

# 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

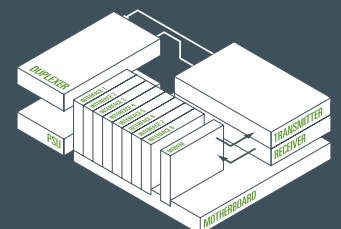
- **Efficient future-proof single-box architecture:** the Aprisa XE built-in multiplexer and cross-connect eliminates external equipment with customer-configurable interface slots integrating IP, TDM voice and flexible data traffic. Configuration, performance monitoring and diagnostics are easy with 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 2392 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.
- **Reliable:** the Aprisa XE has a demonstrated MTBF in excess of 90 years and 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 2392 kbit/s capacity
- 25, 50, 100, 200 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 $\pm 1$ ppm (environmental effects and power supply variations)		
	Long term $\pm 2$ ppm (aging of crystal oscillators $\approx$ 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	$\geq 91$ MHz	1900 – 2300 MHz
POWER SUPPLY			
INPUT RANGE	115 / 230 VAC, 50 / 60 Hz		
	$\pm 24$ VDC (20.5 – 30 VDC), $\pm 48$ 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 25 and 50 kHz ETSI EN 302 217 (NTIA compliance - contact 4RF) 900 MHz 100 and 200 kHz FCC Part 101 and NTIA Certificate of Support 2000 MHz 500 kHz NTIA Certificate of Support
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

25 kHz CHANNEL <sup>(Note 3)</sup>		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY <sup>1</sup>	gross (TS + wayside)	N/A	72 ( 1 TS + 8 ) kbit/s	96 ( 1 TS + 32 ) kbit/s	112 ( 1 TS + 48 ) kbit/s
RECEIVER SENSITIVITY <sup>2</sup>		N/A	-105 dBm	-102 dBm	-99 dBm
SYSTEM GAIN <sup>2</sup>		N/A	136 dB	132 dB	128 dB
50 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY <sup>1</sup>	gross (TS + wayside)	80 ( 1 TS + 16 ) kbit/s	168 ( 2 TS + 40 ) kbit/s	208 ( 3 TS + 16 ) kbit/s	256 ( 4 TS + 0 ) kbit/s
RECEIVER SENSITIVITY <sup>2</sup>		-109 dBm	-103 dBm	-100 dBm	-97 dBm
SYSTEM GAIN <sup>2</sup>		144 dB	134 dB	130 dB	126 dB
100 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY <sup>1</sup>	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 <sup>2</sup>		-106 dBm	-100 dBm	-97 dBm	-94 dBm
SYSTEM GAIN <sup>2</sup>		135 dB	129 dB	126 dB	123 dB
200 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY <sup>1</sup>	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 <sup>2</sup>		-102 dBm	-96 dBm	-93 dBm	-90 dBm
SYSTEM GAIN <sup>2</sup>		131 dB	125 dB	122 dB	119 dB
500 kHz CHANNEL		QPSK	16 QAM	32 QAM	64 QAM
CAPACITY <sup>1</sup>	gross (T1 + wayside)	792 ( 12 TS + 24 ) kbit/s	1592 ( 1 T1 + 8 ) kbit/s	1992 ( 1 T1 + 408 ) kbit/s	2392 ( 1 T1 + 808 ) kbit/s
RECEIVER SENSITIVITY <sup>2</sup>		-99 dBm	-93 dBm	-90 dBm	-87 dBm
SYSTEM GAIN <sup>2</sup>		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.
3. Please consult 4RF for availability.

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.

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Version 9.3.1