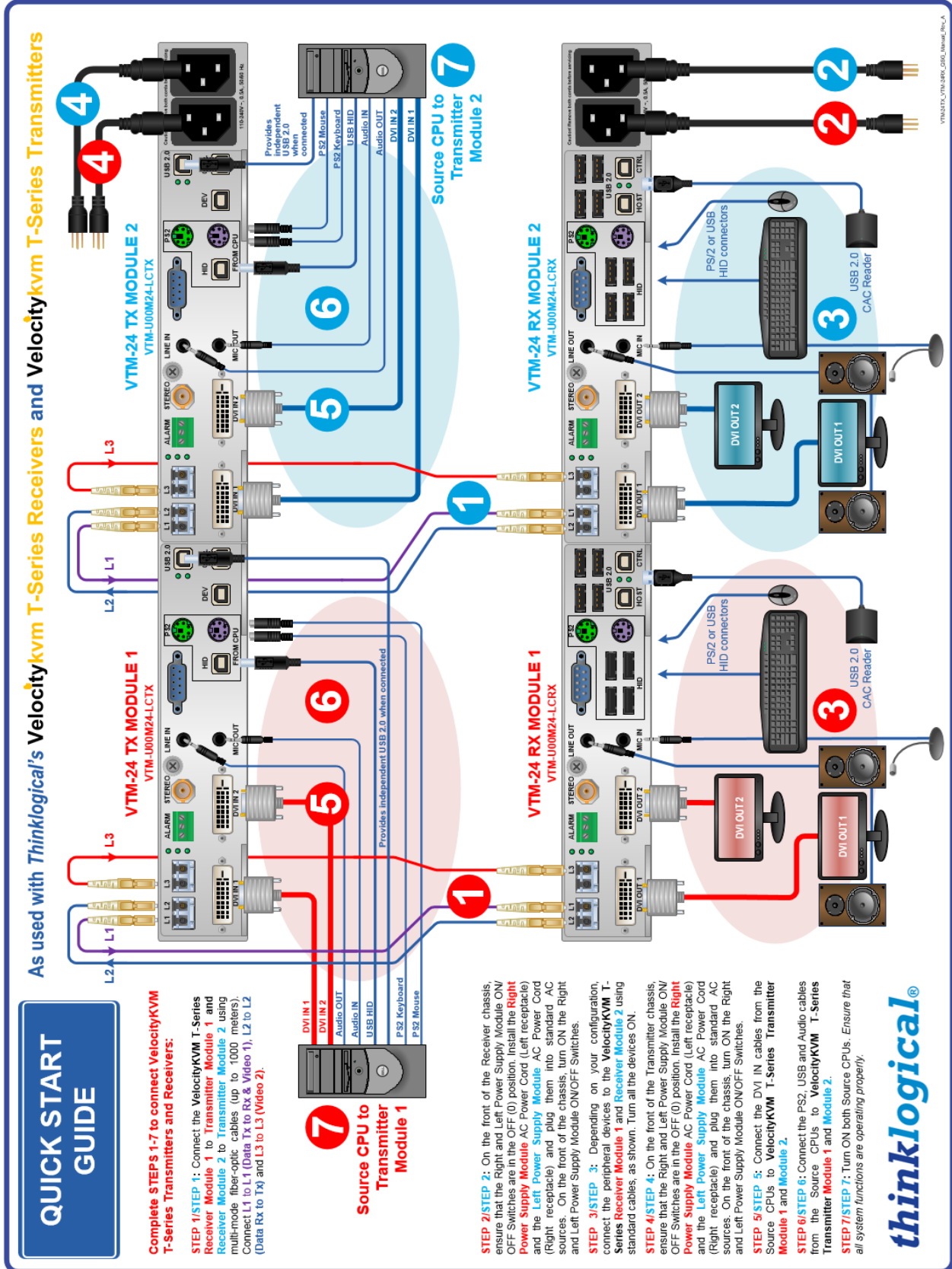
Attn: RMA#
100 Washington Street
Milford, CT 06460 USA



- Website: www.thinklogical.com
- Facebook: www.facebook.com/ThinklogicalUSA
- LinkedIn: www.linkedin.com/company/thinklogical
- Google+: <http://plus.google.com/u/0/109273605590791763795/about>
- YouTube: www.youtube.com/user/thinklogicalNA
- Twitter: @thinklogical

Appendix A- Quick Start Guides

A.1 VTM-24 Transmitters to VTM-24 Receivers (direct)



QUICK START GUIDE

Complete 5 STEPS 1-7 to connect VelocityKVM T-Series Transmitters and Receivers:

STEP 1/STEP 1: Connect the VelocityKVM T-Series Receiver Module 1 to Transmitter Module 1 and Receiver Module 2 to Transmitter Module 2 using multi-mode fiber-optic cables (up to 1000 meters). Connect L1 to L1 (Data Tx to Rx & Video 1), L2 to L2 (Data Rx to Tx) and L3 to L3 (Video 2).

7
Source CPU to Transmitter Module 1

STEP 2/STEP 2: On the front of the Receiver chassis, ensure that the Right and Left Power Supply Module ON/OFF Switches are in the OFF (O) position. Install the **Right Power Supply Module AC Power Cord** (Left receptacle) and the **Left Power Supply Module AC Power Cord** (Right receptacle) and plug them into standard AC sources. On the front of the chassis, turn ON the Right and Left Power Supply Module ON/OFF Switches.

