SMP3 - SYSTEM MANAGEMENT PORTFOLIO

thinklogical
A **BELDEN** BRAND

POWERFUL CONTROL AND MANAGEMENT SOLUTION FOR THINKLOGICAL INSTALLATIONS
DEPLOY - MONITOR - MANAGE - OPTIMIZE

Thinklogical's System Management Portfolio 3 (SMP3) is a package of specialized and fully integrated hardware and software modules that provides powerful configuration, remote management, and maintenance capabilities, making it easier for users to set up, operate and update Thinklogical video distribution and KVM extension and switching systems of any size.

The intuitive graphical user interface enables fast set-up and control of each source, destination, matrix switch, user and tag in the system, with no custom programming required. Tabs along the bottom and top of the screen allow users to navigate effortlessly through the features and capabilities of SMP3 with just a click of the mouse.

New in SMP3 is an enhanced, graphical On-Screen Display (OSD), improved Drag and Drop capabilities, resource pooling, and flexible, user-definable Hot Keys. Other SMP features include remote system monitoring and updating for simplified system maintenance, and mouse and keyboard sharing for improved user collaboration.

- Complete system control and management solution
- Simplified installation, operation, and maintenance
- Powerful features that don't require custom programming
- Enhancements based on customer experience and input
- Reduced training and increased user efficiency and productivity
- Runs on SMP2 hardware (Appliance, Module, Client)
- SMP Integrated Client Transmitter option available for higher performance

EXAMPLE DRAG AND DROP

PRODUCT FEATURES

- User friendly; no complex programming required
- Faster implementation and simplified maintenance
- Spreadsheet-based system setup
- Graphical drag and drop on-screen display
- Designed for increased productivity and efficiency
- Improved resource pooling for reduced hardware and software costs
- Increased application security
- Touch panel interface for easy operation
- Supports large installations

SMP3 from Thinklogical improves overall system performance and value by reducing support effort, lowering total cost of ownership, enhancing productivity, and maximizing system uptime.

SMP3 FEATURES

OSD - On Screen Display
Operators now have access to an intuitive Drag and Drop screen that mimics room and desk layouts. The On-Screen Display provides a graphical representation of the user's specific destination, i.e., number of monitors and available sources. The Drag and Drop, Connect and COMBI pages are now all available to be configured.
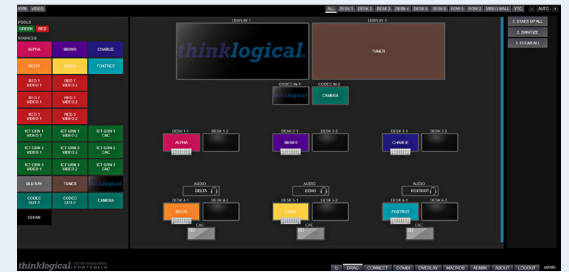
- Graphical interface vs. tabular format
- More intuitive
- Accurate graphical depiction of system deployment
- Greatly reduced training
- More efficient operations
- Asset management capabilities

DRAG - Drag and Drop
The graphical Drag and Drop interface makes it easy for users to visualize their room layouts onscreen and switch between Sources and Destinations by simply moving an icon. As room configurations evolve over time, icons representing Sources and Destinations can be added or removed from the layout as required, making it simple to adapt to changing requirements without moving a single cable or wire. Features include:

- Hierarchical Drag and Drop workflow
- Zoom (+, -, 100%) and Auto Zoom with TAGS / filters
- EZ View: automatically resizes and "snugs" selected view to fit screen
- Levels: change security levels by room or destination with one mouse click

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Pooling

Reduce IT hardware and software costs with resource pooling. Sources such as computers or VTC codecs can be allocated to users on an as-needed basis, with a check in and check out process managed by SMP. This use of a shared pool of resources reduces the need for a dedicated computer, multiplied by every classification or application, for every operator requiring access.

- User can "reserve" a source from pool: no others can access at that time
- Return source to pool after use
- System messages reminder to log out of source prior to return
- Inoperable source ("sick" member) can be flagged and sidelined in pool

Configuration

Intuitive, spreadsheet-based graphical user interface enables faster set-up and simplifies defining users, groups, stations and macros. Includes system management tools for managing redundant switch systems, enabling automatic configuration synchronization. It also provides users with premium tie-line management for bidirectional tie lines, with no restrictions for video path direction over tie lines.

- Spreadsheet-Based Data Entry
- Easy to Set Up and Use
- Easy to Create and Modify Sources and Destinations

Custom Hot Keys & Collaboration

The Hot-Key Manager provides control access from workstations, granting any authorized receiver on the matrix the ability to make a switch. Users define a set of keystrokes to deliver routing control to the desktop, all managed through an easy-to-understand on-screen display. With a simple keystroke or movement of the mouse, multiple users in different locations can easily exchange a single source's keyboard and mouse to more efficiently collaborate and share resources.

API

Enables control of SMP via integration with third party AV control systems.

Remote System Monitoring

System diagnostics, remote monitoring and software updating capabilities for Thinklogical system administration. SMP monitors the connection and system hardware and software, providing various details such as product type, serial number, power supply status, board temperature, optical module status DDC mode, and software version, among other parameters. The included System Update software allows users to remotely update their KVM system hardware over a fiber connection up to 80 kilometers (50 miles) away.

Text Overlay

Provides a customized display capability to identify a source more easily, with configurable text overlay size, color, and positioning.

Intuitive Mouse Control

Seamless, instant, screen selection by just moving the mouse from screen to screen allows for intuitive access to multiple independent computer sources without manual switching or interrupting workflow. A user's mouse can now control all available displays as if they were a single virtual desktop. The mouse seamlessly transitions from one display to the next, providing instant access to and control of the new display's source computer, keyboard, and audio without manual switching. Users with multiple displays on their workstation connected to different computers can now control all with a single keyboard and mouse without interrupting their workflow increasing efficiency and productivity.

- Seamless, instant switching with intuitive control
- Operate multiple displays and computers with single keyboard and mouse
- Increased user efficiency and productivity

Touch Panels: 7" and 10"

Thinklogical Touch Panels support seamless integration with SMP to facilitate control of Thinklogical Matrix Switches. The touch panels function as simple web-based clients that display a customizable graphical interface that is provided by an SMP webserver. The touch panel operates on a closed, isolated network in kiosk mode to limit access to only the SMP webserver.

- Auto size images
- Screen refresh
- On-screen keyboard
- Zoom enhancements
- Asset management

TPL-10

TPL-7

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TOUCH PANELS

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PROJECTED CAPACITIVE, POE+, GBE

Thinklogical's Touch Panels TPL-10 (10") / TPL-7 (7") support seamless integration with Thinklogical's System Management Portfolio (SMP) solution to facilitate control of Thinklogical Matrix Switches.

The Touch Panels function as simple web-based clients that display a customizable graphical interface that is provided by an SMP webserver. The Touch Panel solution operates on a closed, isolated network in kiosk mode to limit access to only the SMP webserver.

The system administrator can configure the SMP so that each Touch Panel's graphical interface has a unique set of sources and destinations, macros, and other system controls.

The Touch Panel is a Linux based computer with a widescreen color PCAP LCD display, with Gigabit Ethernet control, featuring a secured version of a Mozilla Firefox web browser operating exclusively in kiosk mode.

