

thinklogical® Q-Series

High Reliability, Rack-Space Saving, Video Extension Solutions

Q-Series Video Modules

DVI, RGB/DVI, HDCP Compliant and Video Format Scaler Models

For use in the Q-4300, Q-2300 & Q-1300 Chassis



PRODUCT MANUAL

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thinklogical®



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**Q-Series Chassis
& Modules**

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PREFACE

About Thinklogical

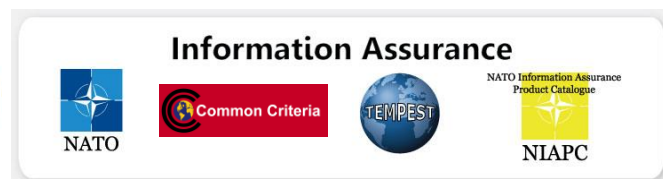


We, the Thinklogical team, are committed to understanding and exceeding our customers' requirements, the first time and every time.

Thinklogical, LLC is the leading manufacturer and provider of fiber optic and CATx KVM, video, audio, and peripheral extension and switching solutions used in video-rich, big-data computing environments.

Thinklogical offers the only fiber-optic KVM matrix switches in the world that are accredited to the Common Criteria EAL4, TEMPEST SDIP 24 Level B, and NATO NIAPC Evaluation Scheme: GREEN and the U.S. DoD DISA JITC UCR 2013 APL information assurance standards. And Thinklogical Velocity products are the first system with both KVM and video matrix switching capabilities to be placed on the Unified Capabilities Approved Product List (UC APL) under the Video Distribution System (VDS) category.

Governments, entertainment, scientific and industrial customers worldwide rely on Thinklogical's products and solutions for security, high performance, continuous operation and ease of integration. Thinklogical products are designed and manufactured in the USA and are certified to the ISO 9001-2008 standard.



Thinklogical is headquartered in Milford, Connecticut and is privately held by Riverside Partners, LLC, Boston, MA (<http://www.riversidepartners.com>). For more information about Thinklogical products and services, please visit www.thinklogical.com.

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Note and Warning Symbols

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.

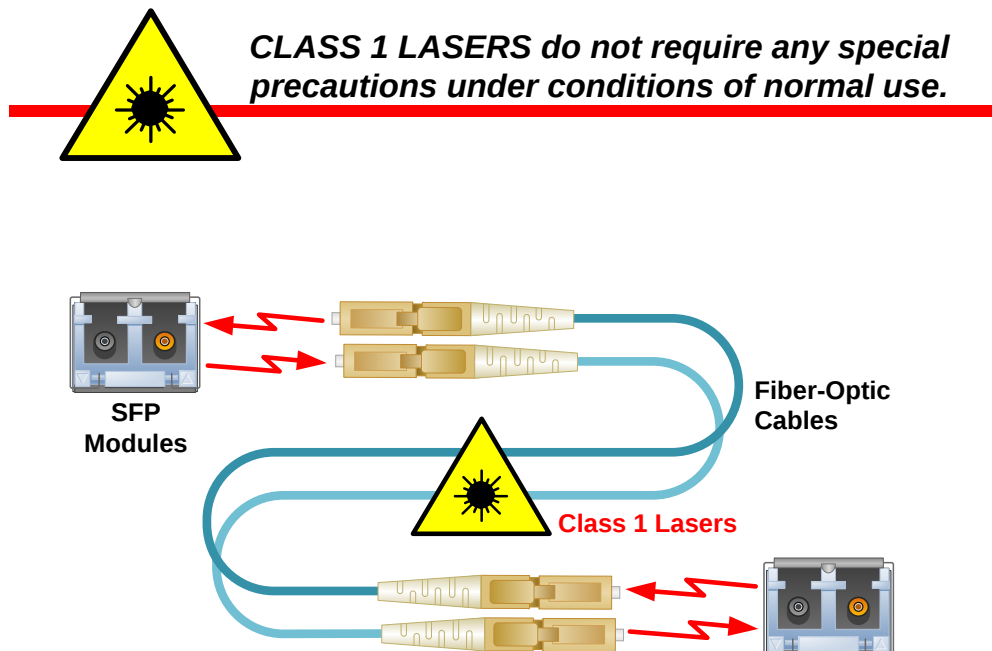


Warning! All Warnings appear in red text, followed by blue text, and preceded by a red stop sign, as shown here.

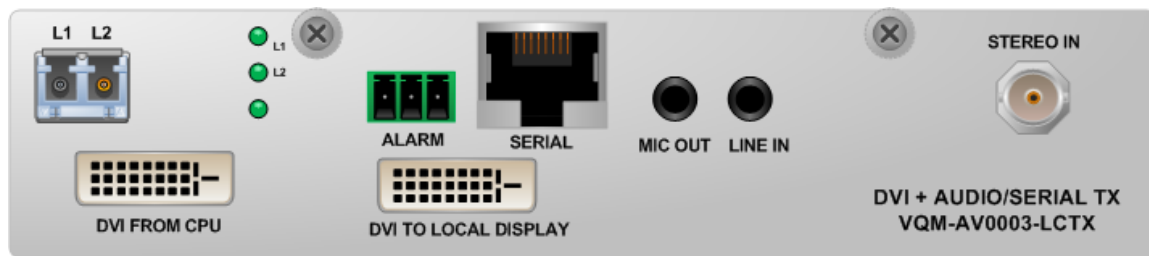
A warning is meant to call the reader's attention to **critical** information at a point in the text that is relevant to the subject being discussed.

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

Q-Series Extenders and Matrix Switches, like all Thinklogical® products, are designed and identified as **Class 1 LASER products**. This means the maximum permissible exposure (MPE) cannot be exceeded when viewing the laser with the naked eye or with the aid of typical magnifying optics (e.g. telescope or microscope).



1. Introduction



VQM DVI Transmitter with Audio

H: 1.592" (4.40cm) x **D:** 6.366" (45.8cm) x **W:** 7.406" (44.5cm), **10 Watts** per unit

1.1. Product Overview

MRTS Technology 6.25 Gbps. allows for Full Frame Rate Transmission of uncompressed DVI or RGB video. Powered by Thinklogical's® cutting edge, patent-pending MRTS (Multi Rate Transmission System) Technology, our video extension systems transport every frame of a DVI or RGB video stream seamlessly with no compression or dropped frames. In addition, all high speed peripherals function with no latency. Incorporating standard SFP+ transceivers, the system uses fiber optic cables to permit the placement of a digital monitor or projector up to 1000 meters (3280 feet) away from the controlling computer without loss of resolution. Installation is plug-and-play and no adjustments are necessary.

All Video modules support **Data Display Channel (DDC)***, with a variety of modes to meet each unique requirement. All models are connected by fiber optic cable(s), to provide communications to and from the transmitter. The transmitter modules connect to a CPU with supplied video cables (and audio & serial or network cables in AV+, AN+, AH and NH models). The receiver modules provide an interface to the monitor(s) (and audio & serial or network devices in AV+, AN+, AH, NH and video format scaler models).

Each **VQM Video Transmitter (TX) Module** features a video input and, in many cases, a local video output which can be used for DDC modification and for displaying video at the source. The TX also has fiber connectors used for transferring video and data to the Receiver. Status LEDs are provided for system information.

Each **VQM Video Receiver (RX) Module** features 2 video outputs. On single DVI models, the video output labeled DDC is always the primary output. The RX also has fiber connectors used for transferring data to the TX and receiving video and data.



*See page 53: **Appendix F: EDID and DDC for Standard and HDCP Modules**

2. Q-Series System Features

2.1 General Q-Series System Features

The **Q-Series' hot-swappable interface modules allow any Q-Series Chassis to be used in a variety of applications.** Both transmitter and receiver modules can be installed together in one chassis. (The Q-4300 Chassis can hold up to four modules and the Q-2300 Chassis can hold up to two modules). Video Modules are available to support single-link or dual-Link video display connections along with full duplex stereo audio, stereo 3D emitter and serial RS-232 or network. A line of HDCP Compliant Velocity Q-Series modules is also available (see page 18).

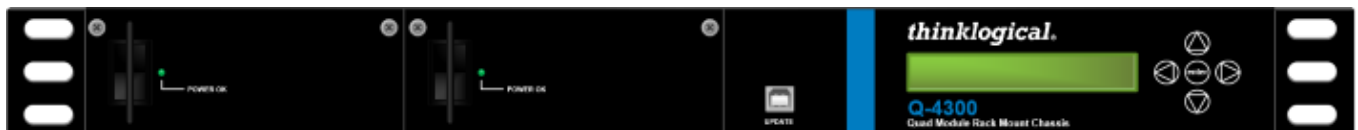
Installation possibilities are expanded with built-in support for either multi-mode or single mode fiber, making this a convenient and cost effective solution to combat the restrictions involved with the distribution of uncompressed broadcast quality video signals over long distances. Each module is hot swappable and, in addition, the standard SFP+ optics (with LC connectors) are hot swappable/hot pluggable. Every module is fully compatible with Thinklogical's VX and MX Router line of products.

2.2 The Q-Series Chassis Line

Each Q-Series chassis allows users to locate DVI, RGB/DVI and SDI monitors (via fiber) from just a few meters away to up to 40 kilometers away from the controlling computer, securely and without loss of resolution.

The **Q-4300** is a rack space-saving, high reliability solution that provides a rack mount for up to 4 modules of DVI, RGB or SDI in a compact 1U chassis. The **Q-2300** holds two modules. Ready for the challenges of demanding applications, both the Q-4300 and Q-2300 Chassis can combine any variety of DVI, RGB/DVI or SDI modules in transmit/receive units for a space saving and cost effective solution.

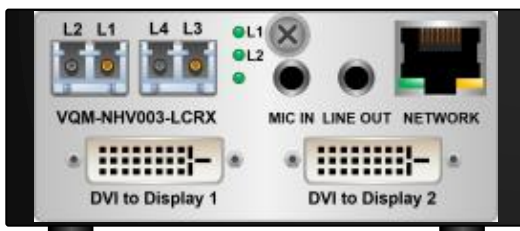
The **Q-1300** is a stand-alone chassis that will accommodate any one Q-Series module. All Q-Series Chassis are powered by standard 100-240 VAC, 47-63 Hz.



Q-4300 Chassis: (VQS-004300) Supports any combination of up to four Q-Series modules. Dual interface and current sharing power supplies. Desktop or 19" rack-mount.



Q-2300 Chassis: (VQS-002300) Supports up to two Q-Series modules. Desktop only.



Q-1300 Chassis: (VQS-001300) Supports one Q-Series module. Desktop only.

2.2.1. Mixing Q-Series Modules and TLX Modules in a single Chassis

Besides Q-Series products, Thinklogical also carries the TLX line of 10G extension products in a modular format. **Non-Q-Series modules, such as TLX, are compatible with the Q-4300, Q-2300 and Q-1300 chassis as well as their own CHS-4, CHS-2 and CHS-1 chassis.** However, because VQM modules generate less heat than TLX modules, they were not designed to allow air-flow through their enclosures as in TLX modules.

Air-Flow through VQM Modules

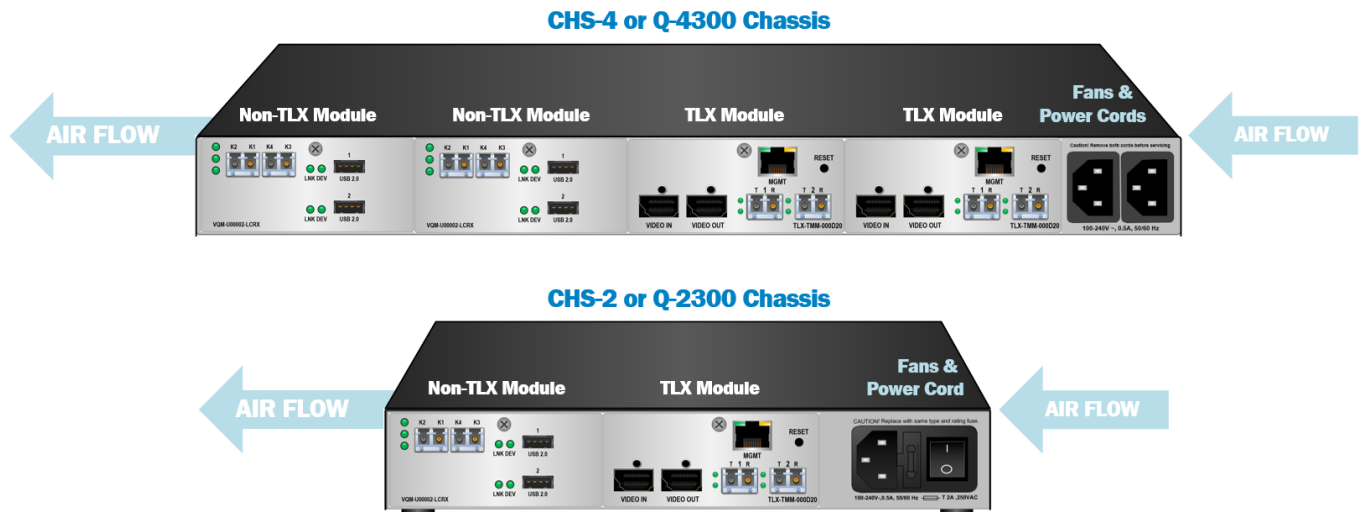
To avoid over-heating of TLX modules when mixed with non-TLX modules, the simple solution is to **always install all non-TLX modules on the left side of the chassis** (as looking from the back where the modules are loaded) **and install all TLX modules on the right side, next to the cooling-air intake fans** (The side next to the power cord receptacles). This will allow proper air-flow over the warmer TLX modules and will prevent over-heating. *This is true for both the Q-4300 and Q-2300 Chassis and for both the CHS-4 and CHS-2 Chassis.*



Warning! To avoid over-heating of TLX modules, always install all non-TLX modules on the left side of the chassis (as looking from the back where the modules are loaded) and install all TLX modules on the right side, next to the cooling-air intake fans (The side next to the power cord receptacles) .



Note: Non-TLX modules, such as Thinklogical's Q-Series (VQM), were not designed to allow air-flow through their enclosures as in TLX modules.



To avoid over-heating, always install all non-TLX modules on the left side of the chassis and install all TLX modules on the right

3. The Q-Series Video System

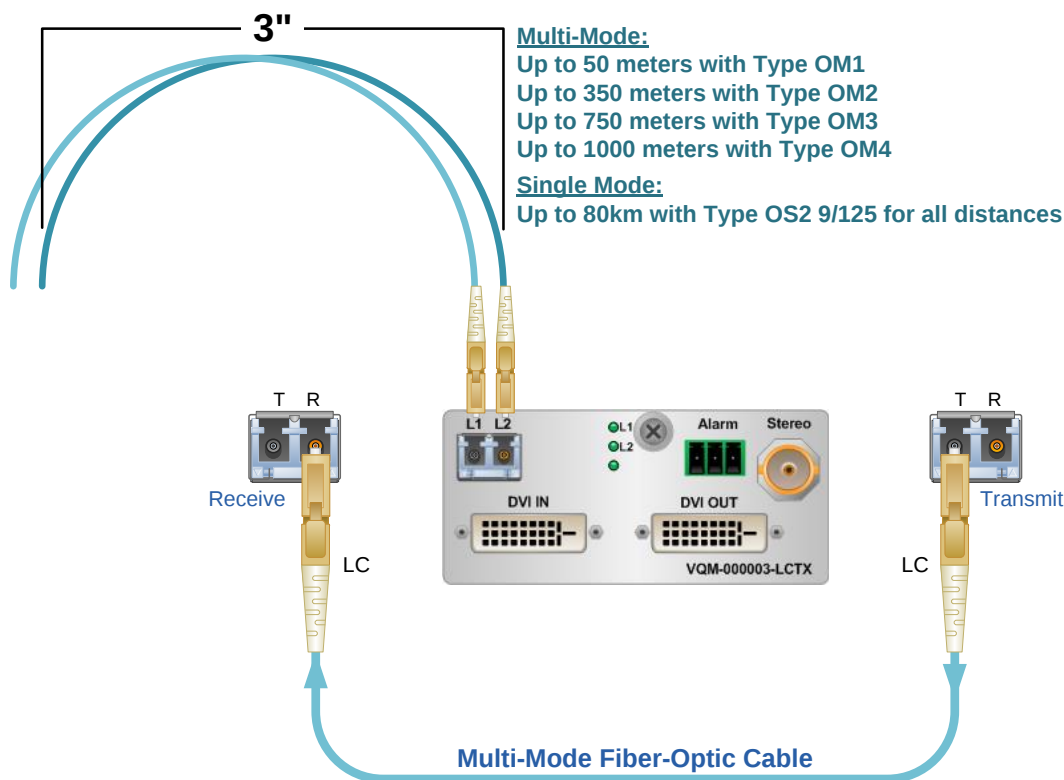
3.1. Types of Connections

All physical connections to the product use industry-standard connectors. Non-supplied cables that may be needed are commercially available. All connections are found on the front panel of each module.

All models are connected via fiber optic cables (see paragraph 4.3. on page 21) **to provide communications to and from the transmitter.** The transmitter connects to the CPU with supplied Video cables (and audio & serial or network cables in AV+, AN+, AH and NH models, and USB cables where applicable). The receiver provides an interface to the monitor(s) and USB, audio, serial or network devices in AV+, AN+, AH, NH and video format scaler models. RJ45 to DB9 serial adapters are included with each transmitter and receiver.

3.1.1 Fiber Optic Cable

Fiber optic cables up to 1000 meters (3280 feet) 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.



