10G VIDEO & KVM EXTENSION

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TLX

Uncompressed 4K Fiber & CATx Extension Systems

Thinklogical's TLX systems offer the highest bandwidth solution, providing **10Gbps bandwidth per port** to preserve signal integrity and deliver **uncompressed, high resolution video and KVM with no latency, lost frames or artifacts.**

TLX systems are powered by **Thinklogical's proprietary multiplexing technology**, which enables multiple data signals (video, audio and peripheral) to be transmitted up to 80km, over a single data stream. Thinklogical completely reconstructs the data clocks at the destination, to offer perfect synchronization with each transmitted stream.

Thinklogical's TLX systems offer best-in-class performance with advanced video, audio and peripheral capabilities. Systems are simple plug and play designs, utilizing either **multi-mode fiber, single mode fiber or CATx cables**. For routing applications, TLX systems are compatible with Thinklogical's TLX Matrix Switches. TLX offers a hybrid (fiber and/or CATx) switching solution, scalable from 12 to 640 ports.

TLX extension systems are highly customizable, to ideally suit any application.

TLX systems offer support for:

Video Signals
- DisplayPort 1.2 up to 4096x2160 @ 60Hz
- HDMI 1.4 up to 3840x2160 @ 30Hz

Audio Signals
- Bidirectional unbalanced analog stereo audio
- Embedded audio, with the ability to de-embed on the Receiver

Peripheral Signals
- DDC
- Serial (RS-232)
- 10/100/1000 Network
- USB HID
- USB 2.0 (480Mbps)

Ease of Integration

- TLX offers a higher bandwidth solution to **address new video resolutions and prepare for future, unknown protocols**.

- Enabled through higher bandwidth, the TLX **reduces system cabling by half**.

  Extend:

  - **a single display up to 4096x2160 @ 30Hz with full 4:4:4 color depth, over a single cable**

  - **a single display up to 4096x2160 @ 60Hz with full 4:4:4 color depth, over two cables**

  - **dual displays up to 4096x2160 @ 30Hz with full 4:4:4 color depth, over two cables**

  - **dual displays up to 4096x2160 @ 60Hz with full 4:4:4 color depth, over four cables**

- Dual connector, offering **support for both HDMI and DisplayPort**, reduces the number of extenders and converter cables required and enables users to future-proof system designs.

DisplayPort Connector →
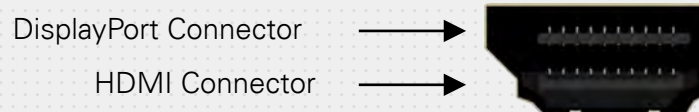
HDMI Connector →

Connector type utilized on every TLX Video and KVM extender module.

- TLX interoperates with Thinklogical's Velocity family of switch and extension solutions, to facilitate an easy upgrade path to Thinklogical's next generation solution.

10G VIDEO & KVM EXTENSION

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TLX extenders are available in several form factors, from rack mount units, to compact chassis for use at the desktop. All chassis types are completely compatible, so users can mix-and-match to reduce the overall footprint of the design.

Fixed Chassis (CATx)

Thinklogical's CATx fixed extenders offer advanced support for numerous video, audio and peripheral extension applications. Each unit is equipped with mounting ears and supports a single receiver or transmitter. As receivers are often co-located with users, Thinklogical utilizes exceptionally quiet fans, which only operate when the temperature of the unit begins to increase, to reduce noise and maximize workflow.

Modular Chassis (Fiber)

Thinklogical offers a variety of modular chassis for TLX fiber systems. Thinklogical's modular systems allow users to create a flexible, custom, space-saving and easily scalable product. Choose from the resilient, rack mount chassis, housing up to four extenders per single rack unit, or from a more compact design, to save space at the desktop or when mounting to a wall. For enhanced resiliency, each extender module is hot-swappable, complete with hot-swappable optical modules. As a system design evolves easily convert a unit from multi-mode to single mode or swap the module to easily reconfigure a system to meet new requirements. Modules include fans to keep the system cool and emit virtually no detectable sound to interfere with the local user.
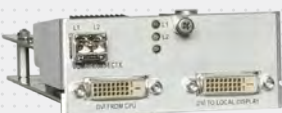
Modular Chassis

Modular Chassis 1
Space Saving at the Desktop & Wall

The compact design of the ¼RU Modular Chassis 1 is ideal for use on or mounted below the desktop, or for wall mounting applications. The modular design is **configurable with a single TLX Video transmitter or receiver module** and offers an internal power supply.

