



**CCTx2**



**CCTx24**

**CCTx reduces your optical link costs compared to Network OEMs and their security-coded optics. Two and twenty-four port versions are shown; four and twelve port versions are available.**

### Overview

- Reliable, low cost integrated Gigabit Ethernet Media Converter using RJ45 copper and pluggable SFP optical connections
- Multimode or Single Mode optics adhere to industry standard specifications
  - 550 M to 2 KM on Multimode (MM)
  - 10, 40, 80, 100, 120 KM Single Mode
  - Eight Channel WDM Transceivers
  - Digital Diagnostics
- 1000Base-T port speed with MDI-x
  - Supports 802.3ab, Auto-Negotiation
- Built in Diagnostics
  - Tx/Rx activity status
  - "GO" link light
  - LED troubleshooting light
- Communications Diagnostic Module option
  - SNMP reporting of system, transceiver data
  - Built in HTTP server for remote configuration
  - Full test at power on and alarm capability
- Standalone or rack mount 2/4 port appliance
- Standalone or rack mount 12/24 port 1RU version
- Enterprise quality
  - 110 to 240 AC built in, redundant AC available on the CCTx4, 12, and 24
  - 0 – 70° C operating temperature

### No EEPROM Errors: Supports Industry Standards



If you're frustrated by "EEPROM errors" on OEM switches, Champion has the solution. By connecting over the copper port, CCTx is "SmartNet" proof. And all of our optics meets full industry standard specifications.

### Support and Warranty



CCTx connects to the standard copper Gigabit port of any network switch, so there are no network OEM service program problems. CCTx comes with a five-year warranty and includes toll-free and email support. Custom programs are available.

Champion ONE™ designs, manufacturers, and distributes optical, copper, solid-state storage, and wireless hardware upgrades. Since 1992, we have created new ways to lower the cost of broadband deployment without restricting quality or reliability.

CCTx™ extends our broad offering of Optical and Copper Transceivers that have saved Telecommunication companies, Service Providers, Enterprise Companies and Universities thousands of dollars on their optical network hardware.

### Solve the Optical Cost Puzzle: How To Save \$



CCTx can reduce the cost of optical links by 60% off OEM List. Further cost savings come from using the copper ports on OEM switches - often up to 50% less than optical equivalents. Rather than buy switches with 2, 4, or 24 optical ports, buy copper based switches and convert as many ports to optical as you need: use CCTx to solve the Gigabit Ethernet port cost puzzle.

### An Intelligent Connection...But Invisible



CCTx will not link if either of the connections are down so the conversion is totally transparent to the switches it connects. IT managers can set the copper port parameters of their switch and know that it will be passed through the optical link because CCTx watches the fiber and copper cables to determine if they are connected: if only one end is linked, an error LED reports a fault and resets the copper port on a timed interval. *This allows the IT manager to remotely troubleshoot a fiber cut.*

### Diagnostics and Management



For more comprehensive information and remote login, the Diagnostics Module upgrade reports the operating parameters of the chassis and the installed C1 transceivers. IP setup, temperature, optical power, and link error information is available to troubleshoot cabling separately from the Layer 2 or 3 network layers.

- The "GO" LED lights when both sides are linked
- A Tx/Rx Activity Light shows Optical/Fiber activity
- An alarm light indicates a copper/fiber cut



*Each conversion has a 1000BaseT and SFP port, & 3 LEDs*

Configurations			
CCTx2	CCTx4	CCTx12	CCTx24
(2) RJ45 <sup>1</sup> -SFP <sup>2</sup> ports	(4) RJ45 <sup>1</sup> -SFP <sup>2</sup> ports	(12) RJ45 <sup>1</sup> -SFP <sup>2</sup> ports	(24) RJ45 <sup>1</sup> -SFP <sup>2</sup> ports
(6) Optical - Copper Link LEDs	(12) Optical - Copper Link LEDs	(36) Optical - Copper Link LEDs	(72) Optical - Copper Link LEDs
AC Power, 110-240V, 15 W	AC Power, 110-240V, 15 W	AC Power, 110-240V, 150 W	AC Power, 110-240V, 150 W
H x W x D: 1.5" x 8" x 8"	H x W x D: 1.5" x 8" x 8"	H x W x D: 1.70" x 17.5" x 10.8"	H x W x D: 1.70" x 17.5" x 10.8"
Weight: 3.2 lbs	Weight: 3.8 lbs	Weight: 10.5 lbs	Weight: 11.5 lbs
Humidity: 85% non-condensing	Humidity: 85% non-condensing	Humidity: 85% non-condensing	Humidity: 85% non-condensing
CFR47 part 15 of the FCC rules Class A product and safety compliance <i>pending</i>			
1. SFP port meets MSA specifications			

