

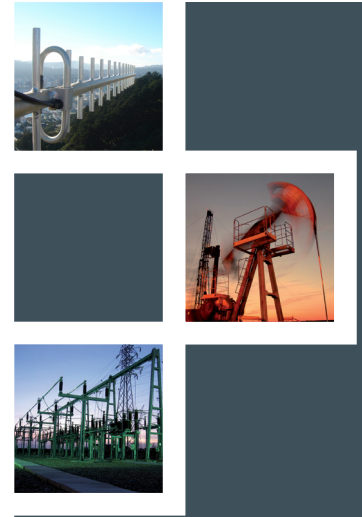
Aprisa SRQ

SMART, SECURE POINT-TO-MULTIPOINT RADIO VHF and UHF licensed bands



Aprisa SRQ: smart, secure, licensed point-to-multipoint and point-to-point SCADA communications for industrial monitoring and control for the electricity, water, oil and gas industries

- **High capacity:** to meet the growing number of data-intensive applications in the SCADA environment, the Aprisa SRQ provides data rates of up to 72 kbit/s in 50 kHz licensed channels.
- **Secure:** with its defence in depth approach, including AES encryption, authentication, address filtering and user access control, the Aprisa SRQ protects against vulnerabilities and malicious attacks.
- **Future-proof:** the Aprisa SRQ supports multiple serial and Ethernet 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.
- **Adaptable:** the Aprisa SRQ integrates into a range of network topologies, with each unit configurable as a base station, repeater or remote station; connect multiple RTUs / PLCs to a single radio.
- **Flexible interfaces:** the data interfaces can be configured for serial or Ethernet operation; a range of options are supported, including two serial and two Ethernet, one serial and three Ethernet, or four Ethernet ports.
- **Link efficiency:** Adaptive forward error correction (FEC) maintains the integrity of the wireless connection while an effective channel access scheme and IP routing ensures efficient transfer of data across the Aprisa SRQ network.
- **Reliable and robust:** the Aprisa SRQ requires no manual component tuning and maintains its high power output and performance over a wide temperature range.
- **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.



The Aprisa SRQ in brief

- VHF and UHF licensed bands
- RS-232 and IEEE 802.3 protocols with multiple port options
- Software selectable 12.5 kHz, 25 kHz, 50 kHz channel sizes
- Full and half duplex operation
- Single or dual frequency
- Gross data rates up to 72 kbit/s
- 256, 192 or 128 bit AES encryption
- Modulation QPSK
- Advanced FEC
- Software selectable dual / single antenna port operation
- Transparent to all common SCADA protocols
- Dedicated alarm port
- Protected station option
- -40 to +70 °C operational temperature
- 210 mm (W) x 130 mm (D) x 41.5 mm (H)
- ETSI standards compliant
- Seamlessly integrates with Aprisa XE and Aprisa SR families of radios

Aprisa SRQ applications

Applications throughout the electricity grid and renewable energy:

- Smart grid: concentrator communications and GPRS replacement
- AMI / AMR: high density data concentrator backhaul
- Renewables: wind farm, tidal, hydro automation
- Measurement, control and protection in MV / HV distribution / transmission
- Co-generation and community energy storage monitoring and control in distributed storage and generation
- Fibre substitution in substation and feeder automation upgrades

SYSTEM SPECIFICATION

GENERAL			
NETWORK TOPOLOGY	Point-to-multipoint (PMP), 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 user traffic; e.g. Modbus, IEC 60870-5-101/10 DNP3 or similar		
RADIO			
FREQUENCY RANGE	FREQ BAND	TUNING RANGE	TUNE STEP
	135 MHz	135 – 175 MHz	3.125 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		
DUPLEX	Single frequency half-duplex Dual frequency half-duplex Dual frequency full-duplex ^(Note 4)		
FREQUENCY STABILITY	± 1.0 ppm		
FREQUENCY AGING	< 1 ppm / annum		
TRANSMITTER			
AVERAGE POWER OUTPUT ^(Note 1)	QPSK	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
SENSITIVITY (BER < 10 ⁻⁹) max coded	QPSK	-115 dBm	-112 dBm
ADJACENT CHANNEL SELECTIVITY		> -47 dBm	> -37 dBm
	^(Note 2)	[> 48 dB]	[> 58 dB]
CO-CHANNEL REJECTION max coded QPSK	> -10 dB		
CO-CHANNEL REJECTION max coded 64 QAM	> -20 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
GROSS DATA RATE	QPSK	20 kbit/s	40 kbit/s
FORWARD ERROR CORRECTION	Variable length concatenated Reed Solomon plus convolutional code		
ADAPTIVE BURST SUPPORT	Adaptive FEC Adaptive Coding Modulation		

SECURITY	
DATA ENCRYPTION	256, 192 or 128 bit AES
DATA AUTHENTICATION	CCM
INTERFACES	
ETHERNET	2, 3 or 4 port RJ45 10/100Base-T switch (specified at order)
SERIAL	2, 1 or 0 port RJ45 RS-232 (specified at order) 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	2 x TNC 50 ohm female Software selectable single or dual port operation
LEDs	Status: OK, MODE, AUX, TX, RX Diagnostics: RSSI, traffic port status
TEST BUTTON	Toggles LEDs between diagnostics / status
PRODUCT OPTIONS	
DATA PORT CONFIGURATION	2 x Ethernet ports + 2 serial ports 3 x Ethernet ports + 1 serial port 4 x Ethernet ports
PROTECTED STATION	Providing redundant hardware switching
POWER	
INPUT VOLTAGE	10 – 30 VDC (13.8 V nominal)
RECEIVE	STANDARD < 7 W POWER OPTIMIZED < 3 W in active receive state < 2 W in idle receive state, < 0.5 W in sleep mode
TRANSMIT	< 35 W
MECHANICAL	
DIMENSIONS	210 mm (W) x 130 mm (D) x 41.5 mm (H)
WEIGHT	1.25 kg
MOUNTING	Wall, Rack or DIN rail
ENVIRONMENTAL	
OPERATING TEMPERATURE	-40 to +70 °C
HUMIDITY	Maximum 95 % non-condensing
MANAGEMENT & DIAGNOSTICS	
LOCAL ELEMENT	Web server with full control / diagnostics Partial diagnostics via LEDs and test button Firmware upgrade via USB memory stick
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
SAFETY	EN 60950 Class 1 division 2 for hazardous locations
ENVIRONMENTAL	ETS 300 019 Class 3.4 Ingress Protection IP51

Notes:

- The Peak Envelope Power (PEP) at maximum set power level is +41 dBm.
- 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 SRQ User Manual for a complete list of coding levels.
- Please consult 4RF for availability.
- Full duplex channel access for point to multi-point available in a future software release.

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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