STEP 3/STEP 3: Depending on your configuration, connect the peripheral devices to the VelocityKVM T-Series Receiver Module 1 and Receiver Module 2 using standard cables, as shown. Turn all the devices ON.

STEP 4/STEP 4: On the front of the Transmitter chassis, ensure that the Right and Left Power Supply Module ON/OFF Switches are in the OFF (O) position. Install the **Right Power Supply Module AC Power Cord** (Left receptacle) and the **Left Power Supply Module AC Power Cord** (Right receptacle) and plug them into standard AC sources. On the front of the chassis, turn ON the Right and Left Power Supply Module ON/OFF Switches.

STEP 5/STEP 5: Connect the DVI IN cables from the Source CPUs to VelocityKVM T-Series Transmitter Module 1 and Module 2.

STEP 6/STEP 6: Connect the PS2, USB and Audio cables from the Source CPUs to VelocityKVM T-Series Transmitter Module 1 and Module 2.

STEP 7/STEP 7: Turn ON both Source CPUs. Ensure that all system functions are operating properly.



A.2 VTM-4/VTM-24 Tx to VTM-4/VTM-24 Rx (through VX80 Router)

QUICK-START GUIDE

As used with Thinklogical's
T-4200 Video Extension System
With VTM-4 and VTM-24 Transmitter and Receiver Modules

router

VX80

KVM Matrix Switch

Powered by
MRTS Technology

STEP 4: Connect your VTM Transmitter Modules to the VX80 using multi-mode fiber-optic cables (up to 1000 meters). Connect L1 to any Receive Port and L2 to the same numbered Transmit Port. Connect L3 to any other Receive Port.

STEP 5: Ensure the Power Supply Switches on the front panel are in the OFF position. Install the Right Power Supply Module AC Power Cord (Left receptacle) and the Left Power Supply Module AC Power Cord (Right receptacle). Plug both Transmitter AC Cards into a standard AC source. Turn ON the Right and Left Power Supply Modules.

STEP 6: Connect the DVI IN cables from the Source CPUs to the DVI IN ports of each Transmitter Module. If desired, connect a local monitor to the Vel-3 Transmitters' DVI OUT port with a standard DVI cable. Connect the peripheral devices from the CPU to the Transmitters with standard copper cables. Ensure the CPU is turned ON.

STEP 7: If stereo 3-D molecular visualization on your desktop is desired, connect the Stereo OUT from the CPU to the Transmitter Module's STEREO INPUT. Connect a 3-D Active Stereo Emitter to the STEREO OUT receptacle on the Receive module.

STEP 1: Connect your VTM Receiver Modules to the VX80 using multi-mode fiber-optic cables (up to 1000 meters). Connect L1 to any Transmit Port and L2 to the same numbered Receive Port. Connect L3 to any other Transmit Port.

STEP 2: Install the Right Power Supply Module AC Power Cord (Left receptacle) and the Left Power Supply Module AC Power Cord (Right receptacle). Plug both Receiver AC Cards into a standard AC source. On the front of the chassis, turn ON the Right and Left Power Supply Modules.

STEP 3: For each module, connect a monitor to each of the DVI OUT ports with a standard DVI cable. Connect the required peripheral devices with standard copper cables and turn them all ON.

