

thinklogical[®] Q-Series

High Reliability, Rack-Space Saving,
Dual-Link SDI & SDI 3G Extension Solutions

SDI 3G/Dual Link Exchange Module

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



PRODUCT MANUAL

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thinklogical[®]



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Subject: Q-Series SDI 3G-Dual Link Exchange Module Product Manual
Revision: C, November 2016



**SDI 3G/Dual Link
Exchange Module**



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Twitter: @thinklogical

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PREFACE

About Thinklogical



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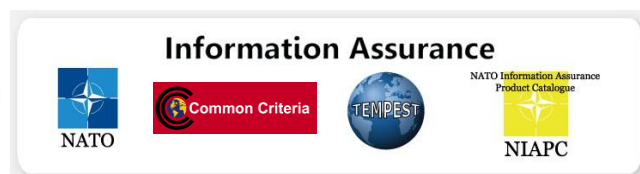
Thinklogical, LLC®
100 Washington St.
Milford, CT 06460

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.

Follow Thinklogical on LinkedIn at <http://www.linkedin.com/company/thinklogical> and on Facebook at <http://www.facebook.com/ThinklogicalUSA>



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.



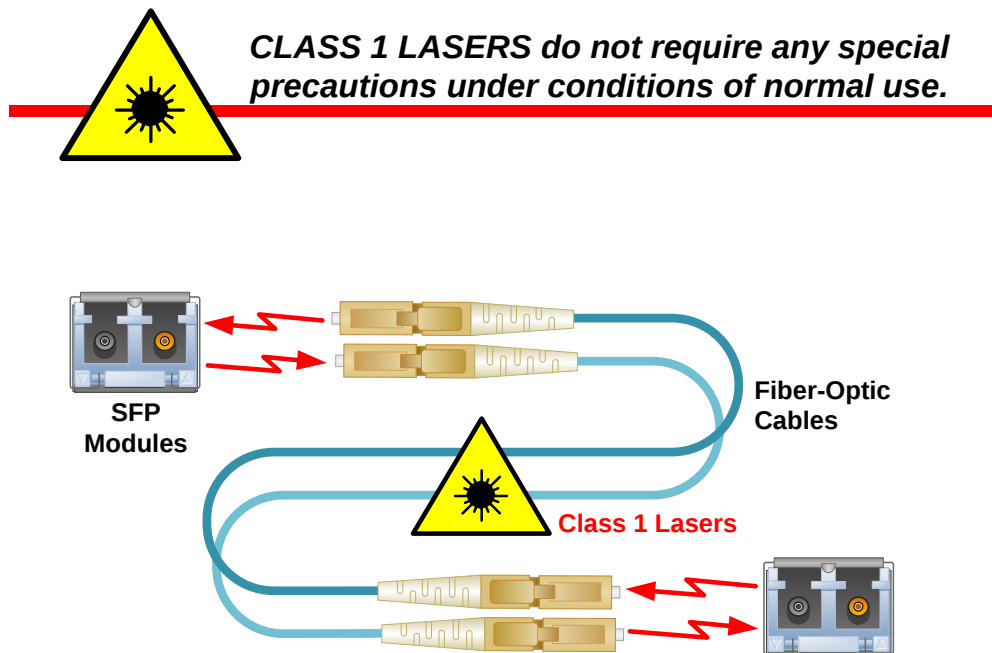
Warning! All Warnings appear in red text, followed by blue text, and preceded by a red stop sign, as shown here.

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!

Class 1 Laser Information

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).

