



# Aprisa SR+

## SMART, SECURE POINT-TO-POINT RADIO

Licensed bands: VHF, 220 MHz, and UHF licensed bands. Private Market Spectrum 220, 700, and 900 MHz

[DATASHEET \[FCC / IC\]](#)

Smart, secure, industry-leading speed licensed point-to-point for linking and backhaul of industrial monitoring and control – now with 256 QAM

- **High capacity:** to meet the growing number of data-intensive applications in the SCADA environment, the Aprisa SR+ PTP provides data rates of up to 1,152 kbit/s full duplex in 100 kHz licensed channels.
- **Secure:** with its defense in depth approach, including AES encryption, authentication, address filtering and user access control including RADIUS, the Aprisa SR+ PTP protects against vulnerabilities and malicious attacks.
- **Future-proof:** the Aprisa SR+ PTP supports dual serial and dual Ethernet ports in a single, compact form factor, designed to cryptographically secure legacy serial, protect existing device investment, and enable new applications. Old and new application protocols can be run side by side.
- **Advanced L2 / L3 capabilities:** selectable L2 bridge, L3 router, or advanced gateway router combination L2 / L3 modes with VLAN, QoS, NAT, and filtering attributes to maximize capacity in constrained bandwidth and prioritize mission critical traffic while meeting tough security and IP network policy imperatives.
- **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. Support for NMEA GPS receiver option.
- **Link efficiency:** Adaptive Coding and Modulation (ACM) and forward error correction maintains the integrity of the wireless connection while an effective channel access scheme and IP routing ensures efficient transfer of data across a Aprisa SR+ PTP link. Automatic Transmit Power Control maintains the minimum transmit power required for effective communications enhancing both frequency reuse and power savings. Advanced payload and Ethernet / IP / TCP / UDP header compression.
- **Reliable and robust:** the Aprisa SR+ PTP requires no manual component tuning and maintains its performance over a wide temperature range using full specification industrially rated components and shared Aprisa family heritage.
- **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 variety of supported third party network management systems.

## Applications

- **Electricity grid:** distribution automation control and protection in MV / HV distribution / transmission
- **Smart grid,** DA, DFA, DER, cap bank control
- **Oil & Gas:** production metering, lift pump automation
- **AMI / AMR:** high density data concentrator backhaul
- **Renewables:** wind farm, tidal, hydro automation
- **Water and wastewater:** flow, level, pressure modulation automation and pump status
- **Ultra low latency** for feeder protection – 6 ms at 100 kHz and 8 ms at 50 kHz

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LICENSED BANDS: VHF, 220 MHz, AND UHF LICENSED BANDS. PRIVATE MARKET SPECTRUM 220, 700, AND 900 MHz



## Specifications

General	
Network Topology	Point-To-Point (PTP) Full Duplex
Network Integration	Serial and Ethernet (router or bridge mode)

  

Protocols	
Ethernet	IEEE 802.3, 802.1d/q/p
Serial	Legacy RS-232 transport, SLIP and Terminal Server support
Wireless	Proprietary
SCADA	Transparent to all common SCADA protocols such as Modbus, IEC 60870-5-101/104, DNP3 or similar

  

Radio	Frequency Band (MHz)	Tuning Range (MHz)	Tune Step (kHz)
Frequency Range	135	135 – 175	0.625
	220	215 – 240	0.625
	400	400 – 470	6.25
	450 <sup>[4]</sup>	450 – 520 <sup>[4]</sup>	6.25 <sup>[4]</sup>
	700 <sup>[4]</sup>	757 – 758 <sup>[4]</sup> 787 – 788 <sup>[4]</sup>	6.25 <sup>[4]</sup>
	896 <sup>[5]</sup>	896 – 902 <sup>[5]</sup>	6.25 <sup>[5]</sup>
	928 <sup>[5]</sup>	928 – 960 <sup>[5]</sup>	6.25 <sup>[5]</sup>
Channel Size	12.5 kHz, 15 kHz, 25 kHz, 30 kHz, 50 kHz and 100 kHz software selectable		
Duplex	Dual frequency full-duplex		
Frequency Stability	± 0.5 ppm		
Frequency Aging	< 1 ppm / annum		

  

Transmitter	
Max Peak Envelope Power (PEP)	10.0 W (+40 dBm)
Average Power Output	256 QAM 0.01 – 2.0 W (+10 to +33 dBm, in 1 dB steps) <sup>[6]</sup>
	64 QAM 0.01 – 2.5 W (+10 to +34 dBm, in 1 dB steps)
	16 QAM 0.01 – 3.2 W (+10 to +35 dBm, in 1 dB steps)
	QPSK 0.01 – 5.0 W (+10 to +37 dBm, in 1 dB steps)
	4-CPFSK 0.01 – 10.0 W (+10 to +40 dBm, in 1 dB steps) <sup>[2]</sup>
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
Emission Designator	Contact Aviat Networks for Emission Reports.

