

Cisco MGX-FRSM-HS2/B

Serial Frame Service Modules

The Cisco Frame Relay Service Module (FRSM) designed for use with the Cisco MGX™ 8230, the Cisco MGX 8250, and the Cisco MGX 8850 PXM-1 ATM multiservice edge concentrators, supports serial, channelized, or fractional unchannelized Frame Relay lines. The Cisco MGX-FRSM-HS2/B combines the features and functionality of the existing Cisco MGX-FRSM-HS2 and FRSM-HS1/B plus additional features.

The Cisco MGX-FRSM-HS2/B is enhanced to offer high-speed serial frame service interfaces for the next generation of data networking. The serial port FRSMs offer connectivity to High-Speed Serial Interface (HSSI), V.35, and X.21 equipment, with the flexibility to operate as a physical data terminal equipment (DTE) or data communications equipment (DCE) interface.

V.35 and X21 Support

The Cisco MGX-FRSM-HS2/B supports eight ports of V.35 and X.21 frame services on a single, seven-inch function module. A new eight-port back card is required to take advantage of the increased connection and port densities of the Cisco MGX-FRSM-HS2/B.

The Cisco MGX-FRSM-HS2/B provides unchannelized Frame Relay service on a maximum of 4,000 connections, across 8 V.35 or X.21 interfaces. The maximum throughput for the card is 64 Mbps. The maximum rate on one line is 8 Mbps for each V.35 or X.21 interface.

HSSI Interface Support

The Cisco MGX-FRSM-HS2/B supports two ports of HSSI frame services on a single, seven-inch function module. Two HSSI interfaces for full-duplex communications at up to 52 Mbps using the existing back card are supported. Each HSSI line consists of a serial connector, along with three LED indicators for line status. Using the FRSM-HS2/B, up to 48 HSSI ports can be operated simultaneously on the Cisco MGX 8800 ATM multiservice switch platform.

Table 1 summarizes these interface types:

Table 1

Interface Type:	V.35/X.21	HSSI
Connections:	4000	2000
Throughput:	Up to 64 Mbps ¹	Up to 104 Mbps ¹

1. Dependent on frame size

Without the cost of a T3 or E3 card, the MGX-FRSM-HS2/B provides greater than T1 or E1 speeds on a port as well as a choice of 50 line rates in a range of 48 Kbps-52 Mbps.

Key Features

Cisco MGX FRSM cards support multiple High-Level Data Link Control (HDLC)-derivative frame service interfaces, which can be configured on a per-port basis. These service interfaces include the Frame Relay UNI, Frame Relay NNI, ATM FUNI, and frame forwarding—HDLC-transparent, providing “channel extension” support for legacy HDLC-based protocols such as Point-to-Point Protocol (PPP).

Traffic is mapped between these service interfaces and the ATM backplane using standards-compliant adaptation. Consistent with Cisco intelligent quality-of-service (QoS) management features, serial port FRSM cards support per-virtual circuit (VC) queuing on ingress and multiple class-of-service queues on egress. Together with closed loop congestion control, this provides flexible, per-VC control for connection-based service-level agreements (SLAs).

Serial Cisco MGX FRSM cards for HSSI interface can be Y-cabled to provide 1:1 hot-standby redundancy of the FRSM.

Frame Relay-to-ATM network interworking and Frame Relay-to-ATM service interworking are both supported on a permanent VC (PVC) basis.

Cisco MGX FRSM cards are supported by standards-based management tools, including Simple Network Management Protocol (SNMP), Trivial File Transfer Protocol (TFTP) (for configuration and statistics collection), and a command-line interface. The Cisco WAN Manager and CiscoView tools also provide full graphical user interface support for connection and equipment management.

With these feature options, customers can independently use either frame- or cell-based interfaces at each site, with independent selection of encapsulation techniques, such as IETF RFC 1490 or 1483, to ensure that the sites communicate.