Upgrades			
CCTx2	CCTx4	CCTx12	CCTx24
N/A	Backup AC thru ext. supply	Backup AC thru ext. supply	Backup AC thru ext. supply
N/A	CDM: Comm. Diagnostic Module	CDM: Comm. Diagnostic Module	CDM: Comm. Diagnostic Module
Copper/Optical patch cables	Copper/Optical patch cables	Copper/Optical patch cables	Copper/Optical patch cables
Rack mount/U Mount brackets	Rack mount/U mount brackets	Rack mount brackets	Rack Mount brackets
Diagnostic module provides system information such as configuration, power usage, operation parameters and transceiver information such as link status, budget, type, user entry for port naming. Information available through an HTTP server and SNMP interface.			

Electrical (Copper) Specifications			
1000Base-T Only	1000Base-T Only	1000Base-T Only	1000Base-T Only
Auto MDI-x	Auto MDI-x	Auto MDI-x	Auto MDI-x
802.3ab, Jumbo Frame	802.3ab, Jumbo Frame	802.3ab, Jumbo Frame	802.3ab, Jumbo Frame

Optical Transceiver Specifications			
1000SFP055, MMX	1000SFP10, 40	1000SFP80	1000SFP120
1062.5 to 1250 Mbaud, 802.3z	1062.5 to 1250 Mbaud, 802.3z	1062.5 to 1250 Mbaud, 802.3z	1062.5 to 1250 Mbaud, 802.3z
1804' (550 M), 1.24 mi. (2 KM)	To 6.2 miles (10KM), to 15.5 miles (25KM), to 24.8 miles (40KM)	To 49.6 miles (80 KM) <sup>1</sup>	To 75 miles (120 KM)
62.5-50.0 core, 160-500 Mhz/KM	Single Mode, 9/10 core size <sup>2</sup>	Single Mode, 9/10 core size	Single Mode, 9/10 core size
Class 1 laser of 850nm, special	Class 1 laser of 1310 nm	Class 1 laser of 1550 nm	Class 1 laser of 1550 nm
Min. Transmit dBm: -10, special	SFP10: Min. Transmit dBm: -9 SFP40: Min. Transmit dBm: -4.5	Min. Transmit dBm: 0	Min. Transmit dBm: 0
Min. Receive dBm: -17, special	SFP10: Min. Receive dBm: -20 SFP40: Min. Receive dBm: -22.5	Min. Receive dBm: -24	Min. Receive dBm: -33
Typical link budget: 7 <sup>3</sup> , special <sup>4</sup>	SFP10: Typical link budget: 11 <sup>3</sup> SFP40: Typical link budget: 18 <sup>3</sup>	Typical link budget: 24 <sup>3</sup>	Typical link budget: 30 <sup>3</sup>
H x W x D: .33 x .52 x 2.24"	H x W x D: .33 x .52 x 2.24"	H x W x D: .33 x .52 x 2.24"	H x W x D: .33 x .52 x 2.24"
Duplex LC Connector, Bail Latch	Duplex LC Connector, Bail Latch	Duplex LC Connector, Bail Latch	Duplex LC Connector, Bail Latch
Operating Temp. -10 - 85 °C	Operating Temp. -10 - 85 °C	Operating Temp. 0 - 70 °C	Operating Temp. 0 - 70 °C
Class 1 Laser 21CFR1040	Class 1 Laser 21CFR1040	Class 1 Laser 21CFR1040	Class 1 Laser 21CFR1040
CDRH, CSA, TUV approval	CDRH, CSA, TUV approval	CDRH, CSA, TUV approval	CDRH, CSA, TUV approval
<ol style="list-style-type: none"> <li>Assumes worst-case fiber loss of 2 to .25 dB/KM. 100 KM possible under certain conditions.</li> <li>Multimode cable is supported but requires a Mode Conditioning Patch Cable.</li> <li>Insertion loss estimate for this calculation is 3.</li> <li>See CWDM data sheet for loss budget information</li> <li>MMX uses Mode shifting technology and a high power laser to achieve longer distances without dispersion</li> </ol>			

### Availability and Evaluation

Champion specializes in optical connectivity and maintains inventory on many transceivers. Use our 30-day "Try Before You Buy" program to evaluate **CCTx** and our transceivers.