TPL-10

TPL-7

PRODUCT FEATURES

- Secure Private Browser
- Forced Kiosk Mode
- FIPS 140-2 Compliant
- Secure Linux Distribution CentOS
- No Desktop Application or Access to Linux Terminal
- PCAP LCD - 7" or 10"
- PoE+ or 12V Brick Supply
- Gigabit Ethernet Control
- Mozilla Firefox Web Browser
- Fanless for Quiet Operation

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
TPL-000007	7" Power-over-Ethernet Touch Panel
TPL-000010	10" Power-over-Ethernet Touch Panel

DISA JITC DoDIN APL CERTIFIED TN 1823401

NIAPC Evaluation Scheme
NATO IACD NCI AGENCY

TEMPEST SDIP 27 Level B

Common Criteria EAL4

SPECIFICATIONS

PHYSICAL

	TPL-7 MODEL	TPL-10 MODEL
HEIGHT x DEPTH x WIDTH	7.72" x 4.72" x 2.25"	10.40" x 7.20" x 2.30"
WEIGHT	2.67 lbs. / 5 lbs. Ship Weight With Brackets	2.92 lbs. / 5 lbs. Ship Weight With Brackets

MECHANICAL

DISPLAY TYPE	7.0" TFT LCD	10.1" TFT LCD
DISPLAY RESOLUTION	1280x800 / 800x480	1280x800
VIEWING ANGLE	V100°, H120°	V150°, H150°
POE+	PD Class 4	
12V BRICK	100/240VAC,50/60Hz	
USB LOCAL KEYBOARD	USB A	
USB LOCAL MOUSE	USB A	
GBE NETWORK	RJ45 Jack	
TILT MOUNT BRACKET	Desktop – Included	
VESA MOUNTING	2.95" x 2.95"; 8-32 THRD Holes (x4)	
BACKLIGHT UNIT	LED	
RESPONSE TIME	25ms Typical	
BACKLIGHT LIFETIME	50,000 Hours	
TOUCH SCREEN TYPE	Projected Capacitive	
INPUT METHOD	Finger/Capacitive Stylus	

ENVIRONMENTAL

TEMPERATURE	Operating: 0°C to 50°C; Storage: -10 to 60 °C
HUMIDITY	0 to 90% @ 35 °C (Non-Condensing)

ELECTRICAL

SUPPLY VOLTAGE	Universal AC Power Supply, 100 to 240VAC, 47 to 63Hz
POWER CONSUMPTION	20 Watts

OTHER

REGULATORY STANDARDS	US/CAN ETL Listing Mark, CB Scheme Including Cert (EN 62368-1), CE Low Voltage Directive (EN 55032 EN 55024), FCC Part 15b (Unintentional Radiator) RE & CE, ICES, VCCI
WARRANTY	One Year From Date of Shipment. Extended Warranties Available.

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MATRIX SWITCH FIBER HARNESSES

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PURPOSE-BUILT FIBER HARNESSES AND CABLE MANAGEMENT FOR THINKLOGICAL MATRIX SWITCHES

HORIZONTAL CABLE MANAGER FOR THINKLOGICAL FIBER HARNESSES

EXAMPLE SHOWN: TLX1280 CABLE MANAGER (TOP ROUTING)

THINKLOGICAL MATRIX SWITCHES

Thinklogical offers the market's widest range of high-performance video and KVM matrix switches, scalable from 12 to 1280 ports. Our switches use an uncompressed bandwidth architecture, providing non-blocking switching of video, audio and computer peripheral signals over multi-mode or single mode fiber optic cable.

IMPROVE CABLE MANAGEMENT FOR THINKLOGICAL MATRIX SWITCHES

Simplify fiber installation, configuration and maintenance to and from Thinklogical Matrix Switches with new Thinklogical Fiber Harnesses. These purpose-built fiber harnesses are the result of a design collaboration between Thinklogical and Belden, a world leader in cabling and connectivity solutions.

A perfect match for Thinklogical Matrix Switch I/O cards, the harnesses support clean, streamlined cable bays for reliable operation. Save time by pulling one Thinklogical Fiber Harness instead of managing bundles of loose cables. The harnesses are designed with enough slack to enable easy removal and swapping of the switch I/O cards. Completely configurable, the solution can be ordered to meet your specifications and requirements from fiber and connector type to leg quantity and length.
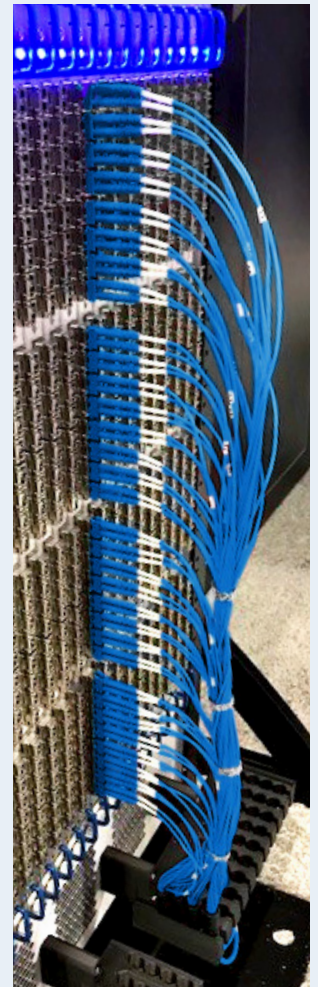
Also available are horizontal cable managers that are optimized for use with the Thinklogical Fiber Harnesses.

SINGLE THINKLOGICAL FIBER HARNESS FOR SWITCH I/O CARD

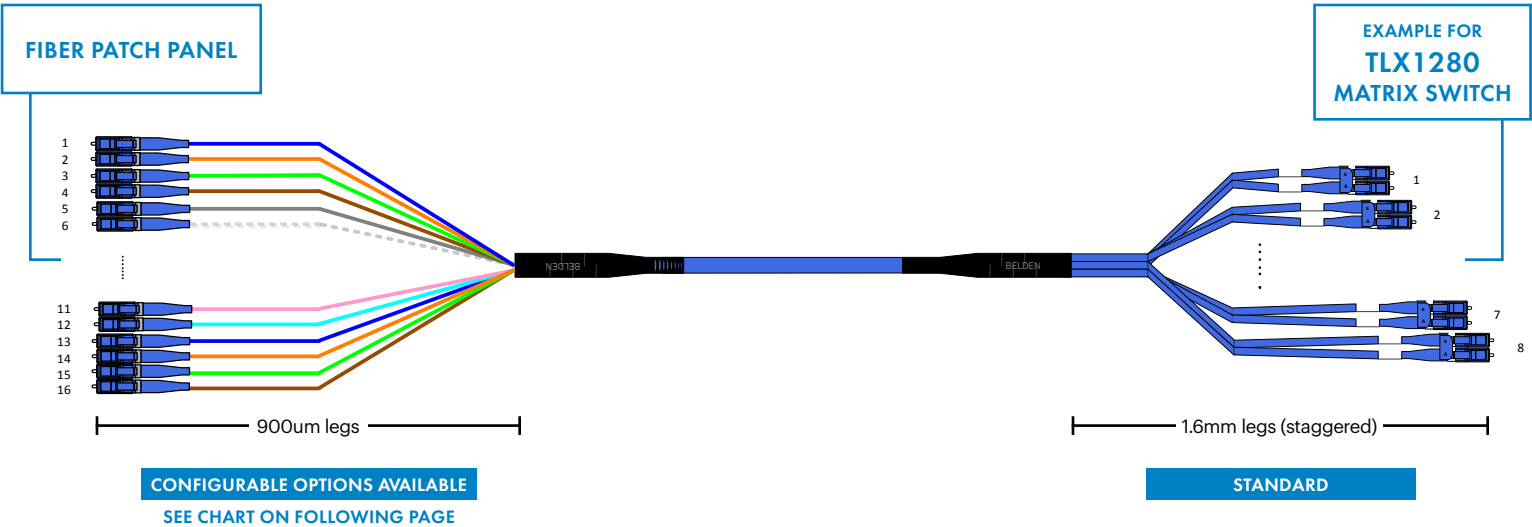**EXAMPLE SHOWN: TLX1280 FIBER HARNESS (BOTTOM ROUTING)**