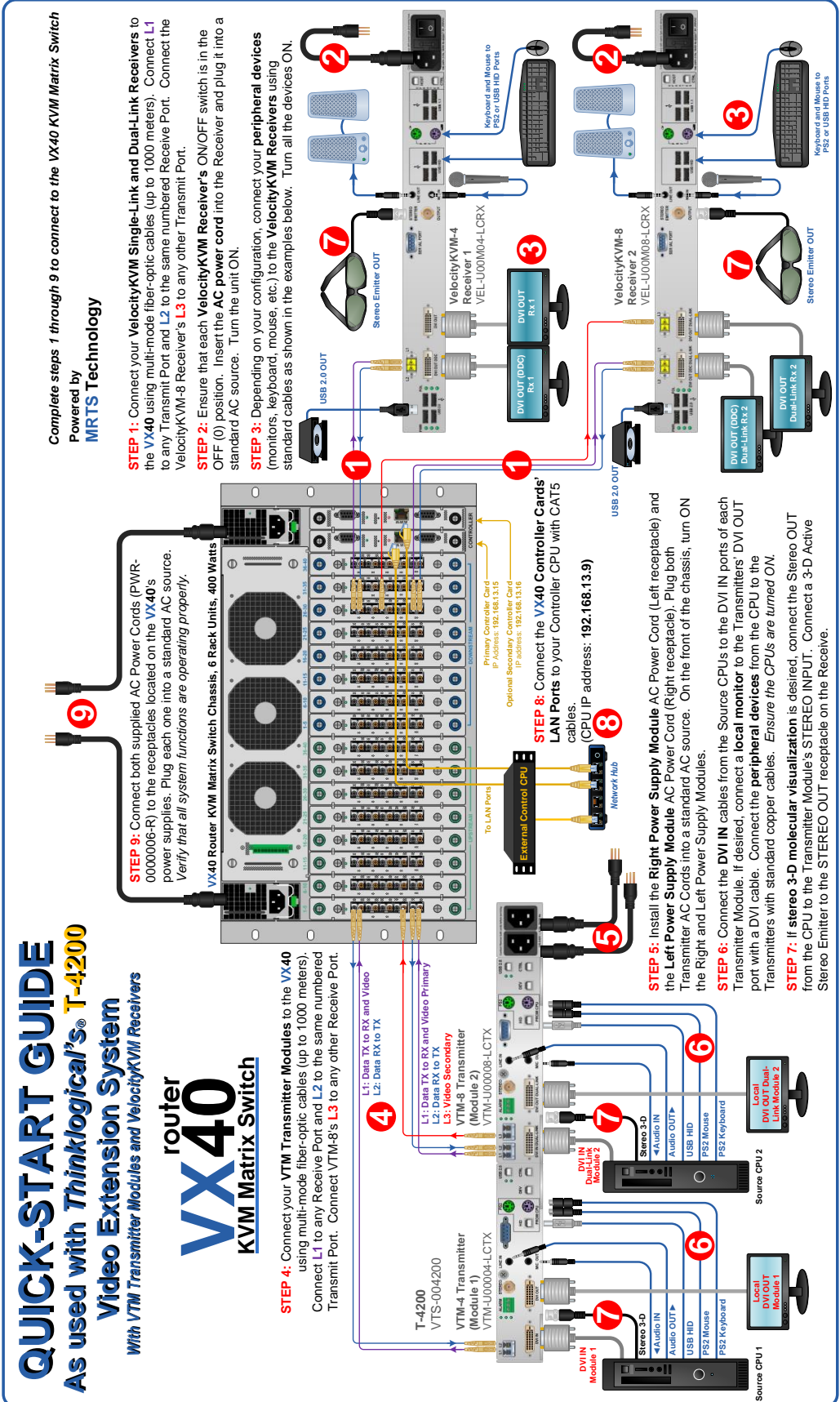
STEP 8: Connect the Controller Cards' LAN Ports to your Controller CPU with CAT5 cables. (CPU IP address: 192.168.13.9)

STEP 9: Connect both supplied AC Power Cords (PWR-0000006-R) to the receptacles located on the VX80's power supplies. Plug each one into a standard AC source. Verify that all system functions are operating properly.

Primary Controller Card IP Address: 192.168.13.15
Optional Secondary Controller Card IP Address: 192.168.13.16

VTM-4_VTM-24_VX80_QSG_Manual

A.3 VTM-4/VTM-8 Tx to VTM-4/VTM-8 Rx (through VX40 Router)



Appendix B- Thinklogical KVM Extenders

The Logical Solution

VelocityKVM Extension Systems are designed for high performance visual applications that require video as well as peripheral support. (VelocityKVM Extension System-5 supports DVI or RGB.) The system allows users, via optical fiber, to station and operate a digital monitor(s) and peripherals from just a few meters away to up to 40 kilometers away from the controlling computer securely and without loss of resolution. The VelocityKVM system is designed to support PS2, full duplex stereo audio, serial (RS-232), USB 1.0 (HID) and USB 2.0 (up to 480 Mbps).

VelocityKVM products are ideally suited for a wide range of applications in the broadcast and post-production field, as well as command and control centers, universities, large scale digital signage and other commercial KVM applications.

Theory of Operation

MRTS Technology

6.25 Gbps. Allows for Full Frame Rate Transmission of Uncompressed DVI

Powered by Thinklogical's cutting edge **MRTS Technology** (Multi Rate Transmission System), this KVM extension system transports every frame of a DVI video stream seamlessly, with no compression or dropped frames. In addition, all high speed peripherals function with no latency. Leveraging standard SFP+ transceivers, the system allows for the use of either multi-mode or single-mode fiber optic cable.

The System

The VelocityKVM Extension System has a simple transmitter/receiver design which allows for ease of installation and straight-forward deployment. Depending on the user's infrastructure, the transmitter and the receiver can be connected by a multi-mode or single-mode fiber optic cable. The transmitter unit connects to the CPU with the supplied peripheral cables. In addition, a local video, keyboard and mouse port is available on the transmitter. The receiver unit provides connections to the user interface devices.

Why Fiber?

The limit on how much bandwidth or data that can be carried across a copper line can become a bottleneck for enterprise access and ultimately, for revenue. This bottleneck often appears in heavy-volume, metropolitan area networks. Fiber Optic Cable alleviates this problem by offering substantially greater bandwidth.

The VelocityKVM Distance (up to 350m using 50/125µm fiber)

Multi-mode fiber is designed for transmission distances such as those found within a single building or facility and so is ideal for multi-channel television broadcast systems. Multi-mode fiber may be used to send video signals from room to room or floor to floor. The VelocityKVM allows for video and peripheral transmission distances up to 350 meters using 50/125µm fiber, making it an ideal solution for in-house applications.

