

# Alcatel-Lucent Service Router SONET/SDH MDAs

## MEDIA DEPENDENT ADAPTERS

The Alcatel-Lucent Service Router MDAs provide industry-leading service density and rich connectivity options in a wide range of service and application solutions for service providers, cable MSOs and enterprise customers.



With industry-leading interface density and variety, the Alcatel-Lucent Service Router (SR) product family comprises purpose-built IP/ MPLS platforms designed to deliver a new wave of next-generation services. The platforms feature a fully modular design to ensure maximum service reliability and reduce CAPEX. Each platform is equipped with redundancy on common, hot-pluggable components to eliminate any single point of failure. The modular design means that the media dependent adapters (MDAs) and optics are portable across the SR family, allowing for maximized investment protection and simplified sparing.

### Alcatel-Lucent SR Family

The Alcatel-Lucent 7750 SR is a superior IP multiservice edge router that is purpose-built for service providers, cable multiservice operators (MSOs) and enterprise customers to deliver a new wave of triple play, premium

business virtual private network (VPN) and multimedia mobile services, and who are looking to converge these services in a single IP/MPLS network. The Alcatel-Lucent 7750 SR is available in three chassis sizes — 1-slot, 7-slot and 12-slot — all of which offer a wide range of interfaces with unmatched density and service performance. The Alcatel-Lucent 7750 SR family gives service providers, cable MSOs and enterprise customers the flexibility to achieve the service continuity, service richness and service assurance that are critical to ensuring customer satisfaction and market leadership.

The Alcatel-Lucent 7710 SR is a feature-rich multiservice edge router, available in compact form factors and purpose-built for modularity. The router has different chassis compared to the

Alcatel-Lucent 7750 SR and facilitates the reuse of selected MDAs to minimize CAPEX. Designed for smaller points of presence (PoPs), hub sites and enterprise offices, the Alcatel-Lucent 7710 SR family gives service providers, cable MSOs and enterprise customers a competitive edge by allowing them to right-size their infrastructure buildouts with a fully featured router in a smaller footprint. The Alcatel-Lucent 7710 SR family is also an ideal solution for enterprise customers in key vertical markets, such as government, utilities and transportation, that need to provide more secure, reliable and manageable data services for their end users. Available in two modular chassis sizes that support up to 4 or 12 interface cards, the Alcatel-Lucent 7710 SR offers a wide range of interface options using compact media adapters (CMAs) and selected MDAs with unmatched service performance.

All products in the Alcatel-Lucent SR family are based on the carrier-grade, production-hardened Alcatel-Lucent Service Router Operating System (SR OS), which is designed to deliver residential, business and mobile services with optimal cost-effectiveness.

## Alcatel-Lucent SR SONET/SDH MDAs

The SONET/SDH MDAs provide the critical high-speed, high-density service interfaces required for a new wave of next-generation IP-based services. Table 1 lists the SONET/SDH MDAs that are supported by the Alcatel-Lucent SR family.

The three available chassis of the Alcatel-Lucent 7750 SR — SR-12, SR-7 and SR-1 — support ten, five and one I/O module (IOM) respectively. The I/O slot capacity for all chassis is 20 Gb/s (full duplex), with scaling to 40 Gb/s (full duplex) for the Alcatel-Lucent SR-12 and SR-7. Each IOM accepts two MDAs.

The Alcatel-Lucent 7710 SR supports the 8-port OC-3c/STM-1c MDA and the 2-port OC-48c/STM-16c MDA, as listed in Table 1. Each MDA requires an MDA carrier module (MCM), which is a small hot-pluggable module that fits across two standard Alcatel-Lucent 7710 SR I/O positions. Each MCM accepts one MDA as a daughter module. The Alcatel-Lucent 7710 SR-c4 supports up to two MDAs while the 7710 SR-c12 supports up to six MDAs, with a throughput rate of up to 4.4 Gb/s per MDA (full duplex) to each control and forwarding module (CFM).

