

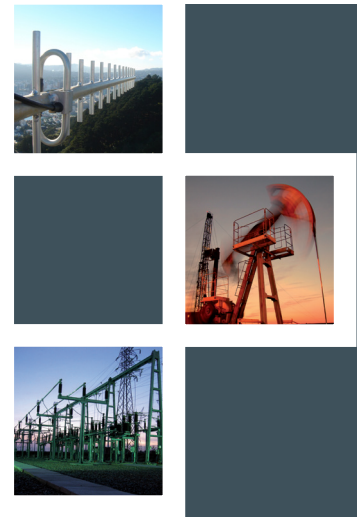
# Aprisa SR

## SMART, SECURE POINT-TO-MULTIPOINT RADIO FCC and IC licensed bands



### Aprisa SR: smart, secure, point-to-multipoint SCADA communications for oil, gas and utility monitoring and control

- **Secure:** with its defence in depth approach, including AES encryption, authentication, address filtering and user access control, the Aprisa SR protects against vulnerabilities and malicious attacks.
- **Future-proof:** the Aprisa SR supports serial, Ethernet and IP interfaces in a single, compact form factor, and is standards-based for long term incorporation into SCADA networks while protecting the legacy investment in serial devices.
- **Advanced L2 / L3 capabilities:** selectable L2 Bridge or L3 Router modes, with VLAN, advanced QoS, filtering and IP header and payload compression attributes to support narrow bandwidth channels and mission critical traffic while meeting increasing security and IP network policy requirements. Advanced payload and Ethernet / IP / TCP / UDP header compression.
- **Efficient:** the ability to configure detailed radio parameters means that network performance and efficiency can be optimized for the exact network topology, however complex.
- **Flexible:** the Aprisa SR integrates into a range of network topologies, with each unit configurable as a base station, repeater or remote unit.
- **Easily managed:** an easy to use GUI supports local element management via HTTPS and remote element management over the air, and SNMP support allows network-wide monitoring and control via a third party network management system.
- **Reliable and robust:** the Aprisa SR requires no manual component tuning and maintains its high power output and performance over a wide temperature range.



#### The Aprisa SR in brief

- Frequency bands of 135 – 175, 215 – 240, 400 – 520, 896 – 902 and 928 – 960 MHz
- RS-232 and IEEE 802.3 protocols
- Software selectable 12.5 kHz, 25 kHz and 50 kHz channel sizes
- Single or dual frequency
- Gross data rate of 72 kbit/s
- 256, 192 or 128 bit AES encryption
- QPSK modulation
- Selectable error correction of min, max or no FEC
- Ethernet and IP / TCP / UDP header compression (ROHC) and payload compression
- Dual / single antenna port product options
- Transparent to all common SCADA protocols
- Dedicated alarm port
- Protected station option
- Radio GPS coordinates
- -40 to +70 °C operational temperature
- 210 mm (W) x 130 mm (D) x 41.5 mm (H)
- FCC and IC standards compliant
- Fully compatible with Aprisa SR+ in 'SR mode'
- Enhanced traffic management
- Enhanced file transfer and activation of new firmware

#### Aprisa SR applications

- Offshore rigs and onshore pump jacks
- Transmission pipelines
- Electricity generation plants and turbines
- Power storage and distribution
- Water and waste processing plants