Advanced Top Quality Video Transmission

Fiber Optic Cable has emerged as a logical solution for next-generation signal routing. The VelocityKVM product family harnesses this capability and ensures long distance, error-free transmission with no frame or bit dropping and complete immunity to interference. The end result is ***no degradation of the video or peripheral signals whatsoever.***

Appendix C- VelocityKVM T-Series Standard Model Ordering Information

Part Numbers and Descriptions

Velocity T-4200 Chassis

VTS-004200 Velocity T-4200 CHASSIS

Velocity Desktop Chassis

VED-000001 Velocity Desktop CHASSIS

Standard DVI and DVI/RGB Modules

Velocity T-Series DVI Modules

VTM-U00004-LCRX VelocityKVM T-Series Receiver, Single Head, Single Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00004-LCTX VelocityKVM T-Series Transmitter, Single Head, Single Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00005-LCRX VelocityKVM T-Series Receiver, Single Head, Single Link RGB/DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00005-LCTX VelocityKVM T-Series Transmitter, Single Head, Single Link RGB/DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00008-LCRX VelocityKVM T-Series Receiver, Single Head, Dual Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00008-LCTX VelocityKVM T-Series Transmitter, Single Head, Dual Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00024-LCRX VelocityKVM T-Series Receiver, Dual Head, Single Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-U00024-LCTX VelocityKVM T-Series Transmitter, Dual Head, Single Link DVI, USB 2.0, USB HID, KMAS, LC

VTM-H00004-LCRX VelocityKVM T-Series Receiver, Single Head, Single Link DVI, USB HID, KMAS, LC

VTM-H00004-LCTX VelocityKVM T-Series Transmitter, Single Head, Single Link DVI, USB HID, KMAS, LC

VTM-H00005-LCRX VelocityKVM T-Series Receiver, Single Head, Single Link RGB/DVI, USB HID, KMAS, LC

VTM-H00005-LCTX VelocityKVM T-Series Transmitter, Single Head, Single Link RGB/DVI, USB HID, KMAS, LC

VTM-H00008-LCRX VelocityKVM T-Series Receiver, Single Head, Dual Link DVI, USB HID, KMAS, LC

VTM-H00008-LCTX VelocityKVM T-Series Transmitter, Single Head, Dual Link DVI, USB HID, KMAS, LC

VTM-H00024-LCRX VelocityKVM T-Series Receiver, Dual Head, Single Link DVI, USB HID, KMAS, LC

VTM-H00024-LCTX VelocityKVM T-Series Transmitter, Dual Head, Single Link DVI, USB HID, KMAS, LC

Single Mode Optics Option

VOP-S04 Velocity 4/5 T-Series Optics Option for Transmitter or Receiver, Single Mode, 3 Fibers, 40KM, LC

VOP-S06 Velocity 8/24 T-Series Optics Option for Transmitter or Receiver, Single Mode, 3 Fibers, 40KM, LC

Multi-Mode Optics Option

VOP-M19 Velocity 4/5 T-Series Optics Option for Transmitter or Receiver, Multi-Mode, 3 Fibers, 1000M, LC

VOP-M30 Velocity 8/24 T-Series Optics Option for Transmitter or Receiver, Multi-Mode, 3 Fibers, 1000M, LC

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100 Washington Street

Milford, CT 06460 USA

sales@thinklogical.com – Sales Department orders, questions or issues

Telephone Sales – 1-203-647-8700 or toll-free 1-800-291-3211

Fax: 1-203-783-9949

Appendix D-

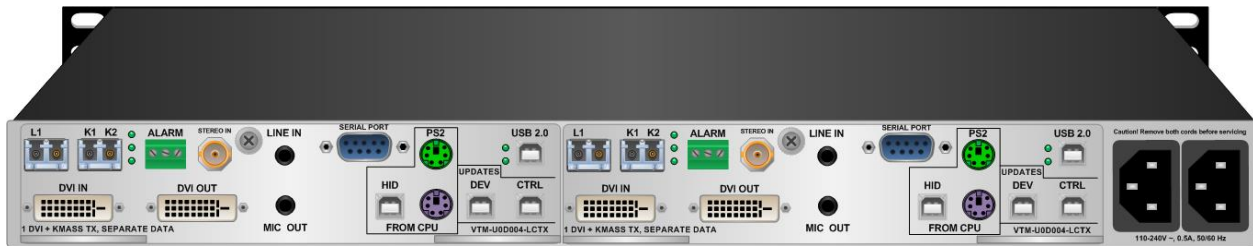
VelocityKVM T-Series/Desktop Series *Multi Video Path, Separate Data Path and Separate Audio Path Module* Ordering Information

Thinklogical's® line of **Separate Video, Audio and Data Path Modules** fit all of our **T-Series and Desktop Series Chassis** and are designed to accommodate systems that require data transmission security and for systems with a lower video transmission rate, or for systems not transmitting video through a Thinklogical® KVM Matrix Switch.

- The **Velocity T-Series Multi Video Path Module** allows one 6.22 Gbps DVI signal to be transmitted across two fibers at a bandwidth of 3.11 Gbps per fiber.
- The **Velocity T-Series Separate Audio Path Module** allows audio signals to be transmitted on one fiber and received on another fiber, separate from Video, USB, PS2, RS-232 and Stereo Emitter data, which are transmitted on two independent fibers.
- The **Velocity T-Series Separate Data Path Module** allows KMASS data to be transmitted on one fiber and received on another fiber, separate from video data, which is transmitted on a separate, third fiber.

