Aprisa XE

POINT-TO-POINT DIGITAL MICROWAVE LINKS
NTIA 900 / 2000 MHz licensed bands

Aprisa XE: maximizing spectrum use and making challenging long distance links possible

- **Efficient future-proof single-box architecture**: the Aprisa XE built-in multiplexer and cross-connect eliminates external equipment with customer-configurable interface slots integrating IP, TDM voice and flexible data traffic. Configuration, performance monitoring and diagnostics are easy with the 4RF embedded web-based element management system, SuperVisor.

- **High capacity**: class-leading spectral efficiency and up to 64 QAM modulation make the maximum use of the available spectrum, with industry leading capacity of up to 1912 kbit/s in a 500 kHz channel.

- **Long range**: a single Aprisa XE can link distances in excess of 80 miles, overcoming the problems of water, environmental conditions and topographical obstacles.

- **Carrier-class performance**: Aprisa XE links are engineered to achieve 'five 9s' availability, benefiting from state of the art forward error correction and inherent low latencies, for unrivaled quality of service.

- **Cost effective**: the Aprisa XE has a low total cost of ownership, providing a rapid return on investment by minimizing both capital and operational expenditure.

- **Common platform:** the Aprisa XE is built on a common hardware platform with a single band dependent field replaceable RF module determining the operating frequency range. Both frequency ranges have NTIA Stage 4 spectrum support.

- **Reliable**: the Aprisa XE has an actual MTBF over 95 years based on actual field data. It can be relied upon to perform in the harshest and most remote environments.

The Aprisa XE in brief

- Federal 900 MHz band
- Federal 2000 MHz band
- NTIA Certificates of Support
- Meets Red Book requirements
- Built-in cross-connect and multiplexer
- Up to 1912 kbit/s capacity
- 100 kHz, 200 kHz and 500 kHz channel sizes
- QPSK to 64 QAM modulation
- Range of 80+ miles
- Industry-leading reliability
- Web server and SNMP management
- All voice, data and IP applications

Future-proof single-box architecture
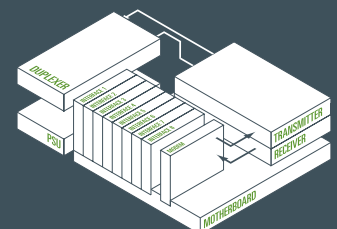
SYSTEM SPECIFICATION

RF	BAND	TUNING RANGE	SYNTHESIZER STEP SIZE
FREQUENCY BANDS	900 MHz	928 – 960 MHz	12.5 kHz
	2000 MHz	1900 – 2300 MHz	62.5 kHz
MODULATION TYPES	Software configurable: QPSK / 16 / 32 / 64 QAM		
FREQUENCY STABILITY	Short term ± 1 ppm (environmental effects and power supply variations)		
	Long term ± 2 ppm (aging of crystal oscillators ≈ over 5 years)		
ANTENNA CONNECTION	N-type female 50 ohm		

TRANSMITTER	
QPSK	+20 dBm to +34 dBm
16 QAM	+17 dBm to +31 dBm
32 QAM	+16 dBm to +30 dBm
64 QAM	+15 dBm to +29 dBm

RECEIVER			
MAXIMUM INPUT LEVEL	–20 dBm		
DYNAMIC RANGE	58 to 87 dB at 10^{-6} BER		
C/I RATIO	Co-channel	QPSK	better than 16 dB
		16 QAM	better than 20 dB
		32 QAM	better than 23 dB
		64 QAM	better than 27 dB
	First adjacent channel		better than –5 dB
	Second adjacent channel		better than –30 dB

DUPLEXER (bandpass)	PASSBAND	TX / RX SPLIT	TUNING RANGE
G2	1 MHz	9 MHz	928 – 960 MHz
I0	14 MHz	≥ 91 MHz	1900 – 2300 MHz
I1	7.0 MHz	≥ 50 MHz	1900 – 2300 MHz
I2	3.5 MHz	≥ 45 MHz	1900 – 2300 MHz

POWER SUPPLY	
INPUT RANGE	115 / 230 VAC, 50 / 60 Hz
	±24 VDC (20.5 – 30 VDC), ±48 VDC (40 – 60 VDC)
POWER CONSUMPTION	53 – 180 W input power (dependent on interface cards fitted and transmitter output power level)

INTERFACES	
ETHERNET	Integrated 4-port 10 / 100Base-T switch with port-based rate limiting, VLAN tagging and QoS Support
E1 / T1	Quad 120 ohm G.703 / 4
DATA	Quad V.24 asynchronous, synchronous and over sampling mode
	Single synchronous X.21 / V.35 / RS-449 / RS-530
ANALOG	Dual 2-wire FXS / FXO (POTS); Quad 4-wire E&M

AUXILIARY INTERFACES	
ALARMS	4 external alarm outputs, 2 external alarm inputs
CONFIGURATION	Embedded web server with SNMP
MANAGEMENT	Ethernet interface for SuperVisor and SNMP; V.24 setup port
RSSI	Front panel test point

ENVIRONMENTAL	
OPERATING	+14° F to +122° F (–10° C to +50° C)
STORAGE	–4° F to +158° F (–20° C to +70° C)
HUMIDITY	Maximum 95 % non-condensing

MECHANICAL	
RACK MOUNT	19” 2U high (internal duplexer)
WEIGHT	23 lbs (10 kg) typical

COMPLIANCE			
RADIO	900 MHz	100 kHz and 200 kHz	SPS-16814/1
	2000 MHz	500 kHz	SPS-18208/2
EMI /EMC	FCC CFR 47 Part 15, EN 301 489 Parts 1 & 4		
SAFETY	EN 60950		
	CSA 253147 applicable for AC, 48 VDC and 24 VDC product variants		
ENVIRONMENTAL	ETS 300 019 Class 3.2, WEEE		

SYSTEM PERFORMANCE

100 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY [1]	gross (TS + wayside)	136 (2 TS + 8) kbit/s	280 (4 TS + 24) kbit/s	352 (5 TS + 32) kbit/s	424 (6 TS + 40) kbit/s
RECEIVER SENSITIVITY [2]		–106 dBm	–100 dBm	–97 dBm	–94 dBm
SYSTEM GAIN [2]		135 dB	129 dB	126 dB	123 dB
200 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY [1]	gross (TS + wayside)	312 (4 TS + 56) kbit/s	632 (9 TS + 56) kbit/s	792 (12 TS + 24) kbit/s	952 (14 TS + 56) kbit/s
RECEIVER SENSITIVITY [2]		–102 dBm	–96 dBm	–93 dBm	–90 dBm
SYSTEM GAIN [2]		131 dB	125 dB	122 dB	119 dB
500 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY [1]	gross (TS + wayside)	632 (9 TS + 56) kbit/s	1272 (19 TS + 56) kbit/s	1592 (1 T1 + 8) kbit/s	1912 (1 T1 + 328) kbit/s
RECEIVER SENSITIVITY [2]		–99 dBm	–93 dBm	–90 dBm	–87 dBm
SYSTEM GAIN [2]		133 dB	124 dB	120 dB	116 dB

NOTES

1. T1 capacities are specified as unframed. The management Ethernet capacity must be subtracted from the gross capacity (default 64 kbit/s).

2. Performance specified at the antenna port for 10^{-6} BER. Figures for 10^{-3} BER are typically 1 dB better.

ABOUT 4RF

Operating in more than 140 countries, 4RF provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analog, serial data and PDH applications.

4RF

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