FEATURES

- Pre-configured and pre-terminated staggering legs to exact specifications of switches
- Flexible options to meet solution requirements: connectors, leg lengths, jacket color, etc
- Completely configurable: choose built to order or standard kits
- Modular design simplifies switch I/O card maintenance and future expansion
- Lighter and smaller transitions for easy attachment points using horizontal cable manager
- For VX80, VX320, VX640, and TLX80, TLX160, TLX320, TLX640, TLX1280 Matrix Switches

BENEFITS

- Significantly reduces installation and fiber-connection configuration time and effort
- Reduce tie wraps and eliminate slack for a tidy installation
- Ensure uptime and reduce disruption when moving or replacing hot-swappable switch I/O cards
- Maximize routing flexibility and reduce cable congestion
- Simplify assembly attachment points, multi-port patching and pulling eye removal with smaller, lighter transitions

MATRIX SWITCH FIBER HARNESS SPECIFICATIONS

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MATRIX SWITCH	NUMBER OF CARDS	PORTS PER CARD	FIBERS PER CARD	TO FILL ONE SWITCH I/O CARD		
				NUMBER OF TRUNKS	ASSEMBLY FIBER COUNT	LOCATION
TLX1280	40	32	64	4	16	TOP & BOTTOM
TLX640 / VX640	32	20	40	2	20	TOP & BOTTOM
TLX320 / VX320	20	16	32	2	16	BOTTOM
TLX160	16	10	20	1	20	BOTTOM
TLX80 / VX80	16	5	10	1	10	BOTTOM

FIBER PATCH PANEL

EXAMPLE FOR TLX1280 MATRIX SWITCH

900um legs

1.6mm legs (staggered)

CONFIGURABLE OPTIONS AVAILABLE
SEE CHART ON FOLLOWING PAGE

STANDARD

ORDERING INFORMATION (STANDARD CONFIGURATIONS)

PART NUMBER	FIBER HARNESS KIT FOR THINKLOGICAL MATRIX SWITCHES	PART NUMBER	HORIZONTAL CABLE MANAGER FOR MATRIX SWITCHES
AX109276	FX Harness Kit, TLX1280 (Top Routing), OM4, 4 x Trunks (To fill one Switch I/O Card), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 1T	Horizontal Cable Manager for TLX1280, Top Routing
AX109281	FX Harness Kit, TLX1280 (Bottom Routing), OM4, 4 x Trunks (To fill one Switch I/O Card), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 1B	Horizontal Cable Manager for TLX1280, Bottom Routing
AX109286	FX Harness Kit, TLX640/VX640 (Top Routing), OM4, 2 x Trunks (To fill one Switch I/O Card), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 2T	Horizontal Cable Manager for TLX640/ VX640, Top Routing
AX109289	FX Harness Kit, TLX640/VX640 (Bottom Routing), OM4, 2 x Trunks (To fill one Switch I/O Card), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 2B	Horizontal Cable Manager for TLX640/ VX640, Bottom Routing
AX109292	FX Harness Kit, TLX320/VX320 (Bottom Routing), OM4, 2 x Trunks (To fill one Switch I/O Card), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 3B	Horizontal Cable Manager for TLX320/ VX320, Bottom Routing
AX109295	FX Harness Kit, TLX160 (Bottom Routing), OM4, 01-10 Ports (01-20 Fibers), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 4B	Horizontal Cable Manager for TLX160, Bottom Routing
AX109296	FX Harness Kit, TLX80/VX80 (Bottom Routing), OM4, 01-05 Ports (01-10 Fibers), LC Duplex (1.6 mm x Staggered Legs) - LC Simplex (900 μm x 1.0 m x In-line Legs), ONFP, 10 m, Blue Jacket	TLHM 5B	Horizontal Cable Manager for TLX80/ VX80, Bottom Routing

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ORDERING INFORMATION (OPTIONAL CONFIGURATIONS)

TL TRUNKS	FIBER TYPE	SWITCH TYPE	SWITCH SIDE A PORT NUMBERS	SWITCH SIDE A CONNECTORS	SWITCH SIDE A FAN-OUT & DIRECTION	OTHER SIDE B CONNECTORS	OTHER SIDE B FAN–OUT CONST x LENGTH	LENGTH & UNIT OF MEASURE
TL	X	X	X	XX	X	XX	X	XXXX
GLOBAL	3 OM3 4 OM4 EV 9 OM4 AQ S OS2	1 TLX1280 2 TLX640/VX640 3 TLX320/VX320 4 TLX160 5 TLX80/VX80	**TLX1280** 1 4 x harnesses (Kit) 01-32 port (01-64 fibers) A 01-08 ports (01-16 fibers) B 09-16 ports (17-32 fibers) C 17-24 ports (33-48 fibers) D 25-32 ports (49-64 fibers) **TLX640/VX640** 2 2 x harnesses (Kit) O 1-20 ports (01-40 fibers) A 01-10 ports (01-20 fibers) B 11-20 ports (21-40 fibers) **TLX320/VX320** 3 2 x harnesses (Kit) 01-16 ports (01-32 fibers) A 01-08 ports (01-16 fibers) B 09-16 ports (17-32 fibers) **TLX160** A 01-10 ports (01-20 fibers) **TLX80/VX80** A 01-05 ports (01-10 fibers)	LD LC Duplex LA LC/APC Duplex LU LC Duplex UHD Uni.	**TLX1280** **TLX640/VX640** T From Top B From Bottom **TLX320/VX320** **TLX160** **TLX80/VX80** B From Bottom	LD LC Duplex LC LC Simplex LM Mini-LC Duplex LA LC/APC Duplex LB LC/APC Simplex LI LC Simplex UHD LU LC Duplex UHD Uni. LF LC/APC Simplex UHD SD SC Duplex SC SC Simplex SA SC/APC Duplex SB SC/APC Simplex ST ST 4M MPO-12 Base 8 (M) SR4 4F MPO-12 Base 8 (F) SR4	A 900 μm x 0.5 m x In-Line B 900 μm x 1.0 m x In-Line C 900 μm x 1.5 m x In-Line D 900 μm x 2.0 m x In-Line E Jacketed x 0.5 m x In-Line F Jacketed x 1.0 m x In-Line G Jacketed x 1.5 m x In-Line H Jacketed x 2.0 m x In-Line	003M to 500M M Meters *use M as decimal **Fan out lengths limit some configurations to 005M minimum overall lengths.