Modular Chasiss 2
Space Saving at the Desktop & Wall

The ½RU Modular Chassis 2 is **configurable with a single TLX KVM or up to two TLX Video transmitter or receiver modules** and offers an internal power supply.

Modular Chassis 4
Space Saving at the Desktop & Rack

The rack mountable Module Chassis 4 is ideal for high density applications, where space may be limited. The 1RU, modular design is **configurable with up to two TLX KVM or up to to four TLX Video transmitter or receiver modules**. Chassis may also be configured with a single TLX KVM and up to two TLX Video transmitter or receiver modules and offers redundant and hot-swappable internal power supplies.

Modular Extenders

enhance system

flexibility, customization, scalability, and space-savings.

Redundant Power Supplies

The Modular Chassis 4 is ideal for 24/7 environments, where minimal downtime is critical. The system is designed with redundant, current-sharing and hot-swappable power supplies. In the unlikely event that one power module fails, the second assumes the full load to power the unit with no delay or data loss. The failed module may be swapped out, without ever powering down the unit or interrupting operations.

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Fixed Chassis

MODULAR CHASSIS 1

T-Series Q-4200 Chassis
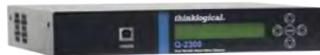
MODULAR CHASSIS 2

MODULAR CHASSIS 4

Hot-Swappable Extender Modules

Specifications

	Fixed	CHS-1	CHS-2	CHS-4
Environmental	Operating Temperature: 0°C-50°C; Humidity: 5-95% RH, non-condensing			
Compliance	Approvals for United States of America, Canada, and European Union			
Warranty	12 months from date of shipment · Extended warranties available for purchase			
Mounting Brackets	Surface Mounting Brackets Included / Call for Rack Mounting Brackets and Chassis	Surface Mounting Brackets Included / Call for Rack Mounting Brackets and Chassis	Surface Mounting Brackets Included / 19" Rack Mounting Hardware, order (2) ENC-001541-R	19" Rack Mounting Brackets Included / Surface Mounting Hardware, order (2) ENC-001598-R
Power Consumption	30 Watts	0 Watts (20 Watts Loaded)	5 Watts (45 Watts Loaded)	10 Watts(90 Watts Loaded)
Supply Voltage	See Extender Specifications	Universal AC Power Supply, 100-240VAC, 47-63Hz (1)		Universal AC Power Supply, 100-240VAC, 47-63Hz (2)
Weight	Weights vary dependent on extender, see extender spec	1.00lb (0.45kg) / 1.50lbs (0.68kg) Loaded	3.00lbs (1.36kg) / 4.00lbs (1.81kg) Loaded	10.00lbs (4.54kg) / 12.00lbs (5.44kg) Loaded
Dimensions				
Rack Size (w/ mounting hardware)	Dimensions vary dependent on the extender, please see extender data sheet.	5.48" (139.17mm)	11.98" (304.24mm)	EIA 19" (483.36mm)
Width (w/o mounting hardware)		4.31" (109.50mm)	10.74" (272.75mm)	17.49" (444.25mm)
Height		1RU · 1.72" (43.69mm)	1RU · 1.72" (43.69mm)	1RU · 1.72" (43.69mm)
Depth		11.44" (290.64mm)	11.11" (282.27mm)	14.62" (371.37mm)
Tolerance	± 0.039" (1.00mm)	± 0.039" (1.00mm)	± 0.039" (1.00mm)	± 0.039" (1.00mm)
Connectors				
Software Updates	See Extender Data Sheet	See Extender Module	USB B (1)	USB B (1)
Cables Included				
	TBD	AC Power Cable (1)	AC Power Cable (1)	AC Power Cable (2)

Ordering Information

For use with TLX Modules.
Modules will not operate without a chassis.

