

# Alcatel-Lucent MDR-8000

## 7/8 GHZ DIGITAL RADIOS



### OVERVIEW

The MDR-8X08 is Alcatel-Lucent's premier digital microwave radio for long-haul, point-to-point wireless communications. The flexible platform offers features designed to provide robust operation, while also reducing your total cost of ownership. With a common platform that supports virtually all frequency bands from 2-11 GHz, the MDR-8X08 operates in the 7 and 8 GHz bands used by the United States Federal Government and Canadian carriers. It also offers customers transmission capacity from 4-32 DS1s, 1-3 DS3s, OC-3, and 10/100/1000 Base-T Ethernet, with the ability to upgrade capacity simply by changing Capacity Keys™. Wayside capacity provides an additional DS1 per each DS3-equivalent available in the system.

Compact mechanical dimensions and low power consumption allow operators to place the MDR-8X08 in cramped spaces without sacrificing system performance and availability. This flexible and scalable architecture provides reliable wireless backbone communications for United States Federal Government operators such as the Department of Defense, Department of Justice, and Department of Interior, as well as local exchange carriers, cellular operators, railways, pipelines, utilities, television stations, public safety agencies, and private enterprise in Canada.

## C O S T - S A V I N G F E A T U R E S

---

- Industry-high system gain
  - ↪ Allows longer paths, potentially avoid repeater sites
  - ↪ Allows smaller antennas
    - Lower purchase price
    - Reduces tower loading & rent
  - ↪ Improves path availability
- Common platform for all frequency bands & capacities
  - ↪ Simplifies training and maintenance
  - ↪ Minimizes spares
- In-service capacity upgrades
  - ↪ Graceful migration to higher capacities
  - ↪ No stranded investment
- Flexible Ethernet options
  - ↪ Provision bandwidth dynamically, as needed
  - ↪ Combined data throughput of 300 Mb/s using dual channel mode
  - ↪ Auto-sensing simplifies installation and turn-up
- Low power consumption
  - ↪ Reduces size of DC power plant and batteries
  - ↪ Reduces cost of HVAC
- Small size
  - ↪ Reduces amount of rack space needed

## P E R F O R M A N C E - E N H A N C I N G F E A T U R E S

---

- All-indoor operation
  - ↪ No tower-mounted electronics
  - ↪ Simplifies maintenance and troubleshooting
- Industry-leading receiver selectivity and interference rejection
  - ↪ Allows coordination in frequency congested areas
  - ↪ Speeds up licensing
- Full range of configurations
  - ↪ Nonstandby, hot-standby, space diversity, frequency diversity, quad diversity
  - ↪ Provides full equipment protection
  - ↪ Used to overcome poor path conditions
- Robust multipath countermeasures
  - ↪ Used to overcome propagation problems



## MDR-8X08 - Low to Medium Capacity

Equipment Identifier	MDR-8508-4	MDR-8508-8	MDR-8508-16	MDR-8708-32
Frequency Band (GHz)	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5
US Dept. of Defense Equipment Identifier		JF12-08187	JF12-08187	
RF Channel Bandwidth (MHz)	2.5	3.5	7.5	10.0
Capacity per RF Channel (DS1s)	4	8	16	32
Modulation Type (TCM)	32	32	32	128
Radio Data Rate (Mb/s)	6.18	12.4	24.7	58.996
System Gain (BER = 10 <sup>-6</sup> ) @ 32 dBm (dB)*	116	113	110	105.5
Transmitter Power Output (dBm)	15	15	15	15
Optional Power Amplifier Outputs (dBm)	28, 30, 32	28, 30, 32	28, 30, 32	28, 30, 32
Receiver Threshold (BER = 10 <sup>-6</sup> ) (dBm)*	-84	-81	-78	-73.5
Maximum RSL for 10 <sup>-6</sup> BER (dBm)*	-17	-17	-17	-17
Dispersive Fade Margin for 10 <sup>-3</sup> BER (dB)	80	80	66	64
Threshold/Interference				
Cochannel (dB)	28	28	28	34
Adjacent Channel (dB)	-8	-8	-8	-8

## MDR-8X08 – High Capacity

EQUIPMENT IDENTIFIER	MDR-8608-45	MDR-8608-135	MDR-8708s-155
Frequency Band (GHz)	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5
US Dept. of Defense Equipment Identifier		JF12-08001	JF12-07984
RF Channel Bandwidth (MHz)	10	30	30
Capacity per RF Channel	1xDS3	3xDS3	3xSTS-1
DS1 Wayside Line Capacity	1xDS1	3xDS1	3xDS1
Modulation Type	64 QAM	64 QAM	128 TCM
Radio Data Rate (Mb/s)	46.3	138.8	160.2
System Gain (BER = 10 <sup>-6</sup> ) @ 32 dBm (dB)*	106.5	101	101
Transmitter Power Output (dBm)	15	15	15
Optional Power Amplifier Outputs (dBm)	28, 30, 32	28, 30, 32	28, 30, 32
Receiver Threshold (BER = 10 <sup>-6</sup> ) (dBm)*	-74.5	-69	-69
Maximum RSL for 10 <sup>-6</sup> BER (dBm)*	-17	-17	-17
Dispersive Fade Margin for 10 <sup>-3</sup> BER (dB)	64	50	46
Threshold/Interference			
Cochannel (dB)	34	34	34
Adjacent Channel (dB)	-8	-8	-8

