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A BELDEN BRAND

TLX 10G MATRIX SWITCH

FAQ

Frequently Asked Questions about Thinklogical's full line of TLX Matrix Switches, including:

TLX12
TLX24
TLX48
TLX80
TLX160
TLX320
TLX640
TLX1280

Thinklogical, A BELDEN BRAND • 100 Washington Street • Milford, Connecticut 06460 U.S.A.

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Telephone: 1-203-647-8700

Subject: TLX 10G Matrix Switch Frequently Asked Questions Manual
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MADE IN USA

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Thinklogical, A BELDEN BRAND
100 Washington St.
Milford, CT 06460

Thinklogical, A BELDEN BRAND, is the leading manufacturer and provider of fiber-optic and CATx video, KVM, 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. Thinklogical products are designed and manufactured in the USA and are certified to the ISO 9001:2015 standard.

CERTIFIED ISO 9001:2015 COMPANY | Information Assurance | JITC | Common Criteria | TEMPEST | NATO Information Assurance Product Catalogue | NIAPC

Thinklogical is headquartered in Milford, Connecticut and is owned by Belden, Inc., St. Louis, MO (http://www.belden.com). For more information about Thinklogical products and services, please visit www.thinklogical.com.

About this Product Manual

This document contains a list a Frequently Asked Questions and answers concerning Thinklogical's line of TLX Matrix Switches, including the TLX1280, TLX640, TLX320, TLX160, TLX80, TLX48, TLX24 and TLX12.

Users must be logged into the TLX Switch's **Linux command line interface** (as root) in order to run the commands listed in this document. When making changes to the network configuration, we suggest using the **serial console port** as your access point.

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

Font Conventions Used in this Document

The following fonts and colors are used throughout this document to help differentiate between file names, commands, outputs and document names (lower & upper case letter **o** and **zero**, shown right):

`Filenames`	`Font: Courier New - 35-35-22`	`oO0`
`Linux Command Entered by the User`	`Font: Consolas - 196-89-17`	`oO0`
`Output from a Command`	`Font: Consolas – 0-128-128`	`oO0`
Document_Name	Font: Georgia – 83-129-53	oOo

Additional Documents Avalable for Download

The following manuals are available to download from the Thinklogical website:

- Manual_Configuring_the_TLX_ASCII_Interface
- Manual_TLX_Matrix_Switch_SNMP_Traps
- Manual_How_To_Change_A_TLX_Matrix_Switch's_IP_Address
- Manual_TLX_Matrix_Switch_Interfaces
- Manual_TLX_Matrix_Switch_ASCII_API_V5
- Manual_TLX12
- Manual_TLX24
- Manual_TLX48
- Manual_TLX80
- Manual_TLX160
- Manual_TLX320
- Manual_TLX640
- Manual_TLX1280

TLX Switch SNMP MIB definition files are available to download from the Thinklogical website:

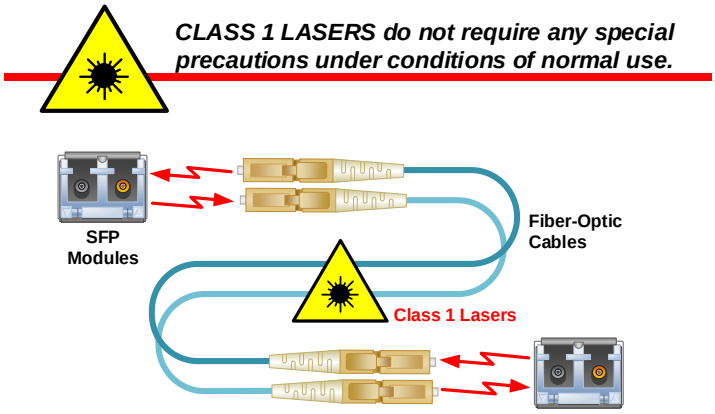
- `LSI-ROOT.mib`
- `LSI-ROUTER-API-INTERFACE.mib`
- `LSI-SFP.mib`
- `LSI-TLXSwitch.mib`

This manual includes changes from the **V5.07.03 TLX Switch** software release.

Regulatory & Safety Requirements

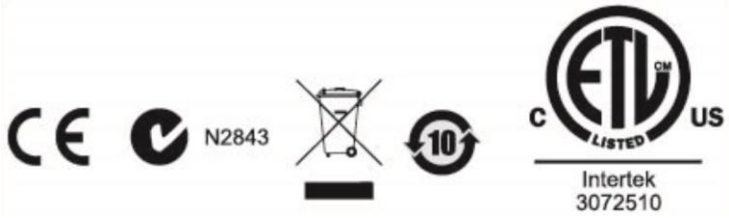
Class 1 Laser Information

TLX Matrix Switches, like all Thinklogical® fiber-optic 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).



