Alcatel-Lucent 9500 MXC Microwave Cross-Connect

A flexible, multiservice wireless transport platform for medium- to high-capacity mixed traffic

Offering a new generation of digital, point-to-point microwave radio capabilities, the Alcatel-Lucent 9500 MXC provides an effective way to meet the growing demand for high-capacity applications. This compact platform supports SDH/SONET and "super PDH" applications — up to 75 E1 — with higher flexibility afforded by its integrated cross connection capabilities. It can also support fixed applications such as DSL and WiMAX backhauling, due to its multiple interfaces, including PDH, SDH and Ethernet with integrated layer-2 switching. The Alcatel-Lucent 9500 MXC is a reliable, complete, homogeneous series, from 6 GHz to 38 GHz. Its unique network management capabilities serve both small and large networks, and its compact design enables easy installation, while ensuring that maximum commonality is achieved across frequencies and capacities.

BENEFITS

- Spectrum efficiency to support increasing broadband traffic
- High reliability
- Reduced costs — with a modular design and cost-optimized IDUs for SDH and Ethernet applications
- Easy installation and reduced cabling
- Enhanced customer satisfaction with QoS management

APPLICATIONS

- Wireless point-to-point
- Mobile, private and carrier network infrastructures
- SDH, high-capacity PDH and Ethernet radio transmissions
- Local traffic aggregation
- High-capacity aggregation
- Backhauling for DSL, WiMAX and PC networks

FEATURES

- High-capacity transport for mixed data and TDM traffic
  - SDH capacity up to 2xSTM-1
  - PDH capacity up to 75xE1 — or 8xE3
  - Ethernet capacity up to 200 Mb/s full-duplex
  - Gigabit Ethernet capacity up to 600 Mb/s with link aggregation and L2 switch integrated
- High-integration design that delivers high reliability
- Node configuration and integrated cross connection functionalities
  - Flexible aggregate capacity sharing between E1s and Ethernet
  - Powerful embedded traffic routing with E1 cross-connect
  - Nodal capabilities supporting up to six radio paths
- Universal ODU (16/32/64/128 QAM – 64 Mb/s to 311 Mb/s)
- Java-based craft terminal
- Full software configurable modulation and capacity
- Highly modular architecture

Technical Specifications

Configurations

- Unprotected
- 1+1 hot-standby
- 1+1 space diversity
- 1+1 frequency diversity
- Co-channel cross-pol operation (XPIC)
- Repeater with traffic add-drop
- 3, 4, 5, 6 way nodal configuration with traffic routing
- E1 and STM-1 line protection

System Level Specifications

- Operating frequencies: 6, 7, 8, 10.5, 11, 13, 15, 18, 23, 26, 28, 38 GHz
- Modulation options:
  QPSK, 16, 32, 64, 128, 256 QAM
- Capacity ranges :
  32, 40, 48, 52, 64, 75 E1
  1, 2, 3, 4, 5, 6, 7, 8 E3
  1, 2 STM-1

Power Requirements

- Input voltage range: -40 to –60 Vdc
- Power consumption
  - IDU: 10W
  - INU: dependent on actual cards installed
    - Radio Access Card 6 W
    - Digital Access Card 3 W
    - Node Control Card 4 W
    - Node Protection Card 4 W
    - Fan Unit 2 W
  - ODU: 50 W maximum

Mechanical Dimensions

- IDU: 44.5 x 480 x 300 mm
- INU: 44.5 x 480 x 300 mm
- INUe: 89 x 480 x 300 mm
- ODU: 284 x 284 x 162 mm

Environmental

- IDU/INU: -5℃ to +45℃
- ODU guaranteed: -33℃ to +55℃
  Extended: -50℃ to +65℃

Standards compliance

- EMC EN 301 489
- Operation Outdoor Units ETS 300 019, Class 4.1
- Operation Indoor Units ETS 300 019, Class 3.2
- Storage ETS 300 019, Class 1.2
- Transportation ETS 300 019, Class 2.3
- Radio Frequency EN 302 217
- Safety EN 60950
  Water Ingress Outdoor Units
  IEC 60529 (IPX6)