Part Number		CHS-000001	CHS-000002	CHS-000004
Description	Fixed Extenders do not require an additional chassis, see Ordering Information.	Modular Chassis 1 / Configure with a single TLX Video Module	Modular Chassis 2 / Configure with a single TLX KVM Module or up to two TLX Video Modules	Modular Chassis 4 / Configure with up to two TLX KVM Modules or up to four TLX Video Modules / Redundant & hot-swappable power supplies

TLX Extension · Product Features

Product Name	1 up to 4K@30Hz	1 up to 4K@60Hz	2 up to 4K@30Hz	2 up to 4K@60Hz	HDMI 1.4	DisplayPort 1.2	TX Local Out RX Copy Out (Fiber Only)	HDCP Compatible	DDC	Management Port	Serial RS-232	Unbalanced Analog Stereo	USB HID	USB 2.0	10/100/1000 Network	Multi-Mode	Single Mode	CATx
	STANDARD FEATURES — Video Heads				**Video Signals**		**Additional Features**		**Control**			**Peripheral Signals**				**CONFIGURABLE — Transport Connectors — Fiber LC**		
TLX10																		
TLX-10	✓				✓	✓	✓	✓	✓	✓						1	1	
TLX-S10	✓				✓	✓	✓	✓	✓	✓	✓	✓				1	1	1
TLX-N10	✓				✓	✓	✓	✓	✓	✓					✓	1	1	
TLX-H10	✓				✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓			1	1	1
TLX-U10	✓				✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓	✓		1	1	1
TLX20																		
TLX-20		✓			✓	✓	✓	✓	✓	✓						2	2	
TLX-S20		✓			✓	✓	✓	✓	✓	✓	✓	✓				2	2	2
TLX-N20		✓			✓	✓	✓	✓	✓	✓					✓	2	2	
TLX-H20		✓			✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓			2	2	2
TLX-U20		✓			✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓	✓		2	2	2
TLX22																		
TLX-H22			✓		✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓			2	2	
TLX-U22			✓		✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓	✓		2	2	
TLX40																		
TLX-H40				✓	✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓			4	4	
TLX-U40				✓	✓	✓	✓ RX HDMI Only	✓	✓	✓	✓	✓	✓	✓		4	4	

All models available as TX or RX

TLX Extension
Ordering Information

Video Extenders

| T | L | X | – | ☐ | ☐ | ☐ | – | ☐ | 0 | 0 | D | ☐ | ☐ |

Unit

T	Transmitter (TX)
R	Receiver (RX)

Transport Medium

M	Multi-Mode Fiber Optic Cable(s)
S	Single Mode Fiber Optic Cable(s), 10km
C	CATx Cable(s)

Form Factor

M	Modular Extender (Fiber)
F	Fixed Extender (CATx)

Video, Audio & Peripheral Support

O	Video Only (Fiber Only)
S	Video, Analog Audio & Serial RS-232
N	Video, Analog Audio & Network 10/100/1000 (Fiber Only)

Connector

D	Dual Connector HDMI 1.4 & DisplayPort 1.2

Video Display(s) and Resolution

10	Single Display up to 4096x2160 @ 30Hz
20	Single Display up to 4096x2160 @ 60Hz

KVM Extenders

| T | L | X | – | ☐ | ☐ | ☐ | – | ☐ | 0 | 0 | D | ☐ | ☐ |

Unit

T	Transmitter (TX)
R	Receiver (RX)

Transport Medium

M	Multi-Mode Fiber Optic Cable(s)
S	Single Mode Fiber Optic Cable(s), 10km
C	CATx Cable(s)

Form Factor

M	Modular Extender (Fiber)
F	Fixed Extender (CATx)

Video, Audio & Peripheral Support

H	Video, Analog Audio, Serial RS-232 & USB HID
U	Video, Analog Audio, Serial RS-232, USB HID & USB 2.0

Connector

D	Dual Connector HDMI 1.4 & DisplayPort 1.2

Video Display(s) and Resolution

10	Single Display up to 4096x2160 @ 30Hz
20	Single Display up to 4096x2160 @ 60Hz
22	Dual Displays up to 4096x2160 @ 30Hz (Fiber Only)
40	Dual Displays up to 4096x2160 @ 60Hz (Fiber Only)

10G KVM EXTENSION

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TLX10 · Single HDMI or DisplayPort Display up to 4K @ 30Hz with Audio, Serial, USB HID and Optional USB 2.0

Modular Fiber Transmitter with USB 2.0

Modular Fiber Receiver with USB 2.0

The System

TLX video systems have a simple transmit and receive design. The TLX Transmitter connects to the source to receive video, audio and peripheral data. Utilizing **Thinklogical's proprietary multiplexing technology** the data is transmitted over **10Gbps per port for up to 80 kilometers over fiber, or up to 100 meters over CATx cable**. At the TLX Receiver, Thinklogical demultiplexes the data stream to deliver **uncompressed, high resolution video, audio and peripheral data** to the destination.