Part Numbers and Descriptions

1. **Velocity T-4200 Chassis:** *Designed to accommodate any combination of up to two Multi Path, Separate Audio or Separate Data Modules and all other VTM Module varieties.*



Velocity T-4200 Chassis **VTM-004200**

2. **Velocity Desktop Chassis:** *Designed to accommodate any Desktop version Multi Path, Separate Audio or Separate Data Module or any other VDM Module variety.*



Velocity Desktop Chassis **VED-000001**

3. T-Series Multi Video Path, Separate Audio Path & Separate Data Path DVI and DVI/RGB Modules

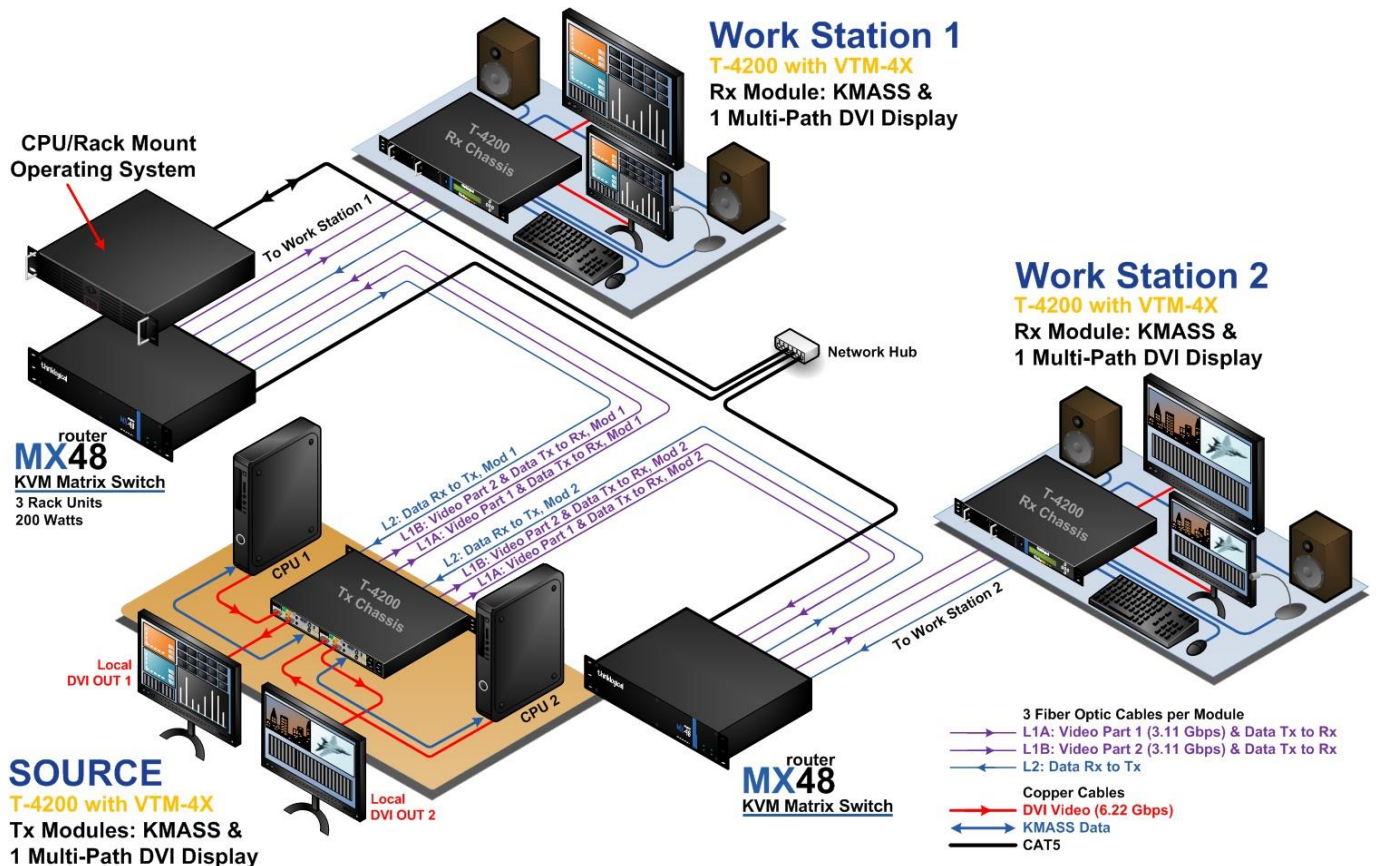
3.1 Velocity T-Series Multi Video Path Modules: Allows one 6.22 Gbps DVI signal to be transmitted across two fibers at a bandwidth of 3.11 Gbps per fiber. See figure 3.1, below.