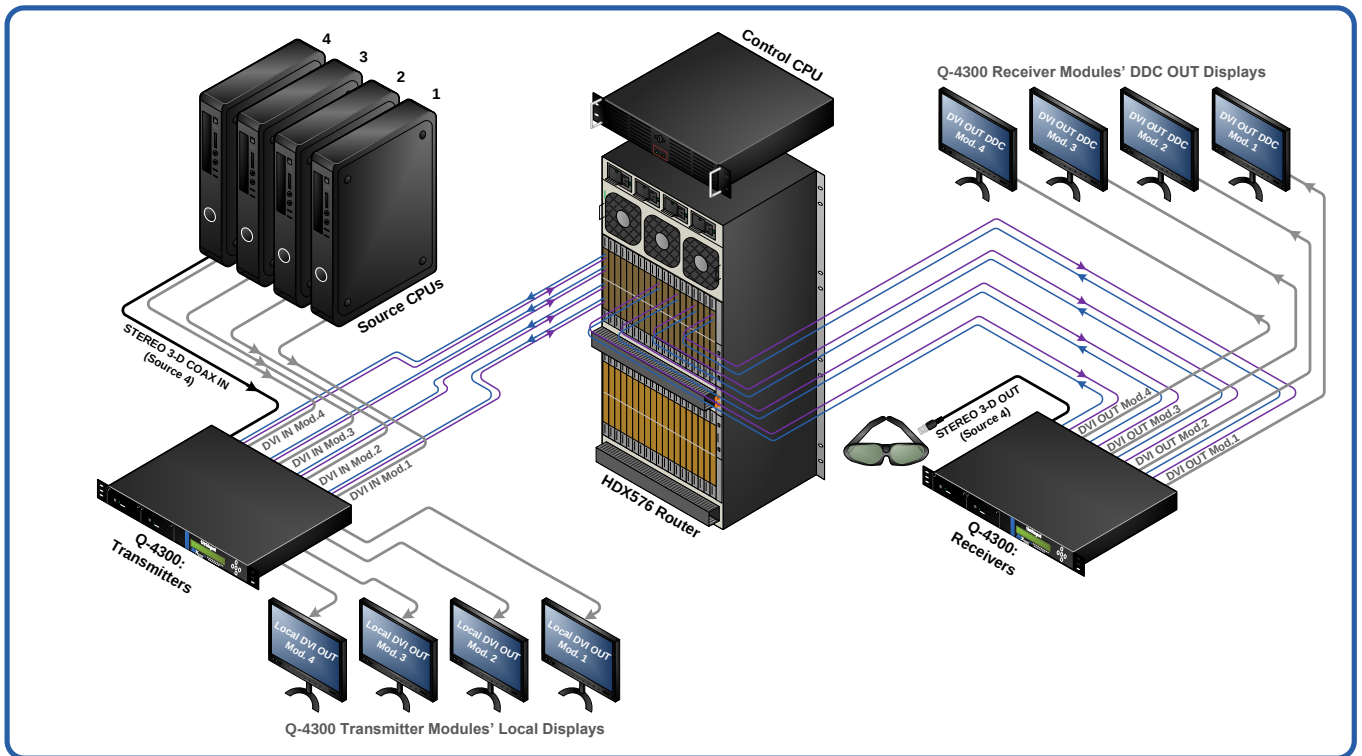
Be careful not to kink or pinch the fiber optic cable as it is being installed and keep all bend diameters to no less than 3 inches (76.2mm).

3.1.2 Transmitter

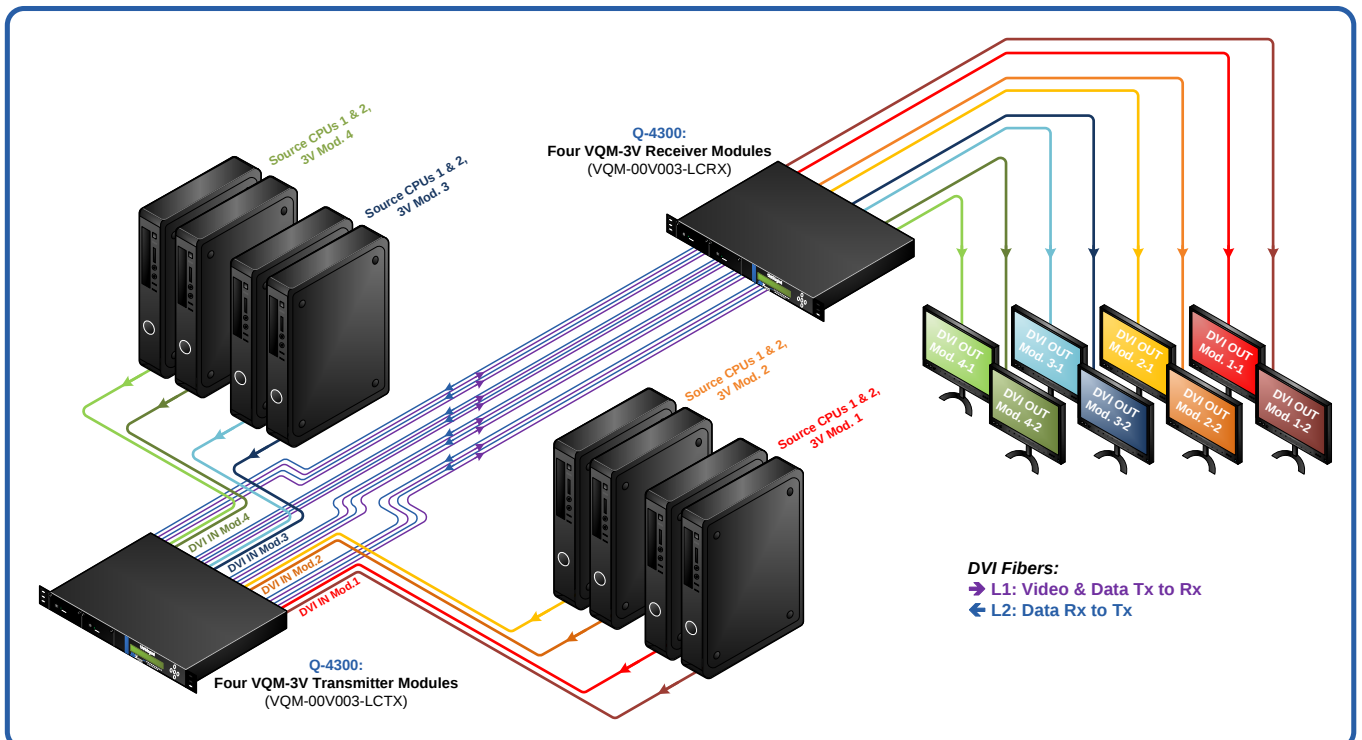
A transmitter unit connects to the computer and peripheral sources through provided copper cables. **The connector configurations of the Q-Series Transmitters can be viewed in detail on pages 13-20.**

3.1.3 Receiver

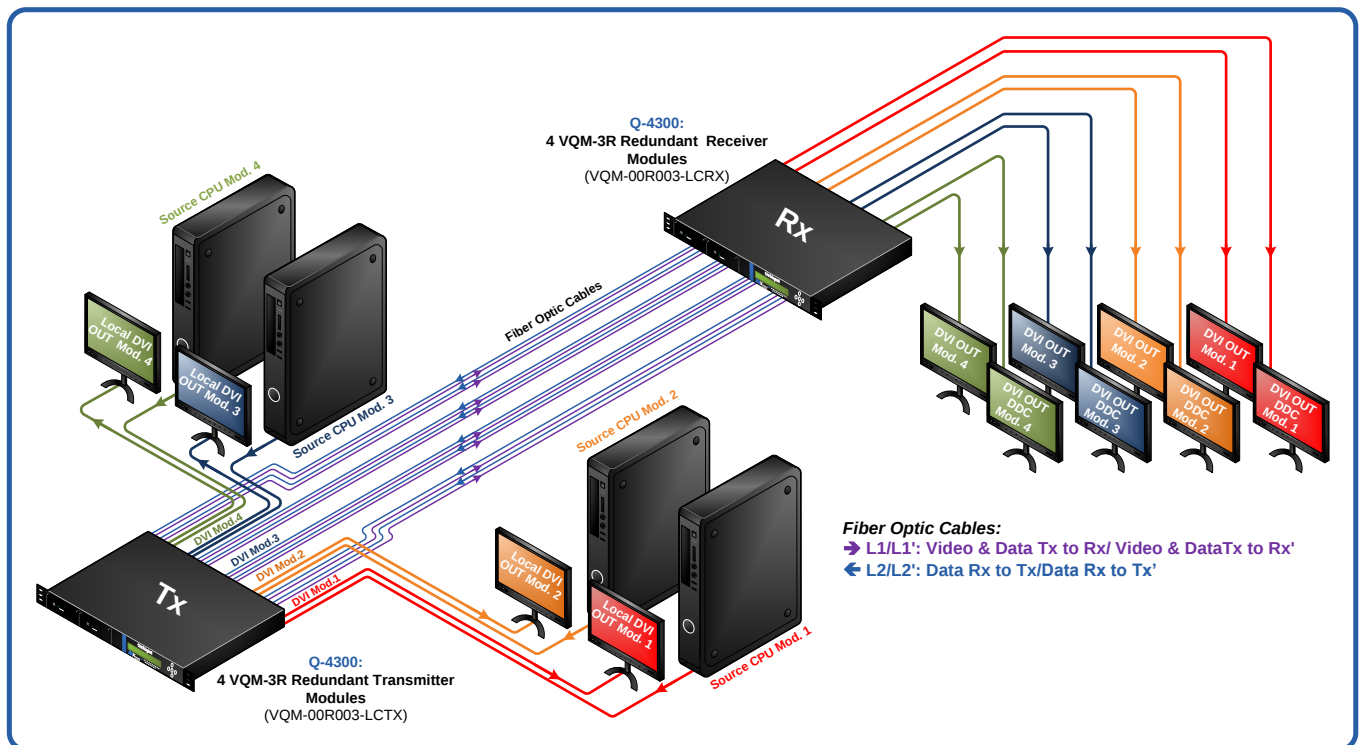
A receiver module connects to a viewing device (monitor, projector) and USB and audio devices with their own standard cables. **The connector configurations of the Q-Series Module Receivers can be viewed in detail on pages 13-20.**



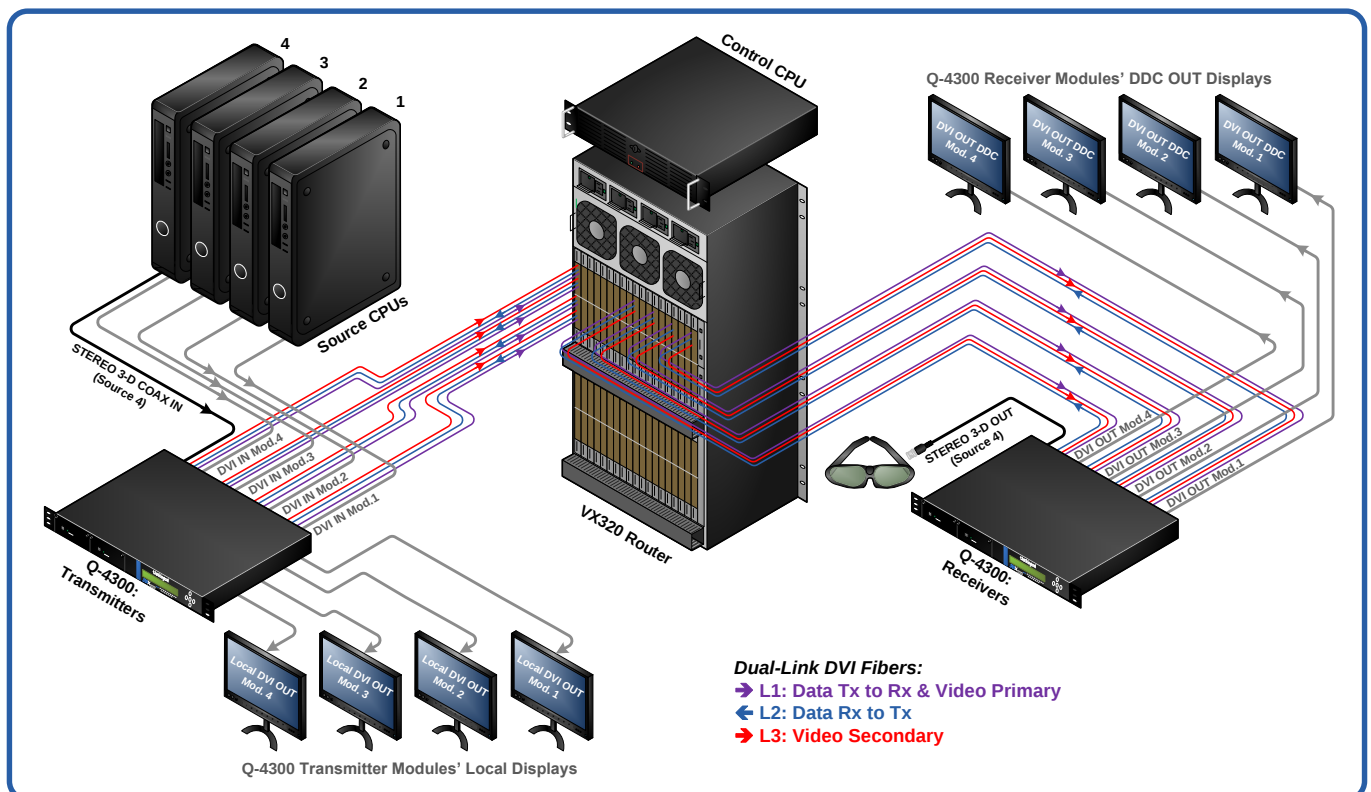
The VQM-3 Fiber Extension System- Up to 4 Single-Link DVI video signals can be extended in 1 RU



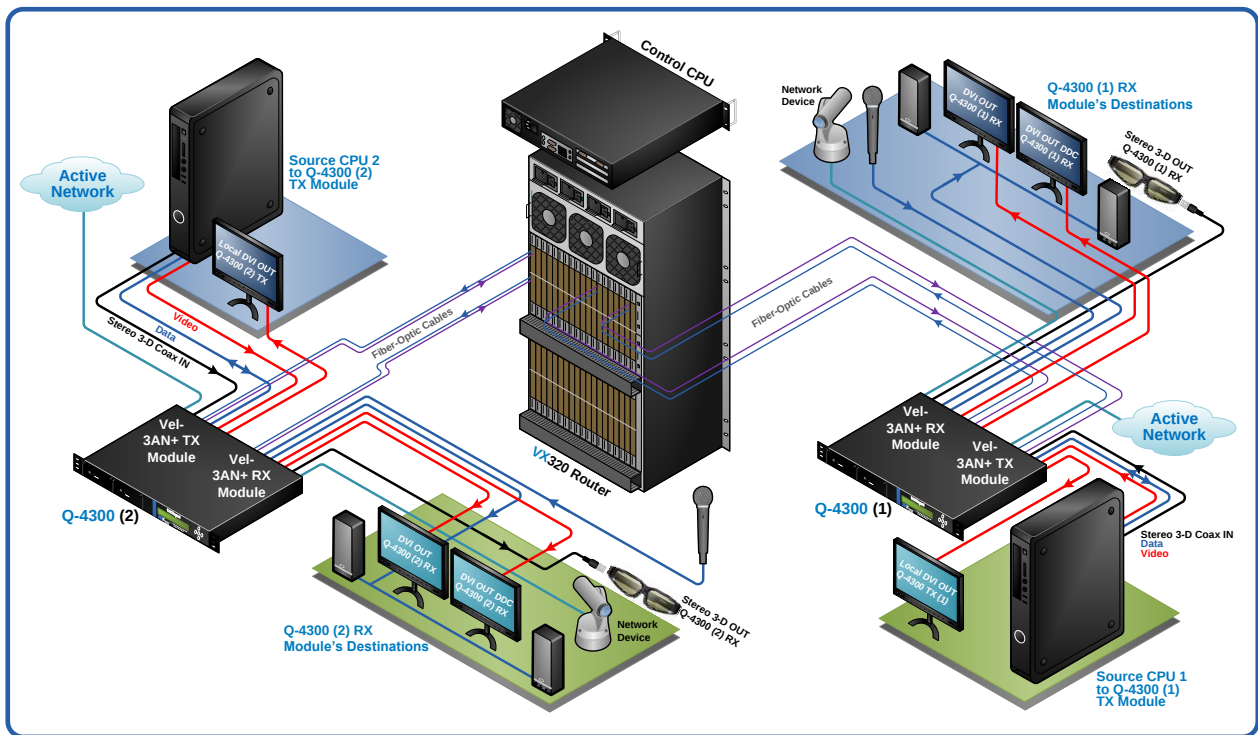
The VQM-3V Fiber Extension System- Up to 8 Independent Single-Link DVI video signals can be extended in 1 RU



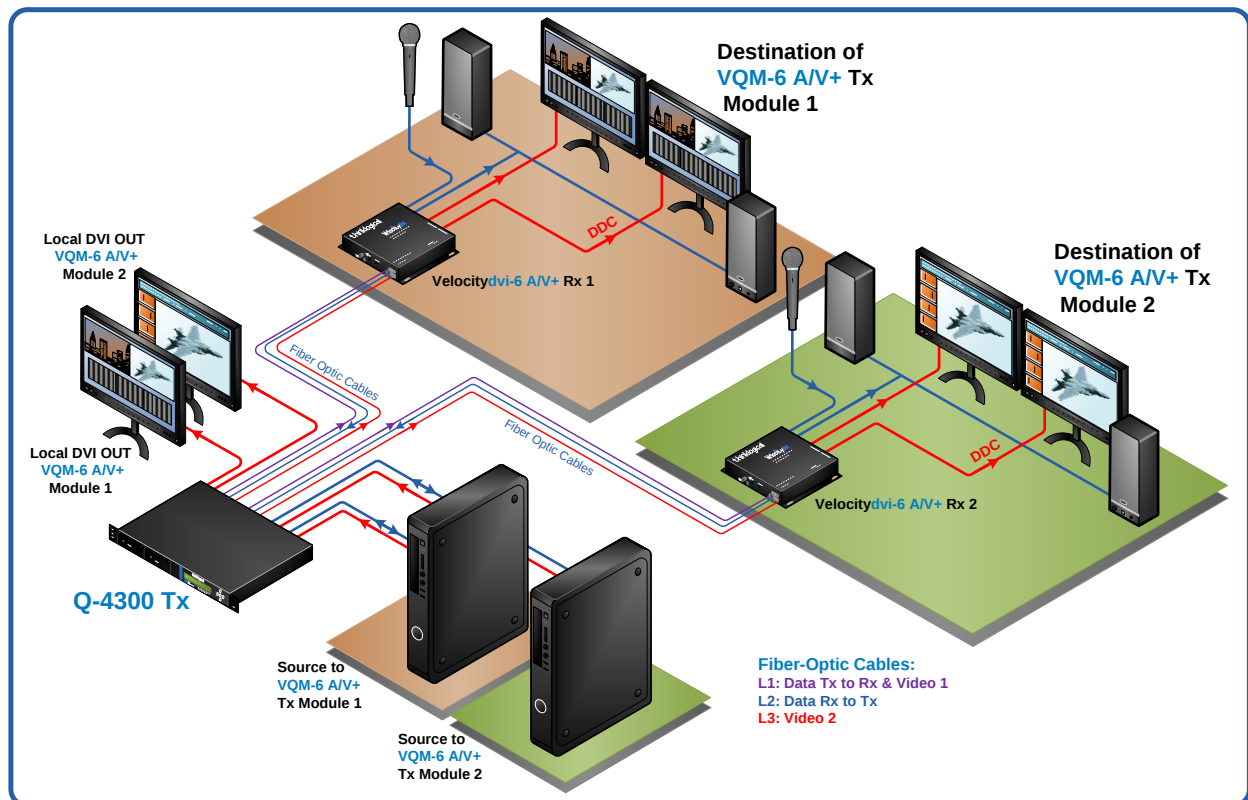
The VQM-3R Fiber Extension System- Up to 4 Single-Link DVI video signals can be extended in 1 RU with 4 Redundant Fiber Paths



The VQM-6 Fiber Extension System- Up to 4 Single-Link DVI video signals can be extended in 1 RU



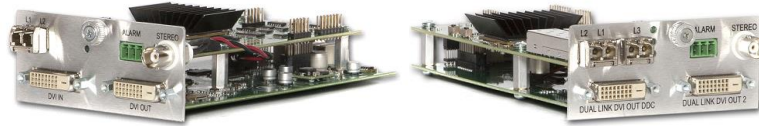
The VQM-3AN+ Fiber Extension System- Up to 2 Single-Link DVI video signals plus a network connection can be extended in 1 RU



The VQM-6AV+ to Vel-6AV+ Fiber Extension System Configuration- Up to 2 Single-Link DVI video signals plus audio can be extended in 1 RU

4. The Q-Series Video Modules

This section lists the various DVI and RGB/DVI Modules designed to work with the Q-Series Video and Audio Extension System. Supported video formats include DVI and RGB/DVI single-link and dual-link and a line of HDCP compliant models. Models are also available with Audio (AV+, AH), Network (AN+, NH), USB HID and video format scaler options. See page 24 for audio specifications and page 53, *Appendix F: EDID and DDC for Standard and HDCP Modules*.



