



## DATA SHEET

# CISCO 8 PORT T1 E1 MULTIPROTOCOL SERVICE MODULE FOR THE CISCO MGX 8800 SERIES SWITCHES AND THE CISCO MGX 8200 SERIES EDGE CONCENTRATORS

The Cisco® 8-Port T1/E1 Multiprotocol Service Module (MPSM) is an 8-port T1 or E1, single-height service module for use in the Cisco MGX® 8800 Series switches and the Cisco MGX 8200 Series edge concentrators. The MPSM delivers connectivity from DS-0 to T1/E1 speeds. It supports the same functions as the 8-port Frame Relay service modules (FRSMs), ATM user service modules (AUSMs), and Circuit Emulation service modules (CESMs) currently deployed and is meant to be a replacement for these cards. The new service module also supports additional features listed in the following section.

## PRIMARY FEATURES

- Any-service any-card (ASAC) function, which reduces operation and deployment costs because one MPSM card can act as a FRSM, AUSM, or CESM
- Built-in bit-error-rate-test (BERT) testing
- Inverse Multiplexing over ATM (IMA) 1.0 and IMA 1.1 along with IMA Restart capability
- Support for multiple ATM frame sizes from 32 to 256 bytes
- Independent Transport Clock (ITC) and Common Transmit Clocking (CTC) clocking modes
- Support for FRF 8.1 Frame Relay-to-ATM service interworking
- Mixed-mode 1:N redundancy support to ease sparing requirements
- Hitless replacement and upgrade for current 8-port FRSM, AUSM, and CESM service modules\*  
Not fully compatible with MGX-CESM-8T1/B.

## ORDERING INFORMATION

Table 1 gives ordering information for the Cisco 8-Port T1/E1 MPSM.

**Table 1.** Ordering Information for Cisco 8-Port T1/E1 MPSM

Product Number	Description
MPSM-8-T1E1(=)	8-port T1/E1 MPSM
AX-RJ48-8T1(=)	8-port T1 RJ-48 backcard
AX-R-RJ48-8T1(=)	Redundancy backcard, supporting 8-port T1 MPSM
AX-RJ48-8E1(=)	8-port E1 RJ-48 backcard
AX-R-RJ48-8E1(=)	Redundancy backcard, supporting 8-port E1 MPSM
AX-SMB-8E1(=)	8-port E1 Subminiature (SMB) backcard
AX-R-SMB-8E1(=)	Redundancy backcard, supporting 8-port E1 MPSM
MPSM-RC-8-LIC(=)	ForeSight or standard available-bit-rate (ABR) license for Frame Relay services on the Cisco 8-port T1/E1 MPSM



To order your Cisco 8-Port T1/E1 MPSM and appropriate license, go to: (Cisco.com login is required to view this content)

<https://tools.cisco.com/qtc/config/jsp/configureHome.jsp>.

## User Documentation

As of August 2004, user documentation for Cisco MPSM licensing is in Appendix F of the “Cisco MGX 8850 (PXM1E/PXM45), MGX 8950, MGX 8830, and MGX 8880 Configuration Guide, Release 5,” at

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/8850px45/rel5/scg/mgx5scg.pdf>.

Additional information about Cisco MPSM cards is under the Cisco MGX product listings at

<http://www.cisco.com/univercd/cc/td/doc/product/wanbu/index.htm>, starting with “Release 5.”

## TECHNICAL SPECIFICATIONS

### Physical Layer Interface

T1/E1

Table 2 gives technical specifications of the Cisco 8-Port T1/E1 MPSM.

**Table 2.** Technical Specifications of Cisco 8-Port T1/E1 MPSM

Type of Backcard	T1	E1
Port speed	1.544 Mbps	2.048 Mbps
Cell transfer delay	3623 cells/sec	4528 cells/sec (G.704), 4830 cells/sec (clear channel)
Number of physical ports on MPSM cards	8	8
Number of ports on backcards	8	8
Line coding	Binary 8-zero substitution (B8ZS) or alternate mark inversion (AMI)	High-density bipolar three (HDB3) with AMI
Line framing	ANSI T1.408 Super Frame (ESF) format line framing	ITU-T G.704 16 frame multiframe line framing and clear channel
Port media	100-ohm twisted-pair or 75-ohm co-axial	120-ohm twisted-pair
Port connector	RJ-48	RJ-48, SMB
Cell mapping	Direct	Direct
Redundancy	1:N	1:N

## ATM Layer

- Configurable for IMA trunk or User-Network Interface (UNI) application
- Conformant to ATM Forum UNI 3.0 and 3.1 specifications and ITU-T I.361 and I.432 specifications
- Supports up to 16 classes of service (CoSs) and includes all ATM Forum traffic type services: ABR, unspecified bit rate (UBR), non-real time variable bit rate (VBR-nrt), real-time variable bit rate (VBR-rt), and constant bit rate (CBR); supports ABR for explicit forward congestion indication (EFCI), RM marking, and ER stamping; supports IP quality of service
- Supports ABR with virtual source and virtual destination
- Supports early packet discard (EPD) and partial packet discard (PPD)
- Supports Weighted Random Early Detection (WRED)
- Supports per-virtual circuit queuing for traffic scheduling
- Supports per-virtual circuit traffic shaping on egress
- Supports per-virtual circuit policing
- Supports 32 virtual interfaces on egress
- Supports virtual path termination
- Supports Integrated Local Management Interface (ILMI) 4.0
- Complies with standard usage parameter control (UPC) per ATM Forum UNI 3.x, TM 4.0, and ITU-T I.371
- Supports virtual circuit connections (VCCs) and virtual path connections (VPCs)
- Supports virtual-path-identifier (VPI) and virtual-circuit-identifier (VCI) range for VCCs and VPCs per UNI 3.1
- Supports virtual circuit merge for egress and multipoint connections
- Supports usage policing on all interfaces