- VTM-U00X05-LCRX Velocity T-Series 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Multi-path, RX, LC
- VTM-U00X05-LCTX Velocity T-Series 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Multi-path, TX, LC
- VTM-U00X04-LCRX Velocity T-Series 4 Receiver, DVI 1 Display, HID, USB 2.0, Multi-path, RX, LC
- VTM-U00X04-LCTX Velocity T-Series 4 Transmitter DVI 1 Display, HID, USB 2.0, Multi-path, TX, LC
- VTM-H00X04-LCRX Velocity T-Series 4 Receiver, DVI 1 Display, HID, Multi-path, RX, LC
- VTM-H00X04-LCTX Velocity T-Series 4 Transmitter DVI 1 Display, HID, Multi-path, TX, LC
- VTM-H00X05-LCRX Velocity T-Series 5 Receiver, DVI/RGB 1 Display, Multi-path, HID, RX, LC
- VTM-H00X05-LCTX Velocity T-Series 5 Transmitter DVI/RGB 1 Display, Multi-path, HID, TX, LC

VelocityKVM-5: DVI/RGB, USB 2.0, HID & Multi-Video Paths
VTM-U00X05-LCTX



VTM-U00X05-LCRX



Appendix D, Fig. 3.1: Multi-Video Path Tx to Multi-Video Path Rx Modules Application

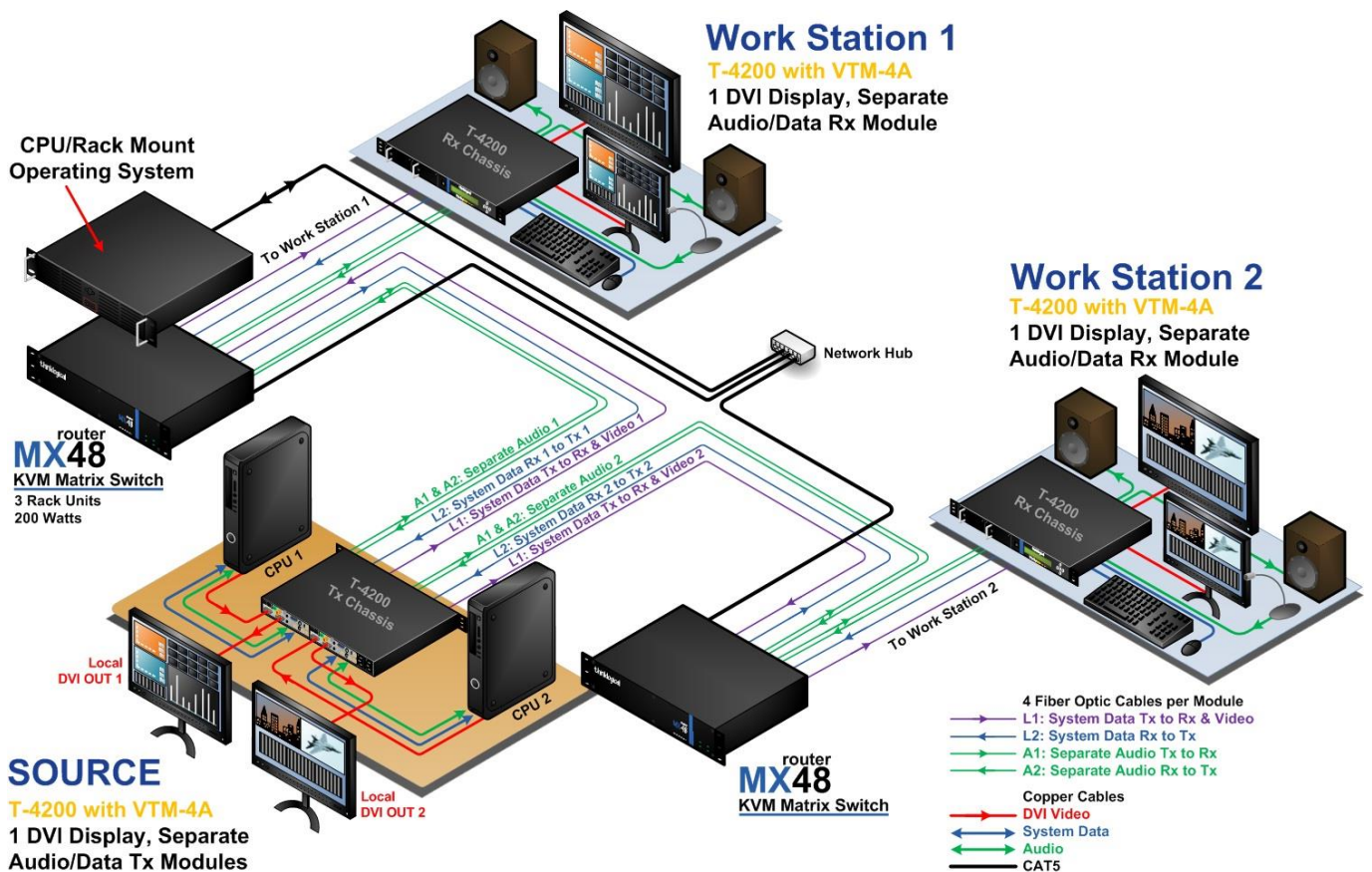
3.2 Velocity T-Series Separate Audio Path Modules: Allows audio data to be transmitted on one fiber and received on another fiber, separate from Video, USB, PS2, RS-232 and Stereo data, which are transmitted on two independent fibers. See figure 3.2, below.