4.1 Single-Link and Dual-Link DVI & RGB/DVI Modules:

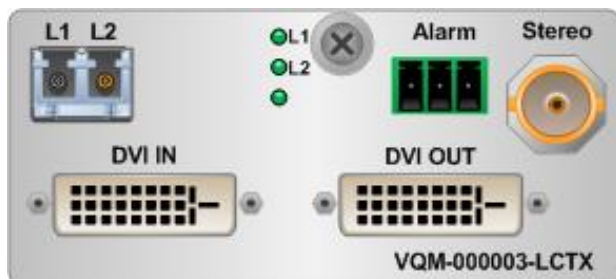
VQM-3, VQM-3R, VQM-3AV+, VQM-3RAV+, VQM-3AN+ & VQM-3RAN+ module features:

- Supports all Single-Link DVI video resolutions
- MRTS technology 6.25Gbps allows for full frame rate transmission of uncompressed DVI
- Signal transmission via fiber optic cable; no RF interference
- Requires one or two fiber optic cables depending on application
- Flawless image quality with no frame dropping
- Local video port on the transmitter
- Additional video output on the receiver
- Redundant Fiber Path (VQM-00R003 models only)
- Audio and RS-232 serial port (on AV + models only)
- Audio and Network port (on AN + models only)
- DDC2B/EDID compliant
- Simple plug and play

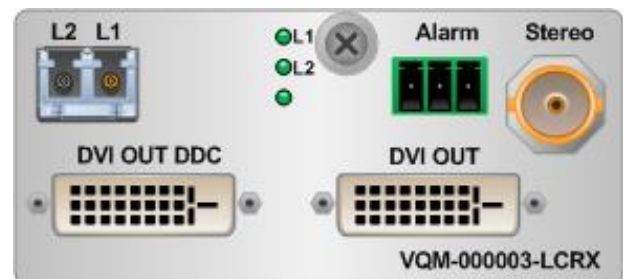
VQM-3V, VQM-3V AV+ and VQM-3V AN+ module features:

- Up to 8 independent Single-Link DVI video signals can be extended in 1 RU
- Supports all Single-Link DVI video resolutions
- Two DVI-D signals can be extended with one module
- MRTS technology 6.25Gbps allows for full frame rate transmission of uncompressed DVI
- Signal transmission via fiber optic cable; no RF interference
- Requires two or four fiber optic cables depending on application
- Flawless image quality with no frame dropping
- Audio and RS-232 serial ports (on AV + models only)
- Audio and Network ports (on AN + models only)
- DDC2B/EDID compliant
- Simple plug and play

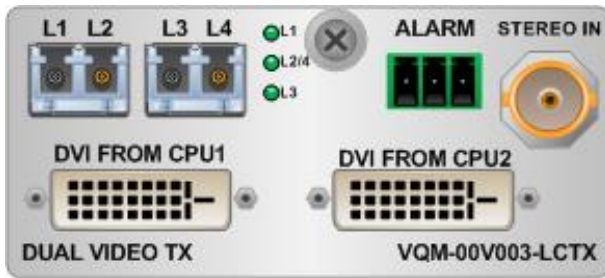
VQM-3, VQM-3V and VQM-3R Tx and Rx DVI Modules:



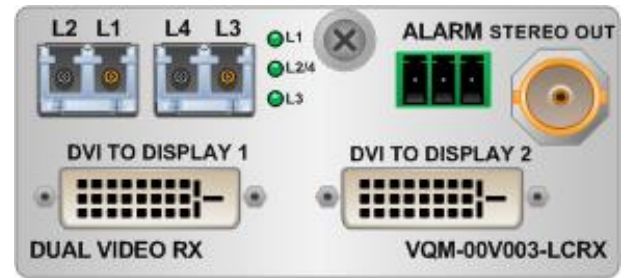
VQM-3, TX Single Video



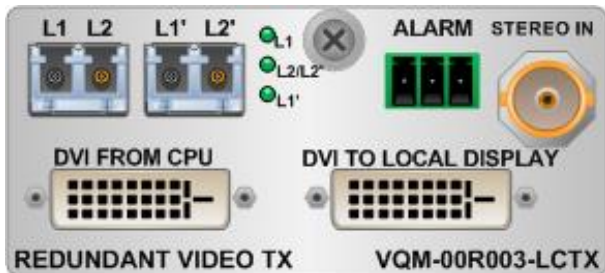
VQM-3, RX Single Video



VQM-3V, TX Dual Video



VQM-3V, RX Dual Video

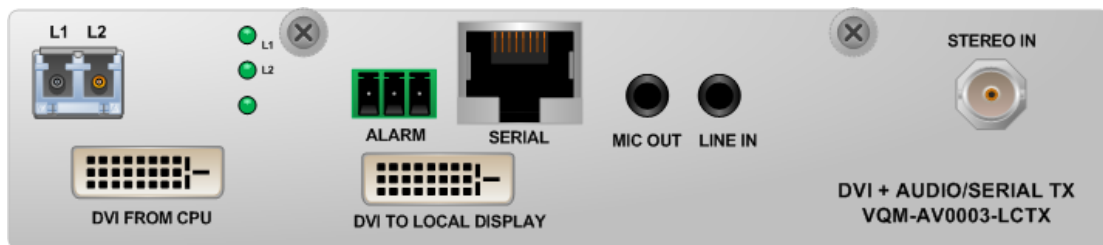


VQM-3R, TX Redundant Video

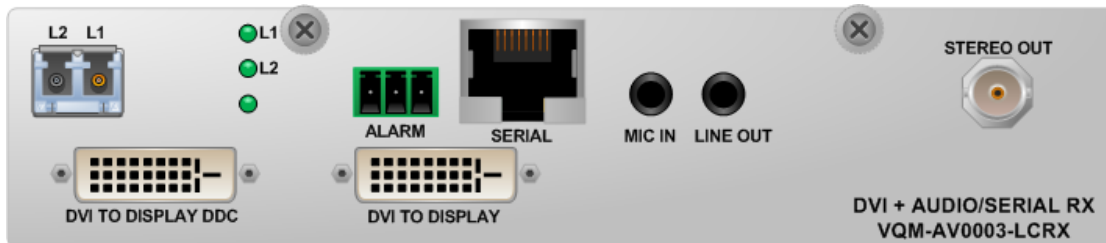


VQM-3R, RX Redundant Video

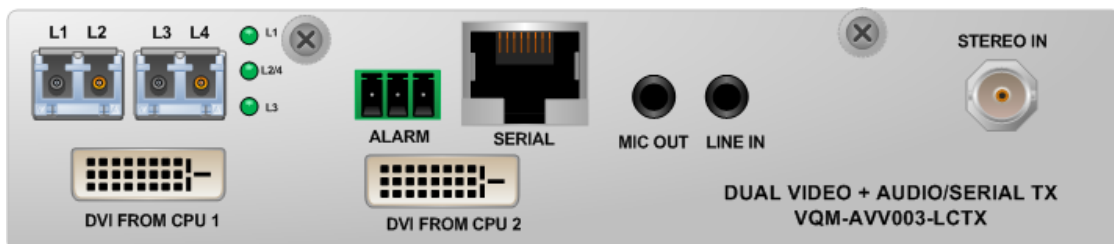
VQM-3 AV+ and VQM-3 AN+ Tx and Rx DVI Family of Modules:



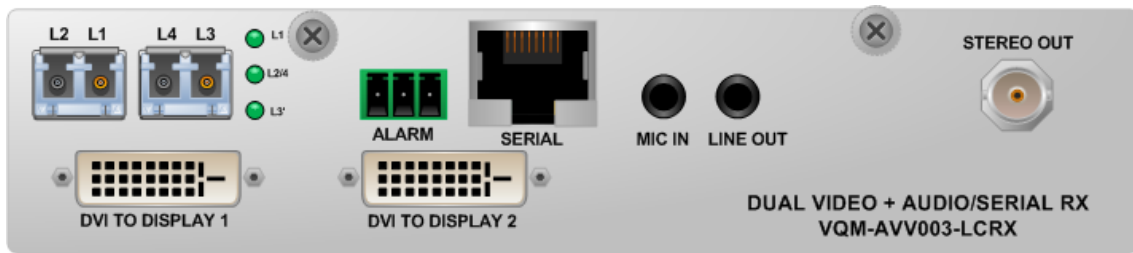
VQM-3 AV+, TX Single Video, Audio, Serial



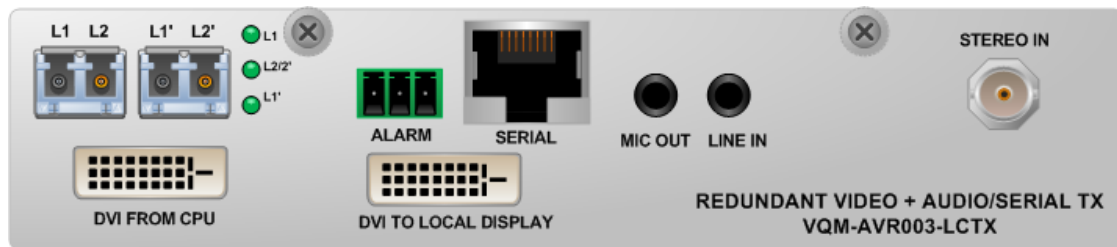
VQM-3 AV+, RX Single Video, Audio, Serial



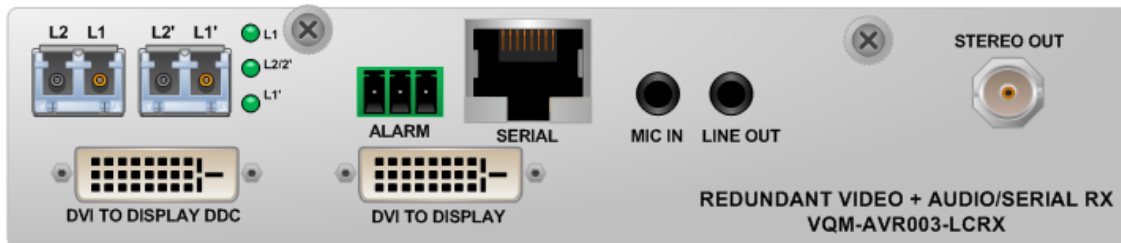
VQM-3V AV+, TX Dual Video, Audio, Serial



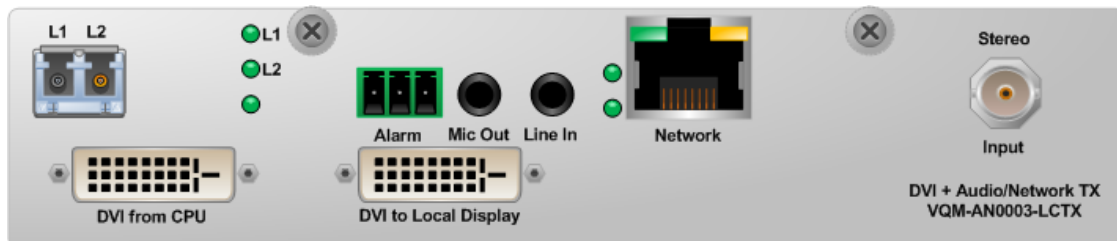
VQM-3V AV+, RX Dual Video, Audio, Serial



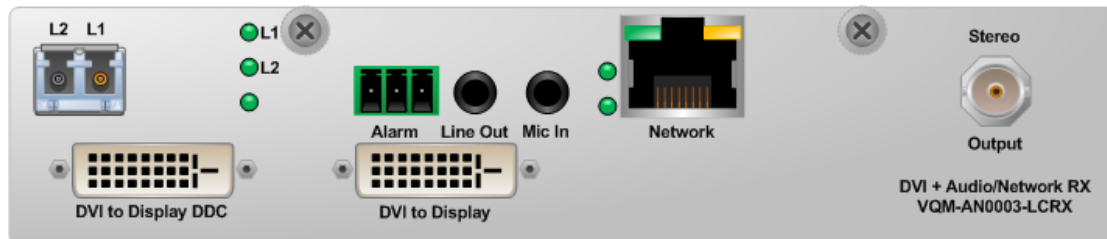
VQM-3R AV+, TX Redundant Video, Audio, Serial



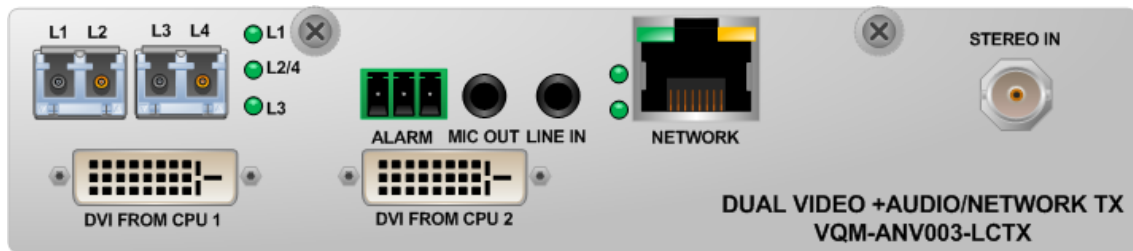
VQM-3R AV+, RX Redundant Video, Audio, Serial



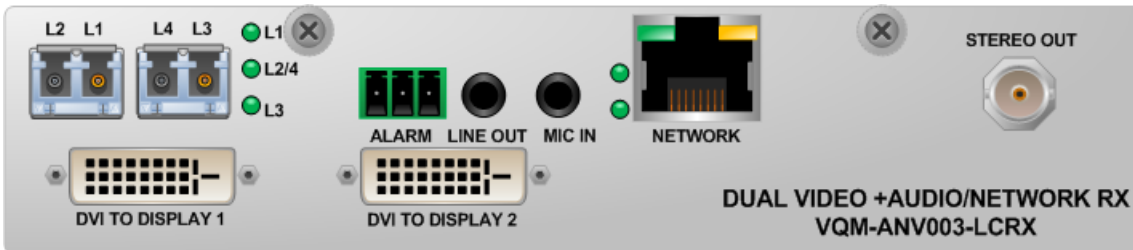
VQM-3 AN+, TX Single Video, Audio, Network



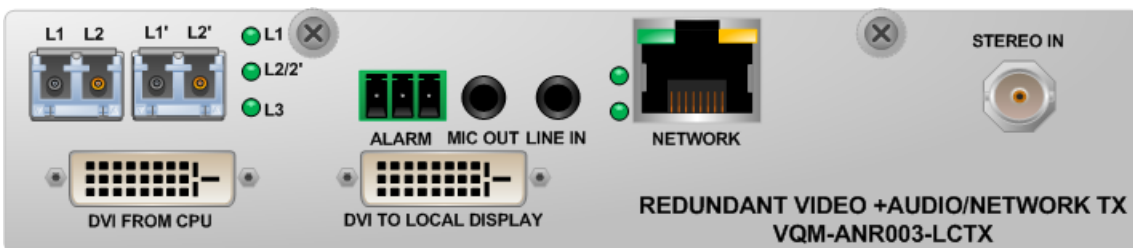
VQM-3 AN+, RX Single Video, Audio, Network



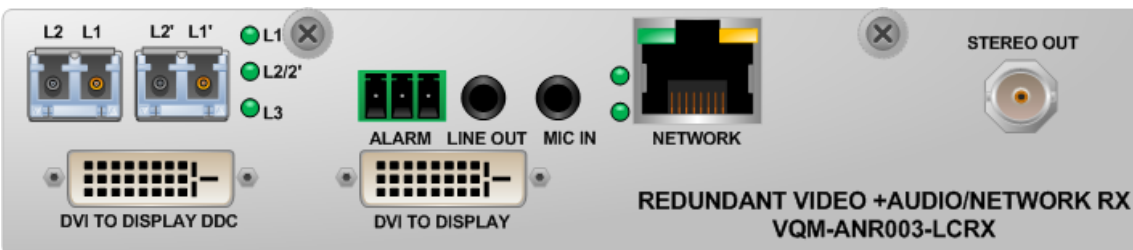
VQM-3V AN+, TX Dual Video, Audio, Network



VQM-3V AN+, RX Dual Video, Audio, Network



VQM-3R AN+, TX Redundant Video, Audio, Network



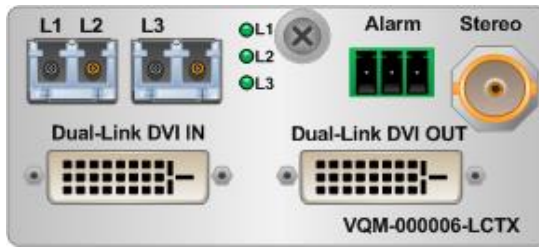
VQM-3R AN+, RX Redundant Video, Audio, Network

VQM-6, VQM-6 AV+ and VQM-6 AN+ Tx and Rx DVI Modules:

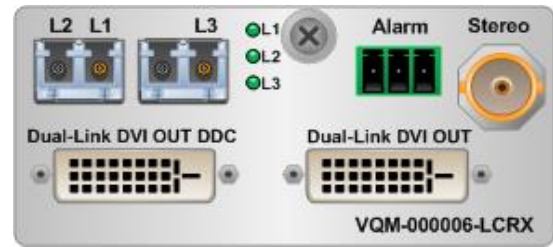
(Pictured on page 17)

VQM-6, VQM-6 AV+ and VQM-6 AN+ module features:

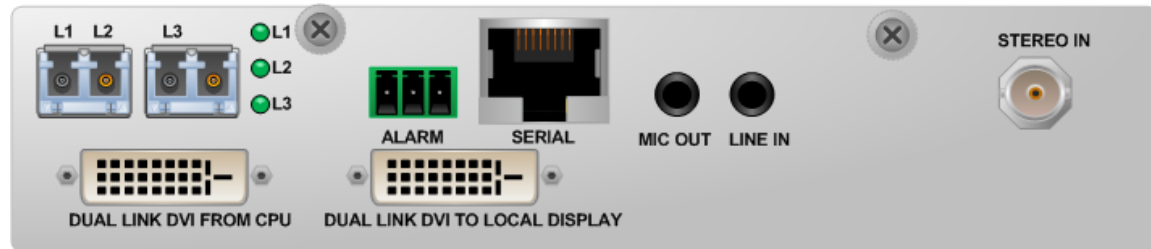
- Supports all Single-Link and Dual-Link DVI video resolutions
- MRTS technology 6.25Gbps allows for full frame rate transmission of uncompressed DVI
- Signal transmission via fiber optic cable; no RF interference
- Requires two or three fiber optic cables depending on application
- Flawless image quality with no frame dropping
- Local video port on the transmitter
- Additional video output on the receiver
- Audio and RS-232 serial ports (on AV+ models only)
- Audio and Network ports (on AN+ models only)
- DDC2B/EDID compliant
- Simple plug and play



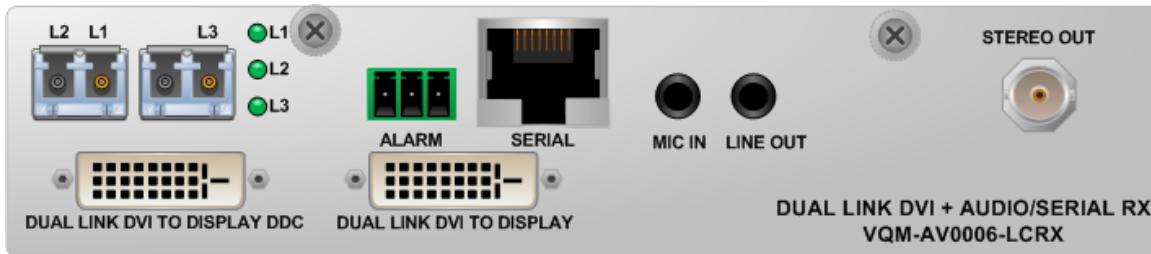
VQM-6, TX Dual-Link Video



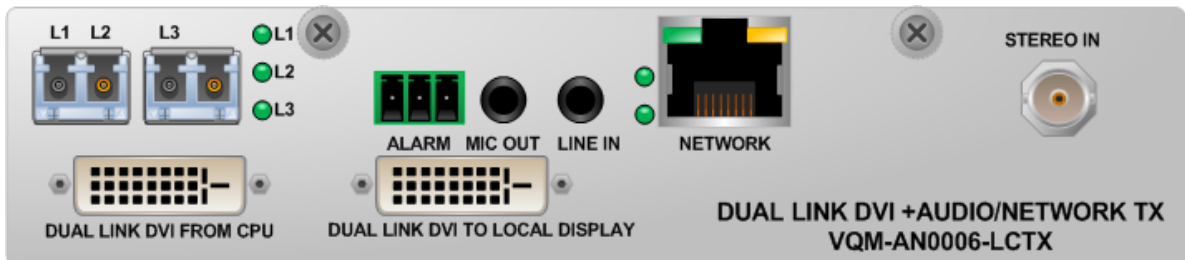
VQM-6, RX Dual-Link Video



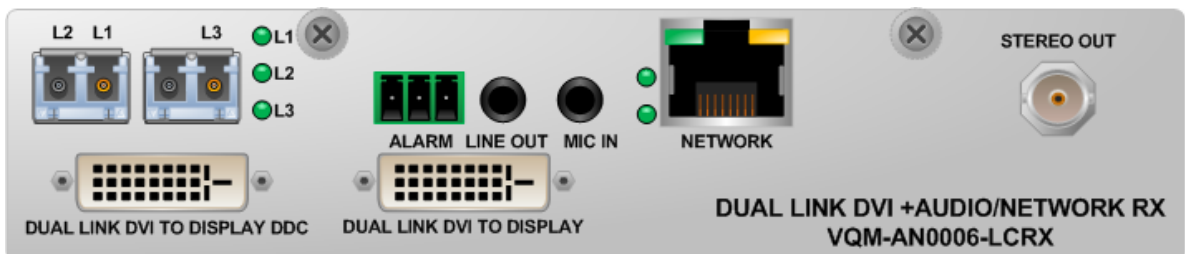
VQM-6 AV+, TX Dual-Link Video, Audio, Serial



VQM-6 AV+, RX Dual-Link Video, Audio, Serial



VQM-6 AN+, TX Dual-Link Video, Audio, Network



VQM-6 AN+, RX Dual-Link Video, Audio, Network

VQM-10 AV+ Tx and Rx RGB/DVI Modules:

VQM-10AV+ module features:

- Supports all Single-Link DVI and most common RGB video resolutions
- MRTS technology 6.25Gbps allows for full frame rate transmission of uncompressed RGB/DVI
- Signal transmission via fiber optic cable; no RF interference
- Requires one or two fiber optic cables depending on application
- Flawless image quality with no frame dropping
- Local video port on the transmitter
- Additional video output on the receiver
- Audio and RS-232 serial ports
- DDC2B/EDID compliant
- Simple plug and play
- See Appendix B (page 36) for VQM-10 AV+ supported analog resolutions
- See Appendix C (page 37-44) for VQM-10 AV+ Tx and Rx LCD Menu options



VQM-10 AV+, TX RGB/DVI Video



VQM-10 AV+, RX RGB/DVI Video

4.2 Velocity Q-Series HDCP Compliant Video Modules



Q-Series HDCP Compliant Video module features:

- Supports all Single-Link DVI video resolutions
- Fully HDCP compliant
- MRTS technology 6.25Gbps allows for full frame rate transmission of uncompressed DVI
- Signal transmission via fiber optic cable; no RF interference
- Flawless image quality with no frame dropping
- Audio and RS-232 serial ports (on AH models only)
- Audio and Network ports (on NH models only)
- Local video port on the transmitter (except on Dual Video models)
- Additional video output on the receiver (except on Dual Video models)
- DDC2B/EDID compliant
- Simple plug and play

VQM-3H, VQM-3AH and VQM-3NH module features:

- Requires one or two fiber optic cables depending on application

VQM-3HV, VQM-3AHV, VQM-3NHV and VQM-3HVK module features:

- Requires two to four fiber optic cables depending on application
- Audio and Network features are functional with the first video channel only
- USB HID available on VQM-3HVK

VQM-3AVS Scaler Receiver module features:

- Automatically scales the video output format to the connected monitor's preferred timing resolution and supports up to 8 channels of embedded audio.

4.2.1. Velocity Q-Series HDCP Compliant Module Part Numbers:

VQM-0H0003-LCRX	VQM-3, Single Link DVI, DDC, HDCP Compliant, RX, LC
VQM-0H0003-LCTX	VQM-3, Single Link DVI, DDC, HDCP Compliant, TX, LC
VQM-AH0003-LCRX	VQM-3 AV+, Single Link DVI, DDC, Audio, Serial, HDCP Compliant, RX, LC
VQM-AH0003-LCTX	VQM-3 AV+, Single Link DVI, DDC, Audio, Serial, HDCP Compliant, TX, LC
VQM-NH0003-LCRX	VQM-3 AV+, Single Link DVI, DDC, Audio, Network, HDCP Compliant, RX, LC
VQM-NH0003-LCTX	VQM-3 AV+, Single Link DVI, DDC, Audio, Network, HDCP Compliant, TX, LC
VQM-NHV003-LCRX	VQM-3 AVV+, Dual Single Link DVI, DDC, Audio, Network, HDCP Compliant, RX, LC
VQM-NHV003-LCTX	VQM-3 AVV+, Dual Single Link DVI, DDC, Audio, Network, HDCP Compliant, TX, LC
VQM-0HV003-LCRX	VQM-3V, Dual Single Link DVI, DDC, HDCP Compliant, RX, LC
VQM-0HV003-LCTX	VQM-3V, Dual Single Link DVI, DDC, HDCP Compliant, TX, LC
VQM-AHV003-LCRX	VQM-3 AVV+, Dual Single Link DVI, DDC, Audio, Serial, HDCP Compliant, RX, LC
VQM-AHV003-LCTX	VQM-3 AVV+, Dual Single Link DVI, DDC, Audio, Serial, HDCP Compliant, TX, LC
VQM-0HVK03-LCTX	VQM-3 Dual Single Link DVI, DDC, USB HID, HDCP Compliant, TX, LC
VQM-AV00S3-LCRX	VQM-3 AV+, Single Link DVI, DDC, Audio, Serial, HDCP Compliant, Scaler RX, LC

4.2.2. Velocity Q-Series HDCP Compliant Module Front Panel Views

VQM-0H0003-LCTX/RX (H=HDCP capability)



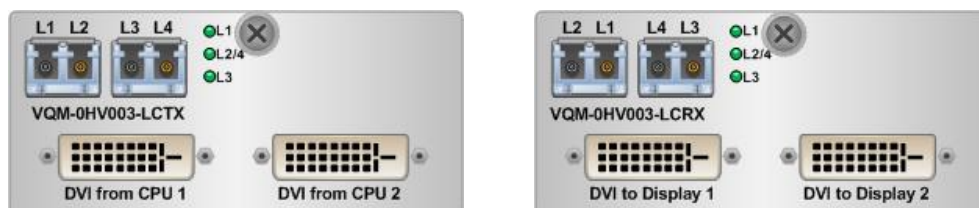
VQM-NH0003-LCTX/RX (N=Network, H=HDCP capability)



VQM-AH0003-LCTX/RX (A=Audio, H=HDCP capability)



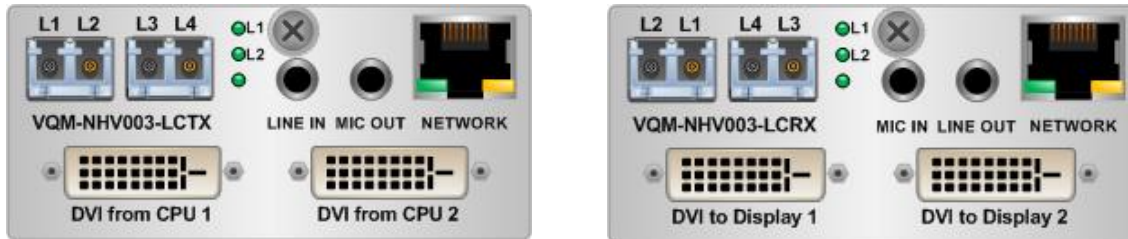
VQM-0HV003-LCTX/RX (V=Dual Video, H=HDCP capability)



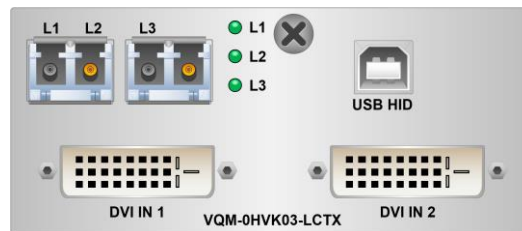
VQM-AHV003-LCTX/RX (A=Audio, H=HDCP capability, V=Dual Video)



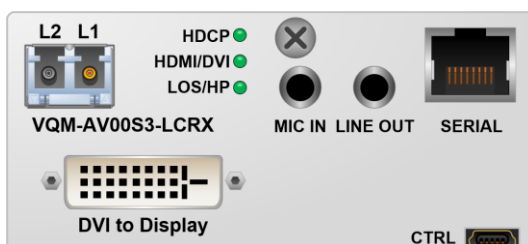
VQM-NHV003-LCTX/RX (N=Network, H=HDCP capability, V=Dual Video)



VQM-0HVK03-LCTX (H= HDCP, V=Dual Video, K=HID)



VQM-AV00S3-LCTX (A= Audio, V=Video, S=Scaler)



Thinklogical's Q-Series Scaler Receiver is HDCP compliant and automatically scales the video output format to the connected monitor's preferred timing resolution while supporting up to 8 channels of embedded audio. As with all HDCP compliant models, the Scaler Receiver is available with LC-Type fiber connectors only. (See **Appendix D: VQM-3 Scaler Menu Options** on page 45.)

All physical connections to the Q-Series Video Modules use industry-standard connectors. Non-supplied cables that may be needed are commercially available. All connections are found on each module's front panel.

4.3 Fiber Connections to the Q-Series Video Modules

4.3.1. Single Fiber Operation, Single-Link Video

The unit will operate with a single fiber from the TX to the RX. In this mode of operation the TX can transmit video and data to the RX over fiber L1. The RX cannot send any information to the TX. Also, DDC information can only be gathered from the TX local port or the Thinklogical default EDID table.

4.3.2. Dual Fiber Operation, Single-Link Video

Video information is transmitted from the TX to the RX over fiber L1. Fiber L2 is used as a data return path from the RX to the TX. Providing a back channel from the RX to the TX allows the RX to modify DDC configuration via the Front Panel LCD and buttons and allows the RX to send DDC information to the TX. DDC information exchange allows the PC to gather information about the connected monitor to determine the display properties.

4.3.3. Three and Four Fiber Operation, Dual Video

VQM-3HV and VQM-3AHV operate in Dual-fiber or Quad-fiber modes. In Dual-Fiber operation, fibers L1 and L3 are used to transmit data and video from the TX to the RX and in Quad-Fiber mode, fibers L2 (video head 1 DDC) and L4 (video head 2 DDC) transmit data from the RX back to the TX.

4.3.4. Two and Four Fiber Operation, Redundant Video

VQM-3R operates in Dual-fiber or Quad-fiber modes. In dual-fiber operation, fibers L1 and L1' are used to transmit data and video from the TX to the RX and in Quad-fiber mode, fibers L2 and L2' transmit data from the RX back to the TX. L1' and L2' are copies of L1 and L2 respectively.

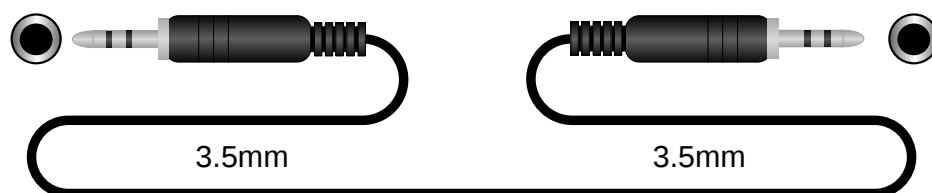
4.3.5. Two and Three Fiber Operation, Dual-Link Video

VQM-6 operates in Dual-fiber or Triple-fiber modes. In dual-fiber operation, fibers L1 and L3 are used to transmit data and video from the TX to the RX. In three-fiber mode, fiber L2 transmits data from the RX back to the TX.

4.4. Supplied Cables

Depending on the customer-specified system configuration, **power, video and peripheral cables from the following list will be supplied by Thinklogical in quantities specific to each configuration:**

4.4.1 3.5mm to 3.5mm Audio Cable, 6 Feet (CBL000016-006FR)



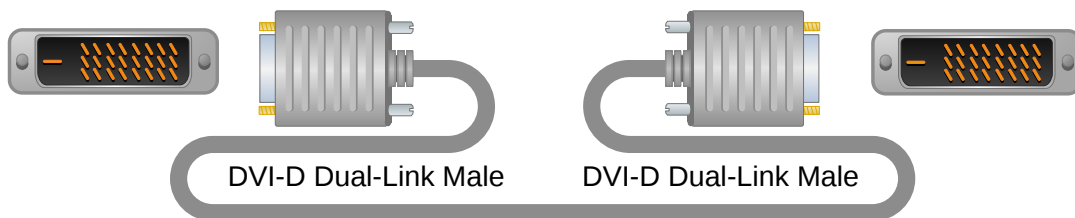
4.4.2 USB A-B Cable, 6 Feet (CBL000015-006FR)



4.4.3 DVI-D Single-Link, 2 Meters (CBL000009-002MR)



4.4.4 DVI-D Dual-Link, 2 Meters (CBL000023-002MR)



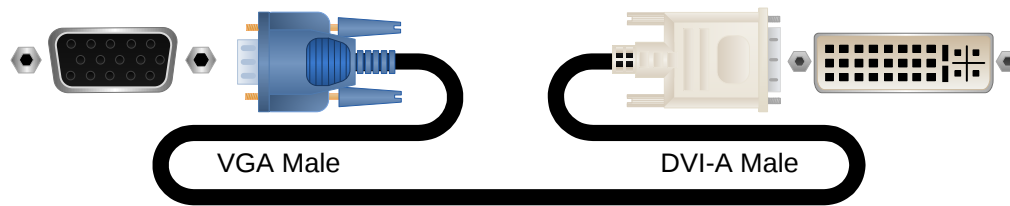
4.4.5 BNC Male to Male, 50Ω, 6 Feet (CBL000018-006FR)



4.4.6 RJ45M to RJ45M CAT5, 2 Meters (CBL000001-002M)



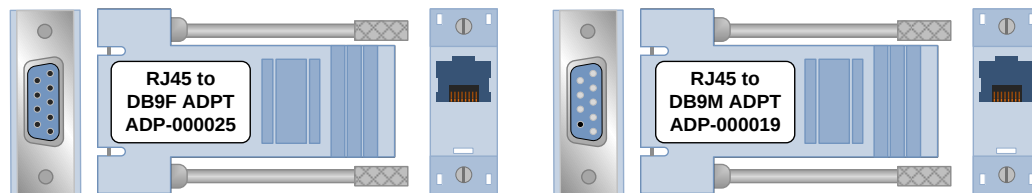
4.4.7. VGA Male to DVI-A Male, 2 Meters (CBL000022-002MR)



4.4.8. Domestic AC Power Cord (PWR-00006-R)



4.4.9. Adapters: RJ45 to DB9F (ADP-000025), RJ45 to DB9M (ADP-000019)

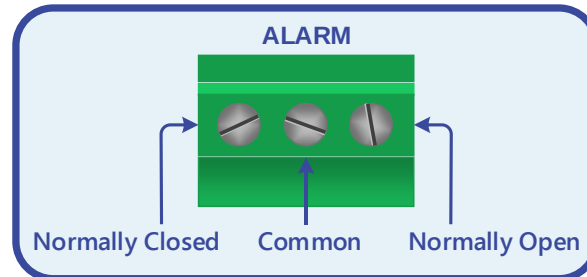


4.4.10. The USB Mini-B to USB-A User Configuration Control Cable (CBL000105-002MR), for use with scaler models housed in a Q-1300 Chassis. Available from *thinklogical*. Please contact your sales representative.