Contact Champion Optical Network Engineering at 800-860-7466 or visit us online at [www.championone.net](http://www.championone.net) for more information

**Inside CCTx: A New Way to 1000BaseX**

In the past, Data Communication Networks utilized Fiber Optic cabling for two main reasons: 1) Speed and 2) Distance. Copper cabling allowed data to travel 100 Meters and until very recently, only at 100Base-T speeds. This limitation led to the prolific installation of fiber optics in the late 1990s. Large LANs could be connected through MANs and WANs at light speed without bottlenecks.

Today, the only reason to transmit a Gigabit of data using fiber optics is distance. Category 5/5e/6 cabling and fiber optic cabling both send data at the same speed. *With more and more 1000Base-T ports available, cost effectively and intelligently connecting Gigabit Ethernet ports has become a problem as well as an opportunity to save money.*

CCTx enables network managers to leverage the lower cost copper ports and avoid the expensive optical transceivers from leading Network OEMs by putting the optical link (the Physical Layer) in a separate device designed specifically for that purpose. While the distance of optical network connectivity has grown from 250 M on Multimode and 5 KM on Single mode to 2 KM on Multimode and 120 KM on Single mode, the distance limitation of sending data over copper has remained at 100 Meters. *The speed of data over copper, however, has caught up.*



CCTx operates at the Physical Layer of the OSI model. The silicon chip that manages the optical to copper conversion is the same one found inside many network switches. Champion programs the chip to convert the signals from the copper to the optical port.

**Reliable Physical Layer Networking**

Adding another device to a network can add additional risk. CCTx has been designed to minimize this risk: the entire optical to copper conversion is done in silicon; the power supply is an enterprise quality device used in many switches from today's leading Network OEMs is rated to 70°C. An option for DC power fail-over or redundant AC power further mitigates the risk of using CCTx for optical transport.

**Diagnostics and Management through the CDM**

An upgrade to CCTx features real-time monitoring and system level feedback through a 10/100 Base-T port. An HTTP client or SNMP network-monitoring tool can access the **CDM** or **Communications Diagnostic Module** over any IP-based network.

**CDM Diagnostic information**

The chassis itself can also be managed: the power supply status, first power on, time of last power on, and, critical to the life of the optical transceiver and power supply, the amount of power being used is reported. Alarms can be set to trigger an event should something malfunction.

**CDM Port Information**

Each port on CCTx identifies the type of SFP installed, the distance it should transmit, and the state of the link. Champion's transceivers all feature the digital diagnostics operation so the actual power budget for the link and the transceiver temperature can be reported. A memory location in the CCTx allows users to define the name of the link.



Port	Location	Link	Tx Power	Rx Power	Alarms
1	Cleveland	OK	-4.567 dBm	-4.225 dBm	OK
2	Location	NO	N/A	N/A	N/A
3	Dayton	OK	-4.625 dBm	-4.690 dBm	OK
4	Location	NO	N/A	N/A	N/A



<b>Transceiver Information</b>		<b>Link Status</b>	
Type:	1000BASE-LX	Link Status:	OK
Distance:	10 km (9µm)	Up Time:	0 days 00:01:12
Manufacturer:	CCT	<b>Transceiver Status</b>	
Part Number:	1000SFP10F	Tx Power:	-4.569 dBm OK
Serial Number:	P5A114S	Rx Power:	-4.259 dBm OK
<b>Port Definition</b>		Tx Bias:	1.493 mA OK
Location:	Cleveland	Voltage:	3.326 V OK
		Temperature:	45.18 °C OK

## Applications



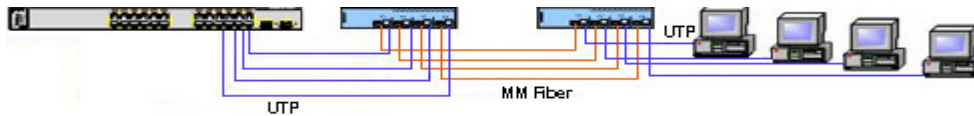
### TWO LOCATIONS, POINT TO POINT

The 1000Base-T ports on a Network OEM switch are connected to CCTx and the Long or Extended Reach fiber optic run is connected at a lower cost. Champion's SFPs allow IT managers to design networks with LX, ZX or our Intermediate Range optics.