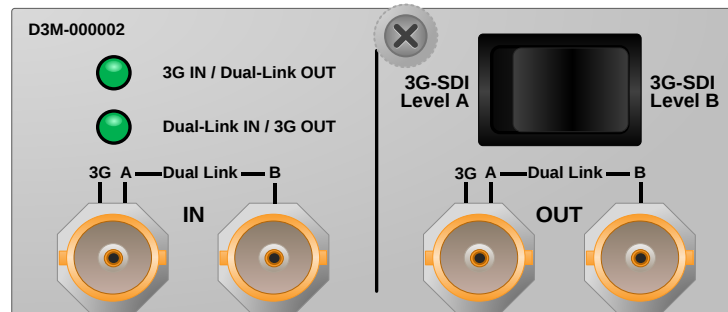


1. Introduction

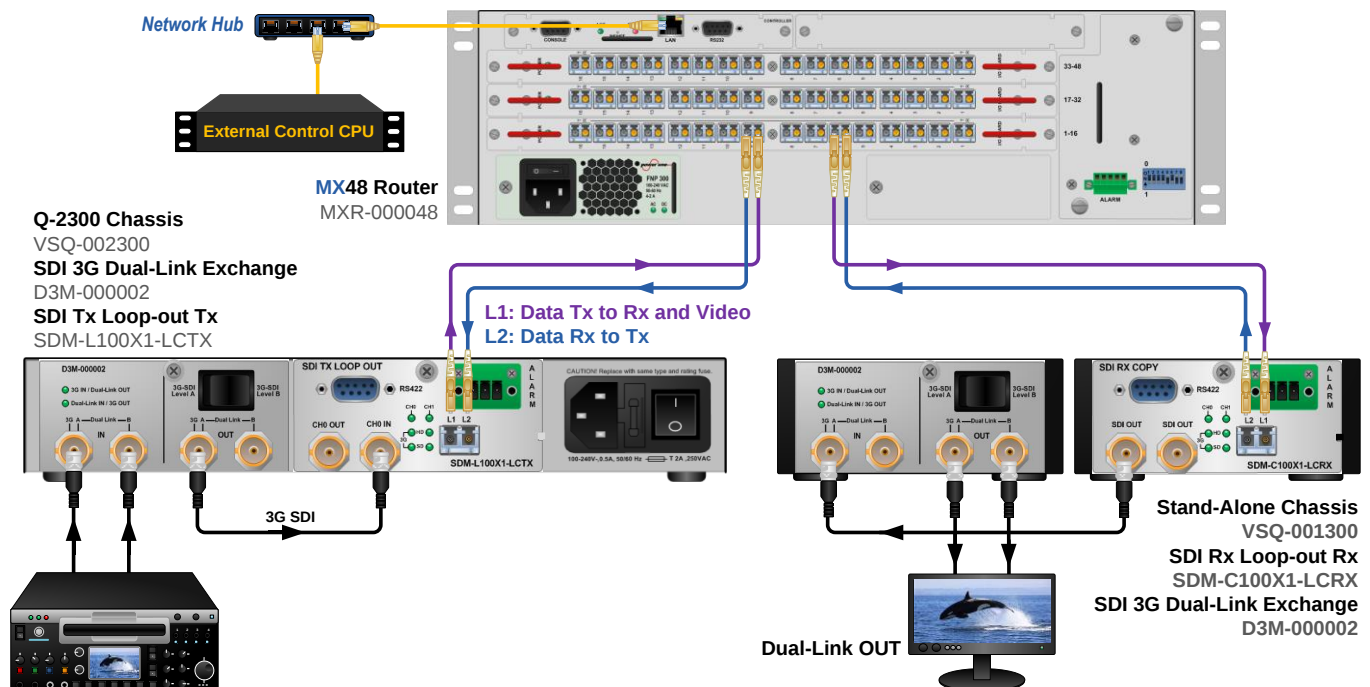
Product Overview

Conveniently convert a dual link SDI signal to a 3G SDI signal over a single-link, or convert one 3G SDI signal to a dual-link signal in a single unit.

The Thinklogical SDI 3G/Dual Link Exchange is a compact broadcast quality, SDI converter. The system allows the user to seamlessly convert a 3G SDI signal to a pair of Dual Link SDI signals, or vice versa, with or without embedded audio and data. All other outputs, HD-SDI and SD-SDI are bypassed to the outputs without conversion. Not only does the SDI 3G/Dual Link Exchange convert video signals in real-time, it also provides the highest quality images for professional audio-visual and broadcast end users.



The SDI 3G/Dual Link Exchange provides industry leading performance and reliable media conversion for a wide variety of applications. Therefore, it is an ideal solution for Pro A/V, broadcast and corporate studio applications, including video production and editing, sports television production, field production, cross-town fiber links, cross-campus production, pre-fibered venues, courtesy feeds and many more. This compact unit is fully compliant with SMPTE 292, 372M, 424M and 425M levels A & B. Each module can be configured as a stand-alone unit or with up to four modules in a convenient, rack-mount chassis and is compatible with all Thinklogical SDI Xtreme 3G Extension Products.