4.5 Dry Contact Alarm

Dry contact alarms are located on each of the individual VQM-3 and VQM-6 modules. The relay is energized when there is an alarm condition, such as over temperature or power regulation.



The dry contact alarm is a Form C contact with the following ratings:

Nominal switching capacity: 1A, 30V DC

Max. switching power: 30W DC



Dry Contact Alarm Receptacle

4.6 Q-Series Modules' Audio Specifications

Audio Sampling Rate	46.875 kHz
Transmitter	Line Input Impedance: 10K Ω Maximum Line Input: 2.5 volts peak to peak Microphone Output Impedance: 300 Ω Maximum Microphone Output: 0.45 volts peak to peak
Receiver	Line Output Impedance: 560 Ω Maximum Output: 3 volts peak to peak Microphone Input Impedance: 5K Ω Maximum Microphone Input: 0.24 volts peak to peak

4.7 Q-Series Video Modules' Technical Specifications

Module Specifications	Power Consumption: 10 watts per unit
VQM-3, VQM-3A, VQM-3N, VQM-3R, VQM-3H, VQM-3AH, VQM-3AVS, VQM-3NH, VQM-3V, VQM-3HV, VQM-3AHV, VQM-3HVK, VQM-6, VQM-10AV+	Dimensions: Height: 1.592" (40.43 mm) Depth: 6.366" (161.69 mm) Width: 3.693" (93.80 mm) (Tolerance: ± .039"; 1 mm)
VQM-3 AV+ VQM-3AN+ VQM-6 AV+ VQM-6AN+	Dimensions: Height: 1.592" (40.43 mm) Depth: 6.366" (161.69 mm) Width: 7.406" (188.11 mm) (Tolerance: ± .039"; 1 mm)
Electrical Cables (supplied with transmitters)	KIT-000005-R Audio Kit 1 (contains the following): CBL000006-006FR 6 Pin Mini-DIN, Male to Male Cable, 6FT (2) CBL000015-006FR USB A-B Cable, 6FT (2) CBL000016-006FR 3.5mm Male to 3.5mm Male Plug, 6FT (2) CBL000017-006FR DB9M to DB9F Cable, 6FT (1) CBL000018-006FR BNC Male to BNC Male Cable, 50Ω, 6FT (1)
DB9 to RJ45 Adapters	With AV+ models only: ADP-000019-R DB9M to RJ45 ADP-000025-R DB9F to RJ45
Copper Video Cables	CBL000009-002MR Single-link DVI-D Male to Male, 2 meters 1 each, VQM-3, VQM-3 AV+, VQM-3 AN+ 2 each, VQM-3V, VQM-3V AV+, VQM-3V AN+ CBL000013-002MR DVI-I Male to DVI-I Male, 2 meters 1 each, VQM-10AV+ CBL000022-002MR DVI Male to VGA Male, 2 meters 1 each, VQM-10AV+ CBL000023-002MR Dual-link DVI-D Male to Male, 2 meters 1 each, VQM-6, VQM-6 AV+, VQM-6 AN+
Optical Distance	Multi-Mode: Up to 50 meters with Type OM1 Up to 350 meters with Type OM2 Up to 750 meters with Type OM3 Up to 1000 meters with Type OM4 Single Mode: Up to 80km with Type OS2 9/125 for all distances
Supply Voltage	100-240 VAC, 47-63 Hz, Universal AC power supply
Operating Temp and Humidity	0° to 50°C (32° to 122 °F), 5% to 95% RH, non-condensing
Compliance	Approvals for US, Canada, and European Union
Warranty	12 months from date of purchase. Extended warranties available.

4.8 Firmware and FPGA Updates

FPGA and Firmware Upgrade Applications are available through Thinklogical's® Technical Assistance Department. Please call us at 1-203-647-8700 and we'll be happy to provide you with all the assistance you'll need to keep your system up and running at its optimum performance level.



*Firmware Upgrade:
USB Cable from CPU to UPDATE Port Front panel LCD*

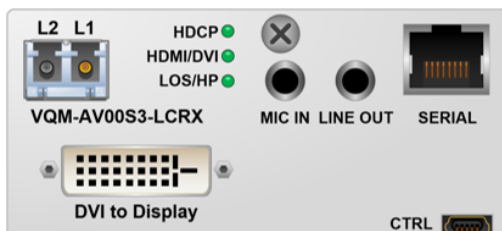
4.9 Status Indicator LEDs

The LED Status Indicators on the Q-Series modules are provided as troubleshooting aides in diagnosing and resolving technical problems so that a technician can easily assess the status of the module.

The LEDs on most devices monitor the status of the fibers at L1-L4 and are labeled as such. The functions of the fiber LEDs are described on page 27.

4.9.1. Scaler Receiver Status LEDs

The LEDs on the Scaler Receiver indicate whether the device is receiving HDCP, HDMI or DVI video signals and if the unit detects an input signal or Hot Plug (a monitor's output signal that lets the video source know if a new monitor has been connected so it can read the DDC table). The Scaler Receiver LED functions are described below.



Scaler RX Status LEDs

- HDCP** ● **FLASHING:** No HDCP, **STEADY:** HDCP OK
- HDMI/DVI** ● **FLASHING:** HDMI OK, **STEADY:** DVI OK
- LOS/HP** ● **FLASHING:** Loss of Input Signal, **STEADY:** No Hot Plug

4.9.2. Q-Series Video Module Tx and Rx Status LEDs

The LED status indicators on the Q-Series modules are provided as troubleshooting aides in diagnosing and resolving technical problems so that a technician can easily assess the status of the module.

All transmitter and receiver LEDs are **GREEN** (with the exception of the Activity LED on the RJ45 port on *Network* models) and can be in one of three states: OFF, FLASHING, or ON.

In the case of dual or redundant video modules, both *return* fibers are monitored by LEDs L2 and L4 (dual video) or L2 and L2' (redundant video) and will operate the same if only one or both of these fibers is detected. LEDs L1 and L3 are mutually-exclusive from each other with ONE exception –

ALL LEDS FLASHING IN UNISON INDICATES THAT THE MODULE IS IN ALARM!

A module will be declared in ALARM if any of the following conditions exist:

- Over the maximum temperature threshold (module or chassis)
- Wrong or missing voltage
- Bad firmware checksum value

Fiber Status LEDs:

Transmitter Fiber Status LEDs (Dual Video)					Receiver Fiber Status LEDs (Dual Video)			
LED	OFF	FLASHING	ON STEADY		LED	OFF	FLASHING	ON STEADY
L1	No SFP	Fiber Active, No DVI 1	Fiber Active, DVI 1 Valid	● L1	L1	Not Locked	Locked, No DVI 1	Locked, DVI 1 Valid
L2 and/or L4	Not Locked		Return Path Locked	● L2/L4	L2 and/or L4	No SFP		Fiber Active
L3	No SFP	Fiber Active, No DVI 2	Fiber Active, DVI 2 Valid	● L3	L3	Not Locked	Locked, No DVI 2	Locked, DVI 2 Valid

LEDs Off:

NO SFP – The SFP is missing or not seated properly in the socket

NOT LOCKED – The SFP and a signal are present but *not locked* to the source.

Transmitter:

RETURN PATH LOCKED – The return signal is present and *locked* to the source.

FIBER ACTIVE, NO DVI 1, 2 – Valid data path but no DVI

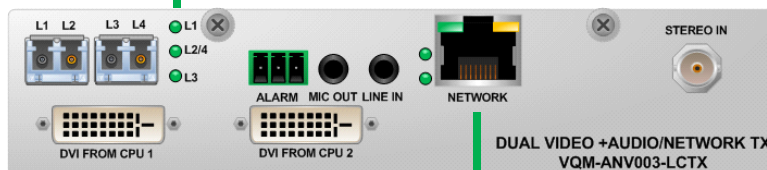
FIBER ACTIVE, DVI 1, 2 VALID – Valid data path and valid DVI

Receiver:

FIBER ACTIVE – A valid return signal is present

LOCKED, NO DVI 1 & 2 – Data is present, but no DVI

LOCKED, DVI 1 & 2 VALID – Data and valid DVI present



Network Status LEDs:

On the RJ45 Port:

Yellow LED Flashing = Activity

Green LED on = Link

10/100:

On when speed of link is **100 Mb/sec.**

Off when speed of link is **10 Mb/sec.**

FD/COL:

On when operating in **Full Duplex.**

Off when operating in **Half Duplex.**

Flashing indicates **Collision.**



5. Regulatory & Safety Compliance

5.1 Safety Requirements

Symbols found on the product

Markings and labels on our product follow industry-standard conventions. Regulatory markings found on our 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

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 60950-1 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

5.2. 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 electromagnetic 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. **05-160125** for example, indicates the unit was built in the 5th month of 2016, and is unit number 125.

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.

6. How to Contact Us

6.1. Customer Support

Thinklogical® is an engineering company and we will always do our best to ensure that you receive any help 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're 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 helpful information.

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:	1-203-647-8769
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. You can 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.

6.2. 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.

6.2.1. Warranty

Thinklogical, LLC® warrants this product against defects in materials and workmanship for a period of one year from the date of delivery. Thinklogical 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 product's 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 authorized dealer where you purchased the device, or if you purchased directly, call Thinklogical at **1-800-291-3211** (USA).

6.2.2. 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 with a Return Merchandise Authorization, please use the following address:

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

QUICK-START GUIDE

As used with the
thinklogical®
VX160
KVM Matrix Switch
Powered by
MRTS Technology

Complete Steps 1-8 to connect
to a VX160 KVM Matrix Switch

STEP 4: Connect the Q-Series Transmitter Modules to the VX160 using multi-mode fiber-optic cables (up to 1000 meters). Connect fiber L1 to any SFP's Receive Port and fiber L2 to the same SFP's Transmit Port. Do the same for each of the four Transmitter modules.

STEP 5: Ensure the Q-4300 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) onto the Q-4300 Chassis. Plug both cords into a standard AC source. On the front of the chassis, turn ON the Right and Left Power Supply Modules.



VX160 Router Chassis
VXR-000160
16 Rack Units, 850 Watts
Upstream Data Card (8)
VXM-D10020
Downstream Data Card (8)
VXM-D00020
Controller Card (2)
VXM-000001

STEP 7: Connect the Controller Cards' LAN Ports to your Controller CPU with CAT5 cables. (CPU IP address: 192.168.13.9)

STEP 8: Connect both supplied AC Power Cords (PWR-0000056-R) to the receptacles located on the VX160's power supplies. Plug each one into a standard AC source. Verify that all system functions are operating properly.



Primary Controller
IP address: 192.168.13.115
Optional Secondary
Controller Card
IP address: 192.168.13.116

L1: Data TX to RX and Video
L2: Data RX to TX

VQM-3 Receivers (4)
VQM-000003-LC-RX
Q-4300 Chassis
VQS-004300

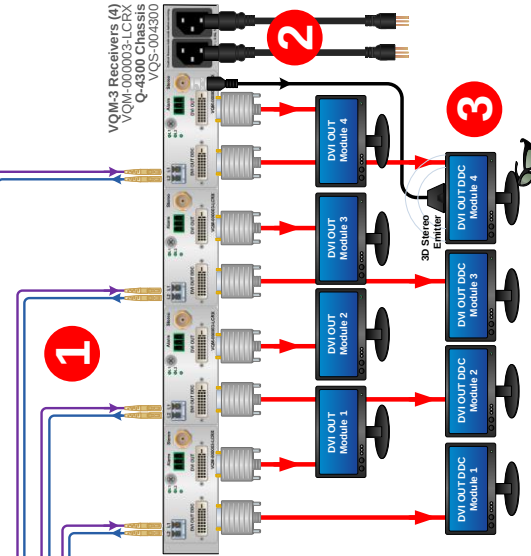
VQM-3 Transmitters (4)
VQM-000003-LC-TX
Q-4300 Chassis
VQS-004300

STEP 6: Connect a DVI cable from the Source CPU to the DVI IN port of each Transmitter Module. If desired, connect an optional local monitor to each of the Transmitters' DVI OUT ports with a standard DVI cable. If stereo 3-D molecular visualization at the destination is desired, connect the Stereo Source's OUTPUT to the Transmitter Module's STEREO INPUT. Ensure the sources are turned ON.

STEP 1: Connect the Q-Series Receiver Modules to the VX160 using multi-mode fiber-optic cables (up to 1000 meters). Connect fiber L1 to any SFP's Transmit Port and fiber L2 to the same SFP's Receive Port. Do the same for each of the Receiver modules.

STEP 2: Ensure the Q-4300 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) onto the Q-4300 Chassis. Plug both cords into a standard AC source. On the front of the chassis, turn ON the Right and Left Power Supply Modules.

STEP 3: Connect a monitor to each of the DVI OUT DDC ports with a standard DVI cable. A second, non-DDC monitor may also be connected to each modules' DVI OUT port. If stereo 3-D molecular visualization on your desktop is desired, connect a 3-D Active Stereo Emitter to the STEREO OUT receptacle on the Receiver module.



QUICK-START GUIDE

As used with Thinklogical's® Q-Series and Velocitydvi-3 Video Extension Systems
with VQM-3V Dual Video Transmitter & Receiver Modules



STEP 4: Connect the VQM-3V Transmitter Modules to the VX80 Router using multi-mode fiber-optic cables (up to 1000 meters). Connect fiber L1 to any Upstream SFP's Transmit Port and fiber L2 to the same SFP's Transmit Port.

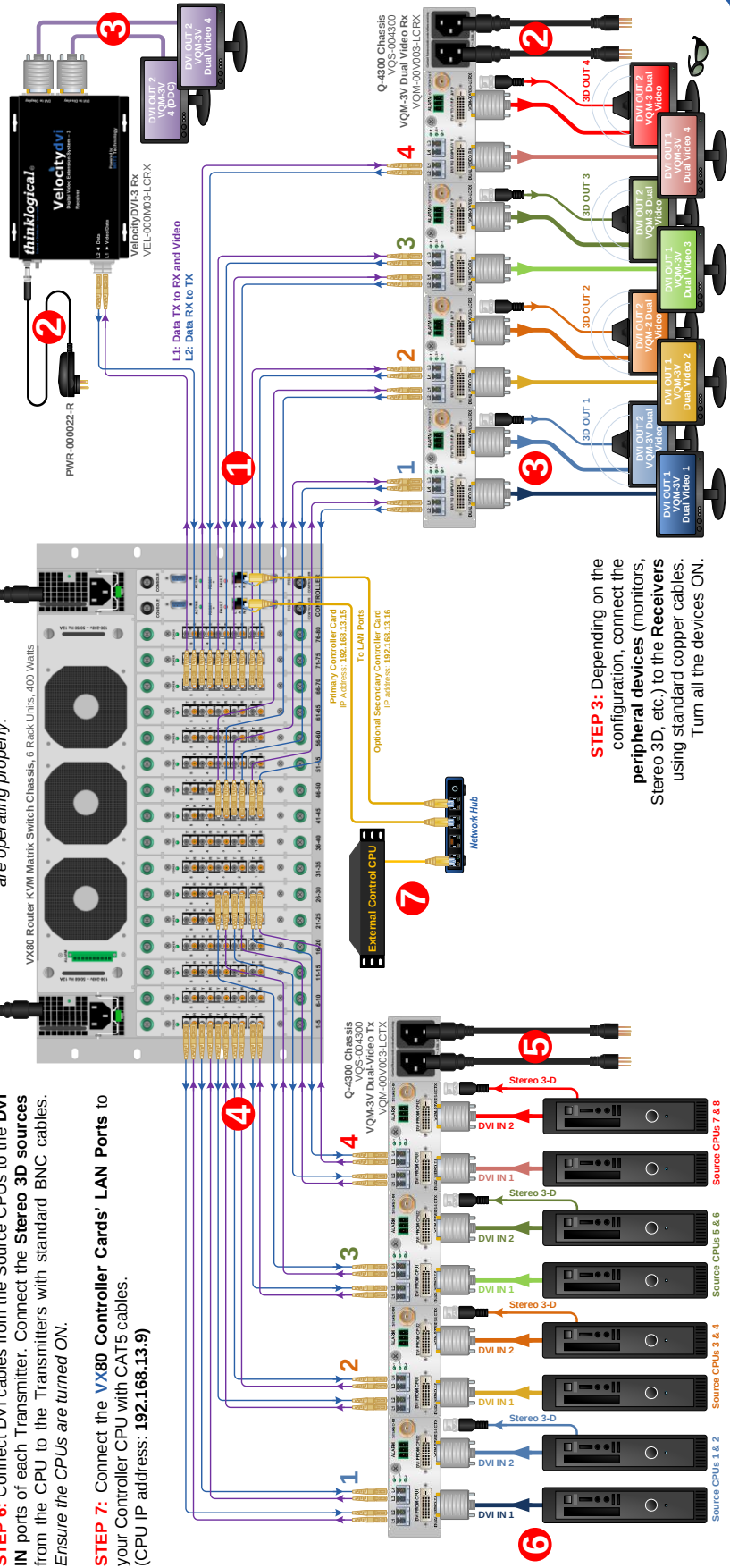
STEP 5: Ensure the Q-4300 Power Supply switches on the front panel are in the OFF position. Install the Right Power Supply Module AC Power Cord (left receptacle) and the Left Power Supply Module AC Power Cord (right receptacle) onto the Q-4300 Chassis. Plug each cord into a standard AC source. On the front of the chassis, turn ON the Right and Left Power Supply Modules.

STEP 6: Connect DVI cables from the Source CPUs to the DVI IN ports of each Transmitter. Connect the Stereo 3D sources from the CPU to the Transmitters with standard BNC cables. Ensure the CPUs are turned ON.

STEP 7: Connect the VX80 Controller Cards' LAN Ports to your Controller CPU with CAT5 cables. (CPU IP address: 192.168.13.9)

8

STEP 8: Connect both supplied AC Power Cords (PWR-000006-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.