EXAMPLE OPTIONAL CONFIGURATION PART NUMBER

TL	3	1	A	LD	T	LD	A	030M

Fiber Harness, TLX1280 (Top Routing), OM3, 01-08 ports (01-16 fibers),
LC Duplex (1.6 mm x Staggered Legs) – LC Duplex (900 μm x 0.5 m x
In-Line Legs), ONFP, 30M, Aqua Jacket and Connectors

FEATURES

- Fan-out Construction for Jacketed legs:
  LC/SC/ST –> 1.6mm
  MPO –> 3mm (Mini-D)

- Fire Rating: PLENUM (OFNP)

- Protective sock installed at both ends

- Pulling eye at Outside End is installed for assemblies equal or longer than 5 m

- Connector Colors: OM3 – Aqua, OM4 - Erika Violet, OS2/APC – Green

- Jacket Colors: OM3 – Aqua, OM4 – Erika Violet, OS2 – Yellow

INTEGRATED CLIENT TRANSMITTER (ICT) MODULE

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THE ALL-IN-ONE SOLUTION FOR SPACE EFFICIENT SECURE COMPUTING

FULL-FEATURED COMPUTER PROCESSOR AND KVM EXTENDER IN ONE SPACE-SAVING 1/4 RU MODULE

Create more secure, productive, and efficient extended computing, VDI and cloud infrastructures using Thinklogical's Integrated Client Transmitter (ICT) all-in-one client and KVM transmitter module. Back-rack your PCs and VDI clients in an IT server room for space-savings and cyber security while providing flexible and secure user access through Thinklogical's fiber-optic KVM (keyboard, video, mouse) extension and switching infrastructure.

The Integrated Client Transmitter module is a full-featured Intel computer processor combined with a high-performance KVM extender transmitter, all in a 1/4RU module form factor, eliminating the need for a separate desktop PC or client device in extended virtual desktop or remote computing installations. The ICT module's processor can act as a zero client, thin client, or full- featured "fat client" PC and can host any supported VDI client software or PC operating system including those produced by VMware®, Citrix®, Microsoft® and others. It is also compatible with many third-party accredited software images.

The small-footprint Integrated Client Transmitter module simplifies rack PC, VDI and cloud infrastructures and reduces cost by eliminating the need to purchase separate desktop PC or VDI clients and KVM transmitters, while optimizing the overall network topology. The ICT reduces computing hardware and cabling complexity and expense and saves a minimum of 50% of the rack space previously required in typical rack PC configurations -- even more in certain applications. The module also increases data security by removing vulnerable client device, cables, and network and USB ports from the desktop workspace, replacing that with a single stateless Thinklogical KVM receiver. By enabling the back-racking computer resources, the ICT allows you to more easily pool and share IT resources with multiple users through the Thinklogical VDS/KVM system for reduced hardware and software licensing costs.

Thinklogical's patented high-bandwidth and uncompressed KVM extension and switching architecture delivers low-latency system performance identical to if the user was connected directly to the desktop client. Simplify your extended PC computing and VDI applications and save costs with the Integrated Client Transmitter.

PRODUCT FEATURES

- Copper or Fiber 1GbE Network Connection from VDI Server to Integrated Client Transmitter Module
- Fiber Connection to Thinklogical matrix switch or KVM Receiver
- Compatible with Thinklogical Velocity and TLX Series VDS/KVM Products
- Supports HDMI 2.0, Single or Dual Head Systems and Resolutions Up to 3840 x 2160 @ 30Hz
- Digital Audio (Can Be Extracted to Analog at Receiver)
- Supports Analog Audio (Mic/Line)
- Redundant, Current-Sharing, Hot-Swappable Power Supplies
- Optional Separate USB 2.0 Data Path at 480MB Available for CAC Applications
- Intel Processor i5 – 2.4GHz/3GHz (Turbo Mode), Dual Core, 4 Threads, 3MB Cache, Intel HD Graphics 520, 4GB RAM – DDR4-2133, 2 Memory Channels, Bandwidth 34.1Gbps
- Intel Processor i7 – 2.8GHz/3.9GHz (Turbo Mode), Dual Core, 4 Threads, 4MB Cache, Intel HD Graphics 620, 8GB RAM – DDR4-2133, 2 Memory Channels, Bandwidth 34.1Gbps
- Field Replaceable 128GB Solid State Drive
- Chassis Supports Up to Four Modules per Single RU
- Certified to TEMPEST SDIP 27 Level B

BENEFITS

Enhanced Security

- Mitigate Insider Threat by Removing Client, Network and USB 2.0 Ports from Desk
- Part of IA-Accredited Multi-Classification VDS/KVM Solution (EAL4, TEMPEST, NATO NIAPC, JITC UCR APL) Hardware Designed to Maximize Security Functions
- Compatible with Security-Based Client Software
- Reduced Requirements for Security Patching

High Performance

- No Signal Compression, Resulting in No Added Latency or Video Artifacts, Jitter or Dropped Frames

Easier Integration and Cost Savings

- Save Valuable Space at the Desktop and Rack
- Reduce IT Clutter and Cabling; Use Less Power, Remove Heat and Noise
- Lower Hardware and Software Licensing Costs by Pooling
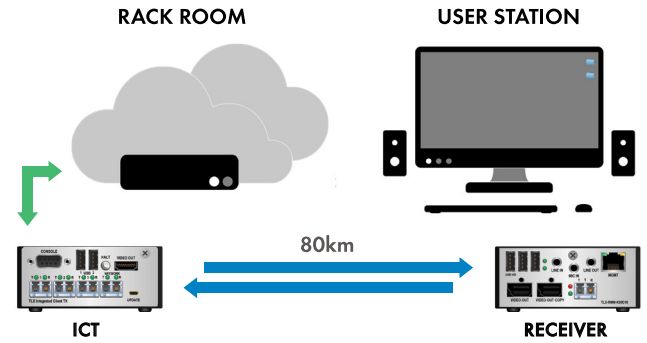
Increased Flexibility and Reliability

- Instantly Switch Between Networks or Classification Levels
- Easily Incorporate CAC for Multi-Classification Application Access
- Modular, High-Density Design Maximizes Space Utilization and Uptime
- Supports all Common Virtualization Software and Desktop Operating Systems: VMware, Citrix, Microsoft

ORDERING INFORMATION

Please contact Thinklogical for configurations specific to your application requirements.

