Alcatel-Lucent MDR-8000

2 GHz DIGITAL RADIOS FOR CANADIAN AND ETSI USE

OVERVIEW

The MDR-8X02 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-8X02 specifically operates in the 2.025-2.285 GHz band used by common carriers in Canada and in countries operating under ITU guidelines. High system gain coupled with excellent RF propagation at 2 GHz make this radio an ideal choice for difficult links to remote locations.

Compact mechanical dimensions and low power consumption allow operators to place the MDR-8X02 in cramped spaces without sacrificing system performance and availability. This flexible and scalable architecture provides reliable wireless backbone communications for cellular operators, public safety agencies, railways, pipelines, utilities, local exchange carriers, television stations, and private enterprise.

COST-SAVING FEATURES

- 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

PERFORMANCE-ENHANCING FEATURES

- 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
  - ¬ Provides full equipment protection
  - ¬ Used to overcome poor path conditions
- Robust multipath countermeasures
  - ¬ Used to overcome propagation problems

MDR-8502 - Low to Medium Capacity

EQUIPMENT IDENTIFIER	MDR-8502-4	MDR-8502-8	MDR-8502-16
Frequency Band (GHz)	2.025 - 2.285	2.025 - 2.285	2.025 - 2.285
Emission Designator	2M50D7W	3M50D7W	7M50D7W
RF Channel Bandwidth (MHz)	2.5	3.5	7.5
Capacity per RF Channel (DS1s)	4	8	16
Modulation Type (TCM)	32	32	32
Radio Data Rate (Mb/s)	6.18	12.4	24.7
System Gain (BER = 10^{-6}) @ 33 dBm (dB)*	119	116	113
Transmitter Power Output (dBm)	15	15	15
Optional Power Amplifier Outputs (dBm)	33	33	33
Receiver Threshold (BER = 10^{-6}) (dBm)*	-86	-83	-80
Maximum RSL for 10^{-6} BER (dBm)*	-17	-17	-17
Dispersive Fade Margin for 10^{-3} BER (dB)	80	80	66
Threshold/Interference			
Cochannel (dB)	28	28	28
Adjacent Channel (dB)	-8	-8	-8

MDR-8X02 - High Capacity

EQUIPMENT IDENTIFIER	MDR-8702-32	MDR-8602-45	MDR-8602-135
Frequency Band (GHz)	2.025 - 2.285	2.025 - 2.285	2.025 - 2.285
Emission Designator	10M0D7W	10M0D7W	30M0D7W
RF Channel Bandwidth (MHz)	10	10	30
Capacity per RF Channel	32xDS1	1xDS3	3xDS3
DS1 Wayside Line Capacity	N/A	1xDS1	3xDS1
Modulation Type	128 TCM	64 QAM	64 QAM
Radio Data Rate (Mb/s)	58.996	46.3	138.8
System Gain (BER = 10^{-6}) @ 33 dBm (dB)*	106	107	102
Transmitter Power Output (dBm)	15	15	15
Optional Power Amplifier Outputs (dBm)	33	33	33
Receiver Threshold (BER = 10^{-6}) (dBm)*, **	-73	-74	-69
Maximum RSL for 10^{-6} BER (dBm)*	-17	-17	-17
Dispersive Fade Margin for 10^{-3} BER (dB)	64	67	53
Threshold/Interference			
Cochannel (dB)	34	34	34
Adjacent Channel (dB)	-8	-8	-8

MDR-8X06E - Ethernet Radios

EQUIPMENT IDENTIFIER	MDR-8502E-8	MDR-8702E-12	MDR-8702E-24	MDR-8702E-50	MDR-8702E-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 µs	185-1180 µs	95-575 µs	194-425 µs	66-142 µs
RF Specifications					
Frequency Band (GHz)	2.025 - 2.285	2.025 - 2.285	2.025 - 2.285	2.025 - 2.285	2.025 - 2.285
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}) @ 33 dBm (dB)*	118	112	109	106	102
Transmitter Power Output (dBm)	15	15	15	15	15
Optional Power Amplifier Outputs (dBm)	33	33	33	33	33
Receiver Threshold (BER = 10^{-6}) (dBm)*, **	-85	-79	-76	-73	-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.

**Receiver thresholds are for the the standard diplexer filters. These filters are designed for the Canadian 2 GHz band from 2025-2110 MHz and 2200-2285 MHz. The maximum channel bandwidth in Canada is 10 MHz. As a result, the MDR-8602-135 and MDR-8702E-150 cannot be used in Canada.

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-8502 (DS1): 69 Watts
  - ¬ MDR-8602 (DS3): 74 Watts
  - ¬ MDR-8702E (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
- 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
  - ¬ USI = 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 or call 1-800-ALCATEL.

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