Complete Steps 1-8 to connect to the VX80 Router:

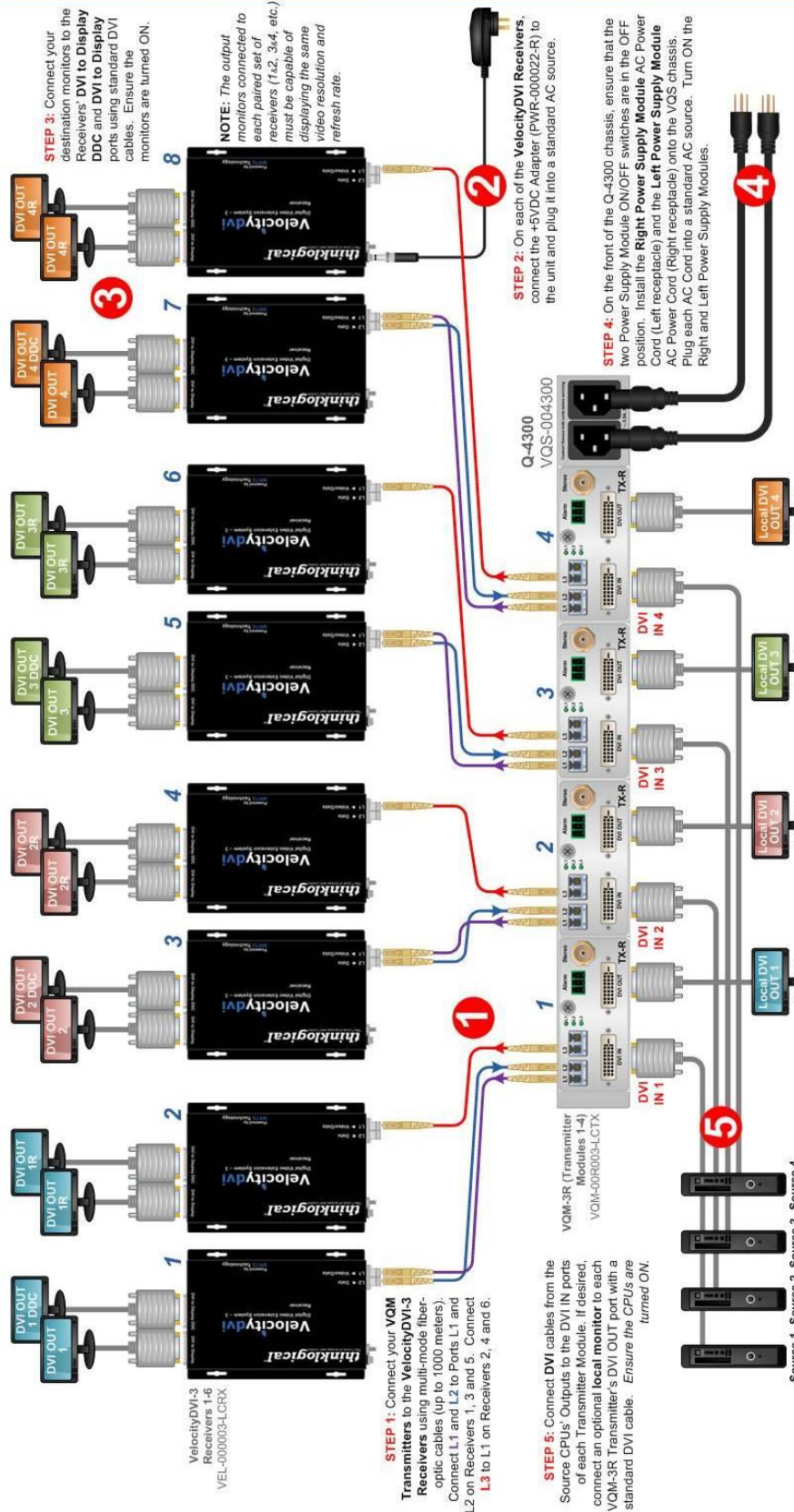
STEP 1: Connect the VQM-3V Receiver Modules to the VX80 Router using multi-mode fiber-optic cables (up to 1000 meters). Connect fiber L1 to any Downstream SFP's Transmit Port and fiber L2 to the same SFP's Receive Port.

STEP 2: Ensure the Q-4300 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) onto the Q-4300 Chassis. Plug each cord into a standard AC source. On the front of the chassis, turn ON the Right and Left Power Supply Modules. On the VelocityDVI Receiver, connect the +5VDC Adapter (PWR-000022-R) to the unit and plug it into a standard AC source.

STEP 3: Depending on the configuration, connect the peripheral devices (monitors, Stereo 3D, etc.) to the Receivers using standard copper cables. Turn all the devices ON.

QUICK-START GUIDE As used with Thinklogical's® Q-4300 and VelocityDVI Fiber Optic Extension Systems

Complete Steps 1-5 to connect VQM Redundant Transmitters to VelocityDVI-3 Receivers.



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Visit us online at www.thinklogical.com for more product information, current updates and the complete line of Thinklogical® products.

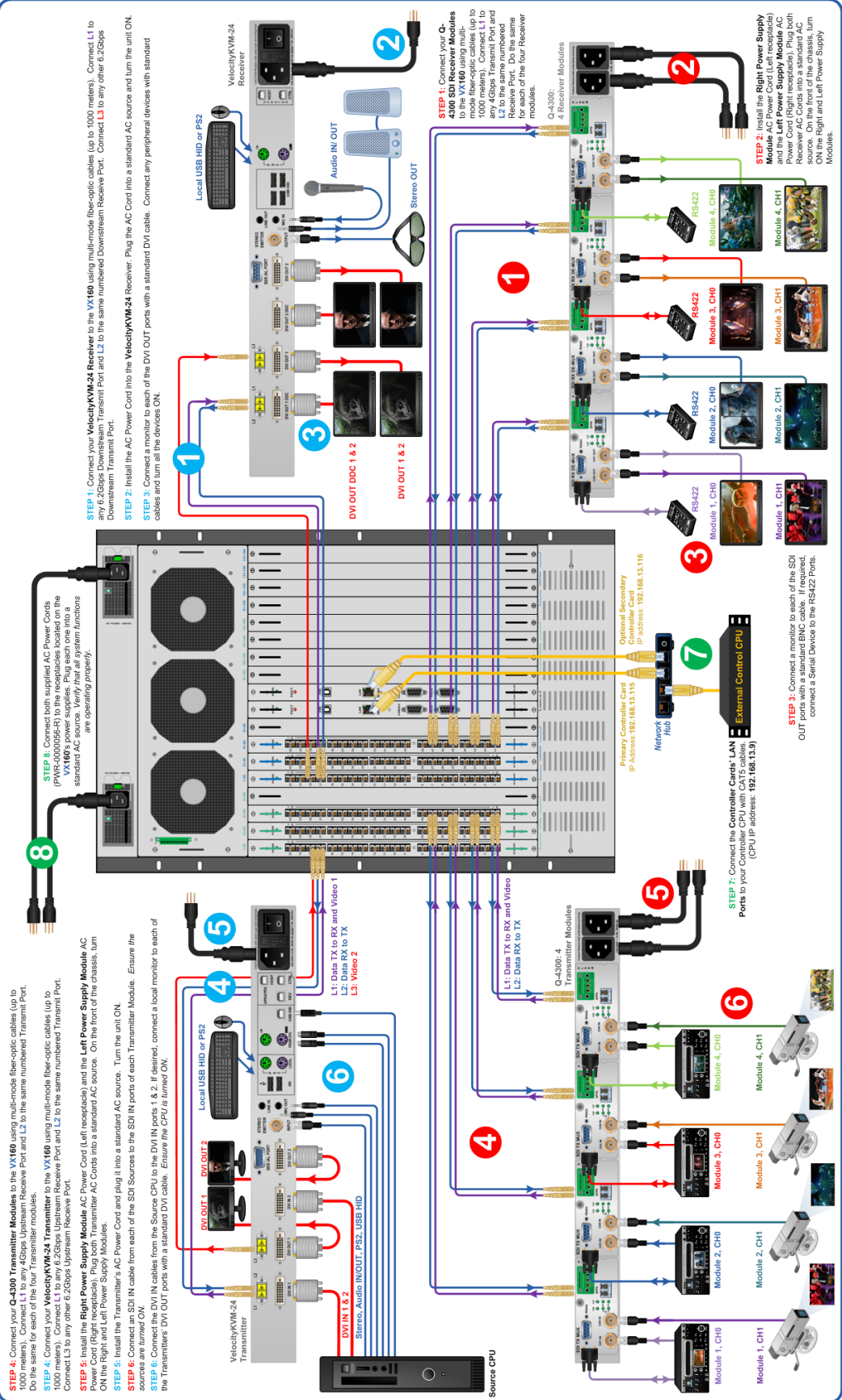
PHONE: 1-800-291-3211
WEBSITE: www.thinklogical.com
EMAIL: support@thinklogical.com

thinklogical®
Extend • Distribute • Integrate

VX160 router KVM Matrix Switch

As used with Thinklogical's™ Q-4300 SDI and
Velocitykvm-24 Video Extension Systems

QUICK-START GUIDE



Appendix B. Thinklogical VQM-10 AV+ Supported Analog Resolutions

Active Resolution		Total Lines	Vertical Freq (Hz)	Horizontal Freq (kHz)	Pixel Clock Freq (MHz)	Video Standard
Pixels	Lines					
640	448	472	66	31.2	25	Honeywell
640	480	525	60	31.5	25.175	Industry Standard
640	480	520	72	37.9	31.5	VESA
640	480	500	75	37.5	31.5	VESA
640	480	509	85	43.3	36	VESA
720	400	449	70	31.5	28.32	Industry Standard
800	600	625	56	35.1	36	VESA
800	600	628	60	37.9	40	VESA
800	600	666	72	48.1	50	VESA
800	600	625	75	46.9	49.5	VESA
800	600	631	85	53.7	56.25	VESA
1024	768	800	50	40	53.44	Folsom
1024	768	806	60	48.4	65	VESA
1024	768	800	75	60	78.75	VESA
1024	768	808	85	68.7	94.5	VESA
1280	720	750	50	37.5	74.25	Folsom
1280	720	750	60	45	74.25	CEA-861-E
1280	800	828	60	49.7	83.46	VESA GTF
1280	1024	1066	50	52.8	89.55	Folsom
1280	1024	1066	60	64	108	VESA
1280	1024	1082	60	64.8	108.88	Discreet
1280	1024	1066	75	80	135	VESA
1280	1024	1072	85	91.1	157.5	VESA
1280	1024	1063	96	102	163.277	SGI Onyx2
1366	768	795	60	47.7	85.5	VESA GTF
1400	1050	1090	50	54.5	94.61	Folsom
1400	1050	1080	60	64.8	120.78	VESA CVT-RB
1400	1050	1089	60	65.3	121.75	VESA
1400	1050	1099	96	105.4	164.5	SGI Stereo
1440	900	932	60	55.8	106.4	VESA GTF
1440	900	934	60	55.9	106.5	VESA DMT
1600	1200	1250	60	75	162	VESA
1680	1050	1089	60	65.3	146.25	VESA DMT
1920	1080	1125	25	28.12	74.25	Folsom
1920	1080	1125	50	56.25	148.5	Folsom
1920	1080	1125	60	67.5	148.5	CEA-861-E

Appendix C:

Thinklogical VQM-10 AV+ LCD Menu Options (Q-2300 & Q-4300 Chassis) *

*Q-Series LCD menus operate the same as on VelocityRGB-10AV+ Stand-Alone units.

Transmitter LCD Menus:

VQM-10AV+ TX Front Panel LCD Display	Modifiable	Description
Thinklogical Velocity TX10 V22.04 *System LS Connected Yes/No. = No Load Defaults Yes/No. = No Store Values Yes/No. = No TX Cntrl. Version Rev.= 22.04 RX Ctrl. Version Name = Unknown Serial Number S/N. = _ _ _ _ _ Debug Values Yes/No. = No LS Des OK Signal 1 LS LOSS of Signal 1=0 2=0 Temp in Celsius Tb= 32C Tf=37C ALARMS TEMP 0 Video FPGA Device ID 0x4100 Video FPGA Version 0x4.1.02 Main FPGA Device ID 0x2400 Main FPGA Version x0.0.05		▽ △ Displays current revision. (Scroll Up or Down to access top level *Menus.) ◀ ▶ Scroll Right or Left within the *System menu
	NO	Low Speed Data Channel Connection
	YES	Customer can choose to load video parameters from factory default settings
	YES	Will save current edited video parameters
	NO	Current control code revision
	NO	Connected receiver's control code revision
	NO	This unit's serial number
	NO	Reserved for manufacturing test use
	NO	Low Speed Deserializer Signal: 1=OK, 0=NO
	NO	Loss Of Low Speed Signal: 0=OK, 1=NO
	NO	Temperature of PC Board (Tb) and FPGA (Tf)
	NO	0=No Temperature Alarm, 1=Temperature Alarm
	NO	Identifies the installed Video FPGA device
	NO	Main FPGA Device's currently installed revision
	NO	Identifies the installed Main FPGA Device
	NO	Identifies the currently installed Main FPGA version

VQM-10AV+ TX Front Panel LCD Display

Modifiable

Description

*Remote SFP's SFP_R 1. R_TxP= N/A SFP_R 1. R_RxP= N/A SFP_R 2. R_TxP= N/A SFP_R 2. R_RxP= N/A SFP_R 3. R_TxP= N/A SFP_R 3. R_RxP= N/A SFP_R 4. R_TxP= N/A SFP_R 4. R_RxP= N/A SFP_R 5. R_TxP= N/A SFP_R 5. R_RxP= N/A SFP_R 6. R_TxP= N/A SFP_R 6. R_RxP= N/A SFP_R 7. R_TxP= N/A SFP_R 7. R_RxP= N/A SFP_R 8. R_TxP= N/A SFP_R 8. R_RxP= N/A SFP_R 9. R_TxP= N/A SFP_R 9. R_RxP= N/A	NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO NO	Scroll Right or Left within the *Remote SFP's menu to scroll through SFPs 1-9. Toggle Up & Down (between Tx & Rx) within each individual Remote SFP.
---	---	--

VQM-10AV+ TX Front Panel LCD Display

Modifiable

Description

*Local SFP's	NO	◀ ▶ Scroll Right or Left within the *Local SFP's menu. (If the unit has more than one SFP, additional menus for each (SFP_L2, _L3...) will be available.)
SFP_L 1. VNDR= FINISAR CO	NO	The SFP vendor's name
SFP_L 1. RxPwr= 0.0022 mW	NO	Receiver's power consumption in milliwatts
SFP_L 1. TxPwr= 0.4779 mW	NO	Transmitter's power consumption in milliwatts
SFP_L 1. WvLn= 850	NO	Optical wavelength in nanometers
SFP_L 1. Rev= A	NO	Vendor's current revision
SFP_L 1. P/N= FTLF8528P3B	NO	Vendor's Part Number for this SFP
*DDC	NO	◀ ▶ Scroll Right or Left within the *DDC menu.
DDC PROM Emula. Mode = Dynamic	YES	DDC PROM emulation mode
Load Default DDC Yes/No = No	YES	Select YES to load Default DDC
Load 1080p DDC Yes/No = No	YES	Select YES to load 1080p DDC
Acquire DDC Yes/No = No	YES	Select YES to Acquire DDC
Force DDC Mode = Digital	YES	Select YES to Force DDC mode

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VQM-10AV+ TX Front Panel LCD Display

Modifiable

Description

*Video	NO	  Scroll Right or Left within the *Video parameters menu
VGA Connected Yes/No = No	NO	Select YES to connect VGA
Resolution Input = N/A	NO	Resolution of video input
Hor. Freq Hz= N/A	NO	Horizontal frequency in Hertz
Auto Phase Yes/No = No	YES	Reconfigures current Analog to Digital conversion parameters
PLL Total 0	YES	Phase Lock Loop
HSOut Width 0	YES	Width of the Horizontal Sync Output
DE Start 0	YES	Clock at which Data Enable signal begins
DE Width 0	YES	Width of Data Enable signal
Line Start 0	YES	Clock at which horizontal video signal begins
Line Width 0	YES	Width of horizontal video signal
Hsync Period 0	NO	Horizontal Sync Period
Vsync Period 0	NO	Vertical Sync Period
ISL Sync Status 0	NO	Digital to Analog conversion
ISL Sync Activity 0	NO	Digital to Analog conversion
Video 1 cnt. 0x0	NO	Reads incoming video CLK frequency
		} Custom resolution information

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Receiver LCD Menus:

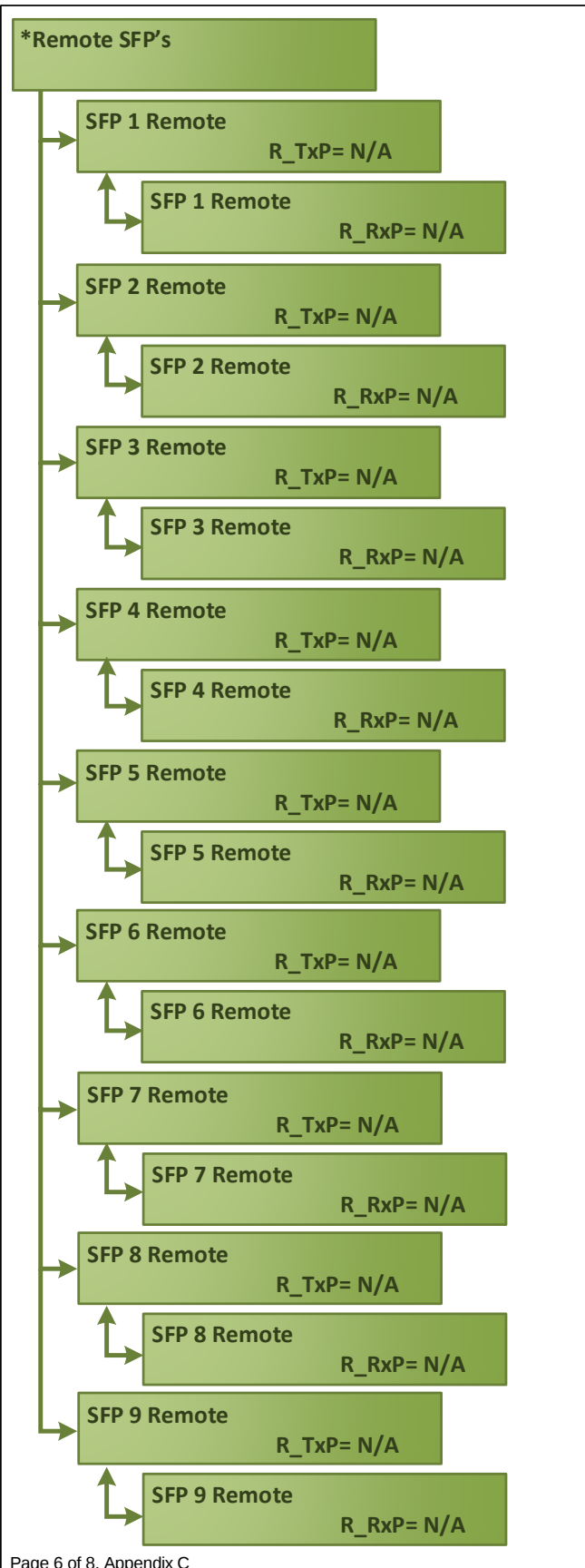
VQM-10AV+ RX Front Panel LCD Display	Modifiable	Description
		Displays current rev. (Scroll Up or Down to access top level *Menus.) Scroll Right or Left within the *System menu
*System		
LS Connected Yes/No. = No	NO	Low Speed Data Channel connection status
TX Cntrl. Version Revision = Unknown	NO	Currently installed revision of connected Transmitter
Rx Cntrl. Version Revision = 21.04	NO	Currently installed revision of Receiver
Serial Number S/N. = _____	NO	This unit's serial number
Debug Values Yes/No. = No	NO	Reserved for manufacturing test use
SFP Des OK Signal 0	NO	Low Speed Deserializer Signal: 1=OK, 0=NO
SFP Loss Of Signal 1	NO	Loss Of Low Speed Signal: 0=OK, 1=NO
Temp in Celsius Tb= 32C Tf=37C	NO	Temperature of PC Board (Tb) and FPGA (Tf)
ALARMS TEMP 0	NO	0=No Temperature Alarm, 1=Temperature Alarm
Video FPGA Device ID 0x4101	NO	Identifies the installed Video FPGA device
Video FPGA Version 0x4.1.01	NO	Main FPGA device's currently installed version
Main FPGA Device ID 0x4101	NO	Identifies the installed Main FPGA Device
Main FPGA Version 0x1.1.01	NO	Identifies the currently installed Main FPGA Version