Symbols Found on Our Products

Markings and labels on our products follow industry-standard conventions. Regulatory markings found on our products comply with all required 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 compliant with the following standards for both domestic USA and many international locations:

North America

Safety
UL 62368-1:2014Ed.2
CSA C22.2#62368-1:2014Ed.2

LASER Safety
CDRH 21 CFR 1040.10
Class 1 LASER Product
Canadian Radiation Emitting Devices Act, REDR C1370
IEC 60825:2001 Parts 1 and 2
Class 1 LASER Product

Electromagnetic Interference
FCC 47CFR Part 15 Subpart B: 2013 Class A
Industry Canada ICES-003: 2016 Ed. 6

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 action.

European Union

Declaration of Conformity

Manufacturer's Name & Address: **Thinklogical,** A **BELDEN** BRAND
100 Washington Street
Milford, Connecticut 06460 USA

Thinklogical's products comply with the requirements of the Low Voltage Directive 2006/95/EC, the EMC Directive 2004/108/EC, the RoHS Directive 2011/65/EU, the WEEE Directive 2012/19/EU and carry the CE marking accordingly.

Standards with Which Our Products Comply

Safety

IEC 62368-1:2014Ed.2+C1
CB Scheme Certificate

Electromagnetic Emissions

CENELEC EN 55022:2010 +AC:2011

Electromagnetic Immunity

EN 55024:2011+A1
CENELEC EN 55032:2015
EN61000-3-2:2000 Harmonics
EN61000-3-3:2008 Flicker
EN 61000-4-2:2009 Electro-Static Discharge Test
EN 61000-4-3:2006 A1:2008, A2:2010 Radiated Immunity Field Test
EN 61000-4-4:2004 Electrical Fast Transient Test
EN 61000-4-5:2006 Power Supply Surge Test
EN 61000-4-6:2009 Conducted Immunity Test
EN61000-4-11:2004 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 exigencies du Règlement sur le matérial brouilleur du Canada*.
- 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 action.
- This equipment has been tested and found compliant 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 make adequate corrective measures at their own expense.
- This Class A digital apparatus complies with Canadian ICES-003 and has been verified as 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.
- The user may notice degraded audio performance in the presence of electro-magnetic fields.

FREQUENTLY ASKED QUESTIONS

How does the TLX Matrix Switch software differ from the VX Matrix Switch software?

The TLX Matrix Switch uses a Debian distribution of Linux and the VX Matrix Switch uses a limited embedded distribution. The Debian distribution is actively maintained and is updated continuously. Standard Linux features that were not available on the VX (such as PAM) are included in Debian by default.

Other differences include:

- **Busybox** is no longer used.
- The API is no longer started via an entry in `/etc/inittab`. Instead, it is started as a service located in `/etc/init.d/tlxapi`.
- **rsyslog** replaced **syslog**.
- Log files are stored on the SD card so they persist after a reboot.
- `/var/log/daemon` contains the log messages that were previously stored in `/var/log/messages`.

How do I access the Command Line Interface (CLI)?

There are two methods to access the Matrix Switch's CLI:

1. **Via the serial console port.**
   Users do not need to login if using the serial console port. Basic settings for the console port are:
   - 115200 baud rate
   - 8 data bits
   - no parity
   - 1 stop bit
   - no flow control
2. **Over the network using SSH.**
   SSH access requires both user name (root) and password.

How do I start/stop/restart programs such as the API or SNMP?

Run the following commands:

- `service XXX start` to start it.
- `service XXX stop` to stop it.
- `service XXX restart` to stop and then start it.

Replace XXX with the name of the program you wish to control.
The following table shows the names to use:

User Name	Program Name
SNMP	`snmpd`
API	`tlxapi`
SYSLOG	`rsyslog`
OOB	`tlxoobm`

How do I restart syslog?

Run the command `service rsyslog restart`

How do I redirect SNMP traps to a computer?

Beginning with release 5.02 of the TLX Matrix Switch software, the **snmp.trap** line in **/etc/hosts** was set to **192.168.13.9.** Users will only need to edit this line if changing the target IP address.

1. Edit the file **/etc/hosts**: Inside the file, find the line: 192.168.13.9 **snmp.trap**
   Replace 192.168.13.9 with the IP address of the computer that will receive the traps.
2. Restart the SNMP program with the command: `service snmpd restart`

How do I modify the API command line to change the command line options?

1. Edit the file **/etc/default/tlxapi**, changing the `TLXAPI_ARGS` command line options.
2. Run the command: `service tlxapi restart`

How do I enable API debugging?

The API program offers several debugging modes. The most basic mode is enabled with the `--verbose` command line option. The procedure to modify command line options is described in the previous FAQ.

The default setting for API logging is `--verbose -api`.