Modulation scheme	QPSK, 16QAM, 32QAM, 64 QAM, 128QAM, 256 QAMSW selectable										
Capacity	PDH ETSI: 20E1,40E1, 52E1, 64E1, 75E1										
	SDH: STM-1, 2xSTM-1 single-carrier@56MHz, 2xSTM-1 XPIC										
	LAN: 4x 10/100 BASE-T(X), 1000 BASE-LX, 3x1000 BASE-T										
Channel spacing (MHz)	7 (5E1), 14 (10E1), 28 (20E1), for QPSK										
	7 (10E1), 14 (20E1), 28 (32E1), 28 (64E1), 56 (75E1), 56 (STM-1), for 16QAM										
	14 (27E1), 28 (52E1) for 32QAM										
	7 (16E1), 14 (32E1), 28 (64E1), 56 (100E1), 40 (STM-1),for 64QAM 28 (75E1), 28 (STM-1), 56 (2xSTM-1),for 128QAM										
	28 (93 E1) for 256 QAM										
Configuration	1+0, 1+1 HSB/SD/FD, 1+1 HSB XP, 2+0										
Frequency [GHz]	**6**	**7/8**	**10**	**11**	**13**	**15**	**18**	**23**	**26**	**28**	**38**
Output Power [dBm] QPSK	28,5	28,5	26,0	24,0	23,0	22,0	19,5	19,5	15,5	15,0	17,5
Output Power [dBm] 16QAM	26,5	26,5	24,0	22,0	21,0	20,0	17,5	17,5	13,5	13,0	15,5
Output Power [dBm] 32QAM	26,0	26,0	23,5	21,5	20,5	19,5	17,0	17,0	13,0	12,5	15,0
Output Power [dBm] 64QAM	25,5	25,5	23,0	21,0	20,0	19,0	16,5	16,5	12,5	12,0	14,5
Output Power [dBm] 128QAM	24,5	24,5	22,0	20,0	19,0	18,0	15,5	15,5	11,5	11,0	13,5
Output Power [dBm] 256QAM	22,5	22,5	20,0	18,0	17,0	16,0	13,5	13,5	9,5	9,0	11,5
Threshold at 10^{-6} BER	**6**	**7/8**	**10**	**11**	**13**	**15**	**18**	**23**	**26**	**28**	**38**
5xE1 7 MHz QPSK	-92,0	-92,0	-91,5	-91,5	-91,5	-91,5	-91,0	-91,0	-90,0	-89,0	-88,5
10xE1 13.75 / 14 MHz QPSK	-89,0	-89,0	-88,5	-89,0	-89,0	-88,5	-88,5	-88,0	-87,0	-86,5	-86,0
20xE1 27.5 / 28 MHz QPSK	-86,0	-86,0	-85,5	-86,0	-86,0	-85,5	-85,5	-85,0	-84,0	-83,5	-83,0
10xE1 7 MHz 16 QAM	-85,5	-85,5	-85,0	-85,0	-85,0	-85,0	-84,5	-84,5	-83,5	-82,5	-82,0
16xE1 7 MHz 64 QAM	-78,5	-78,5	-78,0	-78,5	-78,5	-78,0	-78,0	-77,5	-76,5	-75,5	-75,0
20xE1 13.75 / 14 MHz 16 QAM	-82,5	-82,5	-82,0	-82,0	-82,0	-82,0	-81,5	-81,5	-80,5	-79,5	-79,0
27xE1 13.75 / 14 MHz 32 QAM	-78,5	-78,5	-78,0	-78,0	-78,0	-78,0	-77,5	-77,5	-76,5	-75,5	-75,0
32xE1 27.5 / 28 MHz 16 QAM	-80,5	-80,5	-80,0	-80,0	-80,0	-80,0	-79,5	-79,5	-78,5	-77,5	-77,0
32xE1 13.75 / 14 MHz 64 QAM	-75,5	-75,5	-75,0	-75,5	-75,5	-75,0	-75,0	-74,5	-73,5	-72,5	-72,0
40xE1 27.5 / 28 MHz 16 QAM	-79,5	-79,5	-79,0	-79,0	-79,0	-79,0	-78,5	-78,5	-77,5	-76,5	-76,0
52xE1 27.5 / 28 MHz 32 QAM	-76,0	-76,0	-75,5	-75,5	-75,5	-75,5	-75,0	-75,0	-74,0	-73,0	-72,5
64xE1 27.5 / 28 MHz 64 QAM	-74,0	-74,0	-73,5	-73,5	-73,5	-73,5	-73,0	-73,0	-72,0	-70,5	-70,0
75xE1, 1xSTM1 55 / 56 MHz 16 QAM	-76,5	-76,5			-76,0	-76,0	-76,0	-75,5	-74,5	-73,5	-73,0
75xE1, 1xSTM1 40 MHz 64 QAM	-74,0		-73,5	-74,0							
75xE1, 1xSTM1 27.5 / 28 MHz 128 QAM	-71,0	-71,0	-70,5	-70,5	-70,5	-70,5	-70,0	-70,0	-69,0	-67,0	-66,5
93xE1 27.5 / 28 MHz 256 QAM	-65,5	-65,5	-65,0	-65,0	-65,0	-65,0	-64,5 dBm	-64,5 dBm	-62,5 dBm	-61,5	-60,5
106xE1 55 / 56 MHz 64 QAM							-71,5	-71,0	-69,5	-69,0	-68,5
2xSTM1 55 / 56 MHz 128 QAM	-66,0	-66,0			-66,0	-65,5	-65,5	-65,0	-64,0	-62,5	-62,0