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.

**Features**

- Indoor unit (IDU) supports up to 32 × E1 traffic interfaces or 64-Mb data
- Outdoor unit (ODU) supports 4- and 16-quadrature amplitude modulation (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 remote 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 4 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, Plesiochronous 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)

<table>
<thead>
<tr>
<th>FREQUENCY BAND(^1)</th>
<th>7/8 GHz</th>
<th>13 GHz</th>
<th>15 GHz</th>
<th>18 GHz</th>
<th>23 GHz</th>
<th>25 GHz</th>
<th>38 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range (ITU-R)</td>
<td>7.1 to 8.5 GHz</td>
<td>12.7 to 13.3 GHz</td>
<td>14.4 to 15.4 GHz</td>
<td>17.7 to 19.7 GHz</td>
<td>21.2 to 23.6 GHz</td>
<td>24.5 to 26.5 GHz</td>
<td>37.5 to 39.5 GHz</td>
</tr>
<tr>
<td>Channel spacing</td>
<td>4-QAM</td>
<td>3.5 MHz (2 E1), 7 MHz (4 E1), 14 MHz (8 E1), 28 MHz (16 E1)</td>
<td></td>
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<tr>
<td></td>
<td>16-QAM</td>
<td>7 MHz (8 E1), 14 MHz (16 E1), 28 MHz (32 E1)</td>
<td></td>
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</tr>
<tr>
<td>Nominal Tx output power (dBm)</td>
<td>4-QAM</td>
<td>25</td>
<td>24</td>
<td>24</td>
<td>22</td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td></td>
<td>16-QAM</td>
<td>21</td>
<td>20</td>
<td>20</td>
<td>19</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>ATPC range (dB)</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTPC range (dB)</td>
<td></td>
<td>20 guaranteed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>32 E1 system gain at target (dB)</td>
<td>16-QAM</td>
<td>100</td>
<td>99</td>
<td>99</td>
<td>97</td>
<td>94</td>
<td>91</td>
</tr>
<tr>
<td>16 E1 system gain at target (dB)</td>
<td>4-QAM</td>
<td>111</td>
<td>110</td>
<td>110</td>
<td>107</td>
<td>104</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>16-QAM</td>
<td>103</td>
<td>102</td>
<td>102</td>
<td>97</td>
<td>94</td>
<td>91</td>
</tr>
<tr>
<td>Switching configuration</td>
<td>1+1</td>
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<td></td>
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<tr>
<td>Switching type</td>
<td>Hitless — Revertive/Non-revertive</td>
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<tr>
<td>Configuration</td>
<td>1+0 / 1+1 HSB / 1+1 HSB+SD / 1+1 FD</td>
<td></td>
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<tr>
<td>Maximum power consumption (W)</td>
<td></td>
<td>&lt;48 (1+0) / 92 (1+1)</td>
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</tbody>
</table>

FD – frequency diversity  
HSB – hot standby  
SD – space diversity

Technical specifications

**Interfaces**

**User**
- Up to 32 E1
- Up to 4 x 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 x E1 and 10/100/1000Base-T Ethernet); software controlled with E1 granularity
- One E3

**Layer 2 Ethernet switch**
- 4 Gigabit Ethernet ports
- MAC switching
- MAC learning
- MAC ageing
- IEEE 802.3x flow control
- IEEE 802.1p QoS
- DiffServ
- Autolink shutdown (ALIS)
- Radioport shutdown in case of cable loss
- VLAN management (802.1q)
- Jumbo Frame on one port

**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
- 4.8 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: 3.8 kg (8.8 lb)

**ODU – 7/8 GHz with external diplexer**
- Height: 257 mm (10.1 in.)
- Width: 248 mm (9.8 in.)
- Depth: 162 mm (6.2 in.)
- Weight: 7.2 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**
- Managed by the 1350 OMS and the 5620 SAM GNE
- 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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