API debugging is available via the system log file **/var/log/api**.

More API configuration details may be found in Manual_Configuring_the_TLX_ASCII_Interface

How do I get the API to send a Carriage Return (CR) with every message?

By default, the API terminates every line with a Line Feed (LF) character. This works fine with Linux-based systems, but other systems, such as Windows,want a CR-LF pair to end each line of text. The API has a command line option `--CR` that will add a CR to every line of output. Instructions on how to modify the API's command line are in Manual_Configuring_the_TLX_ASCII_Interface. Basically, the `--CR` option is added to the API's startup script and the API is restarted.

Where can I find system log messages?

There are three log files that contain system information: **/var/log/daemon.log**,

/var/log/api and **/var/log/tlxoobm.log**. The first contains the system log entries and entries from the switch control programs, including SNMP. The second file contains log messages from the API program and the last has messages from the OOB Manager

Where are the (configuration) files that were in /etc/sysconfig?

Debian has moved the program configuration files from the directory **/etc/sysconfig** to the directory **/etc/default**.

How do I send log messages to another computer?

Beginning with release 5.02 of the TLX Matrix Switch software, all log messages are sent to **remotelogger1**. This name is defined in **/etc/hosts** as 192.168.13.9. To change the IP address, edit the **/etc/hosts** file. Then run the command: `service rsyslog restart`

The Matrix Switch is not acting the way I think it should. What can I do?

The TLX Switch continuously writes events to its log files. **`/var/log/api`** records API events such as commands received, command responses and network connection status. If you think you have a problem with connections, check this file.

Other status messages are located in **`/var/log/daemon.log`**. Look through this file for warnings or error messages. The system has several other log files that may be of interest: OOB events are logged into **`/var/log/tlxoobm.log`** System errors are logged into **`/var/log/errors.log`**

I looked at the logs, but I still don't have connections. Now what?

You may have enabled restrictive switching or partitions. Look for **`.csv`** files in the directories **`/var/local/router/partitions`** or **`/var/local/router/restrict`**. If either of these modes are active, there will be a log entry in **`/var/log/daemon.log`** at boot up.

What if I still need help?

There is a program on the Matrix Switch called `sysdump`. This program will capture information about the switch and store it in the file **`/var/tmp/sysdump.txt.gz`**. You can run `sysdump`, copy the output file to another system (using, for example, SCP*) and then email it to **support@thinklogical.com**. We'll help you from there.

**SCP is standard on Linux systems and free third-party Windows versions are available. This is the preferred method for transferring files between systems.*

How do I watch for Out Of Band (OOB) traffic?

Run the command `tcpdump -lnnx port 17560`
Bytes 0x1c through 0x2f contain the OOB data.
OOB traffic is logged into **`/var/log/tlxoobm.log`**

To watch the OOB log file in real-time, run the command: `tail -f /var/log/tlxoobm.log`

How do I make a login required on the serial console port?

1. Edit the file **`/etc/inittab`**.

   Change this line from:

   ```
   T0:23:respawn:/sbin/getty -a root -L ttymxc0 115200 vt100
   ```

   To this: (remove `-a root`)

   ```
   T0:23:respawn:/sbin/getty -L ttymxc0 115200 vt100
   ```

2. Run the command `kill -hup 1`

How do I add a static network route?

Static routes are defined in the file **`/etc/network/interfaces`**. However, the default network procedure for the TLX Matrix Switch is to modify the file during startup as it calculates the IP address from the DIP switch. **We only recommend setting up a static route if you are using fixed IP address and not addresses based on the DIP switch settings.**

"**After:**" *in the example below shows the addition of a static (multicast) route.*

- Two lines are added; a `post-up` and a `pre-down` line.
- Users should replace the `224.0.0.0` and `240.0.0.0` values with values for their network.

1. Add the route parameters to the `eth0` section of the file **`/etc/network/interfaces`**

Before:

```
auto eth0
iface eth0 inet static
        address 192.168.13.75
        netmask 255.255.255.0
        network 192.168.13.0
        broadcast 192.168.13.255
```

After:

```
auto eth0
iface eth0 inet static
        address 192.168.13.75
        netmask 255.255.255.0
        network 192.168.13.0
        broadcast 192.168.13.255
        post-up route add -net 224.0.0.0 netmask 240.0.0.0 dev eth0
        pre-down route del -net 224.0.0.0 netmask 240.0.0.0 dev eth0
```

2. Reboot the switch.

How do I create a secure, encrypted connection to the API?

The default connection to the API port is in plain text and unauthenticated. By using SSH port forwarding, and configuring a firewall on the switch, users can replace the default connection with a secure one.