MULTI-MODE TRANSMITTERS

PART NUMBER	DESCRIPTION
ICT-XMF-H01A10	Integrated Client Multi-Mode Transmitter with Fiber Network, Support for TLX, Single Head up to 4K30, Analog Audio, USB HID
iCT-XMF-C01A22	Integrated Client Multi-Mode Transmitter with Fiber Network, Support for TLX, Dual Head up to 4K30, Analog Audio, USB HID, Separate USB 2.0
ICT-VSC-U01A22	Integrated Client Single-Mode Transmitter with Copper Network, Support for VEL, Dual Head up to 4K30, Analog Audio, USB HID & USB 2.0
ICT-XMF-H02A10	TLX10 ICT Multi-Mode Module, Single Video Head up to 3840x2160@30Hz, Analog Audio & USB HID, Fiber Network
ICT-XMF-H02A22	TLX22 ICT Multi-Mode Module, Dual Video Heads up to 3840x2160@30Hz, Analog Audio & USB HID, Fiber Network
ICT-VMC-C02A22	VEL22 ICT Multi-Mode Module, Dual Video Heads up to 1080p, Analog Audio, USB HID & Separate USB 2.0, Copper Network

RACK ROOM   **USER STATION**

80km

ICT   RECEIVER

TLX HP4 CHASSIS FOR INTEGRATED CLIENT TRANSMITTER MODULE

Save Valuable Rack Space. The high-density HP4 chassis is designed to accommodate the Integrated Client Transmitter combined PC/KVM module and can help you save a minimum of 50% of rack space vs. typical extended computing or VDI configurations. The 1RU, modular design is configurable with up to four Integrated Client Transmitter modules, replacing 4 typical desktop PCs or VDI clients. Chassis offers redundant, current-sharing, and hot-swappable internal power supplies for performance and reliability.

SPECIFICATIONS

PERFORMANCE		
	CHASSIS (CHS-HP0004)	**INTEGRATED CLIENT TRANSMITTER**
RACK SIZE	EIA 19" (482.6 mm)	––
HEIGHT x DEPTH x WIDTH	1 RU-1.72" (43.7 mm) x 17.00" (431.8 mm) [including PS handles: 17.75" (450.8 mm)] x 17.49" (444 mm)	1.59" (40.4 mm) x 10.34" (262.6 mm) x 6.37" (161.7 mm)
TOLERANCE	± .039"; (.991 mm)	± .039"; (.991 mm)
WEIGHT	Chassis only: 9.0 lbs. (4.08 kg); Shipping Weight: 11 lbs. (4.99 kg) Chassis & 4 Modules: 13.8.0 lbs. (6.26 kg); Shipping Weight: 15 lbs. (6.80 kg)	1 ICT module: 1.2 lbs. (.54 kg); Shipping Weight: 2 lbs. (.91 kg)
PHYSICAL		
PROCESSORS	Intel Processor i5 – 2.4GHz/3GHz (Turbo Mode), Dual Core, 4 Threads, 3MB Cache, Intel HD Graphics 520, 4GB RAM – DDR4-2133, 2 Memory Channels, Bandwidth 34.1Gbps Intel Processor i7 – 2.8GHz/3.9GHz (Turbo Mode), Dual Core, 4 Threads, 4MB Cache, Intel HD Graphics 620, 8GB RAM – DDR4-2133, 2 Memory Channels, Bandwidth 34.1Gbps	
MEMORY	4GB RAM – DDR4-2133, 2 Memory Channels, Bandwidth 34.1Gbps	
INTERFACES	1 Serial Console, 2 USB-A, 1 HDMI Video Out, 3 Fiber SFPs, 1 RJ-45 or Fiber Network, 1 USB-Mini-B Update	
ENVIRONMENTAL		
TEMPERATURE AND HUMIDITY	0° to 50°C (32° to 122 °F), 5% to 95% RH, Non-Condensing; Side to Side Cooling	
ELECTRICAL		
POWER REQUIREMENTS	AC Input: 100-240VAC, 47-63Hz; Universal AC Power Supply	
POWER CONSUMPTION	200 Watts Max (When Fully Populated)	
OTHER		
COMPLIANCE	Approvals for US, Canada, and European Union; CE + ROHS	
WARRANTY	One Year From Date of Shipment. Extended Warranties Available.	

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THINKLOGICAL TLX USB-C EXTENSION SYSTEM

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DISPLAYPORT ALT MODE VIDEO UP TO 8K@30HZ WITH USB HID AND USB 2.0

THE SYSTEM

Thinklogical's TLX USB-C extenders provide reliable high-bandwidth transport of USB-C supported signal types, enabling real-time transfer of high-resolution video and USB over fiber optic cabling. The system extends DisplayPort video for a single display, embedded audio and USB HID, connecting at the end points using a single USB-C cable, and extends USB 2.0 using a second cable.

The USB-C extenders support DisplayPort for a single display via DisplayPort Alt-Mode. The C20 series extenders supports up to 4K@60Hz video and are compatible with Thinklogical's TLX extenders supporting DisplayPort 1.2 and HDMI 2.0. The C40 series extenders support 5K (5120 x 2160 60Hz), 6K (6016 x 3384 60Hz) and 8K (7680 x 4320 30Hz) video resolutions.

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.

USB-C40 TRANSMITTER

8K ULTRA **HD**

USB-C40 RECEIVER

FORM FACTOR

TLX fiber optic extension systems are available in a modular form factor, with several 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.

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.

TRANSMITTER FEATURES

- 1 USB-C Video/Audio, USB HID
- 1 USB-B USB 2.0 (configurable)
- 1 Management Port

RECEIVER FEATURES

- 1 USB-C Video/Audio, USB HID
- 3 USB-A USB HID
- 3 USB-A USB 2.0 (configurable)
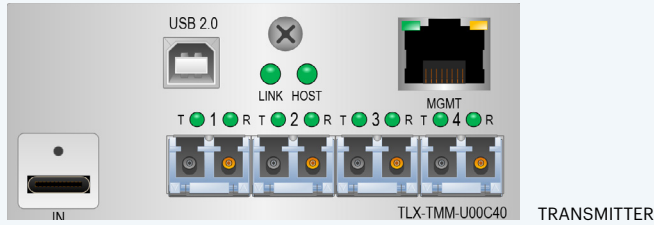- 1 Management Port

ORDERING INFORMATION

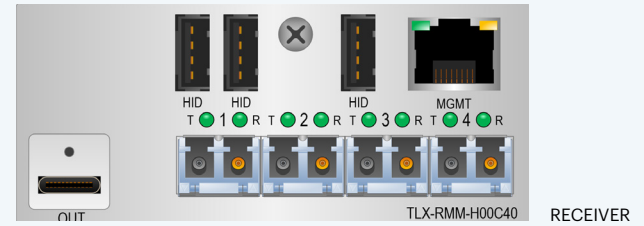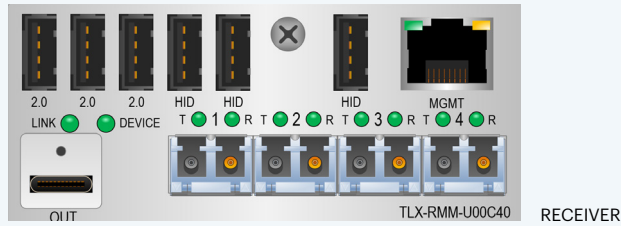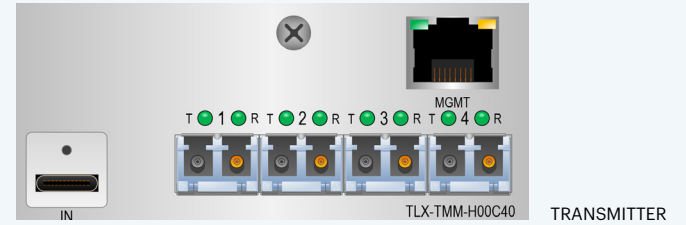| PART NUMBER	DESCRIPTION
TLX-TMM-U00C20	TLX Transmitter, DisplayPort 1.2, USB Type-C, USB HID & USB 2.0
TLX-RMM-U00C20	TLX Receiver, DisplayPort 1.2, USB Type-C, USB HID & USB 2.0
TLX-TMM-U00C40	TLX Transmitter, DisplayPort, USB Type-C, USB HID & USB 2.0
TLX-RMM-U00C40	TLX Receiver, DisplayPort, USB Type-C, USB HID & USB 2.0
TLX-TMM-H00C20	TLX Transmitter, DisplayPort 1.2, USB Type-C, USB HID
TLX-RMM-H00C20	TLX Receiver, DisplayPort 1.2, USB Type-C, USB HID
TLX-TMM-H00C40	TLX Transmitter, DisplayPort, USB Type-C, USB HID
TLX-RMM-H00C40	TLX Receiver, DisplayPort, USB Type-C, USB HID