## MDR-8X08E – Ethernet Radios

EQUIPMENT IDENTIFIER	MDR-8508E-8	MDR-8708E-12	MDR-8708E-24	MDR-8708E-50	MDR-8708E-150
----------------------	-------------	--------------	--------------	--------------	---------------

### Ethernet Specifications

Ethernet Forwarding Capacity	Up to 8 Mb/s	Up to 12 Mb/s	Up to 24 Mb/s	Up to 50 Mb/s	Up to 150 Mb/s
	14,585 pps	21,611 pps	44,448 pps	91,910 pps	278,848 pps
Ethernet Latency (S/F)	265-1270 $\mu$ s	185-1180 $\mu$ s	95-575 $\mu$ s	194-425 $\mu$ s	66-142 $\mu$ s

### RF Specifications

Frequency Band (GHz)	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5	7.125 - 8.5
Emission Designator	2M50D7W	2M50D7W	5M00D7W	10M0D7W	30M0D7W
RF Channel Bandwidth (MHz)	2.5	2.5	5	10	30
TDM Lines Capacity	5xDS1	8xDS1	16xDS1	32xDS1	32xDS1
Modulation Type (TCM)	32	128	128	128	128
Radio Data Rate (Mb/s)	9.093	13.135	26.27	58.996	176.994
System Gain (BER = $10^{-6}$ ) @ 32 dBm (dB)*	115	109	106	105.5	101
Transmitter Power Output (dBm)	15	15	15	15	15
Optional Power Amplifier Outputs (dBm)	28, 30, 32	28, 30, 32	28, 30, 32	28, 30, 32	28, 30, 32
Receiver Threshold (BER = $10^{-6}$ ) (dBm)*	-83	-77	-74	-73.5	-69
Maximum RSL for $10^{-6}$ BER (dBm)*	-17	-17	-17	-17	-17
Dispersive Fade Margin for $10^{-3}$ BER (dB)	80	80	66	64	49
Threshold/Interference					
Cochannel (dB)	28	34	34	34	34
Adjacent Channel (dB)	-8	-8	-8	-8	-8

\*Typical values as measured at the antenna port for nonstandby and hot-standby/space diversity configurations. Hot-standby configurations will have 1 dB less receiver threshold on the A side and 10 dB less receiver threshold on the B side.

Note: These specifications are subject to change without notice.



# TECHNICAL SUMMARY

---

## Power Requirements

- Input voltage: +/- 20 V dc to +/- 60 V dc
- Typical power consumption per T/R @ 15 dBm:
  - MDR-8X08 (DS1): 69 Watts
  - MDR-8608 (DS3): 74 Watts
  - MDR-8708s (OC-3): 71 Watts
  - MDR-8X08E (Ethernet): 71 Watts

## Mechanical Dimensions & Interfaces

- Size: 12.25 x 19.0 x 16.25 in.
- Weight (1+1): 70 lb.
- RF interface: SMA (female) - other RF interfaces available
- DS1 interface: 37 pin D-type
- DS3 interface: BNC 75 Ohm
- OC-3 interface: LC connector, 1310 nm
- Ethernet interface: RJ-45 standard data connector or optical SFP
- Wayside DS1 interface: Two 9 pin D-type (one TX, one RX)
- Orderwire handset interface: RJ-11 standard telephone handset jack
- Alarm/Management interfaces:
  - SNMP = RJ-48, 10 Base-T
  - US1 = RS-232
  - MCS-11 = RS-422
  - TBOS = RS-485
  - Parallel = Form A relays

## Environmental

- Ambient temperature:
  - Specification compliant: 0° to +50° C
  - Operating without failure: -20° to +65° C
  - Storage: -40° to +80° C
- Relative humidity: 5 to 95% noncondensing
- Altitude:
  - Operating: -350 to 16,500 ft.
  - Storage: -350 to 40,000 ft.

Note: These specifications are subject to change without notice.



## ABOUT ALCATEL-LUCENT WIRELESS TRANSMISSION:

---

With more than 50 years of experience in wireless transmission, Alcatel-Lucent provides the solid foundation for your mission-critical network, and continually fosters visions for the future. As a pioneer in point-to-point microwave radios, Alcatel-Lucent has demonstrated leadership in wireless technology.

Our history of design innovation began when the former Collins Radio Company developed the first commercial microwave radios in the 1950s. Alcatel-Lucent maintains the Collins tradition, setting the industry standard for microwave communications all over the world with scalable, reliable, economical and readily deployable wireless backbone communications systems.

In the last five years, Alcatel-Lucent has installed more than 300,000 microwave radios in more than 150 countries. For more information, visit [www.alcatel-lucent.com/microwave](http://www.alcatel-lucent.com/microwave) or call 1-800-ALCATEL.

**[www.alcatel-lucent.com](http://www.alcatel-lucent.com)**

Alcatel, Lucent, Alcatel-Lucent and Alcatel-Lucent logo are trademarks of Alcatel-Lucent. All other trademarks are the property of their respective owners. The information presented is subject to change without notice. Alcatel-Lucent assumes no responsibility for inaccuracies contained herein.  
© 2007 Alcatel-Lucent. All rights reserved. 02-06-09 523-0620213-008A3J