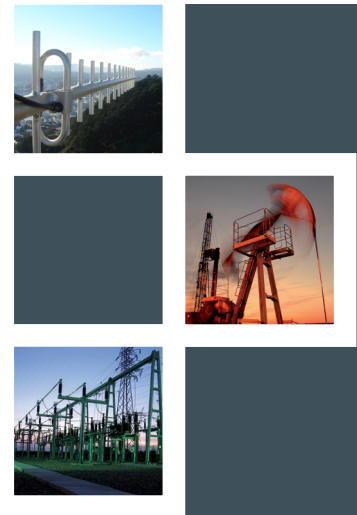# Aprisa SR

SMART, SECURE POINT-TO-MULTIPOINT RADIO
ETSI 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, QoS and filtering attributes to support narrow bandwidth channels and mission critical traffic while meeting increasing security and IP network policy requirements.

- **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

- ETSI licensed bands
- 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 80 kbit/s
- 256, 192 or 128 bit AES encryption
- QPSK modulation
- Selectable error correction of min, max or no FEC
- Advanced forward error correction
- Dual / single antenna port product options
- Transparent to all common SCADA protocols
- Dedicated alarm port
- Hot standby / swappable protected station option
- –40 to +70 °C operational temperature
- 210 mm (W) x 130 mm (D) x 41.5 mm (H)
- ETSI 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

4RF

SYSTEM SPECIFICATION

GENERAL	
NETWORK TOPOLOGY	Point-to-multipoint (PMP), Base, 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	FREQ BAND	TUNING RANGE	TUNE STEP
FREQUENCY RANGE	135 MHz	135 – 175 MHz	3.125 kHz
	320 MHz	320 – 400 MHz	6.25 kHz
	400 MHz	400 – 470 MHz	6.25 kHz
	450 MHz	450 – 520 MHz	6.25 kHz
CHANNEL SIZE	12.5 kHz, 25 kHz and 50 kHz software selectable (Note 4)		
DUPLEX	Single frequency half-duplex		
	Dual frequency half-duplex		
	Half duplex remote with SR+ full duplex master station		
FREQUENCY STABILITY	± 1.0 ppm		
FREQUENCY AGING	< 1 ppm / annum		

TRANSMITTER	
AVERAGE POWER OUTPUT (Note 1)	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^{-6}) max coded		–115 dBm	–112 dBm	–109 dBm
ADJACENT CHANNEL SELECTIVITY		> –47 dBm	> –37 dBm	> –37 dBm
(Note 2)		[> 48 dB]	[> 58 dB]	[> 58 dB]
CO-CHANNEL REJECTION max coded	> –10 dB			
INTERMODULATION RESPONSE REJECTION	> –35 dBm [> 60 dB Note 2]			
BLOCKING OR DESENSITISATION	> –17 dBm [> 78 dB Note 2]			
SPURIOUS RESPONSE REJECTION	> –32 dBm [> 63 dB Note 2]			

MODEM			
	12.5 kHz	25 kHz	50 kHz (Note 4)
GROSS DATA RATE	20 kbit/s	40 kbit/s	80 kbit/s
OCCUPIED BANDWIDTH	12.3 kHz	24.7 kHz	44.3 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)
SERIAL ONLY TRAFFIC	Providing an option of RS-232 serial traffic only

POWER	
INPUT VOLTAGE	10 – 30 VDC (13.8 V nominal)
RECEIVE	< 7 W
TRANSMIT	< 35 W

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	EN 300 113
EMC	EN 301 489-5
	IEEE 1613 (Note 3)
SAFETY	EN 60950
	Class 1 division 2 for hazardous locations
ENVIRONMENTAL	ETS 300 019 Class 3.4
	Ingress Protection IP51

Notes:
1. The Peak Envelope Power (PEP) at maximum set power level is +41 dBm.
2. 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.
3. The Aprisa SR has been successfully evaluated against the requirements of IEEE 1613 for class 1 performance criteria.
4. The 50 kHz channel size is subject to regulatory 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 analogue, serial data and PDH applications.

4RF

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