Cisco ONS 15454 Timing, Communications, and Control Version Two Cards

Product Overview

The Cisco TCC2 and TCC2P cards (Figure 1) provide a next-generation system processor for the Cisco ONS 15454 MSPP. The Cisco TCC2 and TCC2P cards perform system initialization, provisioning, alarm reporting, maintenance, diagnostics, IP address detection and resolution, SONET and SDH data communications channel (DCC) termination, system DC input-voltage monitoring, and system fault detection. The cards reside in slots 7 and 11 of the shelf assembly, providing 1:1 equipment protection.

The Cisco TCC2 and TCC2P cards incorporate a highly stable Stratum 3 internal timing reference to provide system timing based on input received from an external Building Integrated Timing Supply source or from an incoming SONET or SDH optical signal. Synchronous status messaging helps the system to select the best timing sources, and a holdover mode maintains timing accuracy in the event that preprovisioned synchronization references are not available.

Figure 1. Cisco ONS 15454 TCC2 Card

Nonvolatile database storage for communication, provisioning, and system control is provided, allowing full database recovery and survivability with complete system power loss. In addition, short-term clock recovery is also supported, reducing the need to reset the calendar and time-of-day settings after a brownout or complete power outage.

The Cisco TCC2 and TCC2P cards have two built-in interface ports for accessing the system: an RJ-45 connector and an RS-232. The RJ-45 port provides 10BASE-T Ethernet connectivity to the system, providing local and remote access to the craft-management system, Cisco Transport Controller, through a common Web interface. This port can also be used for interconnection to customer operations support systems (OSSs) and network management systems (NMSs), providing integration to external element management systems (EMSs), NMSs, and OSSs.

The Cisco TCC2P card provides additional security enhancements, allowing users to configure the front-panel and rear or Front Mount Electrical Connection (FMEC) Ethernet interfaces as regenerators or provision them with individual IP and MAC addresses for segregated craft and DCC access. The RS-232 port provides a serial ASCII interface for local craft access using VT100 emulation so that Transaction Language 1 (TL1) commands may be directly entered over a Telnet session without the assistance of a browser.

The front panel of the Cisco TCC2 and TCC2P cards provide multicolored LEDs for a quick view of the status of the card activity, raised network alarms, shelf voltage input, LAN interface, and synchronization. Two front-panel buttons allow users to quiet an active external audible alarm (alarm-cutoff button) or test the working state of system LEDs. The Cisco TCC2 and TCC2P cards are supported beginning with the Cisco ONS 15454 MSPP Release 4.0.0 system software for both the SONET and SDH platforms. Deployed networks may consist of nodes equipped with either Cisco Timing, Communications, and Control Plus (TCC+) or Cisco TCC2 or TCC2P processor cards. Nodes operating with previous versions of TCC processor cards can be upgraded, in service, to the new Cisco TCC2 or TCC2P, allowing migration to post-Release 4.0 software loads and possible future features.

Features and Benefits

The Cisco ONS 15454 TCC2 and TCC2P cards provide the following feature set:

- 84 section DCC (SDCC) and multiplex section DCC (MSDCC) terminations[1] allow the interconnection of multiring and linear systems on a
- single shelf assembly, reducing networking costs.
- 84 SDCC tunnels or SDCC-to-line DCC (LDCC) tunnels provide interface flexibility for transparent transport of third-party DCC overhead channels.
- Integrated system input-voltage monitoring facilitates proactive identification of DC power-system issues.
- Time-and-date clock recovery after brownout or power loss prevents clock reprogramming.
- Complete shelf lamp test through faceplate pushbutton simplifies technician LED maintenance testing.
- Local and remote craft user access allows technicians to access nodes from anywhere.
- Local audible alarm cutoff squelches office audible or visual alert systems.

Additionally, the Cisco TCC2P card offers the following enhanced features:

- Enhanced security capabilities through provisionable Ethernet ports allow better control over system- and network-level access.
- HW readiness for for 64-kHz+8-kHz composite timing inputs and 6-MHz composite timing support.