A TLX10 system requires one cable, one duplex fiber or one CATx cable, for the standard configuration. The forward channel is dedicated to transmitting video, audio and peripheral data from the source to the destination. The return channel is dedicated to transmitting DDC/EDID and peripheral data from the destination to the source. All Thinklogical TLX10 systems are available with multi-mode fiber,

single mode fiber or CATx cable.

The TLX10 extension systems are designed to support **a single DisplayPort 1.2 display up to 4096x2160 at 30Hz or a single HDMI 1.4 display to the maximum specification (3840x2160 at 30Hz)**, including support for HDCP content. An additional video output is provided, per input, for a local display. Extenders also support **full duplex stereo audio, embedded audio (with the ability to de-embed audio at the receiver), Serial RS-232, USB HID** and are custom configurable to support **USB 2.0 (480Mbps).**

Additionally, an Ethernet (10/100 Network) port is provided to easily set-up and manage the extender. The Management port provides status for video parameters, DDC configuration, connection status, optical power levels and SFP parameters. The Management port also enables users to load custom

EDID files and update firmware.

FORM FACTOR
TLX fiber extension systems are available in a modular form factor, with several modular chassis sizes available. The modular extenders are compact and hot-swappable, enabling users to field configure any modular chassis. Additionally, the optical modules within the modular extenders are hot-swappable. Thinklogical's modular systems promote system flexibility, scalability and a reduced maintenance effort.

TLX CATx systems are available in a fixed form factor, as a single unit chassis.

To facilitate an easy installation, all TLX extender chassis are equipped with removable surface or rack mounting brackets, depending on the size of the chassis.
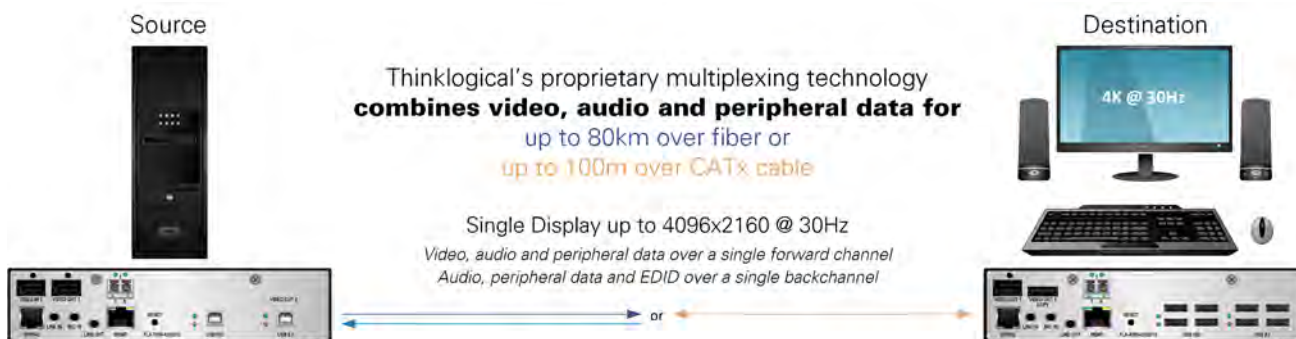
For additional information, please see Fixed and Modular Chassis specifications.