- VTM-U00004-LCRA Velocity T-Series 4 Receiver, DVI 1 Display, HID, USB 2.0, Separate Audio RX, LC
- VTM-U00004-LCTA Velocity T-Series 4 Transmitter DVI 1 Display, HID, USB 2.0, Separate Audio TX, LC
- VTM-U00005-LCRA Velocity T-Series 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, RX, LC
- VTM-U00005-LCTA Velocity T-Series 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, TX, LC
- VTM-H00004-LCRA Velocity T-Series 4 Receiver, DVI 1 Display, HID, Separate Audio, RX, LC
- VTM-H00004-LCTA Velocity T-Series 4 Transmitter DVI 1 Display, HID, Separate Audio, TX, LC
- VTM-H00005-LCRA Velocity T-Series 5 Receiver, DVI/RGB 1 Display, Separate Audio, HID, RX, LC
- VTM-H00005-LCTA Velocity T-Series 5 Transmitter DVI/RGB 1 Display, Separate Audio, HID, TX, LC

VelocityKVM-5: DVI/RGB, USB 2.0, HID & Separate Audio Paths
VTM-U00005-LCTA



VTM-U00005-LCRA



Appendix D, Fig. 3.2: **Separate Audio Tx to Separate Audio Rx Modules Application**

3.3 Velocity T-Series Separate Data Path Modules: Allows KMASS data to be transmitted on one fiber and received on another fiber, separate from video data, which is transmitted on a separate, third fiber. See figure 3.3, below.

- VTM-U0D004-LCRX Velocity T-Series 4 Receiver, DVI 1 Display, HID, USB 2.0, Separate Data Path, RX, LC
- VTM-U0D004-LCTX Velocity T-Series 4 Transmitter DVI 1 Display, HID, USB 2.0, Separate Data Path, TX, LC
- VTM-U0D005-LCRX Velocity T-Series 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, RX, LC
- VTM-U0D005-LCTX Velocity T-Series 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, TX, LC
- VTM-H0D004-LCRX Velocity T-Series 4 Receiver, DVI 1 Display, HID, Separate Data Path, RX, LC
- VTM-H0D004-LCTX Velocity T-Series 4 Transmitter DVI 1 Display, HID, Separate Data Path, TX, LC
- VTM-H0D005-LCRX Velocity T-Series 5 Receiver, DVI/RGB 1 Display, Separate Data Path, HID, RX, LC
- VTM-H0D005-LCTX Velocity T-series 5 Transmitter DVI/RGB 1 Display, Separate Data Path, HID, TX, LC