Typical application using the SDI 3G/Dual Link Exchange with an SDI Loop-out Module and an MX48 Router

System Features

The following features are available in one, convenient, modular unit:

- Converts Dual Link SDI to 3G SDI
- Converts 3G SDI to Dual Link SDI
- Input and output formats supported: progressive, interlaced, PsF
- Supports Closed Captioning and Time Code
- Automatic video input detection
- 3G Outputs are Level A, Level B Selectable
- Supports eight channels of embedded audio
- SMPTE standards supported: 292, 372M, 424M, 425M levels A & B
- Compatible with all Thinklogical SDI Xtreme 3G Extenders
- Available in stand-alone or rack-mount chassis configurations

2. Technical Specifications

Supported Frame Rate Formats

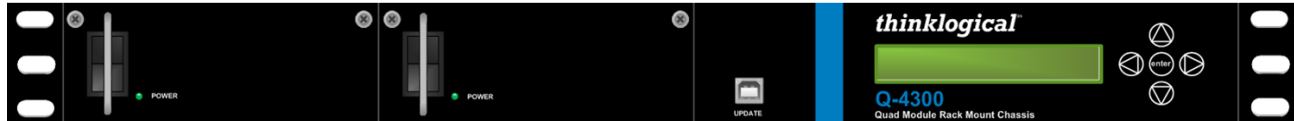
The SDI 3G/Dual Link Exchange supports *Progressive*, *Interlaced* and *PsF* formats.

FUNCTION	SUPPORTED VIDEO STANDARDS	FORMATS
HD-SDI	SMPTE 292M	All standard HD-SDI compatible formats
Dual-Link HD-SDI	SMPTE 372M	All 1080 line video formats compatible with SMPTE 372M
3G-SDI	SMPTE 424M, 425M, Level A & B	All SMPTE 425M level A & B compatible formats

General Technical Specifications

Power Consumption	10 watts per module
Supply Voltage	100-240 VAC, 47-63 Hz, Universal AC Power Supplies
Module Dimensions	Height: 1.592" (40.43 mm) Depth: 6.366" (161.70 mm) Width: 3.693" (93.80 mm) (Tolerance: ± .039"; 1 mm)
Fiber Optic Distances	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
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.
Ordering Information	SDI 3G/Dual Link Exchange, part number D3M-000002

3. The Q-Series Chassis Line



Q-4300 Chassis: (VQS-004300) Supports up to four DVI, RGB/DVI or SDI Q-Series modules. Dual interface and current sharing power supplies. Desktop or 19" rack-mount.



Q-2300 Chassis: (VQS-002300) Supports up to two DVI, RGB/DVI or SDI Q-Series modules. Desktop or 19" rack-mount.



Q-1300 Chassis: (VQS-001300) Supports one DVI, RGB/DVI or SDI Q-Series module. Desktop only.

The Q-4300 Chassis includes the following features:

Desktop/Rack-mount unit can accommodate up to 4 modules in any combination of transmitter or receiver. Features include:

- Hot swappable power supplies to minimize down time
- Current sharing power supplies
- Hot swappable modules
- Front LCD panel status monitoring and control
- Fully compatible with all of Thinklogical's VXRouter line of products.
- Simple plug and play

The Q-2300 Chassis includes the following features:

Desktop unit can accommodate up to 2 modules in any combination of transmitter or receiver. Features include:

- Hot swappable modules
- Front LCD panel status monitoring and control
- Fully compatible with all of Thinklogical's VXRouter line of products.
- Simple plug and play
- 19" Rack-mounts available

The Q-1300 Chassis includes the following features:

Desktop unit can accommodate any one Q-Series transmitter or receiver module. Features include:

- Hot swappable module
- Fully compatible with all of Thinklogical's VXRouter line of products.
- Simple plug and play

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 SDI Dual Link Exchange Modules

