# ATM OC-3c/STM-1

## Ascend ATM OC-3c/STM-1 IP Forwarding Media Card

The Asynchronous Transfer Mode (ATM) OC-3c/STM-1 IP Forwarding Media Card is an intelligent, self-contained IP forwarding engine that provides high-performance ATM OC-3c/STM-1 support for the GRF™. The ATM IP Forwarding Media Card leverages the GRF switch to deliver packets at full line speeds. Two full-duplex OC-3c/STM-1 SONET/SDH ports provide exceptional configuration flexibility and port density.

### Integrated Layer-3 switching capabilities optimize network performance

Within the GRF distributed architecture, each intelligent IP Forwarding Media Card makes Layer-3 decisions. The ATM OC-3c/STM-1 card features two processors, a large route table and memory resources to deliver the performance and capacity for demanding networks such as the Internet. The ATM card is capable of performing hardware-assisted lookups of a full route table 100 times faster than conventional software approaches.

- Aggregate throughput of up to 130,000 packets per second (pps)
- Up to 250,000 route table entries
- 8 MB buffer memory (matches speed between dissimilar media and accommodates cross-country bandwidth-delay products)

### Scalable design maximizes port density and enables full system functionality

The GRF dedicates 1 Gb/s of internal bandwidth to each IP Forwarding Media Card, maximizing the use of every port on the ATM OC-3C/STM-1 card and every slot on the GRF without performance degradation. In fact, the GRF scales linearly with every additional IP Forwarding Media Card. Because the ATM card is designed to utilize every square inch of the system, users have a high-density solution at the lowest price per port available.

### Independent, hot-swappable architecture increases uptime

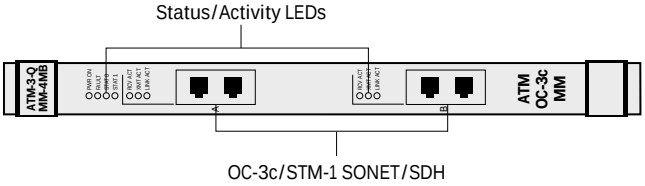
Because downtime is not an option for a network, the ATM OC-3c/STM-1 IP Forwarding Media Card has been designed so that the GRF system operates continuously.

The card is easy to install and maintain, and it automatically configures itself after initial installation.

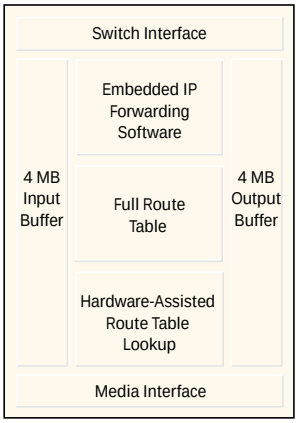
Since each card functions independently, the system continues to operate if an ATM OC-3c/STM-1 card problem occurs. Network administrators can reset the card or place it on hold until the situation has been corrected. Or they can replace the card while the system continues to operate, and the new card is configured automatically.

- Auto-configure
- Hot-swap capability
- Maintenance of each card occurs while system is on-line

### ATM OC-3c/STM-1 backpanel




### ATM OC-3c/STM-1 Architecture




### The software on the ATM card supports:

- Full IP
- UNI 3.0, 3.1
- RFCs 1577, 1483, 1755
- IP over ATM
- Traffic shaping
- SVCs, PVCs

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## Features

| | |
|---|---|
| Standard IP Routing | Performs IP datagram forwarding, header validation and processing, ICMP processing |
| IP over ATM | Encapsulation of IP datagrams and routing on ATM networks using AAL-5 and LLC/SNAP, as recommended in RFC 1483 and RFC 1577<br>VC multiplexing (null encapsulated) circuits<br>Implements inverse ATM ARP (InATMARP) |
| Traffic Shaping | Supports UBR and VBR |
| Quality of Service (QoS) | Supports two priority classes, high and low, on a per VC basis |
| UNI 3.0 and 3.1 Signaling | Configurable for either UNI 3.0 or 3.1 per interface<br>Supports SVCs between any ATM Forum-compliant devices |
| Virtual Circuits | 512 active VCs per connector, 1024 active VCs per card |
| ATM Multicast | Implements IP multicast extensions in RFC 1112 |
| ANSI Standards | Complies with ANSI T1.105-1991 and ANSI T1E1.2/93-020R1 |
| SDH (STM-1) | Complies with Synchronous Digital Hierarchy standards |
| Cables | Single Mode and multimode options |
| SNMP Monitoring | Traffic on the card is monitored by the SNMP agent (RFC 1157), which can in turn be monitored by any SNMP manager<br>MIBs include: MIB-II (RFC 1213) and the GRF enterprise MIB |
| HIPPI over ATM (tunneling) | Extends HIPPI long-distance using public carrier services<br>Tunneling transparent to HIPPI hosts<br>Transfers all HIPPI protocols, IP, IPI-3, etc., per ANSI X311, Project 1026 |

## Internet Standards

| | |
|---|---|
| RFC 791 | Internet Protocol |
| RFC 792 | Internet Control Message Protocol |
| RFC 1112 | Host Extensions for IP Multicasting |
| RFC 1157 | A Simple Network Management Protocol |
| RFC 1191 | Path MTU Discovery |
| RFC 1213 | TCP/IP Managemenet Information Base |
| RFC 1483 | Multiprotocol Encapsulation over ATM Adaptation Layer-5 |
| RFC 1577 | Classical IP and ARP over ATM |
| RFC 1626 | Default IP MTU for use over ATM AAL-5 |
| RFC 1755 | ATM Signaling Support for IP over ATM |

## Specifications

| | |
|---|---|
| Transfer Rate | 155 Mbps |
| Transmission Distance | LAN; WAN distances with use of repeaters |
| Interfaces Per Card | 2 full-duplex OC-3c/STM-1 SONET/SDH |
| Cable Requirements | Single-mode cables: 9/125 micron optical fiber<br>Multimode cables: 62.5/125 micron optical fiber |
| Physical Connectors | Duplex 9-pin SC transceivers |
| Connector Requirements | Must meet JIS C 5973 standards |
| LASER Components | Class 1, 1,310 nm LASER diodes |
| Optical Input (avg.) | -32.5 dBm minimum, -14 dBm maximum (SM) |
| Optical Output (avg.) (9/125 um) | -14 dBm minimum, -8 dBm maximum (SM)<br>-19 dBm minimum, -14 dBm maximum (MM) |
| Optical Wavelength | 1,261 nm minimum, 1,310 nm typical, 1,360 nm maximum (SM)<br>1,270 nm minimum, 1,310 nm typical, 1,380 nm maximum (MM) |
| Spectral Width | 7.7 nm maximum (SM)<br>120 nm typical, 200 nm maximum (MM) |
| Card Dimensions | 9 in x 16 in [22.9 cm x 40.6 cm] |
| Card Weight | ~2 lbs [0.9 kg] |
| DC Power Supplies | +5.0 V @ (max) 9 amps = 45 watts max |
| Hot-swap Capability | Yes |
| Operating Requirements | Temperature: 32-104˚F [0-40˚C]<br>Relative Humidity: 10-90% (noncondensing) |

SM = Single Mode
MM = Multimode

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