COMPATIBILITY

USB-C MODULES ARE COMPATIBLE WITH THE FOLLOWING THINKLOGICAL PRODUCTS:

- TLX Extenders (C20 series modules only)
- TLX Matrix Switches
- Modular Chassis
- System Management Portfolio (SMP)
- Integrated Client Transmitter (ICT)

THINKLOGICAL TLX USB-C EXTENSION SYSTEM SPECIFICATIONS

THINKLOGICAL USB-C C40 MODULES

TLX-TMM-U00C40   TRANSMITTER

TLX-RMM-U00C40   RECEIVER

THINKLOGICAL USB-C C40 MODULES (WITHOUT USB 2.0)

TLX-TMM-H00C40   TRANSMITTER

TLX-RMM-H00C40   RECEIVER

USB-C EXTENDER TECHNICAL SPECIFICATIONS

VIDEO RESOLUTION	DisplayPort using DisplayPort Alt-Mode up to 4K DCI (4096×2160 60Hz), 5K (5120 x 2160 60Hz) video resolution uncompressed, and 6K (6016 x 3384 60Hz) (HBR-3, 28Gbps) and 8K (7680 x 4320 30Hz) resolutions using Display Stream Compression (DSC)
CABLE	C20: two (2) fiber optic cables (4K); C40: four (4) fiber optic cables (5K, 6K, 8K). Additional fiber required for USB backchannel. Fiber not included, available for purchase.
DISTANCE	Multi-Mode up to 400m · 33m: OM1 (62.5/125); 82m/125); 300m: OM3 (50/125 SX+); 400m: OM4 (50/125eSX+) Single Mode up to 80km · OS2 (9/125)
OPTICAL WAVELENGTH	Multi-Mode: 850nm; Single Mode: 1310nm (CWDM and DWDM wavelengths available, contact Thinklogical for additional information)
DATA RATE	10Gbps per port
REGULATORY	US / Canada EN 90650, FCC 47 CFR Part 15, ICES, CE
WARRANTY	One year from date of shipment. Extended warranties available.
MOUNTING BRACKETS	Brackets Included, See Modular Chassis Specifications
INCLUDED CABLES (TRANSMITTER ONLY)	(1) USB-C; USB 2.0 Configuration: (1) USB A-B, 1.8 Meters (CBL000015-006FR) (1) CAT 5, 2 Meters (CBL000001-002MR)

DIMENSIONS

HEIGHT x WIDTH x DEPTH	1.592" (40.43 mm); 3.693" (93.80 mm); 6.642" (168.71 mm)
WEIGHT	Weight: .54 lbs. (.245 kg); Shipping Weight: 2 lb. (.908 kg)

CONNECTORS

TX INTERFACES	1 USB-C Video, USB HID	2 Status LEDs LINK/HOST
	1 USB-A USB 2.0 (configurable)	2 Bi-color Status LEDs (per SFP) T and R Status
	1 RJ-45 Jack, MGMT	2 or 4 SFP+ Modules (2 per C20 module, 4 per C40 module)
RX INTERFACES	1 USB-C Video, USB HID	2 Status LEDs LINK/DEVICE
	3 USB-A USB HID	2 Bi-color Status LEDs (per SFP) T and R Status
	3 USB-A USB 2.0 (configurable)	2 or 4 SFP+ Modules (2 per C20 module, 4 per C40 module)
	1 RJ-45 Jack, MGMT	

ENVIRONMENTAL

TEMPERATURE	Operating: 0° to 50°C (32°F to 122°F) Ambient; Storage: -10°C to 60°C (-4°F to 158°F)
HUMIDITY	Operating: 0% to 90% @ 35°C, non-condensing; Storage: Unlimited
ALTITUDE	Operating: Thinklogical components are rated to 1000m max. elevation. Max. operating temp. de-rates by 3% for every 330m > 1000m Storage: Unlimited

ELECTRICAL

	See Modular Chassis Specifications

Contact Thinklogical for additional specifications.

SINGLE FIBER 12G-SDI EXTENDERS

thinklogical®

A **BELDEN** BRAND

EXTEND UP TO 12G-SDI SIGNALS UNCOMPRESSED OVER A SINGLE FIBER

12G-SDI Extenders support up to 12G-SDI signals in a variety of input and output formats over a single fiber optic cable. Thinklogical provides 12G-SDI extension and available matrix switching via a 100% uncompressed signal path with the lowest latency in the industry, offering precise pixel-for-pixel transmission of video with no visual artifacts, no added jitter, or lost frames. These unique features enable higher efficiency and productivity without compromising image quality or system reliability and performance.

With the 12G-SDI Extenders, Dual-Link and Quad-Link video signals are multiplexed into a single data stream where an SDI pathological Transmitter (TX) SFP module, which supports data rates between HD-SDI (1.5G) and 12G-SDI, is used to transport the serial stream over a single fiber-optic cable. An SDI pathological Receiver (RX) SFP module then receives the data. Operating in either pass-through mode or demultiplex mode generates the output video signal and allows cross-conversion between the input signal and the output signal. For instance, a Quad-Link 3G input can be displayed at 12G Single-Link, and vice versa.

The 12G-SDI extenders come in a stand-alone transmitter and receiver form factor and can be switched using the Thinklogical TLX160 matrix switch with a 12G-SDI input/output card.

Thinklogical 12G-SDI extenders are ideal for applications requiring SDI signal support and high-resolution video transport such as video distribution, image magnification and projection mapping, camera connectivity, video editing, VFX and post-production, video analysis, modeling, and simulation.