Feature Availability

Table 1 outlines the feature availability supported on the Cisco ONS 15454 TCC2 and TCC2P

Table 1. Feature Availability

Feature	Platform Support	Supported Card	Availability
DCC terminations	SONET/ANSI and SDH/ETSI	TCC2 or TCC2P	Release 4.0: 32 DCCs Release 4.6: 68 DCCs
Rings per shelf (maximums)	SONET/ANSI and SDH/ETSI	TCC2 or TCC2P	Release 4.0: 1x 4F-BLSR/MS-SPR; 2x 2F-BLSR/MS-SPR; 16x UPSR/SNCP Release 4.6: 1x 4F-BLSR/MS-SPR; 5x 2F-BLSR/MS-SPR; 34x UPSR/SNCP
Secure-mode supporting 2 MAC and 2 IP addresses	SONET/ANSI and SDH/ETSI	TCC2P	Release 5.0
64-kHz + 8-kHz timing input	SONET/ANSI	TCC2P	HW ready
8-MHz timing output	SONET/ANSI	TCC2P	HW ready

Summary

The Cisco ONS 15454 MSPP equipped with TCC2 or TCC2P cards provides significant advantages over traditional SONET/SDH opticaltransport network elements, including the following:

- Multiservice capabilities – The Cisco ONS 15454 provides support for TDM-based, private-line interfaces (DS-1/E1, DS-3/E3, and OC-3/STM-1 through OC-192/STM-64) along with advanced 10/100/1000-Mbps Ethernet and future storage area network (SAN) interfaces, thus simplifying a service provider's migration to new revenue opportunities and an enterprise's multiple technology transport needs.
- Integrated, flexible optical networking – Optical transport speeds from OC-3/STM-1 to multiwavelength OC-192/STM-64 are supported to allow the proper level of bandwidth to be deployed for the user application. Supporting in-service bandwidth upgrades and an integrated span upgrade wizard, the Cisco ONS 15454 allows the user to keep pace with growing network demands.
- Flexible architecture – The Cisco ONS 15454 supports ring, linear point-to-point, linear add/drop multiplexer (ADM), and mesh networking topologies to employ many technologies, including 2- and 4-fiber bidirectional line switched ring (BLSR) and multiplex section subnetwork protection ring (MS-SPR) with protection channel access, unidirectional path switched ring (UPSR) and subnetwork connection protection (SNCP), linear automatic protection switching (APS) and subnetwork connection (SNC), and Path Protected Mesh Networking (PPMN SONET only). Networks can be built using a combination of architectures and protection technologies to meet the needs of the defined services to be transported or delivered.
- Comprehensive and efficient network management – A full complement of TDM, SONET, and Ethernet statistics are provided to allow for the proper operation maintenance of the network. Additionally, network management is simplified through a common Data Communications Network (DCN) connection and user access to TDM, Ethernet and optical operations, administration, maintenance, and provisioning functions.
- Competitive first- and long-term costs – Advanced capabilities are only practical when a system is affordable enough to deploy and deliver a return on the investment. The Cisco

ONS 15454 was designed for ease of use, therefore speeding installation time, decreasing personnel training requirements, and simplifying equipment maintenance. An integrated browser-based, point-and-click, craft user interface allows even an untrained user to quickly set up and provision services across an entire network using helpful networkwide provisioning wizards.

Product Specifications

Table 2 and Table 3 outline the specifications for the Cisco ONS 15454 TCC2 and TCC2P cards.

Table 2. Product Specifications

Countries	
SONET platform	Canada European Union Hong Kong Japan Korea Mexico United States
SDH platform	Australia China European Union Hong Kong Korea Mexico New Zealand Singapore
Electromagnetic compliance (EMC) – Class A	ETSI 300-386-TC Telcordia Technologies Network Equipment Building Standards (NEBS) GR-1089-CORE, Issue 3 (Level 3, Type 2 and Type 4) CISPR 22, CISPR 24 IC ICES-003 Issue 3, 1997 FCC 47CFR15 EN55022, EN55024
Product safety	Telcordia Technologies NEBS GR-1089-CORE, Issue 3 Level IEC 60950-1/EN 60950-1, 1st Edition UL and cUL/CSA 60950-1 1st Edition (Level 3, Type 2 and Type 4)
Environmental	Telcordia Technologies NEBS GR-63-CORE, Level 3 ETS 300 019-2-1 (Storage, Class 1.1) ETS 300 019-2-2 (Class 2.3) ETS 300 019-2-3 (Class 3.1E)
Customer requirements	AT&T Network Equipment Design Specification (NEDS) SBC (TP76200MP) Verizon TCG Checklist MCI/Worldcom ESD

