

# A-1200

## Carrier Ethernet Access Switch

The Nokia Siemens Networks A-1200 Carrier Ethernet Access Switch has been developed specifically for delivering MEF-based E-Line, E-LAN and E-Tree services in the most mission-critical customer environments both for Business Applications and Mobile Backhaul. The A-1200 plays an important role in the Nokia Siemens Networks Carrier Ethernet Transport (CET) E2E Solution.

This 1U MEF-certified device is equipped with DC or AC power supplies, redundant fans and a dry contact alarm interface for alarm management. The A-1200 supports an industrial temperature range making it suitable for location at a cell site or as an outdoor cabinet switch that enables the backhauling of 2G, 3G and future LTE data to the BSC/RNC sites.

In addition to business services & mobile backhaul applications, with Nokia Siemens Networks' industry-leading Circuit Emulation Service support, the A-1200 can help service providers to seamlessly migrate TDM-based traffic over a high-performance, cost-effective Carrier Ethernet network.

### Features

- Carrier-class features such as N+1 fan redundancy and dry contact
- Multi-service enabled, including E-Line, E-LAN, E-Tree, and CES services, in a single device
- CES support including E1/T1, STM-1/OC-3\* with 1+1 APS\* protection
- High bandwidth & capacity – 10G
- Support for Hard QoS such as CIR, EIR, Shaping and WRR
- Support for 50 ms carrier-class protection with guaranteed E2E BW
- High performance and very low delay and jitter
- Strong and comprehensive OAM functions such as Ethernet loopbacks and per-connection PM (Y.1731)
- Supports ATM-IMA\*

With the rapid increase in the need for high bandwidth, and a similar increase in the need for Ethernet performance within the LAN environment, the demand for metro network performance has never been greater. The biggest challenge for service

providers of all types is to deliver not only cost-effective and scalable performance, but also, and more importantly, a Carrier Ethernet solution that facilitates new services, rapid and easy provisioning, and dramatically reduced operational costs.