12G-SDI TRANSMITTER

12G-SDI RECEIVER

PRODUCT FEATURES

- Accepts One Video Signal Over One to Four Standard BNC Connectors

- Video Extension of Multiple SDI Formats, From 1.5G Up to 12G

- Cross Conversion Between Single-Link 12G, Dual-Link 6G, and Quad-Link 3G

- Supports Up to 4K DCI (4096 x 2160) Resolution: 60Hz 4:2:2 10-Bit; 30/24 Hz 4:4:4 10-Bit; 30/24Hz 4:2:2 12-Bit

- Passes All Video and Ancillary Data Uncompressed and Unaltered

- Extend 12G-SDI Signals Up to 40km Between Source and Destination Using Only One Fiber
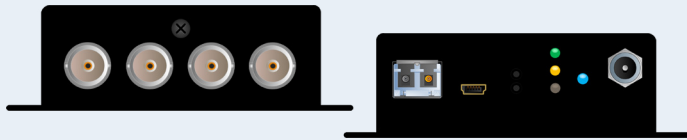
ORDERING INFORMATION

PART NUMBER	DESCRIPTION
SDI-S00012-LCTX	12G-SDI Single Fiber, Single Mode Transmitter
SDI-S00012-LCRX	12G-SDI Single Fiber, Single Mode Receiver
TLX-MSD-S12G10	TLX160 Matrix Switch Data Input/ Output Card, 10 Ports, 12G-SDI Dual Fiber Single Mode

COMPATIBILITY

- This product is compatible only with the 12G-SDI input/output card for the Thinklogical TLX160 matrix switch. Input/output card and switch sold separately.

- This product is a stand-alone design and is not compatible with the Thinklogical TLX or SDIXtreme extender product lines.
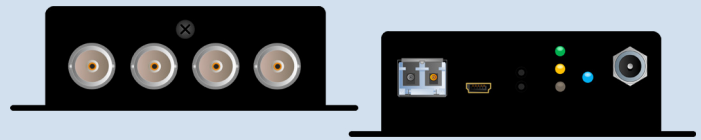
SINGLE FIBER 12G-SDI EXTENDERS

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A **BELDEN** BRAND

TRANSMITTER

RECEIVER

SPECIFICATIONS

TRANSMITTER (TX)

NUMBER OF SDI INPUTS	1 SDI source, up to 4 BNC's (supporting SL, DL, and QL Signals)
DATA RATE RANGE	1.485 Gbps to 11.88 Gbps
SUPPORTED INTERFACES	SMPTE 292M, 372M, 424M, ST-2081, and ST-2082
RE-CLOCKED DATA RATES	All Supported Data Rates from 1.485 Gbps to 11.88 Gbps
NUMBER OF OPTICAL OUTPUTS	1
CONNECTOR	LC Receptacle
SFP TYPE	10 km Single Mode 40 km Single Mode
WAVELENGTH (NOMINAL)	1310 nm 1550 nm
EMITTER TYPE	DFB Laser DFB Laser
OUTPUT POWER (NOMINAL)	-5 to 1dBm 4 to 8dBm
EQUALIZATION	Automatic up to 50m of Belden 1694A at 11.88 Gbps, 80m at 5.94 Gbps, 133m at 2.97 Gbps, and 186m at 1.485 Gbps
INPUT RETURN LOSS	-20dB up to 1.485 GHz, -18dB up to 2.97 GHz, -13dB up to 5.94 GHz, -6.5dB up to 11.88 GHz

RECEIVER (RX)

NUMBER OF SDI OUTPUTS	1 SDI video up to 4 BNC's (supporting SL, DL, and QL Signals)
DATA RATE RANGE	1.485 Gbps to 11.88 Gbps
SUPPORTED INTERFACES	SMPTE 292M, 372M, 424M, ST-2081, and ST-2082
RE-CLOCKED DATA RATES	All Supported Data Rates from 1.485 Gbps to 11.88 Gbps
NUMBER OF OPTICAL INPUTS	1
CONNECTOR	LC Receptacle
SFP TYPE	Single Mode
WAVELENGTH	1260-1620nm
MAXIMUM INPUT SENSITIVITY	-13dBm @ 11.88 Gbps, -14dBm @ All Other Rates
RX OVERLOAD POWER	-2 dBm (min)
SIGNAL LEVEL	800mV ± 10%
DC OFFSET	0V ± 0.5V
OVERSHOOT	< 10% of Amplitude
ALIGNMENT JITTER	< 0.1 UI from 1.485 Gbps to 2.97 Gbps; < 0.15 UI at 5.97 Gbps; < = 0.2 UI at 11.88 Gbps
RISE/FALL TIME	< 70 ps from 1.485 Gbps to 2.97 Gbps; < 40 ps from 5.97 Gbps to 11.88 Gbps

SIGNAL FORMATS	1 x HD-SDI (1.485/1.4835 Gbps), per SMPTE ST 292 2 x HD-SDI (1.485/1.4835 Gbps), per SMPTE ST 372 4 x HD-SDI (1.485/1.4835 Gbps), per SMPTE ST 425-3 1 x 3G-SDI (2.97/2.967 Gbps), per SMPTE ST 425-1 2 x 3G-SDI (2.97/2.967 Gbps), per SMPTE ST 425-3	4 x 3G-SDI (2.97/2.967 Gbps), per SMPTE ST 425-5 1 x 6G-SDI (5.94/5.934Gbps), per SMPTE ST 2081-10 MODE 1 and MODE 2 2 x 6G-SDI (5.94/5.934Gbps), per SMPTE ST ST 2081-11 MODE 1 1 x 12G-SDI (11.88/11.868 Gbps), per SMPTE ST 2082-10 MODE 1

PHYSICAL

HEIGHT x WIDTH x DEPTH (TX AND RX)	1.26" (32.0 mm); 3.41" (86.6 mm); 3.69" (93.7 mm) Width (with Mounting Brackets): 4.40" (111.8 mm)
WEIGHT	Weight (per Module): 0.6 lb. (0.27 kg); Shipping Weight: 1 lb. (0.45 kg)

CONNECTORS

CONNECTIONS & INTERFACES	5VDC Input Indicators: (3) Power, Data Rate (HD, 3G, 6G, 12G) Data Format (SL, DL, QL) Select & Store Buttons (Rx)	USB-mini-B Update Port (Cable Included) Fiber SFP Four BNC IN / OUT Ports
FIBER-OPTIC CABLE	This Product Requires Single-Mode Fiber-Optic Cable. Distances of 10km and 40km are Available, Depending Upon the SFP Selection. Thinklogical Recommends Type OS2 9/125um Fiber.	

ENVIRONMENTAL

TEMPERATURE	Operating: 0° to 50°C (32°F to 122°F) Ambient; Storage: -20°C to 70°C (-4°F to 158°F)
HUMIDITY	Operating: 5% to 95%, Non-Condensing; Storage: Unlimited
ALTITUDE	Operating: Thinklogical Components are Rated to 1000m Max. Elevation. Max. Operating Temp. De-Rates by 3% for Every 330m > 1000m; Storage: Unlimited
THERMAL	Heat Load (BTU/HR): Equal to DC Power Consumption x 3.412; 21.3 BTU/HR

ELECTRICAL

SUPPLY VOLTAGE	+5.0 VDC (AC/DC adapter, universal input 100-240VAC)
MAX. DC POWER CONSUMPTION	6.25 Watts

OTHER

RELIABILITY	MTBF (Calculated): TX: 170,814 hrs. RX: 127,240 hrs.
CABLES INCLUDED	USB Mini-B (CBL00105-002MR)
REGULATORY	US / Canada EN 90650, FCC 47 CFR Part 15, ICES, CE
WARRANTY	One Year From Date of Shipment. Extended Warranties Available.

Contact Thinklogical for additional specifications.