## Frame Relay

- Supports ITU-T Q.933 Annex A, ANSI T1.617 Annex D, and Local Management Interface (LMI) local management for semipermanent virtual circuits (both UNI and Network-Network Interface [NNI] portions); enhanced LMI provides autoconfiguration of traffic management parameters for attached Cisco Systems® routers
- Supports Frame Relay-to-ATM network interworking (FRF 5) and Frame Relay-to-ATM service interworking (FRF 8 and FRF 8.1), both transparent and translation modes, configured on a per-permanent virtual circuit (PVC) basis
- Supports standards-based committed-information-rate (CIR) policing, tagging, and discarding
- Supports end-to-end ForeSight rate-based flow-control option to improve trunk use and user goodput
- Supports capability to extend ForeSight closed-loop congestion management between two Cisco networks across Frame Relay-UNI or Frame Relay-NNI using ANSI T1.618 consolidated link-layer management (CLLM) messages
- Supports Cisco IOS® Software enhancements to Frame Relay-to-ATM service interworking to allow interworking for a wider range of protocols
- Each logical port independently configurable as Frame Relay UNI or Frame Relay NNI
- Meets ANSI T1.618, using 2-octet headers

## ATM FUNI

- Supports ATM Forum Frame Relay-based UNI (FUNI) mode 1A
- Supports interpretation of CCITT-16 cyclic redundancy check (CRC) at end of the frame (frame discard if in error)
- Supports ATM Adaption Layer 5 (AAL5) mapping of user payload to ATM
- Supports 16 VPI values (15 plus the zero VPI); supports virtual path connections (VPCs) for all nonzero VPI values (up to 15 VPCs)
- Supports 64 VCI values
- Supports operation, administration, and maintenance (OAM) frame and cell flows
- Supports standards-based UPC
- Supports end-to-end ForeSight rate-based flow-control option (licensed option)

### **Circuit Emulation**

- The Cisco 8-Port T1/E1 MPSM supports standards-based AAL1.
- The Cisco 8-Port T1/E1 MPSM is compliant with ATM Forum Circuit Emulation Service Version 2.0 (CESv2.0).
- The Cisco 8-Port T1/E1 MPSM offers a choice of structured data transfer (SDT) or unstructured data transfer (UDT) per physical interface.
- Time slots must be contiguous for n x 64-kbps fractional T1/E1 service.
- Any n x 64-kbps channel can be mapped to any virtual circuit
- The Cisco 8-Port T1/E1 MPSM supports T1 cards up to 192 DS-0 ports (24 channels x 8 lines) operating simultaneously with each interface configurable as a single port (UDT) or up to 24 ports (SDT) running at full line rate at n x 64 kbps.
- The Cisco 8-Port T1/E1 MPSM supports E1 cards up to 248 DS-0 ports (31 channels x 8 lines) operating simultaneously with each interface configurable as a single port (UDT) or up to 31 ports (SDT) running at full line rate at n x 64 kbps.
- The Cisco 8-Port T1/E1 MPSM offers a choice of partially filled AAL1 cells per virtual circuit.
- The Cisco 8-Port T1/E1 MPSM supports Super Frame and Extended Super Frame (ESF) framing modes.
- The Cisco 8-Port T1/E1 MPSM supports synchronous clocking for both UDT and SDT.
- The Cisco 8-Port T1/E1 MPSM supports asynchronous clocking for UDT, with synchronous residual time stamp (SRTS) and adaptive clock recovery methods.
- The Cisco 8-Port T1/E1 MPSM supports ON/OFF hook detection and idle suppression using channel-associated signaling (CAS).
- The Cisco 8-Port T1/E1 MPSM allows the choice of per-virtual circuit partially filled AAL1 cell payload to improve cell delay. Type fill range (bytes):
  - T1 structured: 25–47
  - T1 unstructured: 33–47
  - E1 structured: 20–47
  - E1 unstructured: 33–47
- The Cisco 8-Port T1/E1 MPSM supports per-virtual circuit queuing in both directions and per-virtual circuit traffic shaping in the egress direction.
- The Cisco 8-Port T1/E1 MPSM supports Private Network-Network Interface (PNNI) Preferred Routing for switched permanent virtual circuits (SPVCs).
- The Cisco 8-Port T1/E1 MPSM supports customer edge-to-customer edge and customer edge-to-ATM SPVC endpoints.
- The Cisco 8-Port T1/E1 MPSM supports xPVC Cisco WAN Manager as well as PVC (portable AutoRoute [PAR]) support for feeder nodes.



### **Reliability**

- Greater than 100,000 hours mean time between failure (MTBF)

### **Physical Specifications**

- Dimensions: (H x D): 7.25 x 15.83 in.

### **Electrical Specifications**

- Input power required: (48 VDC)
- Power consumption: 36W

### **Electrical and Safety Standards Compliance**

- EMI/ESD compliance
  - FCC Part 15
  - Bellcore GR1089-CORE
  - IEC 801-2
  - EN55022
- Safety compliance
  - EN 60950
  - UL 1950
- Bellcore Network Equipment Building Standards (NEBS): Level 3 compliant



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