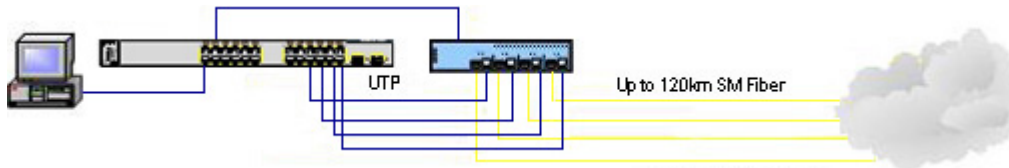
### TWO LOCATIONS, POINT TO MULTI-POINT

IT managers can reduce optical link costs by not buying optical NIC cards for servers and leveraging the copper connectivity of CCTx. Further, the servers can be located in any location and connected without VLAN switching or routing setup time.



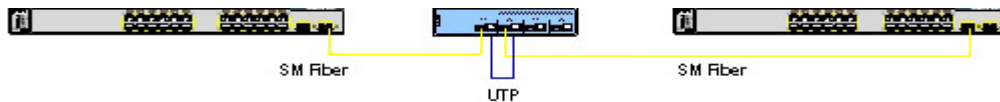
### ONE LOCATION, POINT TO MULTI-POINT

Rather than running fiber optic cable to each desktop, CCTx allows a remotely installed conversion without a network equipment rack. A CCTx4 links the copper ports of a switch to another CCTx4 in an office area; individual media converters are not needed saving on installation and hardware costs.



### EDGE SWITCHING AND MONITORING

A CDM is installed in the CCTx connecting back to the main network switch. Information on the multiple fiber optic connections such as dB loss and transceiver status is available via a web browser or SNMP client. The CDM uses DHCP or static IP addressing.



### FIBER OPTIC REPEATER, SINGLE OR MULTIPLE WAVELENGTH

CCTx4-CDM is used as an optical repeater extending the distance that single or CWDM wavelengths can run. With the multi-port capability, the copper ports are linked providing complete signal regeneration without the need for a Layer 2 or 3 switch at a midpoint.

## Ordering Information

Product Number	Description	Port Information
CCTx2	2-Port Converter, AC Power	2 RJ45, 2 SFP slots
CCTx4 or 4-2	4-Port Converter, AC Power	4 RJ45, 4 SFP slots, 4 or 2 SFPs
CCTx4-2 or 4-CDM	4-Port Converter, CDM installed, AC Power	4 RJ45, 4 SFP slots; CDM: 1 RJ45 10BaseT & 1 RJ45 serial
CCTx4-Supply	Redundant External AC Supply	CCTx4-CDM
CCTx12 or 12-6-CDM	12-Port Converter, CDM installed, AC Power	12 RJ45, 12 SFP slots; CDM: 1 RJ45 10BaseT & 1 RJ45 Serial
CCTx24 or 24-12-CDM	24-Port Converter, CDM installed, AC Power	24 RJ45, 24 SFP slots; CDM: 1 RJ45 10BaseT & 1 RJ45 Serial
CCTx12/24-Supply	Redundant External AC Supply	CCTx12/24-CDM
1000SFP055-CCTx	SFP 550 Meter Multimode Gigabit Transceiver	Duplex LC
1000SFPMMX-CCTx	SFP 2 KM Multimode Gigabit Transceiver	Duplex LC
1000SFP10-CCTx	SFP 10 KM Single Mode Gigabit Transceiver	Duplex LC
1000SFP40-CCTx	SFP 40 KM Single Mode Gigabit Transceiver	Duplex LC
1000SFP80-CCTx	SFP 80 KM Single Mode Gigabit Transceiver	Duplex LC
1000SFP120-CCTx	SFP 120 KM Single Mode Gigabit Transceiver	Duplex LC
CCTx2/4-1URM-Kit	Single Unit Rack Mount Kit	Two rack mount brackets to hold one unit
CCTx2/4-2URM-Kit	Double Unit Rack Mount Kit	Two rack mount brackets and one U bracket to hold two units
FIBER-LC-SC-ADAPTER	Adapter to convert SC Male to LC Male LC end	SFP

Contact Champion Optical Network Engineering at 800-860-7466 or visit us online at [www.championone.net](http://www.championone.net) for more information  
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