CONTACT THINKLOGICAL
800-291-3211 · INFO@THINKLOGICAL.COM · WWW.THINKLOGICAL.COM

EXTEND UP TO 12G-SDI SIGNALS UNCOMPRESSED OVER FIBER WITH TLX COMPATIBILITY

TLX 12G-SDI Extenders support up to 12G-SDI in a variety of input and output formats over one or two fiber optic cables. Thinklogical provides 12G-SDI extension and available matrix switching via a 100% uncompressed signal path with the lowest latency in the industry, offering precise pixel-for-pixel transmission of video with no visual artifacts, no added jitter or lost frames. These unique features enable higher efficiency and productivity without compromising image quality or system reliability and performance.

The TLX 12G-SDI Extenders multiplex Dual-Link and Quad-Link video signals into a single data stream, supporting data rates between HD-SDI (1.5G) and 12G-SDI, as well as RS-422 and network signal formats.

The TLX 12G-SDI Extenders also offer the option to cross-convert SDI signals to and from HDMI or DisplayPort inputs and outputs, simplifying multi-format video infrastructures.

Thinklogical 12G-SDI extenders are ideal for applications requiring SDI signal support and high-resolution video transport such as video distribution, image magnification and projection mapping, camera connectivity, video editing, VFX and post-production, video analysis, modeling, and simulation.
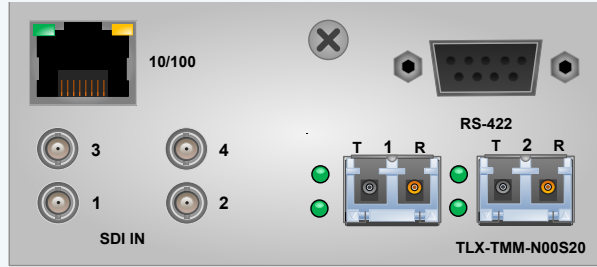
12G-SDI TRANSMITTER

12G-SDI RECEIVER

PRODUCT FEATURES

- Accepts one video signal over one to four mini-BNC connectors

- Video extension in multiple SDI formats: single 12G-SDI, dual 6G-SDI, quad 3G-SDI

- Supports up to 4K DCI (4096 x 2160) resolution: 60Hz 4:2:2 10-bit; 30/24 Hz 4:4:4 10-bit; 30/24Hz 4:2:2 12-bit

- Passes all video and ancillary data uncompressed and unaltered

- Extend up to 12G-SDI signals up to 40km between source and destination using one or two fibers; additional return fiber required for 10/100 Ethernet and/or RS-422 extension

- Modular, chassis-mount design

- Compatible with TLX Series product line

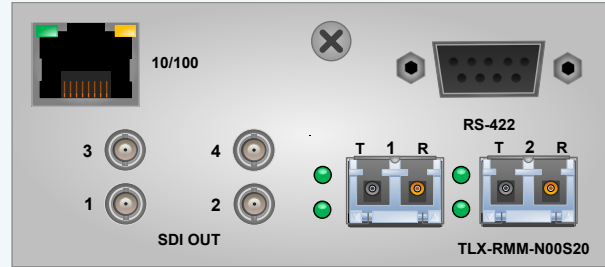- Compatible with all TLX Matrix Switches

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
TLX-TMM-N00S20	TLX Multi-Mode Transmitter, 1 Display up to 4K@60Hz SDI, Serial RS-422, Network 10/100 Ethernet
TLX-RMM-N00S20	TLX Multi-Mode Receiver, 1 Display up to 4K@60Hz SDI, Serial RS-422, Network 10/100 Ethernet

TLX 12G-SDI EXTENSION SYSTEM

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TLX-TMM-N00S20

TLX-RMM-N00S20

HD, 3G, 6G or 12G-SDI, 4 BNC-mini coax, Serial RS-422

SPECIFICATIONS

PERFORMANCE

VIDEO RESOLUTION	Supports Up to 4K DCI (4096 x 2160) Resolution: 60Hz 4:2:2 10-Bit; 30/24 Hz 4:4:4 10-Bit; 30/24Hz 4:2:2 12-Bit.
SIGNAL FORMATS	1 x HD-SDI (1.485/1.4835 Gbps), per SMPTE ST 292 / 2 x 6G-SDI Dual-Link (5.94/5.934Gbps), per SMPTE ST 2081-11 MODE 1 2 x HD-SDI Dual-Link (1.485/1.4835 Gbps), per SMPTE ST 372 / 1 x 12G-SDI (11.88/11.868 Gbps), per SMPTE ST 2082-10 MODE 1 1 x 3G-SDI (2.97/2.967 Gbps), per SMPTE ST 425-1 / 8- and 10-bit Color 4 x 3G-SDI Quad-Link (2.97/2.967 Gbps), per SMPTE ST 425-5 / RGB and YUV Color Space 1 x 6G-SDI (5.94/5.934Gbps), per SMPTE ST 2081-10 MODE 1 and MODE 2 / 4:2:2 and 4:4:4 Encoding
CABLE	Transports HD, 3G, or 6G Video with Ancillary Data over One Fiber Transports 12G-SDI Video Signals (4x3G, 2x6G, or 1x12G) over Two Fibers Additional Return Fiber Required for 10/100 Ethernet and/or RS-422 Extension Fiber Not Included, Available for Purchase
DISTANCE	Multi-Mode: 400m (OM1: 33m; OM2: 82m; OM3: 300m; OM4: 400m); Single Mode: 10/40/80km (OS2 9/125)
OPTICAL WAVELENGTH	Multi-Mode: 850nm; Single Mode: 1310nm (CWDM and DWDM Wavelengths Available; Contact Thinklogical for More Information)
OPTICAL DATA RATE	10Gbps per Port

PHYSICAL

HEIGHT x DEPTH x WIDTH (TX AND RX)	1.592" (40.43 mm); 6.642" (168.71 mm); 3.693" (93.80 mm) Chassis Required. See Modular Chassis Specifications
WEIGHT	.54 lbs. (.245 kg); Shipping Weight: 2 lb. (.908 kg)

CONNECTORS

INTERFACES (TX OR RX)	4 Mini-BNC Input/Output Ports / 2 Status LEDs LINK/HOST 1 RJ-45 Jack, MGMT / 2 Bi-color Status LEDs (per SFP) T and R Status 1 RS-422 / 2 SFP+ Modules

ENVIRONMENTAL

TEMPERATURE	Operating: 0° to 50°C (32°F to 122°F) Ambient; Storage: -10°C to 60°C (-4°F to 158°F)
HUMIDITY	Operating: 0% to 90% @ 35°C, Non-Condensing; Storage: Unlimited
ALTITUDE	Operating: Thinklogical Components are Rated to 1000m max. Elevation. Max. Operating Temp. De-Rates by 3% for Every 330m > 1000m Storage: Unlimited

OTHER

CABLES INCLUDED	(1) CAT 5, 2 Meters (CBL000001-002MR); Thinklogical Recommends Belden 6G (1694A) Coaxial Cable or Better to Extend 12G-SDI Signals
MOUNTING BRACKETS	See Modular Chassis Specifications
REGULATORY	US / Canada EN 90650, FCC 47 CFR Part 15, ICES, CE
WARRANTY	One Year From Date of Shipment. Extended Warranties Available.

Contact Thinklogical for additional specifications.

CONTACT THINKLOGICAL

800-291-3211 • INFO@THINKLOGICAL.COM • WWW.THINKLOGICAL.COM