A-1000

12 T1/E1 Access Platform for ATM and Frame Relay Traffic

The ASC product family is the broadband services access platform for service providers' points of presence (PoPs). ASC dramatically lowers the cost of delivering broadband services, including capital equipment, provisioning, rack space, trunks, and upstream switch costs.

A-1000 aggregates ATM, inverse multiplexing over ATM (IMA), frame relay and multilink frame relay (MFR) traffic from 12 T1/E1circuits and an optional T3/E3 connection. Using state-of-the-art MultiStream™ technology, A-1000 delivers ATM and frame relay-based services, including hybrid voice, video, and data services over fractional, single or multi-T1/E1 connections. Inherently scalable, A-1000 operates either as standalone in its single-slot chassis, or as an access card in the 18-slot A-4000.

MultiStream Technology   ASC's groundbreaking MultiStream technology offers maximum flexibility to provide just the right access bandwidth — from fractional T1/E1 to NxT1/E1 levels — through any port and with any protocol. MultiStream software adds incremental bandwidth capacity remotely, without interrupting service.

- *NxT1/E1 Options*   Supports bundling of T1s/E1s with IMA and MFR to fill the cost and bandwidth gap between T1/E1 and T3/E3. Up to four groups supported.
- *Software Configurable Ports*   All ports are individually and remotely software configurable for ATM, IMA, frame relay, or MFR.
- *ATM-Frame Relay Interworking*   Converts traffic between protocols using FRF.5 and FRF.8.

Multiple Trunk Options   The network-side port can be any T1/E1, an IMA or MFR group, or the optional T3/E3.

Virtual Path Cross Connect   Establishes blocks of connections with a single configuration step to eliminate repetitive provisioning tasks.

Quality of Service (QoS) Support   Advanced traffic engineering supports multiple service classes to enable value-added service level agreements and integrated services.

Compact   12 T1/E1 ports, optional T3/E3 port in single rack unit (1 RU) chassis.

Management Support   Includes Web-based element manager, full SNMP agent, CLI, and configuration-file downloads.

Carrier Class   A-1000 is NEBS-3 certified, and has internal stratum level 3 timing.

Benefits

Affordable PoPs   ASC offers low entry cost and "pay as you grow" scaleability. Innovative packaging, with industry-leading density, minimizes space costs.

Remote Provisioning   Improve customer responsiveness. By choosing protocols and configuring ports remotely, you speed provisioning and eliminate costly onsite visits.

Reduce Trunk Facilities Costs   By aggregating with multiple network trunk options, you can "rightsize" trunks to exploit statistical gain and eliminate wasted bandwidth.

Reduce Switch Costs   By aggregating and adapting lower-speed lines to a high speed, single protocol network trunk, you avoid wasting expensive core switch capacity.

Adapt to the Future   ASC flexible software protocol engine prepares your network to adapt to additional protocols, such as IP, and new functions with software upgrades.

A-1000 Specifications

A-1000 Network Interfaces
12 DSX-1 Ports
- Connector: 50-pin amphenol female, rear panel
- ATM speed: clear channel at full T1
- FR speed: full/fractional (Nx64) T1
- Frame formats: SF (D4) or ESF
- Line codes: B8ZS, AMI

1 DS-3 Port option for single-slot chassis
- Connector: dual BNC, 75W, rear panel
- Speed: clear channel at full DS-3
- Frame formats: C-bit or M23
- Line code: B3ZS

A-1000E Network Interfaces
12 E1 Ports
- Connector 50-pin amphenol female, rear panel
- ATM speed: clear channel at full E1
- FR speed: full/fractional (Nx64) E1
- Frame formats per ITU-T G.704:
    E1-CRC CAS enabled
    E1-CRC CAS disabled
    E1-CAS disabled
    E1-CAS enabled
- Line code: HDB3 or AMI

1 E3 Port option for single-slot chassis
- Connector: dual BNC 75Ω rear panel
- Speed: clear channel at full E3
- Frame formats:
    ITU-T G.832 ADM mapping
    ITU-T G.751 ADM mapping
    ITU-T G.751 PLCP mapping
- Line code: HDB3

Protocol Support
ATM
- ATM UNI 3.0, 3.1, 4.0
- Virtual UNI on network-side port
- ILMI
- Connections: VPCC, PVCC, PVPC
- Class of service categories:
    CBR, nrtVBR, rtVBR, and UBR
- Per VC queuing
- 14 assignable priorities plus one default priority
- Informational CAC
- Traffic policing: single and dual leaky bucket
- Congestion control: AAL5 autodetect with EPD and PPD procedures

IMA (Orderable Option)
- ATM Forum inverse multiplexing over ATM (IMA) 1.0, 1.1
- Up to four groups; up to eight circuits per group

Frame relay
- UNI (FRF.1.1 and FRF.4)
- NNI (FRF.2.1 and FRF 10)
- LMI/annex A, annex D, gang of four
- CIR policing, FECN/BECN
- Per VC queuing
- 14 assignable priorities plus one default

MFR (Orderable Option)
- Frame relay forum FRF.16 multilink frame relay; FRF.12 fragmentation
- Up to four groups; up to six circuits per group
- MFR available for access or network ports

ATM-to-frame relay interworking
- Network interworking FRF.5
- Service interworking FRF.8 – transparent mode & translation mode
- ILMI/LMI interworking
- EFCI-to-FECN/BECN mapping
- CLP-to-DE mapping

Management & User Interface
- HTTP manager for standard Web-browser access
- Full SNMP v1 agent includes traps for dynamic alarming
- FTP Agent for ASCII configuration via 10base2 or in-band
- CLI manager via telnet over 10Base2 (BNC) or craft port (front panel DB-9 female connector) or in-band
- Extensive physical layer and network protocol statistics
- Detailed status per-port and per-connection with user-configurable polling

Timing Sources
- Internal timing: free-running stratum level 3
- External timing: BITS A and B primary reference source via wire wrap pins
- Line timing: from any T1/E1 or T3/E3 interface
- User-definable timing hierarchy

Alarms, Visual Diagnostics and File System
- Event and alarm log with timestamps in NV RAM
- Physical port and VC statistics collection in NV RAM
- Critical, major and minor alarm contact closures with front panel LEDs and alarm cut off
- Front panel LEDs for power, timing, fan fail and each T1/E1 and T3/E3
- Alarms: RDI, LOS, LOF, OOF, AIS
- Loopbacks: line or payload
- Field-upgradeable FLASH file system holds dual code loads and configurations; upload and download by FTP
- BERT line testing any access or network port

Certifications
- Safety: UL 1950, EN 60950/IEC950, CSA 22.2 950
- Emissions: EN 55022/CISPR 22, FCC Part 15 Class A
- Immunity: EN 61000
- NEBS level 3: GR-1089, GR-63
- CE approved

Environmental
- Size: 1.75" (1U) H x 19"W x 18"D
- Rackmountable, center or flush mount
- Operating temp: 0° to 40° C, short term -5° to 50° C
- Temperature storage: -40° to 70°C
- Humidity: 5% to 80% (relative, non condensing)
- Weight: 9 lbs.
- Dual voltage input feeds: -48 VDC @ 1.7A
- Optional external AC power supply
- Typical DC power: under 50 watts, 168 BTU
- Max DC power: 85 watts, 286 BTU
- Cooling: field serviceable air filter and fan tray with redundant fans

Ordering Information
- Base System:
    Available in T1 and E1 versions
    12 T1 or E1 ports
    Rackmountable chassis
- Orderable options:
    DS-3 mux port (E3 for A-1000E)
    IMA
    MFR
    ATM-to-frame relay interworking
    External AC power supply

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