Page 5 of 8, Appendix C

VQM-10AV+ RX Front Panel LCD Display

Modifiable

Description

 *Remote SFP's SFP 1 Remote R_TxP= N/A SFP 1 Remote R_RxP= N/A SFP 2 Remote R_TxP= N/A SFP 2 Remote R_RxP= N/A SFP 3 Remote R_TxP= N/A SFP 3 Remote R_RxP= N/A SFP 4 Remote R_TxP= N/A SFP 4 Remote R_RxP= N/A SFP 5 Remote R_TxP= N/A SFP 5 Remote R_RxP= N/A SFP 6 Remote R_TxP= N/A SFP 6 Remote R_RxP= N/A SFP 7 Remote R_TxP= N/A SFP 7 Remote R_RxP= N/A SFP 8 Remote R_TxP= N/A SFP 8 Remote R_RxP= N/A SFP 9 Remote R_TxP= N/A SFP 9 Remote R_RxP= N/A	NO NO	⏪ ⏩ Scroll Right or Left within the *Remote SFP's menu to scroll through SFPs 1-9. ⬆ ⬇ Toggle Up & Down (between Tx & Rx) within each individual Remote SFP.
---	---------------------	--

VQM-10AV+ RX Front Panel LCD Display

Modifiable

Description

*Local SFP's	NO	◀ ▶ Scroll Right or Left within the *Local SFP's menu. (If the unit has more than one SFP, additional menus for each (SFP 2, SFP 3...) will be available.)
SFP 1 Local VNR= FINISAR CO	NO	The SFP vendor's name
SFP 1 Local RxPwr= 0.0022 mW	NO	Receiver's power consumption in milliwatts
SFP 1 Local TxPwr= 0.4779 mW	NO	Transmitter's power consumption in milliwatts
SFP 1 Local WvLn= 850	NO	Optical wavelength in nanometers
SFP 1 Local Rev= A	NO	Vendor's current revision
SFP 1 Local P/N= FTLF8528P3B	NO	Vendor's Part Number for this SFP
*DDC	NO	◀ ▶ Scroll Right or Left within the *DDC menu.
DDC PROM Emula. Mode = Dynamic	YES	DDC PROM emulation mode
Load Default DDC Yes/No = No	YES	Select YES to load Default DDC
Load 1080p DDC Yes/No = No	YES	Select YES to load 1080p DDC
Acquire DDC Yes/No = No	YES	Select YES to Acquire DDC
Force DDC Mode = Digital	YES	Select YES to Force DDC mode

Page 7 of 8, Appendix C

VQM-10AV+ RX Front Panel LCD Display

Modifiable

Description

*Video Resolution Input = N/A Horizontal Frequency Hz= N/A Auto Phase Yes/No = No PLL Total 0 HSOut Width 0 DE Start 0 DE Width 0 Line Start 0 Line Width 0 Hsysnc Period 0 Vsysnc Period 0 ISL Sync Status 0 ISL Sync Activity 0 Video RX 1 Count 0x80008		
	NO	◀ ▶ Scroll Right or Left within the *Video parameters menu
	NO	Resolution of video input
	NO	Horizontal frequency in Hertz
	YES	Reconfigures current Analog to Digital conversion parameters
	YES	Phase Lock Loop
	YES	Width of the Horizontal Sync Output
	YES	Clock at which Data Enable signal begins
	YES	Width of Data Enable signal
	YES	Clock at which horizontal video signal begins
	YES	Width of horizontal video signal
	NO	Horizontal Sync Period
	NO	Vertical Sync Period
	NO	Analog to Digital conversion Analog to Digital conversion Reads incoming video CLK frequency Custom resolution information

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Appendix D:

Thinklogical VQM-3 Scaler Menu Options

D.1. Q-2300 & Q-4300 Chassis LCD Menus

Scaler Chassis Front Panel LCD Display	Modifiable	Description
Thinklogical LLC Q4300 Chassis V23.1b	NO	At turn-on, displays chassis type and current revision. (Scroll Up or Down to access top level *Menus.)
*Card4 (near Pwr Cord) VQME5CRX	NO	Scaler Mod. can be in either of 2 ports in the Q-2300 or any one of 4 ports in the Q-4300.
*Card4 SCALER_RX U/D = Menus, L/R = Exit	NO	Scroll Up or Down to get to the *System Settings menu.
#System Settings	NO	Scroll Left or Right to get to the Flash Overlay Enable menu.
Flash Overlay Enable Yes/No. = Yes	YES	Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Flash Overlay Enable Yes/No = No	YES	Scroll Up or Down to select Yes or No. The right-most character will remain underscored.
Flash Overlay Enable Yes/No = No	YES	Press <i>enter</i> . No underscore means Yes or No has been selected.
#System Info	NO	Scroll Up or Down to get to the *System Info menu, then scroll Left or Right within the menu.
Card Type Type= 0x6b	NO	Information For programming.
Software Rev Rev.= b5.02	NO	Current software revision.
FPGA Rev Rev.= 0001.00.0C	NO	Current FPGA revision.
Serial Number S/N = 02-150135	NO	Scaler's programmed serial number. (MM-YY1234)
Video Input Stable Status = Stable	NO	Video input signal stability indicator.
Preferred Resolution Res = 1920x1200	NO	Preferred resolution of the attached monitor.

Page 1 of 3, Appendix D

Scaler Chassis Front Panel LCD Display

Modifiable

Description

#Set Output Select	NO	⏮ ⏭	Scroll Up or Down to get to the *Set Output Select menu.
Force Output Resolution Res = Preferred	NO	⏮ ⏭	Scroll Left or Right within the menu.
Force Output Resolution Res = Preferred	YES	enter	Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Force Output Resolution Res = 1920 x 1200	YES	⏮ ⏭	Scroll Up or Down to get to the desired resolution.* The right-most character will remain underscored.
Force Output Resolution Res = 1920 x 1200	YES	enter	Press <i>enter</i> . No underscore means the resolution has been selected.
Force Output Mode Mode = Preferred	NO	⏮ ⏭	Scroll Left or Right to get to Force Output Mode.
Force Output Mode Res = Preferred	YES	enter	Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Force Output Mode Res = HDMI	YES	⏮ ⏭	Scroll Up or Down to get to the desired mode.** The right-most character will remain underscored.
Force Output Mode Res = HDMI	YES	enter	Press <i>enter</i> . No underscore means the mode has been selected.
Maintain Aspect Ratio Yes/No = Yes	NO	⏮ ⏭	Scroll Left or Right to get to Maintain Aspect Ratio.
Maintain Aspect Ratio Yes/No = Yes	YES	enter	Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Maintain Aspect Ratio Yes/No = No	YES	⏮ ⏭	Scroll Up or Down to select Yes or No. The right-most character will remain underscored.
Maintain Aspect Ratio Yes/No = No	YES	enter	Press <i>enter</i> . No underscore means Yes or No has been selected.

***Supported forced resolutions include:**
1280x720, 1920x1080p, 1920x1080i, 1920x1200, Preferred

****Supported modes include:**
DVI, HDMI, Preferred

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Scaler Chassis Front Panel LCD Display

Modifiable

Description

Show Video Overlay Yes/No. = No	NO	 	Scroll Left or Right to get to Show Video Overlay.
Show Video Overlay Yes/No = Yes	YES		Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Show Video Overlay Yes/No = No	YES	 	Scroll Up or Down to select Yes or No. The right-most character will remain underscored.
Show Video Overlay Yes/No = No	YES		Press <i>enter</i> . No underscore means Yes or No has been selected.
Wall Mon. Count Max. Monitors = 1	NO	 	Scroll Left or Right to get to Wall Monitor Count.
Wall Mon. Count Max. Monitors = 1	YES		Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Wall Mon. Count Max. Monitors = 4	YES	 	Scroll Up or Down to select 1 through 4. The right-most character will remain underscored.
Wall Mon. Count Max. Monitors = 4	YES		Press <i>enter</i> . No underscore means the number has been selected.
Wall Mon. Select This Monitor = 1	NO	 	Scroll Left or Right to get to Wall Monitor Select.
Wall Mon. Select This Monitor = 1	YES		Press <i>enter</i> . The right-most character will be underscored, indicating it is selected.
Wall Mon. Select This Monitor = 3	YES	 	Scroll Up or Down to select 1 through 4. The right-most character will remain underscored.
Wall Mon. Select This Monitor = 3	YES		Press <i>enter</i> . No underscore means the number has been selected. (In this example, Wall Monitor 3 is selected.)

1	2
3	4

D.2. Q-1300 Chassis Menu Options

When a Q-Series Scaler Module is used in a Q-1300 Chassis, no LCD is available for programming. Parameters can be set or modified using the **USB Mini-B CTRL port** on the connector panel of the module. A terminal emulation program, such as *Hyper Term* or *Tera Term*, set to the following baud rate, is required:

Factory-set baud rate in Scaler Mod.

Baud Rate: 115200

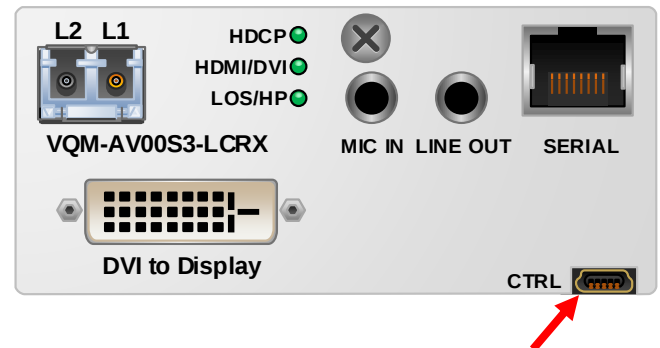
Data Bits: 8

Parity: None

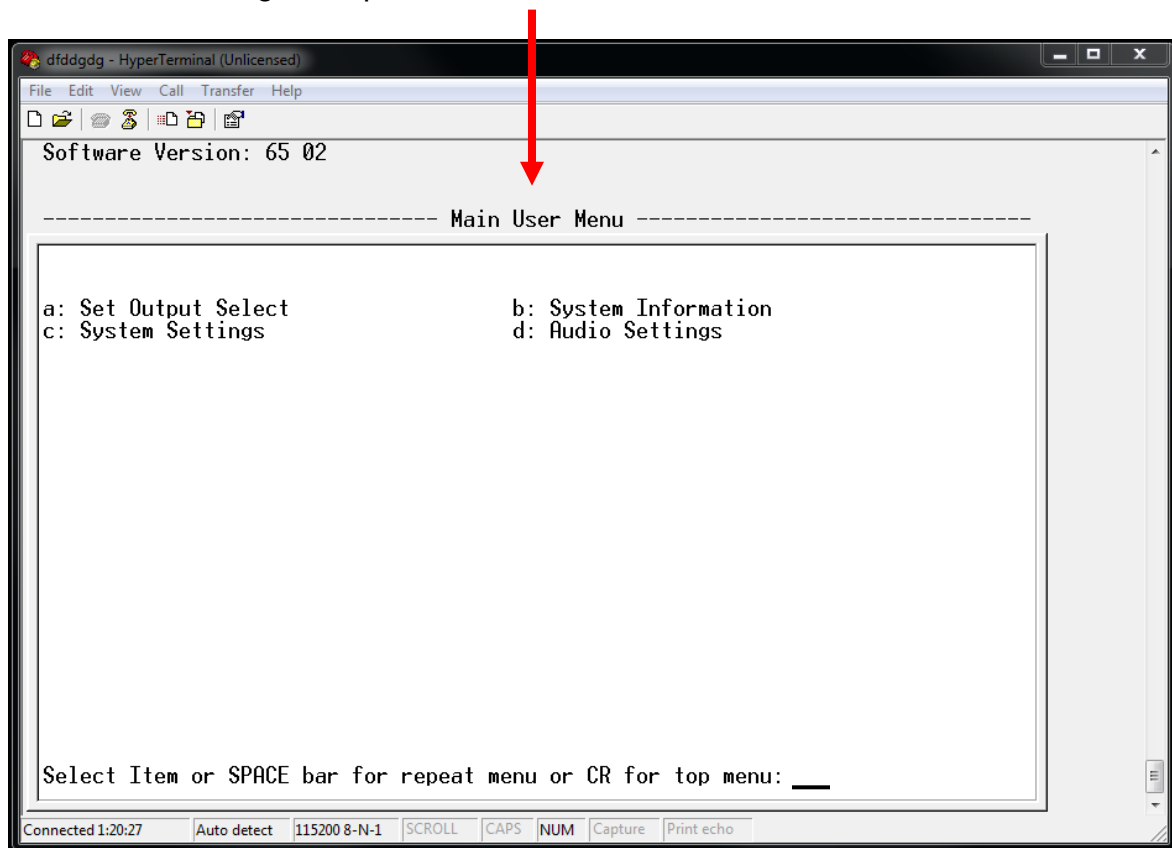
Stop Bits: 1

Flow Control: None

Set user's terminal program (*Hyper Term*, *Tera Term* or other such terminal emulation program) to this baud rate.

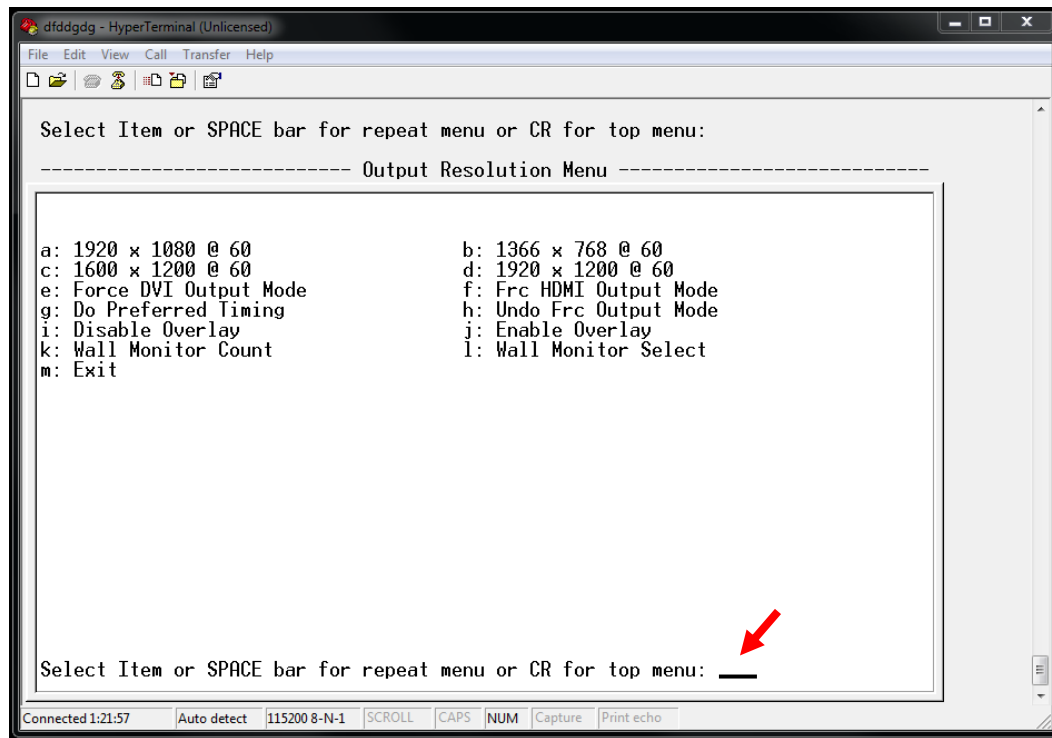


From the terminal emulation program's Main User Menu, users can select the same options that are available on the Q-2300 and Q-4300 LCDs. By entering a letter from the corresponding choices, users can modify the available settings. Pressing *CR* or *enter* will return to the main menu. The name of each menu is listed along the top of the window, as shown below.