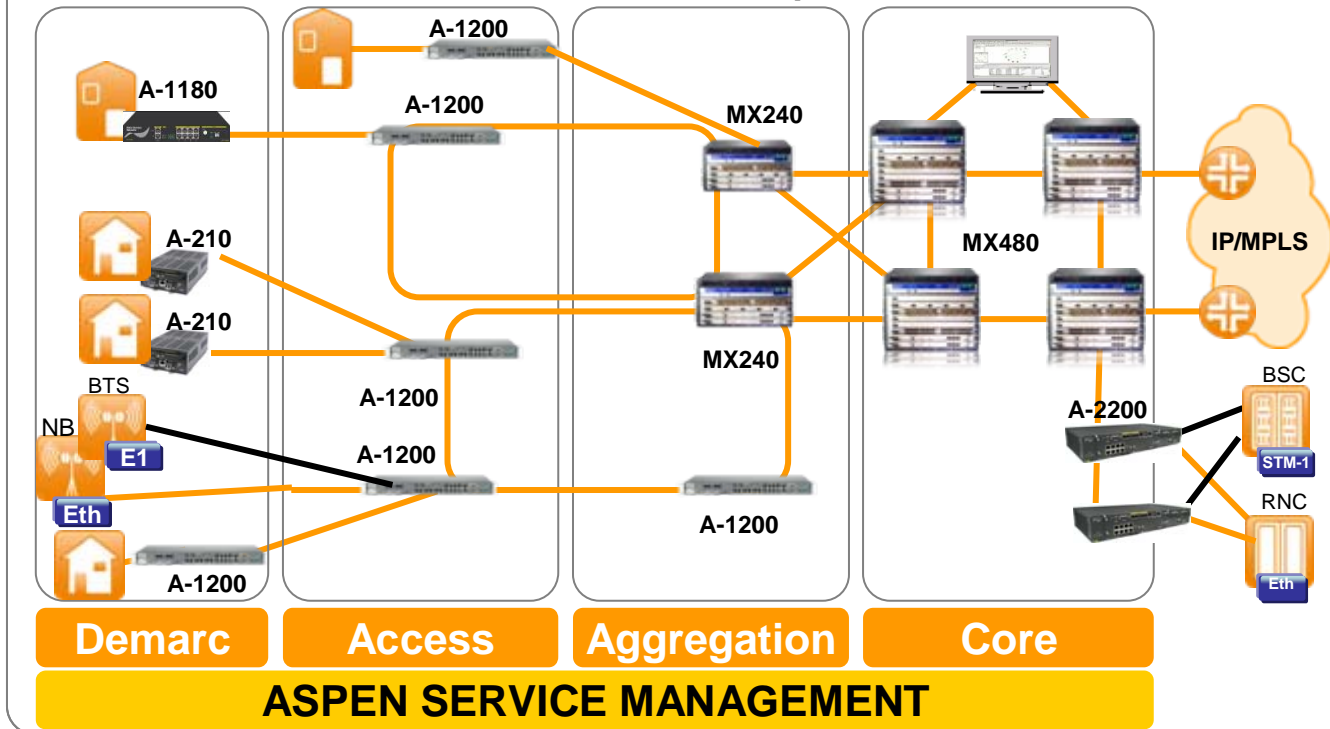


AT12003 – Carrier Ethernet Access Switch – Modular version



AT12002 – Carrier Ethernet Access Switch – Fixed version

# A-1200 End-to-End Carrier Ethernet Transport Solution



## Product Overview

Nokia Siemens Networks A-1200 complements the A-series product line by adding extended switching capacity for the most mission-critical applications and for providing Ethernet services from mobile operators cell sites to BSC/RNC site or from SMB/business centers to other locations within the Carrier Ethernet metro. It is a one rack-unit high, compact Carrier Ethernet

Access Switch that delivers cost-effective 10/100 Ethernet, Gigabit Ethernet and CES/TDM access interfaces for end customers. In addition, a modular configuration of the A-1200 exists which provides media layer extension capability. The A-1200 supports four Gigabit Ethernet SFP/SSF-pluggable ports for connectivity to the Carrier Ethernet core network.

The A-1200 can be deployed as a high-end CPE working with the Nokia Siemens Networks A-2200 Edge switch and the Juniper MX series. The Nokia Siemens Networks' ASPEN management system enables E2E carrier-grade management which includes: provisioning, monitoring and performance analyses. The A-1200 can also be used as an aggregation switch working together with the A-210 or A-1180 demarcation device to provide a very cost-effective access solution. Using these products in conjunction, carriers and service providers can construct a powerful high-performance and efficient Metro infrastructure, designed to quickly deliver profitable communication services.

The A-1200 features up to 10 Gbps non-blocking switching capacity. It offers protected simultaneous connections supporting point-to-point, point-to-multipoint and multipoint-to-multipoint services. Customer traffic can be mapped to connections using multiple and flexible rules from layer 1 (port-based) up to layer 3 (IP Address, Protocol Type and DSCP bits).

### Functionality

- Hard QoS supporting CIR, EIR and priority with 64 Kbps and 1 Mbps granularity
- Traffic Shaping and Connection Admission Control (CAC), ensuring end-to-end bandwidth guarantee
- SONET-like 50 ms protection with guaranteed E2E BW that is much faster and more scalable than the Spanning Tree or Rapid Spanning Tree protocol
- Strong and comprehensive OAM functions including fast and pinpoint fault detection, alarm-service correlation, Ethernet loopbacks, as well as round-trip delay, jitter and packet loss measurement
- Wire-speed performance
- Very low delay and jitter
- Flexible and intelligent customer traffic mapping mechanisms that allow multi-services on one access interface
- Advanced synchronization including: Synchronous Ethernet, IEEE 1588V2 and differential clocking
- Strong management capability (ASPEN NMS, Netviewer)

## Applications

### Mobile Backhauling applications

The A-1200 can be used as a 2G/3G aggregator at tail sites and as a tail site aggregator at hub sites.