SONET/SDH MDAs provide:

- Interface speeds from OC-3/STM-1c to OC-192/STM-64c
- High interface density — up to 320 OC-3c/STM-1c or OC-12c/STM-4c ports per Alcatel-Lucent 7750 SR-12 chassis
- Multiple-rate OC-3c/OC-12, STM-1c/STM-4c, and software selectable on a per-port basis
- Multimode and single-mode media types
- SFP optics for added flexibility and optimal slot utilization
- Optical link budget, supporting distances up to 85 kilometers (52.8 miles)
- In-service removal and insertion

## FEATURES

The SONET/SDH MDAs support the full scope of the Alcatel-Lucent SR OS feature set, including:

- Flexible, high-performance services:
  - virtual private LAN service (VPLS)
  - BGP/MPLS VPN (based on RFC 4364) and IP-VPN services
  - dedicated Internet access services
  - Ethernet, frame relay and ATM virtual private wire (VPWS) services
- High-performance IP and MPLS tunneling
- Rich MPLS multiservice transit capabilities
- Flexible Fast Path technology, providing up to 10 Gb/s packet processing with service headroom
- Tens of thousands of configurable ingress/egress access control lists (ACLs)
- Scalable BGP, OSPF and IS-IS routing with traffic-engineering extensions
- Per-service hierarchical quality of service (H-QoS), with up to 8,000 ingress and egress queues per MDA and 200-ms buffering up to 10 Gb/s
- Granular, per-service accounting and billing
- Extensive operations, administration and maintenance (OAM) tools for service-aware troubleshooting and faster service activation

Table 1. SONET/SDH MDA Support for the SR Family

SONET/SDH MDA TYPE	ALCATEL-LUCENT 7750 SR	ALCATEL-LUCENT 7710 SR
8-port OC-3c/STM-1c	✓	✓
16-port OC-3c/STM-1c	✓	–
8-port OC-3c/OC-12c/STM-1c/STM-4c	✓	–
16-port OC-3c/OC-12c/STM-1c/STM-4c	✓	–
2-port OC-48c/STM-16c	✓	✓
4-port OC-48c/STM-16c	✓	–
1-port OC-192c/STM-64c	✓	–

## Port Density

Table 2 lists port densities for each SONET/SDH MDA and the associated Alcatel-Lucent SR chassis.

**Table 2. SONET/SDH MDA Port Densities for the SR Family**

ADAPTER TYPE	INTERFACE SPEED	PORTS PER MDA	PORTS PER ALCATEL-LUCENT 7750 SR			PORTS PER ALCATEL-LUCENT 7710 SR	
			SR-1	SR-7	SR-12	SR-c4	SR-c12
OC-3c/STM-1c MDA	155 Mb/s	8	16	80	160	16	48
OC-3c/STM-1c MDA	155 Mb/s	16	32	160	320	–	–
OC-3c/OC-12c/STM-1c/STM-4c MDA	155 Mb/s/622 Mb/s	8	16	80	160	–	–
OC-3c/OC-12c/STM-1c/STM-4c MDA	155 Mb/s/622 Mb/s	16	32	160	320	–	–
OC-48c/STM-16c MDA	2.5 Gb/s	2	4	20	40	4	12
OC-48c/STM-16c MDA	2.5 Gb/s	4	8	40	80	–	–
OC-192c/STM-64c MDA	10 Gb/s	1	2	10	20	–	–

## Optical Interface Module Specifications

Table 3 provides module specifications for each optical interface type.