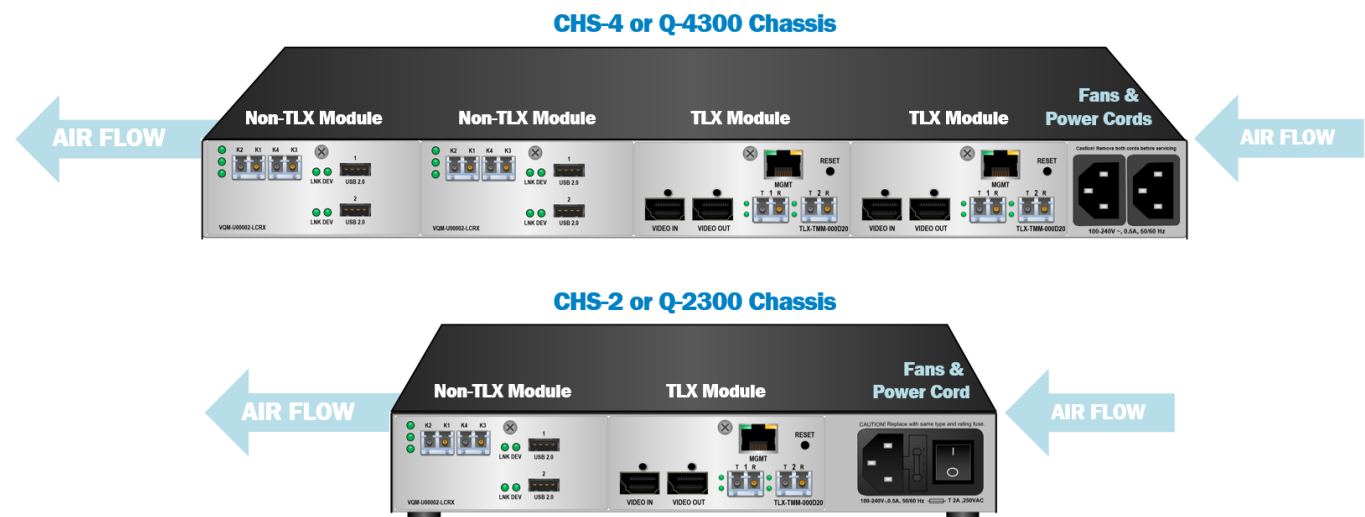
To avoid over-heating of TLX modules when mixed with non-TLX modules such as SDI Dual Link Exchange, the simple solution is to always install all non-TLX modules on the left side of the chassis (as looking from the back where the modules are loaded) and install all TLX modules on the right side, next 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) .