As an MBH solution, the A-1200 offers:

- TDM and Ethernet interfaces supporting 2G/3G and future LTE
- Support of E1, T1, STM-1/OC-3\*
- Support of ATM-IMA\*
- Advanced synchronization including: Synchronous Ethernet, IEEE 1588V2 and differential clocking
- QOS assurances for delay, jitter and loss
- Shaping per port
- Standard OAM mechanisms and protocols (Y.1731 & 802.1ag)
- APS 1+1\* protection of STM-1/OC-3\*
- ASPEN (A-series) E2E management

Multi-service low cost CPE with high service availability for business customers

The A-1200 boasts a broad range of intelligent network services, featuring granular Quality of Service (QoS) and sub-50 ms protection that enable service providers to rapidly provision secure Ethernet access with fully MEF-compliant Service Level Agreements (SLAs).

Benefits include:

- High revenues from multi-services
- Fast troubleshooting with the help of strong OAM functions
- Flexible customer traffic mapping schemes
- Support for single-strand fiber, thus reducing fiber costs
- Ease of management and service provisioning

Microwave Radio complementary solution

The A-1200 acts as an IDU (indoor unit) for the FlexiPacket Microwave Radio (MWR) product line.

As part of the MWR complementary solution:

- A special mechanism has been developed to provide full protection in case of failure within the MWR equipment.
- The A-1200 is managed by the Nokia Siemens Networks Netviewer application.

\* Future release

### MEF-compliant service attributes

The A-1200 delivers flexible, affordable Fast Ethernet and Gigabit Ethernet interfaces, supporting point-to-point, point-to-multipoint and multipoint-to-multipoint services. Customer traffic can be mapped to connections using any combination of rules from layer 1 to layer 3.

The A-1200 fully supports SLAs defined by MEF service definitions including:

- Committed Information Rate (CIR)
- Excess Information Rate (EIR)
- Priority for bounded delay and jitter
- Protection levels

In addition to pure Ethernet connectivity, service providers can migrate legacy TDM traffic onto their Carrier Ethernet network using Nokia Siemens Networks Circuit Emulation Services that provide ITU-T compliant E1/T1 and STM-1/OC-3 interfaces.

### Full protection and reliability

The A-1200 has been designed to deliver the SONET-like reliability that carriers demand, but with the price, performance and scalability of Carrier Ethernet. The protection mechanism of the A-1200 can achieve sub-50 ms fail-over time with guaranteed E2E BW.

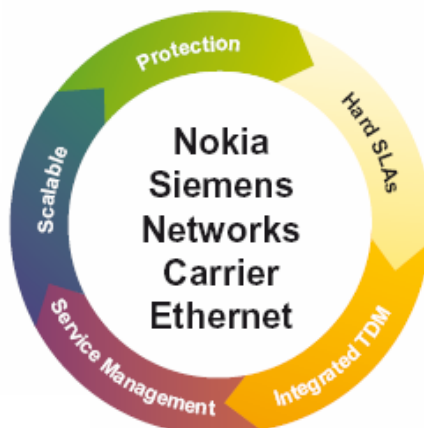
It also offers an end-to-end protection mechanism that protects against any type of failure according to service profiles.

Industry-leading service provisioning and management solution: Nokia Siemens Networks Advanced Service Platform for Ethernet Networks (ASPEN)

Nokia Siemens Networks' ASPEN is the industry's simplest network management and service management platform for managing Carrier Ethernet services. ASPEN delivers enhanced service management capabilities for rapid service provisioning, comprehensive network and element management, performance and fault management, and seamless integration with existing OSS applications.

ASPEN software allows carriers and service providers to efficiently manage all elements of the network to deliver the most reliable, scalable and cost-effective Ethernet service offerings.

Using a multi-layered modular architecture, ASPEN software supports large, dynamic carrier-class networks and is ideal for minimizing hardware deployment time, service planning, provisioning and monitoring.



