

# Alcatel-Lucent 9400 AWY Digital Microwave Radio Links

SHORT-HAUL LOW- AND MEDIUM-CAPACITY

The Alcatel-Lucent 9400 AWY family of digital point-to-point microwave radio systems offers scalability and flexibility to satisfy the transmission needs of 2G, 2.5G and 3G cellular mobile networks and microcellular network backhauling. The 9400 AWY systems are also suitable for multiple applications in public and private networks, such as private data networks — WANs and LANs — and utility networks. These cost-effective microwave radio systems cover radio frequencies from 7 GHz to 38 GHz, with outstanding performance in each frequency band.

The 9400 AWY family supports IP-based solutions such as UMTS Release 5 and WiMAX. The LAN interface expands network-design options for both indoor and outdoor use and increases new application choices.



Main IDU



ODU Views

## Features

- Indoor unit (IDU) supports up to 32 × E1 traffic interfaces
- Outdoor unit (ODU) supports 4- and 16-quadrature analog multiplier (QAM); software upgradable as needed
  - One ODU version exists with 32 Mb/s capacity/4-QAM only
- Offers comprehensive application options
- Can combine with the Alcatel-Lucent 9500 MPR/MXC and 9600 LSY/USY families in the same network
- Provides output power agility: automatic transmit power control (ATPC) and static/reactive TPC (RTPC) in all frequency bands
- Offers capacity agility to support up to 32 × E1, 1 × E3, or 4 Ethernet ports, with a maximum capacity of up to 64 Mb/s, including mixed configurations such as 16 × E1 and 2 Ethernet ports
- Provides flexible TDM/LAN interfaces
- Is software configurable, with easy installation/setup and multilevel loopback/test facilities

## Benefits

- Reduced capital/operating expenses, with equipment/material commonalities in 1+0/1+1 configurations
- Reduced equipment expenses — Minimal number of ODUs needed for complete frequency-band coverage
- Scalability — Modular upgrades as traffic capacity grows
- Complete network integration — Compatibility and interoperability with the Alcatel-Lucent wireless radio portfolio: short/long-haul, Pleisiochronous Digital Hierarchy (PDH) and Synchronous Digital Hierarchy (SDH) equipment, and Add Drop Multiplexer (ADM) Optical Multi-Service Node (OMSN) family

## Applications

- Mobile-network backhauling: GSM/GPRS/UMTS
- Wireless data access
- WAN/LAN data networks
- Data-terminal connections: private automatic branch exchange (PABX), ATM, videoconferencing
- Utility networks: pipelines, electricity, railways, municipalities

## Technical characteristics (typical values)

FREQUENCY BAND <sup>1</sup>	7/8 GHz	13 GHz	15 GHz	18 GHz	23 GHz	25 GHz	38 GHz
Frequency range (ITU-R)	7.1 to 8.5 GHz	12.7 to 13.3 GHz	14.4 to 15.4 GHz	17.7 to 19.7 GHz	21.2 to 23.6 GHz	24.5 to 26.5 GHz	37.5 to 39.5 GHz
Channel spacing	4-QAM	3.5 MHz (2 E1), 7 MHz (4 E1), 14 MHz (8 E1), 28 MHz (16 E1)					
	16-QAM	3.5 MHz (4 E1) <sup>2</sup> , 7 MHz (8 E1), 14 MHz (16 E1), 28 MHz (32 E1)					
Nominal Tx output power (dBm)	4-QAM	25	24	24	22	19	17
	16-QAM	21	20	20	19	16	14
ATPC range (dB)	20						
RTPC range (dB)	20 guaranteed (up to 30 <sup>2</sup> )						
32 E1 system gain at 10-3 typ (dB)	16-QAM	100	99	99	97	94	91
16 E1 system gain at 10-3 typ (dB)	4-QAM	111	110	110	107	104	101
	16-QAM	103	102	102	100	97	94
Switching configuration	1+1						
Switching type	Hitless — Revertive/Non-revertive						
Configuration	1+0 / 1+1 HSB / 1+1 HSB+SD / 1+1 FD						
Maximum power consumption (W)	<50 (1+0) / 100 (1+1)						

<sup>1</sup> Frequency band availability according to roadmap

<sup>2</sup> Depending on frequency band/shifter

FD – frequency diversity

HSB – hot standby

SD – space diversity

## Technical specifications

### Interfaces

#### User

- Up to 32 E1
- Up to 4 × 10/100/1000Base-T Ethernet (IEEE 802.3)
- Up to 64 Mb/s with level 2 switching-capability option
- Flexible combination of mixed traffic (N × E1 and 10/100/1000Base-T Ethernet); software controlled with E1 granularity
- One E3

### Network management

- Local craft terminal (LCT): TIA/EIA-232-E
- Network management system: 10/100Base-T Ethernet
- Network management data channel: 64 kb/s TIA/EIA-422-B/G.703

### Service channels

- Omnibus voice-channel dual tone multifrequency (DTMF) (Q.23) Engineering Order Wire (EOW) plus two-way party line
- 64 kb/s G.703 or V11 co-/contra-directional

- 64 kb/s one-port V11 co-directional, one-port G.703 co-directional (network management)

- 9.6 kb/s asynchronous V28
- 4.8 kb/s asynchronous V28
- 9.6 kb/s V11
- 4.8 kb/s V11

### Indoor/outdoor connection

- Single coaxial cable – up to 250 m (820 ft), depending on coaxial cable used
  - limited to 150 m (492 ft) for 64 Mb/s capacity
- Impedance: 50 ohms

### Dimensions and weight

#### Main and extension IDU (rack, desk or wall-mount)

- Height: 43 mm (1.7 in.)
- Width: 443 mm (17.4 in.)
- Depth: 210 mm (8.3 in.)
- Weight: <2.5 kg (<5.5 lb)

### ODU – split-mount

- Height: 235 mm (9.3 in.)
- Width: 235 mm (9.3 in.)
- Depth: 72 mm (2.8 in.)
- Weight: 3.9 kg (8.8 lb)

### ODU – 7/8 GHz with external diplexer

- Height: 257 mm (10.1 in.)
- Width: 248 mm (9.8 in.)
- Depth: 157 mm (6.2 in.)
- Weight: 7.4 kg (16.3 lb)

### Certification

#### EMI/EMC

- EN 55022 Class B
- EN 301 489-1
- EN 301 489-4

#### Safety

- EN 60950:2000
- UL 60950:2000

#### Ecological

- ECMA TR/70

### Operating environment

- IDU temperature: -5°C to +55°C (+23°F to +131°F)
- ODU temperature: -33°C to +55°C (-27.4°F to +131°F)

### Power supply

- Standard: ±48 to ±60 V DC ± 20% (±38 to ±72 V DC)
- Optional: ±24 to ±60 V DC ± 20% (±19 to ±72 V DC)

### Services

- Network design and planning
- Hotline
- Express repair and return, swap and repair, spare-parts management
- On-site visits, urgent interventions, technical assistance
- Training from theory to installation – Alcatel-Lucent University-based or at customer premises
- Bundled services during warranty period and warranty extensions

### Network management

- Integrated network management in Microsoft® Windows® environment
- Intuitive supervision systems
- Simple Network Management Protocol (SNMP) agent with TCP/IP rerouting capability
- Interoperability with all Alcatel-Lucent wireless microwave portfolio and transmission equipment
- Preprovisioning tool to further reduce time spent on-site

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