Configure the firewall on the switch to reject all connections to port 17567 from eth0. (*Configuring a firewall is beyond the scope of this document.*)

The latest version of the API (V5.07.02) has added a command line option `--noexternalapi` that forces the API to only listen on the internal address of 127.0.0.1. A firewall is not needed if this option is used.

From the external system, create the ssh tunnel to port 17567.

For example:

`ssh -N -L 23456:localhost:17567 192.168.13.15` will create a tunnel using the port 23456 on the external system to a switch at 192.168.13.15. The `-N` option prevents a command shell from being opened to the Switch.

Then, from the external system, the command `telnet localhost 23456` will connect you to the API port at 192.168.13.15.

While doing this, if the Matrix Switch were to failover to the secondary CPU, your secure link to the API will be broken. You will have to create a new tunnel to the secondary CPU API port.

Is there documentation for Thinklogical's Matrix Switch software?

Documentation for many of the programs developed by Thinklogical for the TLX Matrix Switch are stored on the system as *man pages*. Man pages are text-based documents that provide information about particular topics. Typically, man pages give a brief description of the item, document any command line options a program might have, give examples on how to use the program and references to any related topics that might be of interest.

Man pages are accessed from the command line using the command `man <topic>`, replacing `<topic>` with the name of the item in question. For example `man tlxapi` will display the page for the tlxapi program.

The command `apropos TLX` will create a list of available pages that were created by Thinklogical.

How do I safely remove a Controller Card from the Matrix Switch?

Before removing a controller card from a switch, you should halt the processor. This process will close any open files on the internal SD card and perform a OS shutdown. The command to do this, which must be executed from the Linux command line, is `poweroff`.

Why can't I connect to the SNMP agent on the Matrix Switch?

The SNMP community keywords are 'router-public' and 'router-private', not the default keywords 'public' and 'private'.

Does the Matrix Switch support SNMP v3 protocol?

Yes, beginning with software version V5.04. However, only the bare minimum is setup. There is a v3 user and group defined in the file **`/etc/snmp/snmpd.conf`**. These are **tlxsnmpv3group** and **tlxsnmpv3user**. *It is up to the end user to define the passwords and encryption methods to fully enable v3 support.*

What is the recommended way to turn OFF the TLX Matrix Switch?

Thinklogical recommends that you perform an orderly power off sequence. **Pulling the plug or flipping the on/off switch is not recommended!** The preferred method is to run the program `pwroff` on either the primary or secondary CPU module. This will shut down both CPU modules and on some models, turn off the AC supplies. Early versions of the software do not have the `pwroff` software, so users must run the command `poweroff` on both CPU modules.

Where are SSH Host and User Keys stored?

There are two locations where SSH Host and User keys are stored: **`/etc/ssh`** and **`/root/.ssh`**. When you create new keys for the switch be sure to have the SAME keys in both locations on BOTH SD Cards (Primary CPU and Backup CPU).

What is the format of the Product Serial Number?

Thinklogical products have a unique serial number, which includes a date-code, printed on an adhesive label that is affixed to the unit. The format for the date-code is *2 digits for the month*, dash, *2 digits for the year*, plus *at least four digits for a unique unit number*. For example:
09-180127 indicates the unit was built in the **9**th month of 20**18**, and is unit number **127**.

Do all Thinklogical Matrix Switches use industry-standard connectors?

Connections and installation hardware for all 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.

Thinklogical Support

Customer Support

Thinklogical® is an engineering company and we offer the best customer support available. You can count on our most knowledgeable engineers to assist you with any questions or problems. *We* won't be satisfied until *you* are satisfied.

Thank you for choosing Thinklogical® products for your application.

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

thinklogical® is always here to help you.

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

Website

Check out our website at www.thinklogical.com for current products, support documents and useful information about all the products and services we offer, including technical specification sheets, quick-start guides and product manuals (for viewing online or for download).

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 Merchandise Authorization.

Telephone

Thinklogical Operator	**1-203-647-8700**
Product & Customer Support:	**1-203-647-8798**

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 on holidays. Please leave a voice message 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, if possible, and we will have someone available to assist you.

Warranty

Thinklogical warrants this product against defects in materials and workmanship for a period of one year from the date of delivery, with longer term available at time of purchase on most products. Thinklogical and its suppliers disclaim all other warranties. Please refer to your product invoice for the 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).

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 must return a product to Thinklogical directly, please contact us at **1-800-291-3211** or **1-203-647-8700**. Customer Support will ask you to describe the problem and will issue you a **R**eturn **M**erchandise **A**uthorization **number** (RMA#). Pack the device in its original box, if possible, and return it with the RMA# printed on the outside of the box.

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

Our Addresses

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

Please include the Return Merchandise Authorization number:

Thinklogical, A **BELDEN** BRAND
100 Washington Street
Milford, CT 06460 USA
Attn: *RMA#*

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