

# Aprisa LE

## POINT-TO-POINT DIGITAL MICROWAVE ETHERNET LINK 900 MHz licensed band



### 900 MHz Aprisa LE: maximizing spectrum use and making challenging long distance links possible

- **Long range:** a single Aprisa LE can link distances in excess of 120 miles, overcoming the problems of water, environmental conditions and topographical obstacles.
- **Carrier-class performance:** Aprisa LE 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 LE has a low total cost of ownership, providing a rapid return on investment by minimizing both capital and operational expenditure.
- **Maximum 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 952 kbit/s in a 200 kHz channel.
- **Redundancy options:** monitored hot standby and hitless space diversity are available for protection.
- **Easy-to-manage:** configuration, performance monitoring and diagnostics are easy with the 4RF embedded web-based element management system, SuperVisor.

#### The Aprisa LE in brief

- Licensed 900 MHz frequency band
- Up to 952 kbit/s Ethernet capacity
- 100 kHz and 200 kHz channel sizes
- QPSK to 64 QAM modulation
- Range of 120+ miles
- Web server and SNMP management
- MHSB and HSD protection option

SYSTEM SPECIFICATION

| RF                  | BAND  | TUNING RANGE   | SYNTHESIZER STEP SIZE |
|---------------------|---|----------------|-----------------------|
| FREQUENCIES         | 900 MHz   | 928 – 960 MHz  | 12.5 kHz              |
| MODULATION TYPES    | Software configurable: QPSK / 16 / 32 / 64 / 128 QAM  |                |                       |
| FREQUENCY STABILITY | Short term $\pm 1$ ppm (environmental effects and power supply variations)<br>Long term $\pm 2$ ppm (aging of crystal oscillators = over 5 years) |                |                       |
| ANTENNA CONNECTION  | N-type female 50 ohm  |                |                       |
| TRANSMITTER         |   |                |                       |
| POWER OUTPUT        | +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     |
|                     |   | 128 QAM        | better than 30 dB     |
|                     | First adjacent channel  |                | better than -5 dB     |
|                     | Second adjacent channel   |                | better than -30 dB    |
| DUPLEXER (bandpass) | PASSBAND  | TX / RX SPLIT  | TUNING RANGE          |
|                     | 1.0 MHz   | $\geq 9.0$ MHz | 928 – 960 MHz         |
| POWER SUPPLY        |   |                |                       |
| INPUT RANGE         | 115 / 230 VAC, 50 / 60 Hz   |                |                       |
|                     | $\pm 12$ VDC (10.5 – 18 VDC), $\pm 24$ VDC (20.5 – 30 VDC), $\pm 48$ VDC (40 – 60 VDC)  |                |                       |
| POWER CONSUMPTION   | 53 – 75 W input power (dependent on transmitter output power)   |                |                       |

| TRAFFIC INTERFACE    |   |
|----------------------|---|
| ETHERNET             | Integrated 4-port 10/100Base-T switch with port-based rate limiting, VLAN tagging and QoS Support               |
| AUXILIARY INTERFACES |   |
| ALARMS               | 4 external alarm outputs, 2 external alarm inputs   |
| CONFIGURATION        | Embedded web server with SNMP   |
| MANAGEMENT           | Ethernet interface for SuperVisor and SNMP; RS-232 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  |
| PROTECTED OPTIONS    |   |
| MHSB                 | $\leq 4$ dB splitter / cable loss, $\leq 1$ dB TX relay / cable loss (system gain reduced by a maximum of 5 dB) |
| HSD                  | $\leq 1$ dB TX relay / cable loss, < 25 ms TX switching / hitless RX switching                                  |
| COMPLIANCE           |   |
| RADIO                | RSS-GEN, FCC part 101   |
| EMI /EMC             | ICES-003  |
| SAFETY               | EN 60950<br>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     | 128 QAM <sup>2</sup> |
|-----------------------------------|------------|------------|------------|------------|----------------------|
| CAPACITY (GROSS)                  | 136 kbit/s | 280 kbit/s | 352 kbit/s | 424 kbit/s | 608 kbit/s           |
| RECEIVER SENSITIVITY <sup>1</sup> | -106 dBm   | -100 dBm   | -97 dBm    | -94 dBm    | -91 dBm              |
| SYSTEM GAIN <sup>1</sup>          | 135 dB     | 129 dB     | 126 dB     | 123 dB     | 120 dB               |
| 200 kHz CHANNEL                   |            |            |            |            |                      |
| CAPACITY (GROSS)                  | 312 kbit/s | 632 kbit/s | 792 kbit/s | 952 kbit/s | 1112 kbit/s          |
| RECEIVER SENSITIVITY <sup>1</sup> | -102 dBm   | -96 dBm    | -93 dBm    | -90 dBm    | -87 dBm              |
| SYSTEM GAIN <sup>1</sup>          | 131 dB     | 125 dB     | 122 dB     | 119 dB     | 116 dB               |

NOTES

- Performance specified at the antenna port for  $10^{-6}$  BER. Figures for  $10^{-3}$  BER are typically 1 dB better.
- Unreleased: Please contact 4RF for availability.

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