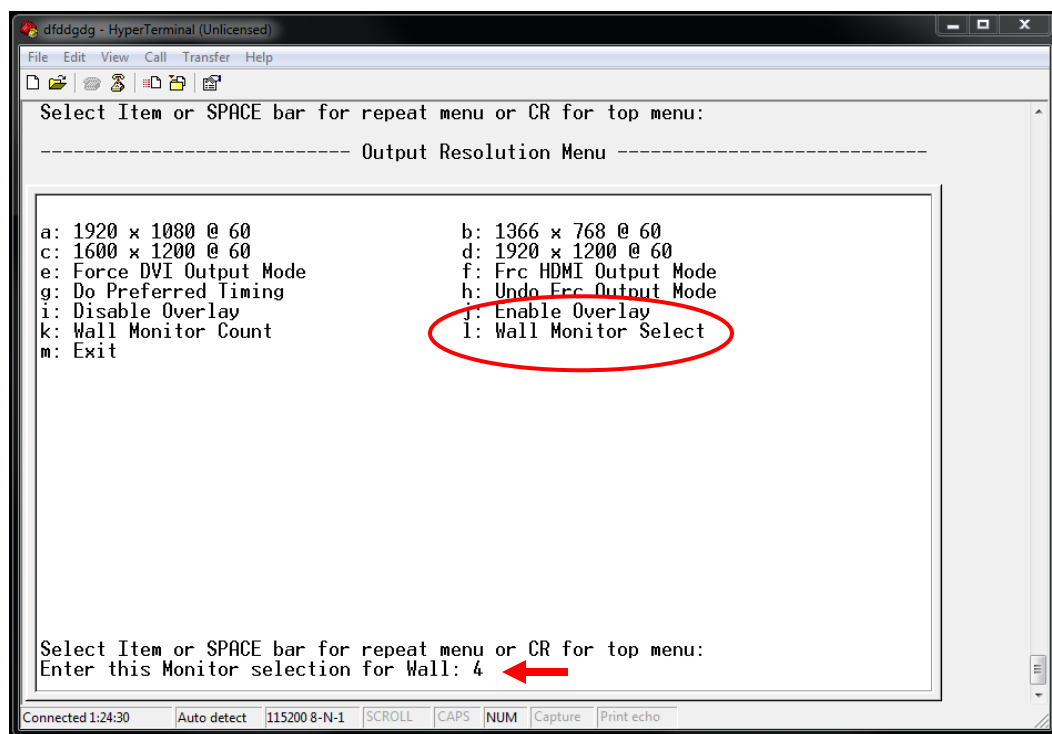


The Main User Menu

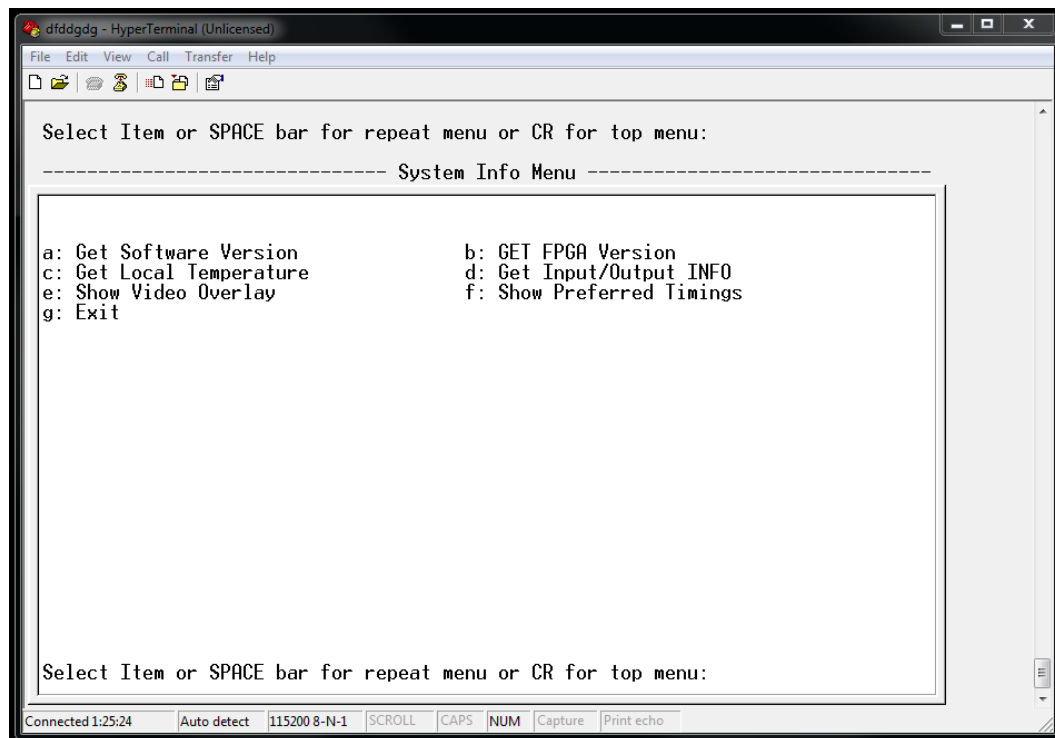
By entering 'a' at the flashing cursor at the bottom of the Main User Menu screen, the user has accessed the 'Set Output Select' menu.



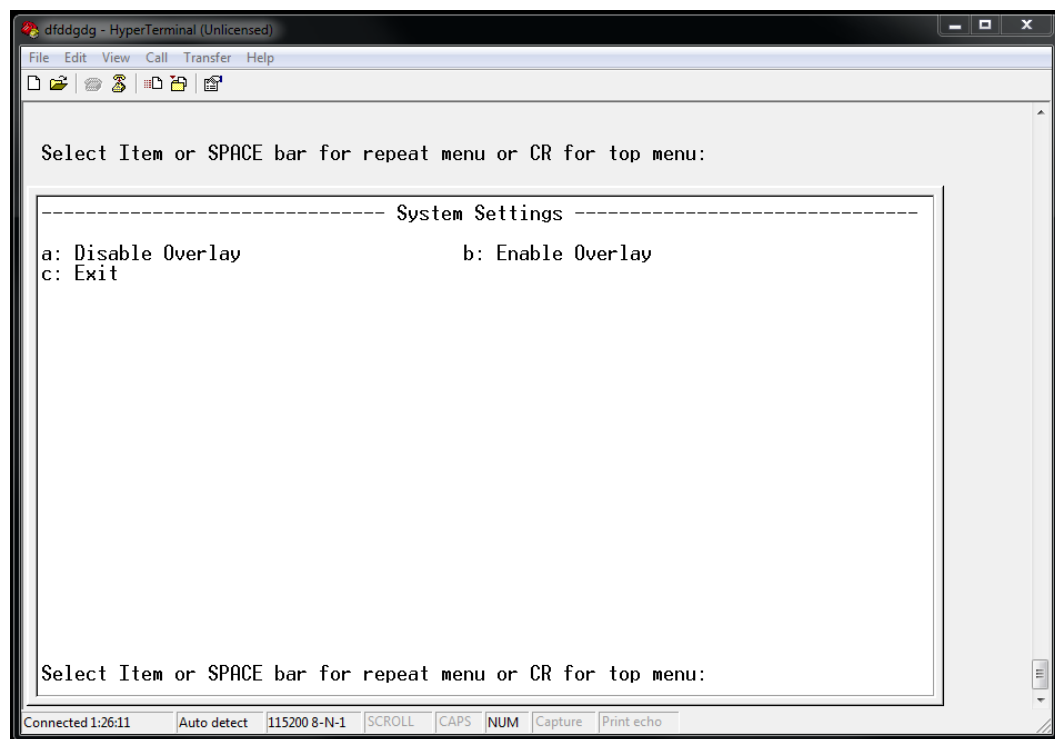
By selecting 'l' for example, from the 'Set Output Select' menu, the user can specify the number of wall monitors the Scaler will read. In this case, the number entered is 4.



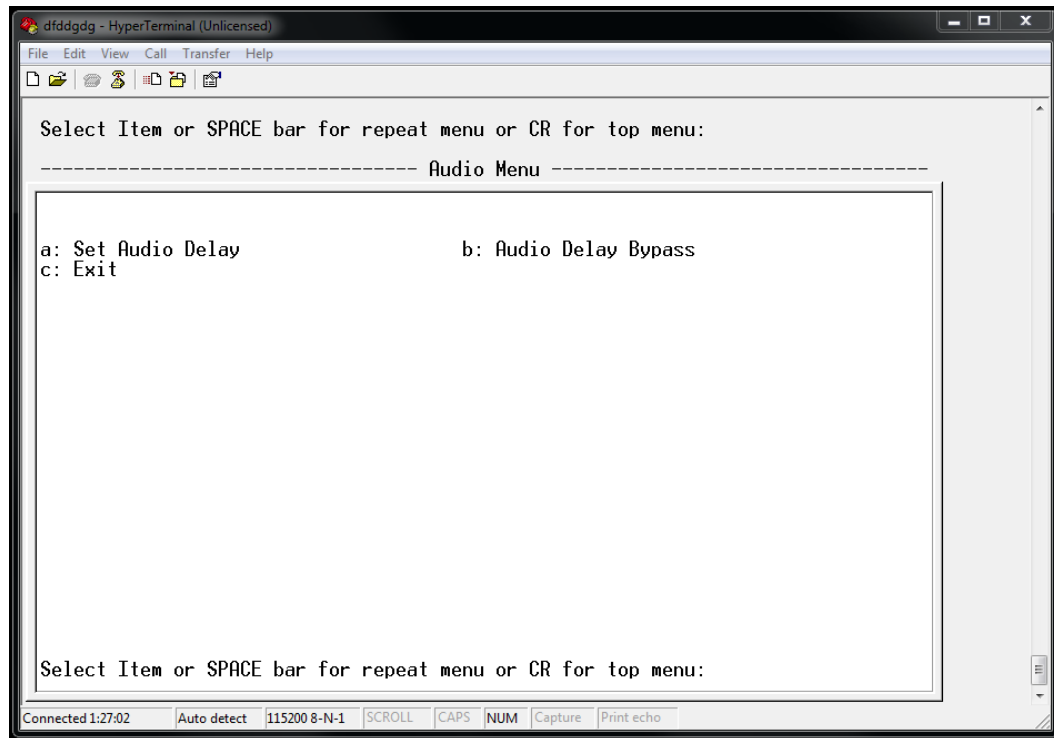
By selecting 'b' from the Main User Menu the 'System Information' menu can be accessed.



By selecting 'c' from the Main User Menu the 'System Settings' menu can be accessed.

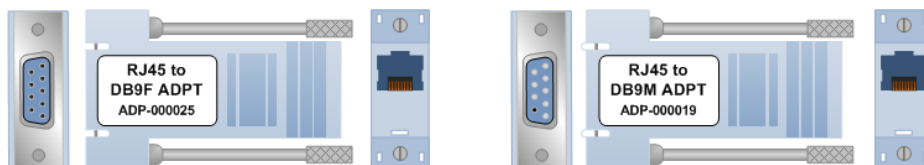
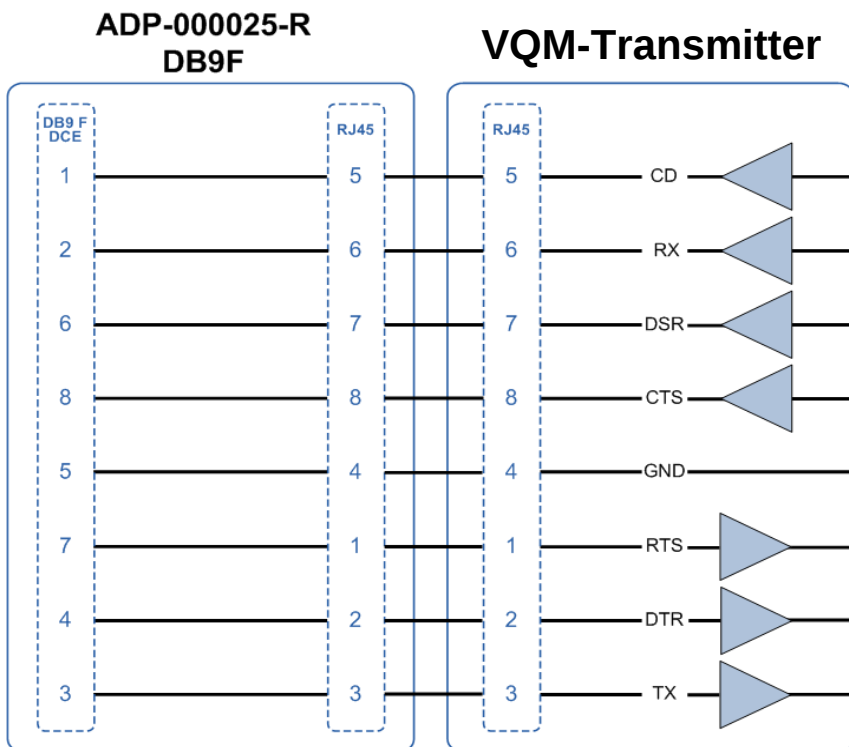
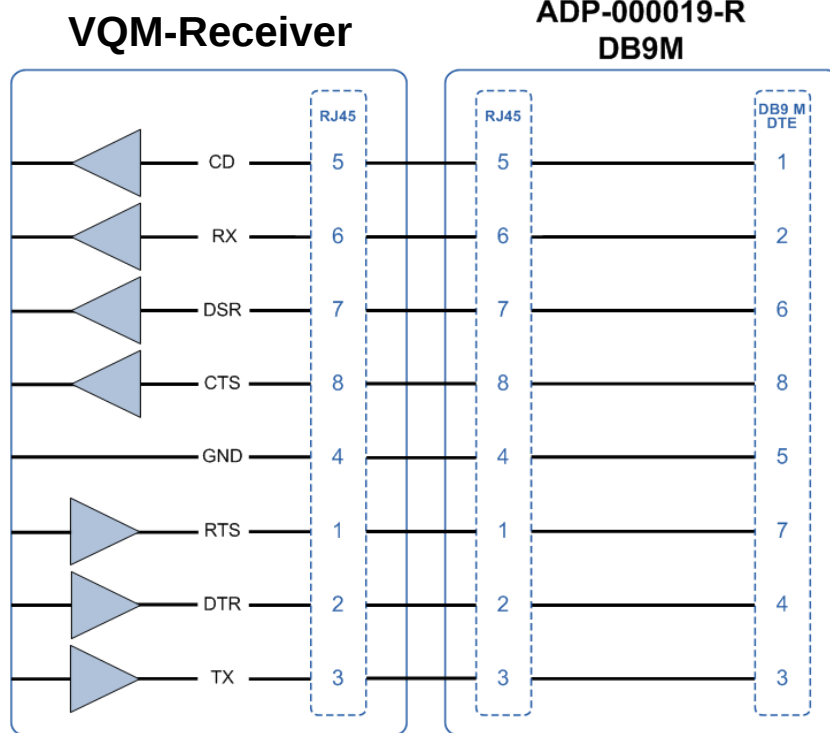


By selecting 'd' from the Main User Menu the 'Audio Settings' menu can be accessed.



Pressing *CR* or *enter* will return to the main menu.

Appendix E: RJ45 to DB9 Adapter Pin-outs



Appendix F: EDID and DDC for Standard and HDCP Modules

Extended Display Identification Data (EDID) is a data structure provided by a digital display to describe its identity (*manufacturer's name, product type, serial number, etc.*) and capabilities (*native timing, frequency range, video and audio formats, etc.*) to a video source.

EDID is what enables a modern personal computer to know what kind of monitor is connected.

With this information the CPU and video card can determine what resolutions the monitor is capable of. EDID is defined by a standard published by the Video Electronics Standards Association (VESA). The EDID also includes such information as the phosphor or filter type, timings supported by the display, display size, luminance data and pixel mapping data for digital displays.

Display Data Channel (DDC) is a VESA standard transport medium between a CPU's graphics adapter and monitor used to pass EDID, and **can be either unidirectional or bidirectional**.

A bidirectional bus supports content protection (HDCP) and display calibration software. (*High-bandwidth Digital Content Protection* is a specification used to encrypt and protect digital video and audio signals transmitted between two HDCP-enabled devices.)

H Models (HDCP Compliant) EDID Table					
Feature	Remote Dynamic	Remote Static	Pass-Thru	Local Static	Load Default
Supports HDCP	Yes	Yes	No	Yes	Yes
Supports Monitor calibration	No	No	No	No	No
Monitor on Rx side required to boot video	No	No	No	No	No
EDID table loaded from Rx	Yes	Yes	No	No	No
EDID table loaded from Tx	No	No	No	Yes	No
EDID table stored in non-volatile memory	Yes	Yes	No	Yes	Yes

Standard Models EDID Table					
Feature	Remote Dynamic	Remote Static	Pass-Thru	Local Static	Load Default
Supports HDCP	No	No	Yes	No	No
Supports Monitor calibration	No	No	Yes	No	No
Monitor on Rx side required to boot video	No	No	Yes	No	No
EDID table loaded from Rx	Yes	Yes	No	No	No
EDID table loaded from Tx	No	No	No	Yes	No
EDID table stored in non-volatile memory	Yes	Yes	No	Yes	Yes

When placed in DDC Pass-thru mode, Thinklogical fiber optic extenders act as a wire between the HDCP video source and sink device. Whether they tolerate this extension is dependent upon the sink and source's implementation of the HDCP negotiation protocol. Thinklogical has extended HDCP compliant devices up to 200m in the past, but cannot guarantee the same performance in every installation.



NOTE: Most DVI-D graphics adapters will not boot if a valid EDID table is not received at power up.

Default DDC Modes (HDCP Compliant Models):

Remote Dynamic Mode

The unit acts as a direct connection between the RX and TX. In this mode DDC data is read at the RX and sent to the TX. Once verified at the TX the information is written into a PROM on the TX and provided to the CPU video card. The RX will not send DDC data to the TX unless a different display is connected to the RX.

Advantage: Allows CPU video card to boot when there is no fiber connection to the RX.

Limitations: No communication link from the CPU to the display. Remote Dynamic prevents the use of HDCP or monitor configuration /color tuning.

Remote Static Mode

Remote Static Mode is a subset of Dynamic Mode in that once a transfer from the RX to the TX is completed successfully, no other transfer will be made unless specifically requested. The DDC data stored in the TX PROM will not change regardless of display changes.

Advantage: Allows the user to acquire and use an EDID table regardless of changes in connection at the RX.

Limitations: No communication link from the CPU to the display. Remote Static prevents the use of HDCP or monitor configuration/color tuning. This may result in no video if a display with lower resolution capability is subsequently connected.

Pass-Thru Mode

Does not work with HDCP compliant modules.

Local Static Mode

Local Static mode operates in the same manner as Remote Static mode, except that the EDID table is read from a monitor plugged into the local port of the TX. The TX will read the DDC from the locally connected monitor until it reads a valid EDID table. The table will then be stored on the TX and presented to the CPU.

Advantages: The TX does not need to be connected to the video card or RX. The EDID table can be loaded before the TX is installed.

Limitations: No communication link from the CPU to the display. This prevents the use of HDCP or monitor configuration/color tuning and may result in loss of remote video if a display with lower resolution capability is connected to the RX.

Default EDID Table

Two EDID Tables are present. One supports resolutions of 1920x1200 and the other supports 1920x1080.

Advantage: Sends a valid EDID table to the CPU to boot the graphics adapter .

Limitations: Default EDID table may not support required resolutions.

Default DDC Modes (Standard Models):

Remote Dynamic Mode

The unit acts as a direct connection between the RX and TX. In this mode DDC data is read at the RX and sent to the TX. Once verified at the TX the information is written into a PROM on the TX and provided to the CPU video card. The RX will not send DDC data to the TX unless a different display is connected to the RX.

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Limitations: No communication link from the CPU to the display. Remote Static prevents the use of HDCP or monitor configuration/color tuning. This may result in no video if a display with lower resolution capability is subsequently connected.

Pass-Thru Mode

The units act as a direct connection between the TX and RX. This mode allows the CPU to communicate directly with the monitor.

Advantage: Allows monitor color tuning and HDCP.

Limitations: If a monitor is not connected to the RX, most video cards will not boot. Does not work with HDCP compliant modules.

Local Static Mode

Local Static mode operates in the same manner as Remote Static mode, except that the EDID table is read from a monitor plugged into the local port of the TX. The TX will read the DDC from the locally connected monitor until it reads a valid EDID table. The table will then be stored on the TX and presented to the CPU.

Advantages: The TX does not need to be connected to the video card or RX. The EDID table can be loaded before the TX is installed.

Limitations: No communication link from the CPU to the display. This prevents the use of HDCP or monitor configuration/color tuning and may result in loss of remote video if a display with lower resolution capability is connected to the RX.

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