## Standards

### IETF Standards

- RFC 768
- RFC 783
- RFC 791
- RFC 792
- RFC 793
- RFC 826
- RFC 854
- RFC 1157
- RFC 1256
- RFC 1907
- RFC 2030
- RFC 2236
- RFC 2863
- RFC 2668
- RFC 2737
- RFC 2495
- RFC 4252
- RFC 4253

### IETF Standards

#### MIB Support

- IanaifType
- RFC 2096
- RFC 2668
- RFC 1213
- RFC 2737
- RFC 2863
- RFC 2495
- RFC 2558

### Metro Ethernet Forum Standards

- MEF 2
- MEF 3
- MEF 4
- MEF 6
- MEF 9
- MEF 10
- MEF 11
- MEF 12
- MEF 13
- MEF 14

### IEEE 802 Standards

- IEEE 802.3
- IEEE 802.3u
- IEEE 802.3z
- IEEE 802.3ad
- IEEE 802.1p
- IEEE 802.1D\*
- IEEE 802.1Q
- IEEE 802.1ad
- IEEE 802.1ag
- IEEE 802.3ah\*
- IEEE 802.1w/s\*

All specifications are subject to change.

## Management

- ASPEN, Netviewer
- RS-232 Administration Console: Industry-standard Command Line Interface (CLI)
- Out-of-band management
- In-band management of entire network
- Dedicated management VLAN
- Supports multiple NMS stations
- SNMP
- Telnet
- Modem

## A-1200 Specifications

- Access ports - Ethernet**
- 6 Ethernet ports of 10/100/1000 Base-TX ports, RJ-45 connectors
  - 2 or 4 Gigabit Ethernet ports of 100/1000Base-X ports, accommodating hot-swappable SFP transceivers, SC connectors:
    - 1000Base-SX Multi-mode (500 m)
    - 1000Base-LX Single-mode (10 km)
    - 1000Base-LH Single-mode (70 km)
  - Coarse Wavelength Division Multiplexing (CWDM) interfaces (50 km, 100 km)

- Access ports - TDM**
- 8 TDM ports of E1/T1, RJ-48C connectors
  - 16 ports T1/E1 CES\*
  - 4 ports STM-1/OC-3\*

- Access ports - ATM\***
- 24 x E1/T1 ports
    - IMA termination
    - 8 IMA groups, 1-16 members per group
  - 4 x STM-1/OC-3 ports, SFP supported
    - ATM concatenated mode

- EMC**
- FCC Part 15 ( Class B ) - USA/Canada
  - EN 300-386 ( Class B ) - Europe
  - EN 300-132 ( PSU Standard) - Europe (EN 300-132-2,3)
  - CISPR22:1997 Class B - (International Emissions)
  - EN55022:1998 Class B - (European Emissions)
  - EN55024:1998 includes EN61000-4-2, 3,4,5,6,8,11 - (European Immunity)
  - ES 201-468 (Enhanced EN 300386 Immunity)
  - ITU-T K.20, K.21, K.45, K.54, K.44, K56
  - EN 61000-3-2 Harmonic current emissions - (Europe)
  - EN 61000-3-3 Voltage fluctuations and flicker - (Europe)
  - EN61000-4-2

- Safety**
- UL 60950 - USA/Canada
  - EN 60950 - Europe
  - IEC 60950 (CB report) - International
  - CE marking

- Environmental**
- EN 300 019-1-1
  - EN 300 019-1-2
  - EN 300 019-1-3

- Power Consumption**
- Min power consumption 30 W
  - Max power consumption 58 W

- Power**
- DC power supply 48 V (Dual Feed)
  - AC power supply

- Operating Environment**
- Temperature: -40 to +65 °C (DC version)
  - Altitude: Up to 13,000 ft (4000 m)
  - Relative humidity: 5 to 95% non-condensing

- Storage Environment**
- Temperature: -40 to 70 °C
  - Altitude: 15,000 ft (4570m)

- Dimensions**
- AT12003/4 - 445 mm x 230 mm x 43.6 mm (1U)
  - AT12002 - 330 mm x 230 mm x 43.6 mm (1U)