PRODUCT FEATURES

Standard
- Single Head 4K@30Hz
- DisplayPort 1.2
- HDMI 1.4
- TX Local (Fiber Only)
- TX Local RX Copy (Fiber Only)
- HDCP Compatible
- Management Port
- RS-232
- Analog Audio
- USB HID

Configurable
- USB 2.0
- Fiber Connectors (LC)
- CATx Connectors

Thinklogical's proprietary multiplexing technology **combines video, audio and peripheral data for** up to 80km over fiber or up to 100m over CATx cable

Single Display up to 4096x2160 @ 30Hz
Video, audio and peripheral data over a single forward channel
Audio, peripheral data and EDID over a single backchannel

10G KVM EXTENSION

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TLX10 · Single HDMI or DisplayPort Display up to 4K @ 30Hz with Audio, Serial, USB HID and Optional USB 2.0

CATx Transmitter with USB 2.0

CATx Receiver with USB 2.0

Specifications	TLX Fiber Extender Modules (TLX-TMM/RMM)	TLX CATx Extenders (TLX-TCF/RCF)
Video Resolution	DisplayPort up to 4096x2160 @ 30Hz; 4:4:4 color depth; 10-bit color HDMI up to 4096x2160 @ 24Hz or 3840x2160 @ 30Hz; 4:4:4 color depth and 8-bit color or 4:2:2 color depth and 10-bit color	
Cable	Two (2) fiber optic cables, (fiber not supplied, available for purchase)	One (1) CATx cable (CATx not supplied, available for purchase)
Distance	Multi-Mode up to 400m · 33m: OM1 (62.5/125); 82m: OM2 (50/125); 300m: OM3 (50/125 SX+); 400m: OM4 (50/125eSX+) Single Mode up to 80km · All Distances: OS2 (9/125)	100m: CAT6a
Optical Wavelength	Multi-Mode: 850nm; Single Mode: 1310nm (CWDM and DWDM wavelengths available, contact Thinklogical for further information)	
Data Rate	10Gbps	
Environmental	Operating Temperature: 0°C-50°C; Humidity: 5-95% RH, non-condensing	
Compliance	Approvals for United States of America, Canada, and European Union	
Warranty	One year · Extended warranties available for purchase	
Mounting Brackets	Brackets Included, See Modular Chassis Specifications	Surface Mounting Brackets Included
Power Consumption	20 Watts	30 Watts
Supply Voltage	Universal AC Power Supply, 100-240VAC, 47-63Hz	Desktop 5VDC
Weight	1.00lb (0.45kg)	1.50lb (0.68kg)
Dimensions		
Rack Size	See Modular Chassis Specifications	Contact Thinklogical for Rackmount Solution
Height x Width x Depth	1.65" (41.91mm) x 7.41" (188.11mm) x 9.06" (230.15mm)	1.2" (30.50mm) x 8.86" (225.0mm) x 7.2" (182.9mm) with brackets
Tolerance	± 0.039" (1.00mm)	± 0.039" (1.00mm)
Connectors		
Video	TX: HDMI 1.4 (2) & DisplayPort 1.2 (2); RX: HDMI 1.4 (2) & DisplayPort 1.2 (1)	HDMI 1.4 (1) & DisplayPort 1.2 (1)
Audio MIC/LINE	3.5mm Jack (3)	
RS-232 Serial Port	RJ45 (1)	
USB HID	TX: USB B (1); RX: USB A (4)	
USB 2.0 (Configurable)	TX: USB B (1); RX: USB A (4)	
Software Updates	USB B (1) with CHS-2 & CHS-4; Management Port: RJ45 (1)	Mini USB (1); Management Port: RJ45 (1)
Transport Connectors	LC (1)	RJ45 (1)
Cables Included		
Transmitter	Fiber: (1) Power Cable [see Modular Chassis Specifications]; CATx: (1) 5VDC Power Supply (PWR-000084-R) (1) HDMI 1.4 Male to Male with Screw, 2 Meters (CBL000103-002MR); (2) 3.5mm Male to 3.5mm Male Plug, 1.8 Meters (CBL000016-006FR) (2) CAT 5, 2 Meters (CBL000001-002MR); (1) DB9 Female RJ45 Modem (ADP-000025-R); (1) USB A-B, 1.8 Meters (CBL000015-006FR) *USB 2.0 Configuration*: (1) USB A-B, 1.8 Meters (CBL000015-006FR)	
Receiver	Fiber: (1) Power Cable [see Modular Chassis Specifications]; CATx: (1) 5VDC Power Supply (PWR-000084-R) (1) HDMI 1.4 Male to Male with Screw, 2 Meters (CBL000103-002MR) (2) CAT 5, 2 Meters (CBL000001-002MR); (1) DB9 Male RJ45 Modem (ADP-000019-R)	

Contact Thinklogical for additional specifications.