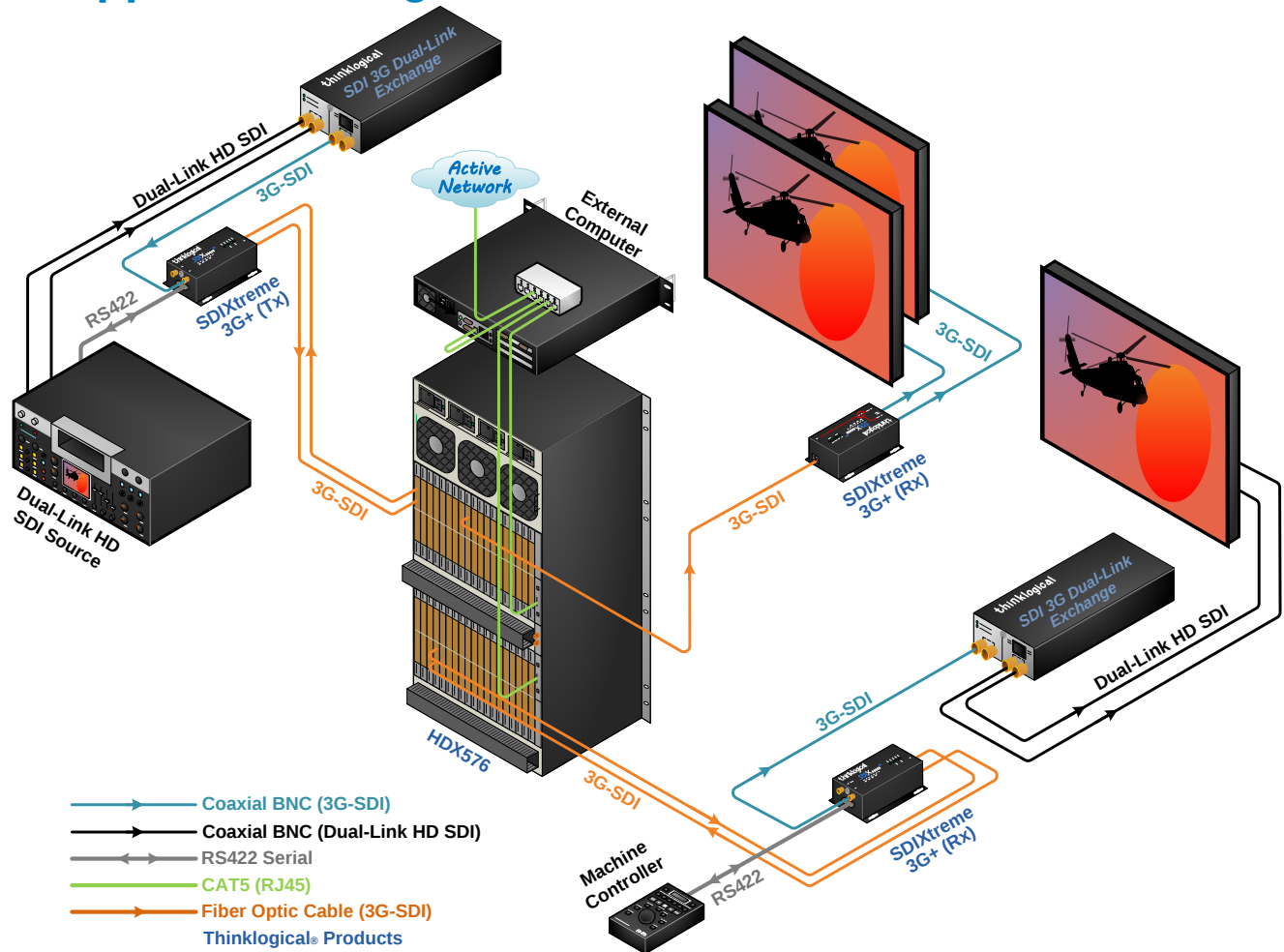


Note: Non-TLX modules, such as Thinklogical's Q-Series, were not designed to allow air-flow through their enclosures as in TLX modules.



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

4. Application Diagram (Also see the *Quick Start Guide* on page 16)



Typical SDI 3G/Dual Link Exchange application using an SDIXtreme 3G Extender and an HDX576 Router

5. FPGA Downloads

Updates are available through Thinklogical.

For technical assistance, please call us at 1-203-647-8700.

6. Regulatory & Safety Compliance

Symbols found on the product

Markings and labels on these products 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. Each product has been tested by a certified testing laboratory and found to be compliant with the following standards (for both domestic USA and 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 corrective 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 EN 60950-1, 1st Edition (2001)

Electromagnetic Emissions

EN55022: 1994 (IEC/CSPIR22: 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

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 four digits for a unique unit number. For example, **05-160127** indicates the unit was built in the **5th** month of 20**16**, 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.

7. How to Contact Us

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 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, please 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 try to respond to your email inquiries promptly, use the following email addresses for your different needs:

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.

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.

If you need to 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 products to Thinklogical® without **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- FPGA Upgrade Procedure

The following procedure documents the steps necessary to perform a Slot FPGA Field Upgrade for the Q-4300 Extender Chassis. Perform the following steps in the order described below.

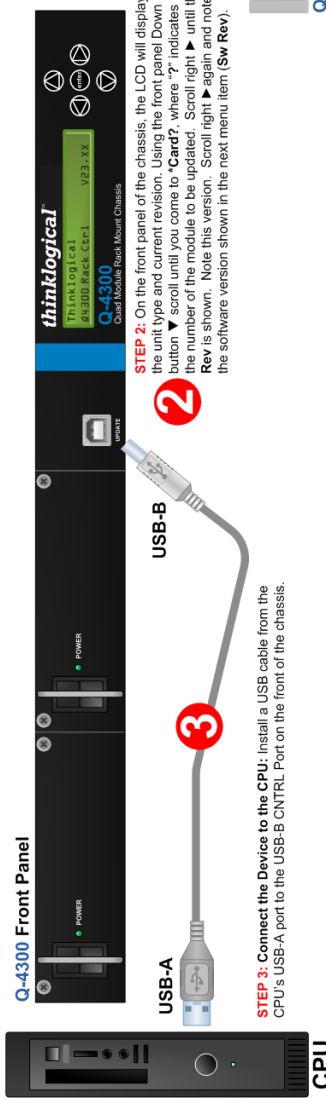
Q-4300 Extender FPGA Upgrade Procedure

FPGA Update Preparation:

- Retrieve the *Firmware files/revision numbers* and the *FPGA_Download application/instructions* and place them in an accessible directory in your CPU.
- Copy the file *FPGA_firmware.zip* to a local directory and extract the contents to a temporary directory.
- Copy the file *FPGA_upgrade.zip* to a local directory.
- Open the *FPGA_upgrade.zip* file and extract the contents to a temporary directory.