Table 3. Product Specifications

Attribute	TCC2 Value	TCC2P Value
Hardware components		
Processor speed	400 MHz	
Nonvolatile memory (Flash)	256 MB	
Volatile memory (synchronous dynamic RAM)	256 MB	
Timing		
Internal clock	Stratum 3	
SONET inputs	1.544-Mbps T1 framed/unframed	
SONET outputs	2 x 1.544-Mbps T1 framed/unframed	

Attribute	TCC2 Value	TCC2P Value
SDH inputs	2.048-Mbps E1 2.048-MHz composite	
SDH outputs	2.048-Mbps E1 2.048-MHz composite	
Japan SONET inputs	–	64-kHz + 8-kHz composite (HW ready)
Japan SONET outputs	–	6.312-MHz composite (HW ready)
Physical card interfaces		
LAN_1	RJ-45, 10BASE-T Ethernet	
Craft	DB-9, RS-232 serial, DTE	
TL1	9.6 K baud	
Management		
Card LEDs		
Failure (FAIL)	Red	
Status (ACT/STBY)	Green/yellow	
System LEDs		
Critical (CRIT)	Red	
Major (MAJ)	Red	
Minor (MIN)	Yellow	
Remote (REM)	Red	
Synchronization (SYNC)	Green	
Alarm cutoff (ACO)	Green	
Power A (PWR-A)	Green/amber/red	
Power B (PWR-B)	Green/amber/red	
Port LEDs		
LAN link (LINK)	Green	
LAN activity (ACT)	Amber (flash)	
Section/multiplex section overhead		
SDCC/MSDCC terminations	84	
SDCC/MSDCC tunnels	84	
Input voltage monitoring (per input)[2]		
–48 VDC nominal systems Less than –40.5 VDC –40.5 to –56.7 VDC Greater than –56.7 VDC –60 VDC nominal systems Less than –50.0 VDC –50.0 to –72.0 Greater than –72.0 VDC	GR-499-CORE and ETS 300 132-2 Major alarm, red LED Normal, green LED Major alarm, red LED ETS 300 132-2 Annex A Major alarm, red LED Normal, green LED Major alarm, red LED	
Power		
Nominal	19.2W	21.8W
Maximum	26W	26W
Physical		
Size (H x W x D)	Single card slot 12.65 x 0.72 x 9.00 in. (32.13 x 1.83 x 22.86 cm)	
Weight	2.05 lb/0.93 kg	
Operating environment		
Temperature	–40 to 149°F (–40 to 65°C)	
Humidity	5 to 95%, noncondensing	
Storage environment		
Temperature	–40 to 185°F (40 to 85°C)	
Humidity	5 to 95%, noncondensing	

System Requirements

Table 4 outlines the system requirements for deploying the Cisco ONS 15454 TCC2 and TCC2P cards.

Table 4. System Requirements

Component	Cisco ONS 15454 SONET	Cisco ONS 15454 SDH
Shelf assembly	15454-SA-NEBS 15454-SA-NEBS3E 15454-SA-ANSI 15454-SA-HD	15454E-SA-ETSI version
Processor[1]	1+1	1+1
Cross-connect	XC XC-VT XC-10G XC-VXC-10G	XC-10G XC-VXL-10G XC-VXL-2.5G XC-VXC-10G
System software	Release 4.0.0 or later [2]	Release 4.0.0 or later [2]
Shelf slot compatibility	7 and 11	7 and 11

1. Versions TCC2 and TCC2P cards can be deployed within the same shelf, but the features supported will be that of the TCC2 card.

2. Functions of TCC2P card are equivalent to TCC2 card when operated with system software releases prior to 5.0.

Ordering Information

Table 5 lists the ordering information for the Cisco ONS 15454 TCC2 and TCC2P cards. To place an order, visit the Cisco Ordering Home Page.

To place an order, visit the Cisco Ordering Home Page. To download software, visit the Cisco Software Center.

Table 5. Ordering Information

Product Description	Part Number
Timing, Communications, and Control rated, SONET platform Card, Version 2 Plus, enhanced security, industrial temperature	15454-TCC2P-K9
Timing, Communications, and Control rated, SDH platform Card, Version 2 Plus, enhanced security, industrial temperature	15454E-TCC2P-K9
Timing, Communications, and Control Card, Version 2, industrial temperature rated, SONET platform	15454-TCC2
Timing, Communications, and Control Card, Version 2, industrial temperature rated, SDH platform	15454E-TCC2

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For More Information

For more information about the Cisco ONS 15454 MSPP, visit http://cisco.com/en/US/products/hw/optical/ps2006/index.html or contact your local account representative.

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