### SYSTEM SPECIFICATION

GENERAL			
NETWORK TOPOLOGY	Point-to-multipoint (PMP), Master, Remote, Repeater		
NETWORK INTEGRATION	Serial and Ethernet (router or bridge mode)		
PROTOCOLS			
ETHERNET	IEEE 802.3, 802.1d/q/p		
SERIAL	Legacy RS-232 transport		
WIRELESS	Proprietary		
SCADA	Transparent to all common SCADA protocols such as Modbus, IEC 60870-5-101/104, DNP3 or similar		
RADIO			
FREQUENCY RANGE	FREQ BAND	TUNING RANGE	TUNE STEP
	135 MHz	135 – 175 MHz	0.625 kHz
	220 MHz	215 – 240 MHz	0.625 kHz
	400 MHz	400 – 470 MHz	6.25 kHz
	450 MHz	450 – 520 MHz	6.25 kHz
	896 MHz	896 – 902 MHz	6.25 kHz
	928 MHz	928 – 960 MHz	6.25 kHz
CHANNEL SIZE	12.5 kHz, 25 kHz and 50 kHz software selectable		
DUPLEX	Single frequency half-duplex Dual frequency half-duplex Half duplex remote with SR+ full duplex master station		
FREQUENCY STABILITY	± 0.5 ppm		
FREQUENCY AGING	< 1 ppm / annum		
TRANSMITTER			
MAX PEAK ENVELOPE POWER (PEP)	10.0 W (+40 dBm)		
AVERAGE POWER OUTPUT	0.01 – 5.0 W (+10 to +37 dBm, in 1 dB steps)		
ADJACENT CHANNEL POWER	< –60 dBc		
TRANSIENT ADJACENT CHANNEL POWER	< –60 dBc		
SPURIOUS EMISSIONS	< –37 dBm		
ATTACK TIME	< 1.5 ms		
RELEASE TIME	< 0.5 ms		
DATA TURNAROUND TIME	< 2 ms		
RECEIVER			
	12.5 kHz	25 kHz	50 kHz
SENSITIVITY (BER < 10 <sup>-9</sup> ) max coded	–115 dBm	–112 dBm	–109 dBm
ADJACENT CHANNEL SELECTIVITY	> –47 dBm	> –37 dBm	> –37 dBm
	(Note 1) > 48 dB	> 58 dB	> 58 dB
CO-CHANNEL REJECTION max coded	> –10 dB		
INTERMODULATION RESPONSE REJECTION	> –35 dBm [> 60 dB Note 1]		
BLOCKING OR DESENSITISATION	> –17 dBm [> 78 dB Note 1]		
SPURIOUS RESPONSE REJECTION	> –32 dBm [> 63 dB Note 1]		
MODEM			
	12.5 kHz (Note 2)	25 kHz	50 kHz
GROSS DATA RATE	20 kbit/s	32 kbit/s	72 kbit/s
OCCUPIED BANDWIDTH	11.8 kHz	19.8 kHz	43.0 kHz
FORWARD ERROR CORRECTION	Variable Reed Solomon plus convolutional code		

SECURITY	
DATA ENCRYPTION	256, 192 or 128 bit AES
DATA AUTHENTICATION	CCM
INTERFACES	
ETHERNET	2 port RJ45 10/100Base-T switch
SERIAL	1 port RJ45 RS-232 Additional RS-232 / RS-485 port via USB converter (optional)
MANAGEMENT	1 x USB micro type B (device port) 1 x USB standard type A (host port) 1 x Alarm port RJ45
ANTENNA	1 x TNC 50 ohm female (2 x TNC for dual antenna port)
LEDs	Status: OK, MODE, AUX, TX, RX Diagnostics: RSSI, traffic port status
TEST BUTTON	Toggles LEDs between diagnostics / status
PRODUCT OPTIONS	
DUAL ANTENNA PORT	Separate transmit and receive antenna ports
PROTECTED STATION	Providing hot-swappable / hot-standby redundant hardware switching (13.8 VDC or 48 VDC)
GPS RECEIVER	Support for NMEA GPS receiver with radio coordinates
POWER	
INPUT VOLTAGE	10 – 30 VDC (13.8 V nominal)
RECEIVE All bands	< 3 W (217 mA at 13.8 VDC) in active receive state < 2 W (145 mA at 13.8 VDC) in idle receive state < 0.5 W (36 mA at 13.8 VDC) in sleep mode
TRANSMIT 135 and 220 MHz	< 26 W (1884 mA at 13.8 VDC)
400, 450, 896, 928 MHz	< 28 W (2028 mA at 13.8 VDC)
MECHANICAL	
DIMENSIONS	210 mm (W) x 130 mm (D) x 41.5 mm (H) 8.27" (W) x 5.12" (D) x 1.63" (H)
WEIGHT	1.25 kg (2.81 lbs)
MOUNTING	Wall, Rack or DIN rail
ENVIRONMENTAL	
OPERATING TEMPERATURE	–40 to +70 °C (–40 to +158 °F)
HUMIDITY	Maximum 95 % non-condensing
MANAGEMENT & DIAGNOSTICS	
LOCAL ELEMENT	Web server with full control / diagnostics Partial diagnostics via LEDs and test button Software upgrade from PC or USB flash drive
REMOTE ELEMENT	Over-the-air remote element management with control / diagnostics Network software upgrade over-the-air
NETWORK	SNMPv2 and SNMPv3 security support for integration with external network management systems
COMPLIANCE	
RF	FCC CFR47 Part 90, IC RSS 119
EMC	FCC CFR47 Part 15, EN 301 489-1 and 5, ICES-003
SAFETY	EN 60950 Class 1 div 2 for hazardous locations
ENVIRONMENTAL	ETS 300 019 Class 3.4, IEEE 1613 Class 2 IEC 61850-3, Ingress Protection IP51

#### Notes:

- The receiver figures are shown in typical fixed interference dBm values and dB values [in brackets] relative to the sensitivity. Relative values are given for QPSK modulation and max coded FEC. Refer to the Aprisa SR User Manual for a complete list of modulation and coding levels.
- The gross data rate for the 12.5 kHz channel size in the 896 / 928 MHz bands varies with regulatory compliance.

### 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 analogue, serial data and PDH applications.

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