



## DIGITAL MICROWAVE RADIO

- Compact high-performance access solution for low-capacity linking applications
- Robust transmission of Internet, voice and data services over long distances and difficult terrain
- Simple migration from legacy networks to IP and broadband capabilities

- Licensed 330 – 470, 1350 – 1550 MHz
- 16, 32 64 QAM and QPSK
- 64 to 1200 kbps
- 25 kHz to 250 kHz channels
- In-built customer interface cards
- Embedded micro cross-connect switch
- Aprisa View™ NMS with SNMP output
- MHSB protected option

### APPLICATIONS

The Aprisa SE radio is a standalone point-to-point wireless access solution delivering connectivity over challenging radio paths between two fixed points up to 100 kilometres apart. The radios provide up to 1200 kbps capacity for robust, carrier-class transmission of a wide-range of broadband enabled services (including Internet, VPN and LAN interconnect, VoIP, video conferencing, and web-hosting) and integrated voice and data services (including remote monitoring and control data, phone, PABX, mobile radio, and fax).

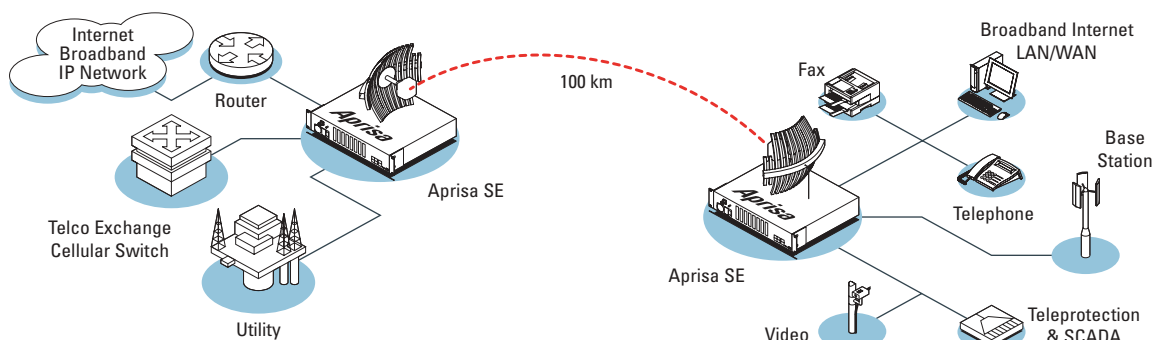
### PERFORMANCE

The Aprisa SE radio operates in the 330 – 470 and 1350 – 1550 MHz licensed frequency bands. These regulated bands allow exclusive frequency assignment and guarantee carrier-class performance and minimized interference over long distances and difficult terrain, including water and partly obscured paths. The RF design integrates high-performance digital processing techniques including FEC (forward

error correction) and interleaving for data integrity and a multi-tap transversal adaptive equalizer minimizes transmission degradation from interference and atmospheric effects. Sophisticated modulation techniques in the radio platform enable highly efficient transmission in narrow channels. This enables the optimization of available spectrum where that resource may be limited and expensive.

### INTEGRATION AND CONFIGURATION

The Aprisa SE radio features an in-built multiplexer managing data, voice and IP traffic with customer-configurable interfaces enabling straightforward integration with legacy and next-generation network elements. The Aprisa SE is simply configured using the PC-based Aprisa Setup™ software, and can be remotely managed in a wide area network. Where multiple Aprisa SE links are integrated into a network, they may be managed by the Aprisa View™ NMS (network management system) running on any IP-based management network.



GENERAL RF			
Frequency Ranges <sup>1</sup>	330 – 470 MHz 1350 – 1550 MHz	Frequency Selection	Synthesized 12.5 kHz steps
Modulation	16/32/64 QAM and QPSK (software configurable)	Frequency Stability	±1.5 ppm
		Antenna Connection	N-type female 50 ohm