Features

Card Specific

Cisco MGX-FRSM-HS2/B and X.21 and V.35 Interfaces:

- Eight X.21 or V.35 lines
- DCE or DTE selection on a per-port basis
- As DCE, clock speeds of 48 Kbps, 56 Kbps, n x 64 Kbps up to 2 Mbps, n x 1.5 Mbps and n x 2 Mbps, up to 8 Mbps, are supported
- As DTE, obtains clock from line, up to 8 Mbps
- Supports 4000 data-link connection identifiers (DLCIs) per card
- Support for per-VC queuing on ingress with closed-loop traffic management

- Support for two priority levels of egress port queues for data traffic
- Various DCE and DTE loopbacks

Cisco MGX-FRSM-HS2/B HSSI Interfaces:

- Two HSSI lines
- DCE or DTE interface selection on a per-port basis
- As DCE, clock speeds of n x 1.5 Mbps and n x 2 Mbps, up to 52 Mbps, are supported
- As DTE, obtains clock from line, up to 52 Mbps
- Supports 2000 DLCIs per card
- Support for per-VC queuing on ingress with closed-loop traffic management
- Support for five classes of service (high-priority, rt-VBR, nrt-VBR, ABR, UBR) for data traffic
- Various DCE and DTE loopbacks
- 1:1 redundancy with Y-cabling for Cisco MGX-FRSM-HS2/B cards

All FRSM Serial Cards

All Port Types:

- Transmitter loop-timed to receiver or synchronized to shelf
- Each logical port on an FRSM independently configurable to run Frame Relay UNI, Frame Relay, NNI, ATM FUNI, or frame forwarding
- 7E flags used to delineate frames (with bit stuffing to prevent false flags) and for interframe gaps
- One flag between frames is considered valid upon receipt
- Supports configuration of one- or two-flag minimum interframe gap for transmission
- Valid frames sizes are from five octets up to 4510 octets
- Supports up to 2000 virtual connections per card when using the HSSI interfaces, or up to 4000 virtual connections per card when using V.35 or X.21 interfaces

Frame Relay:

- Each logical port is independently configurable as Frame Relay UNI or Frame Relay NNI
- Meets ANSI T1.618, using two-octet headers
- Interpreted CCITT-16 CRC at end of the frame (frame discard if in error)
- Supports ITU-T Q.933 Annex A, ANSI T1.617 Annex D, and LMI local management for semi-permanent virtual circuits (both UNI and NNI portions)
- Enhanced LMI provides auto-configuration of traffic management parameters for attached Cisco routers

- Frame Relay-to-ATM network interworking (FRF.5) and Frame Relay-to-ATM service interworking (FRF.8), both transparent and translation modes, configured on a per-permanent virtual circuit (PVC) basis
- Cisco IOS® Software enhancements to Frame Relay-to-ATM service interworking to allow interworking for a wider range of protocols
- Standards-based committed information rate (CIR) policing and DE tagging/discarding
- End-to-end ForeSight rate-based flow-control option to improve trunk utilization and user goodput
- Capability to extend ForeSight closed-loop congestion management between two Cisco networks across FR-UNI or FR-NNI using ANSI T1.618 consolidated link-layer management (CLLM) messages
- A single set of Frame Relay traffic access parameters (for example, CIR) is configured for the logical port in frame-forwarding mode. All arriving frames are treated as if they arrived without a set DE bit. If the frame is determined to exceed the committed rate (exceeding CIR), the CLP of all cells associated with that frame are set to indicate low priority. If the frame exceeds the total rate allowed for committed and uncommitted traffic, the frame is discarded.
- Available end-to-end ForeSight rate-based flow-control option

ATM FUNI:

- ATM Forum FUNI mode 1A supported
- Interpreted CCITT-16 CRC at end of the frame (frame discard if in error)
- ATM Adaptation 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 OAM frame and cell flows
- Standards-based usage parameter control
- End-to-end ForeSight rate-based flow-control option
- Frame forwarding
- No assumptions made on the frame header format
- Interpreted CCITT-16 CRC at end of frame (with frame dropping on an error)
- If a connection is set up, all frames are routed to or from that connection; otherwise the frame is discarded
- No translation or mapping attempted between frame header bits and ATM layer EFCI and DE bits

General Card Information

Indicators:

- Per card: Active (green), standby (yellow), fail (red)
- Per line: Active and OK (green), active and local alarm (red), active and remote alarm (yellow)

Maintenance and Serviceability Features:

- Internal problem isolation loopbacks
- Hot pluggable

Reliability:

- 100,000 hours mean time before failure (MTBF)

Card Size:

- Front cards: 7.25 x 15.83 in. (18.42 x 40.20 cm)
- Back cards: 7.0 x 4.125 in. (17.78 x 10.48 cm)

Power:

- -48 VDC, 48.4W with the V.35 or X.21 interfaces
- -48 VDC, 61.4W with HSSI interfaces

Temperature Range:

- 0-50 C (32 -122 F)

Electrical and Safety Compliance:

- FCC Part 15 Class A
- CISPR Class A (EN55022)
- NEBS GR-63-CORE, GR-1089-CORE

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