VelocityKVM-4: DVI, USB HID & Separate Data Paths
VTM-H0D004-LCTX



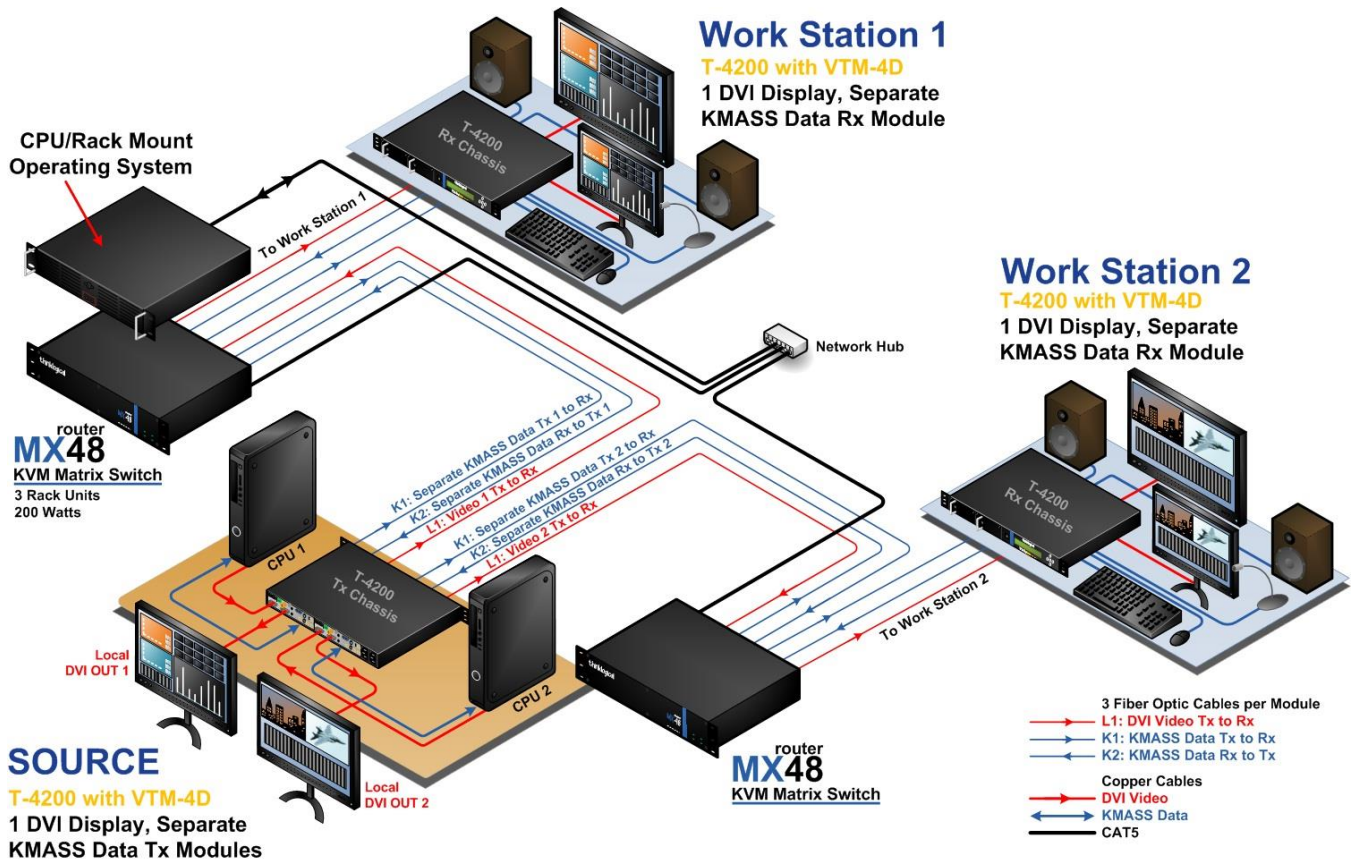
VTM-H0D004-LCRX



VelocityKVM-4: DVI, USB 2.0, HID & Separate Data Paths
VTM-U0D004-LCTX



VTM-U0D004-LCRX



Appendix D, Fig. 3.3: Separate Data Tx to Separate Data Rx Modules Application

4. Desktop Multi Video Path, Separate Audio Path & Separate Data Path DVI and DVI/RGB Modules

4.1 Velocity Desktop Multi Video Path Modules: *Allows one 6.22 Gbps DVI signal to be transmitted across two fibers at a bandwidth of 3.11 Gbps per fiber.*

VDM-U00X05-LCRX Velocity Desktop 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Multi-path, RX, LC
 VDM-U00X05-LCTX Velocity Desktop 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Multi-path, TX, LC
 VDM-U00X04-LCRX Velocity Desktop 4 Receiver, DVI 1 Display, HID, USB 2.0, Multi-path, RX, LC
 VDM-U00X04-LCTX Velocity Desktop 4 Transmitter DVI 1 Display, HID, USB 2.0, Multi-path, TX, LC
 VDM-H00X04-LCRX Velocity Desktop 4 Receiver, DVI 1 Display, HID, Multi-path, RX, LC
 VDM-H00X04-LCTX Velocity Desktop 4 Transmitter DVI 1 Display, HID, Multi-path, TX, LC
 VDM-H00X05-LCRX Velocity Desktop 5 Receiver, DVI/RGB 1 Display, Multi-path, HID, RX, LC
 VDM-H00X05-LCTX Velocity Desktop 5 Transmitter DVI/RGB 1 Display, Multi-path, HID, TX, LC

4.2 Velocity Desktop Separate Audio Path Modules: *Allows audio data to be transmitted on one fiber and received on another fiber, separate from Video, USB, PS2, RS-232 and Stereo data, which are transmitted on two independent fibers.*

VDM-U00004-LCRA Velocity Desktop 4 Receiver, DVI 1 Display, HID, USB 2.0, Separate Audio RX, LC
 VDM-U00004-LCTA Velocity Desktop 4 Transmitter DVI 1 Display, HID, USB 2.0, Separate Audio TX, LC
 VDM-U00005-LCRA Velocity Desktop 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, RX, LC
 VDM-U00005-LCTA Velocity Desktop 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, TX, LC
 VDM-H00004-LCRA Velocity Desktop 4 Receiver, DVI 1 Display, HID, Separate Audio, RX, LC
 VDM-H00004-LCTA Velocity Desktop 4 Transmitter DVI 1 Display, HID, Separate Audio, TX, LC
 VDM-H00005-LCRA Velocity Desktop 5 Receiver, DVI/RGB 1 Display, Separate Audio, HID, RX, LC
 VDM-H00005-LCTA Velocity Desktop 5 Transmitter DVI/RGB 1 Display, Separate Audio, HID, TX, LC

4.3 Velocity Desktop Separate Data Path Modules: *Allows KMASS data to be transmitted on one fiber and received on another fiber, separate from video data, which is transmitted on a separate, third fiber.*

VDM-U0D004-LCRX Velocity Desktop 4 Receiver, DVI 1 Display, HID, USB 2.0, Separate Data Path, RX, LC
 VDM-U0D004-LCTX Velocity Desktop 4 Transmitter DVI 1 Display, HID, USB 2.0, Separate Data Path, TX, LC
 VDM-U0D005-LCRX Velocity Desktop 5 Receiver, DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, RX, LC
 VDM-U0D005-LCTX Velocity Desktop 5 Transmitter DVI/RGB 1 Display, HID, USB 2.0, Separate Audio, TX, LC
 VDM-H0D004-LCRX Velocity Desktop 4 Receiver, DVI 1 Display, HID, Separate Data Path, RX, LC
 VDM-H0D004-LCTX Velocity Desktop 4 Transmitter DVI 1 Display, HID, Separate Data Path, TX, LC
 VDM-H0D005-LCRX Velocity Desktop 5 Receiver, DVI/RGB 1 Display, Separate Data Path, HID, RX, LC
 VDM-H0D005-LCTX Velocity Desktop 5 Transmitter DVI/RGB 1 Display, Separate Data Path, HID, TX, LC

5. Single Mode Optics Option

VOP-S04 Velocity 4/5 T-Series Optics Option for Transmitter or Receiver, Single Mode, 3 Fibers, 40KM, LC

6. Multi-Mode Optics Option

VOP-M19 Velocity 4/5 T-Series Optics Option for Transmitter or Receiver, Multi-Mode, 3 Fibers, 1000M, LC

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