SYSTEM PERFORMANCE								
Channel Spacing		25 kHz	50 kHz	75 kHz	150 kHz	250 kHz		
Capacity (data rate)	QPSK	Gross rate	–	–	–	240 kbps	400 kbps	
		E1 + wayside	–	–	–	3DSO + 48 kbps	6DSO + 16 kbps	
	16 QAM	Gross rate	72 kbps	152 kbps	240 kbps	480 kbps	800 kbps	
		E1 + wayside	DSO + 8 kbps	2DSO + 24 kbps	3DSO + 48 kbps	7DSO + 32 kbps	12DSO + 32 kbps	
	32 QAM	Gross rate	96 kbps	200 kbps	296 kbps	592 kbps	1000 kbps	
		E1 + wayside	DSO + 32 kbps	3DSO + 8 kbps	4DSO + 40 kbps	9DSO + 16 kbps	15DSO + 40 kbps	
	64 QAM	Gross rate	120 kbps	240 kbps	360 kbps	720 kbps	1200 kbps	
		E1 + wayside	DSO + 56 kbps	3DSO + 48 kbps	5DSO + 40 kbps	11DSO + 16 kbps	18DSO + 48 kbps	
Receiver Sensitivity <sup>2,3</sup>	16 QAM	-104 dBm	-102 dBm	-100 dBm	-97 dBm	-94 dBm		
System Gain <sup>2,4</sup>	16 QAM	135 dB	133 dB	131 dB	128 dB	125 dB		

<b>TRANSMITTER</b> Power Output <sup>2</sup> +35 dBm (QPSK) <sup>5</sup> +31 dBm (16 QAM) +30 dBm (32 QAM) +29 dBm (64 QAM) Power Control        15 dB (in 1 dB steps)			<b>INTERFACE OPTIONS<sup>6</sup></b> Ethernet                10Base-T, 10/100Base-TX Fractional E1            G.703/4 (120 ohm balanced) Data                        Asynchronous V.24/RS232 Synchronous V.11/X.21/V.35 Analog                    2-Wire FXS/FXO (POTS) 4-Wire E&M		
<b>RECEIVER</b> Maximum Input Level    -30 dBm Dynamic Range            74 – 58 dB (10 <sup>-6</sup> BER) C/I Ratio Co-channel              > 16 dB (QPSK) > 20 dB (16, 32 QAM) > 27 dB (64 QAM) 1st Adj. Channel        > -5 dB 2nd Adj. Channel        > -30 dB			<b>AUXILIARY INTERFACES</b> Alarms                    2 outputs, 2 inputs Setup (RS-232)         Aprisa Setup™ configuration via PC/laptop Aprisa View™ network management with SNMP via RS-232 over Ethernet		
<b>DUPLEXER (BANDPASS)<sup>1</sup></b> 330 – 400 MHz            2 MHz passband      > 15 MHz TX/RX split 400 – 470 MHz            2 MHz passband      > 5/9 MHz TX/RX split 1350 – 1550 MHz        5 MHz passband      > 48 MHz TX/RX split			<b>PROTECTED OPERATION</b> Equipment Redundancy    Monitored hot standby (MHSB) RX Splitter Loss            3.5 dB TX Switch Loss              1.5 dB		
<b>POWER SUPPLY</b> Input Range                ±12 V (11 – 15 VDC) ±24 V (20.5 – 30 VDC) ±48 V (40 – 60 VDC) Power Consumption       50 W (typical)			<b>ENVIRONMENTAL</b> Operating                  -10 to +50° C Storage                      -20 to +70° C Humidity                    Max. 95% non-cond. Altitude                      Up to 5000 m		
<b>MECHANICAL</b> 19-inch Rack Mount      3 U high (1400 MHz - side mounted duplexer) 4 U high (top mounted duplexer) Wall Mount (mm)        165 wide x 350 high x 260 deep Weight                       10 kg (typical)			<b>ETSI PERFORMANCE</b> Radio                        EN 300 630 EMI/EMC                    EN 300 385, EN 301 489 Parts 1 & 4 Safety                        EN 60950 Environmental              ETS 300 019 Class 3.2		

Specifications are typical unless stated otherwise and are subject to change without notice.

- Contact 4RF for other duplexer and frequency options.
- Performance specified at the antenna port for 10<sup>-6</sup> BER. Figures for 10<sup>-3</sup> BER are typically 2 dB better.
- Receiver sensitivities reduce by 3 dB for 32 QAM and 6 dB for 64 QAM. Receiver sensitivities increase by 6 dB for QPSK.
- System gains reduce by 4 dB for 32 QAM and 8 dB for 64 QAM. System gains increase by 10 dB for QPSK (8 dB for QPSK in 1350 – 1550 MHz band).
- Power output for 330 – 470 MHz frequency ranges. Power output for 1350 – 1550 MHz is +33 dBm.
- A mix of up to four ports on a Customer Interface Card (CIC). Please consult 4RF for standard and custom configurations.