**Table 3. Module Specifications for Optical Interfaces**

INTERFACE TYPE	SUBTYPE	CONNECTOR TYPE	FIBER TYPE	WAVELENGTH	RANGE
OC-3c/STM-1	–	SFP - LC	Multimode	1,310 nm	2 km
OC-3c/STM-1	IR-1/S-1.1	SFP - LC	Single mode	1,310 nm	21 km/15 km
OC-3c/STM-1	LR-1/L-1.1	SFP - LC	Single mode	1,310 nm	50 km/40 km
OC-12c/STM-4	–	SFP - LC	Multimode	1,310 nm	500 m
OC-12c/STM-4	SR-1/I-4	SFP - LC	Single mode	1,310 nm	12 km/2 km
OC-12c/STM-4	IR-1/S-4.1	SFP - LC	Single mode	1,310 nm	21 km/15 km
OC-12c/STM-4	LR-2/L-4.2	SFP - LC	Single mode	1,550 nm	85 km/80 km
OC-48c/STM-16	SR-1/I-16	SFP - LC	Single mode	1,310 nm	12 km/2 km
OC-48c/STM-16	IR-1/S-16.1	SFP - LC	Single mode	1,310 nm	21 km/15 km
OC-48c/STM-16	IR-2/S-16.2	SFP - LC	Single mode	1,550 nm	42 km/15 km
OC-48c/STM-16	LR-2/L-16.2	SFP - LC	Single mode	1,550 nm	85 km/80 km
OC-192c/STM-64	SR-1/I-64.1	Simplex SC	Single mode	1,310 nm	7 km/2 km
OC-192c/STM-64	IR-2/S-64.2b	Simplex SC	Single mode	1,550 nm	40 km/40 km
OC-192c/STM-64	LR-2/L-64.2	Simplex SC	Single mode	1,550 nm	80 km

## SONET/SDH MDA Part Numbers

Table 4 provides an ordering summary for the Alcatel-Lucent SR SONET/SDH MDAs.

**Table 4. SONET/SDH MDA Ordering Information for the Alcatel-Lucent SR Family**

PART NUMBER	MDA TYPE	PLATFORM	NOTES
3HE00032AA	8-port OC-3/STM-1	7750 SR/7710 SR	8-port SONET/SDH OC-3c/STM-1c MDA, accepts up to eight (8) OC-3/STM-1 SFP Optics Modules
3HE00033AA	16-port OC-3c/STM-1c	7750 SR	16-port SONET/SDH OC-3c/STM-1c MDA, accepts up to sixteen (16) OC-3/STM-1 SFP Optics Modules
3HE00037AA	8-port OC-12c/STM-4c	7750 SR	8-port SONET/SDH OC-12c/STM-4c MDA, each port can operate as OC-12c/OC-3c or STM-4c/STM-1c, accepts up to eight (8) OC-12/STM-4, OC-3/STM-1 SFP Optics Modules
3HE00038AA	16-port OC-12c/STM-4c	7750 SR	16-port SONET/SDH OC-12c/STM-4c MDA, each port can operate as OC-12c/OC-3c or STM-4c/STM-1c, accepts up to sixteen (16) OC-12/STM-4, OC-3/STM-1 SFP Optics Modules
3HE00043AA	2-port OC-48c/STM-16c	7750 SR	2-port SONET/SDH OC-48c/STM-16c MDA, accepts up to two (2) OC-48/STM-16 SFP Optics Modules
3HE00044AA	4-port OC-48c/STM-16c	7750 SR	4-port SONET/SDH OC-48c/STM-16c MDA, accepts up to four (4) OC-48/STM-16 SFP Optics Modules
3HE00048AA	OC-192c/STM-64c	7750 SR	1-port SONET/SDH OC-192c/STM-64c MDA with SR-1 / I-64.1 optics, 1310 nm, Simplex SC Connector
3HE00049AA	OC-192c/STM-64c	7750 SR	1-port SONET/SDH OC-192c/STM-64c MDA with IR-2 / S-64.2 optics, 1550 nm, Simplex SC Connector
3HE00709AA	OC-192c/STM-64c	7750 SR	1-port SONET/SDH OC-192c/STM-64c MDA with LR-2 / L-64.2 optics, 1550 nm, Simplex SC Connector

## PHYSICAL SPECIFICATIONS (FOR ALL MODULES)

### Dimensions

- Height: 1.3 cm (0.5 in.)
- Width: 17.1 cm (6.7 in.)
- Depth: 17.8 cm (7.0 in.)
- Weight: 0.45 kg (1.0 lb)

### Environmental Specifications

- Operating temperature: 5 C to 40 C (41 F to 104 F)
- Relative humidity: 15% to 85% (non-condensing)
- Altitude: 3,048 m (10,000 ft)

### Regulatory Agency Standards

- Safety: UL 60950-1, CAN 60950-1, EN 60950-1, CE Mark
- EMC: EN 55022
- EMI: FCC Part 15, Class A; EN 55022

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