Firmware files and revision numbers are stored in the following:
<http://ftp.thinklogical.com/ftp/visualization/instructions/>
 Then select *FPGA Upgrade.zip*
 The *FPGA_Download.exe* application & instructions are stored in:
<http://ftp.thinklogical.com/ftp/visualization/updates/>

After completing steps A-D, perform steps 1-20 below to program the Q-4300.



Q-4300 Front Panel

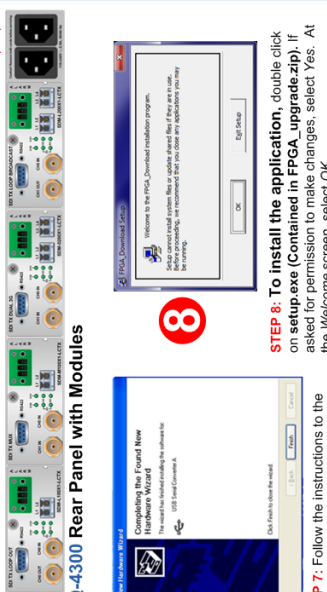
USB-A

USB-B

POWER

Q-4300

Q-4300 Rear Panel with Modules



Q-4300 Rear Panel with Modules

STEP 1: To program a Q-4300 Extender, ensure that the POWER ON/OFF switches, located on the front of the chassis, are in the OFF (0) position. Connect the supplied AC Power Cords to the two receptacles located on the rear of the chassis and plug them into standard AC sources. Turn the POWER switches ON (!).

STEP 2: On the front panel of the chassis, the LCD will display the unit type and current revision. Using the front panel Down button ▼ scroll until you come to "Card?". where "7" indicates the number of the module to be updated. Scroll right ► until the Rev is shown. Note this version. Scroll right ► again and note the software version shown in the next menu item (Sw Rev).

STEP 3: Connect the Device to the CPU: install a USB cable from the CPU's USB-A port to the USB-B CNTRL Port on the front of the chassis.

STEP 4: If running Windows XP, the Found New Hardware Wizard may open if the Thinklogical product is being connected to the PC for the first time. If the Wizard does not open, proceed to Step 8

STEP 5: If not connected to the Internet, select No and navigate to where the FPGA Update application is installed. The driver is in the Install Directory. Proceed to step 6. If using an Internet connection, select: Yes, this time only. Click on Next.

STEP 6: Select Install the software automatically (Recommended). Click on Next

STEP 7: Follow the instructions to the Completing the Found New Hardware Wizard Box. Click on Finish.

STEP 8: To install the application, double click on setup.exe (Contained in FPGA_upgrade.zip). If asked for permission to make changes, select Yes. At the Welcome screen, select OK.

STEP 9: Begin installation by clicking the displayed button.

STEP 10: Choose program group: Select Continue when the default selections are displayed.

STEP 11: The files will now attempt to download. If a Version Conflict is displayed, select No to all.

STEP 12: The FPGA download installation will now occur. When completed, press OK.

STEP 13: Connect the Device to the CPU: A. Using the front panel Down button ▼ go to "System". B. Scroll right ► until Allow FPGA Update is displayed. C. Use the down arrow ▼ to select Yes and press enter.

STEP 14: To Run the Application click on the CPU's START button, then select FPGA Download. Select Identify Product.

STEP 15: Once the product name is displayed, similar to above, select Open File.

STEP 16: Select the slot that describes the unit being updated and press OK.

STEP 17: Press Open. Select the file to be loaded. (The file name will be displayed in the small box near the bottom of the window, but may need to be specified under certain circumstances.)

STEP 18: The upgrade window will display the loading progress.

STEP 19: When completed, reboot the unit. On the front panel LCD, scroll down until you come to "Card?" where "7" indicates the number of the module to be verified. Scroll right ► until the Rev is shown. Note this version is now displayed. NOTE: It is good practice to verify that all the ports have been properly updated.

STEP 20: Repeat Steps 15-19 for all units to be updated.

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

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

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Appendix B: SDI Dual Link Exchange Quick Start Guide