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Receiver			12.5 kHz	25 kHz	50 kHz	100 kHz
Sensitivity (BER < 10 <sup>-6</sup> )	min coded <sup>[6]</sup>	256 QAM	-95 dBm	-91 dBm	-88 dBm	-85 dBm
	max coded	64 QAM	-103 dBm	-99 dBm	-96 dBm	-93 dBm
	max coded	16 QAM	-110 dBm	-107 dBm	-104 dBm	-101 dBm
	max coded	QPSK	-115 dBm	-112 dBm	-109 dBm	-106 dBm
	min coded	4-QPSK	-113 dBm	-110 dBm	-107 dBm	-104 dBm
Adjacent Channel Selectivity			>-47 dBm	>-37 dBm	>-37 dBm	>-37 dBm
			<sup>[1]</sup> [>48 dB]	[>58 dB]	[>58 dB]	[>58 dB]
Co-Channel Rejection	max coded	QPSK	>-10 dB			
Co-Channel Rejection	min coded	256 QAM	>-26 dB			
Intermodulation Response Rejection			>-35 dBm [>60 dB <sup>[1]</sup> ]			
Blocking or Desensitisation			>-17 dBm [>78 dB <sup>[1]</sup> ]			
Spurious Response Rejection			>-32 dBm [>63 dB <sup>[1]</sup> ]			

Modem	12.5 kHz <sup>[1]</sup>		15 kHz	25 kHz	30 kHz	50 kHz	100 kHz			
<b>Gross Data Rate (kbit/s)</b>										
Bands (MHz)	220, 400, 450	700, 896, 928	135	220	220, 400, 450, 896, 928	700	135	135, 220, 400, 896, 928	700	700, 896, 928
256 QAM <sup>[6]</sup>	72	80	72	80	128	160	128	288	320	576
64 QAM	54	60	54	60	96	120	96	216	240	576
16 QAM	36	40	36	40	64	80	64	144	160	288
QPSK	18	20	18	20	32	40	32	72	80	144
4-QPSK	9.6	9.6	9.6	9.6	19.2	19.2	19.2	38.4	38.4	76.8
Forward Error Correction			Variable Reed Solomon plus convolutional code							
Adaptive Burst Support			Adaptive Coding and Modulation							

Security	
Data Encryption	256, 192 or 128 bit AES
Data Authentication	CCM

Interfaces	
Ethernet Ports	RJ45 10/100Base-T auto-neg MDI/MDIX
Serial Ports	RJ45 RS-232 Additional RS-232 / RS-485 port via USB converter (optional)
GPS Receiver	Support for optional USP connect GPS receiver
Management	1 x USB micro type B (device port) 1 x USB standard type A (host port)
Antenna	2 x TNC 50 ohm female
Alarm I/O	1 x RJ45 Alarm I/O interface 2 x inputs + 2 x outputs
LEDs	Status: OK, MODE, AUX, TX, RX Diagnostics: RSSI, traffic port status

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Interfaces	
Test Button	Toggles LEDs between diagnostics / status

  

Product Options (specified at order)	
Data Port Configuration Options	2 x Ethernet ports + 2 serial ports 3 x Ethernet ports + 1 serial port 4 x Ethernet ports
Duplex Options	Half Duplex or Full Duplex
Protected Station Options	Providing hot-swappable / hot-standby redundant hardware switching (10-30 VDC or 18-60 VDC)

  

Power		
Input Voltage	Radio	10 – 30 VDC negative earth
Receive	All bands	< 3 W (217 mA at 13.8 VDC)
Transmit	135 and 220 MHz	< 26 W (1884 mA at 13.8 VDC)
	400, 450, 700, 896, 928 MHz	< 28 W (2028 mA at 13.8 VDC)

  

Mechanical		
Dimensions (not including connectors)	Radio	210 mm (W) x 130 mm (D) x 41.5 mm (H) 8.27" (W) x 5.12" (D) x 1.63" (H)
	Protected Station	434 mm (W) x 372 mm (D) x 88.9 mm (H) 2 RU 17.1" (W) 14.6" (D) 3.5" (H)
Weight	Radio	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 Management	SSH and HTTP/S web servers with full control / diagnostics Partial diagnostics via LEDs and test button Software upgrade from PC or USB flash drive
Remote Element	SSH and HTTP/S 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
Over the Air	Low overhead SuperVisor Extended NetworkManagement (EXM)

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Compliance																									
RF	FCC CFR47 Part 24 / 27 / 80 / 90 / 95 / 101 IC RSS 119 / RSS 134																								
	<table border="1"><thead><tr><th>Band</th><th>FCC ID</th><th>IC</th></tr></thead><tbody><tr><td>135</td><td>UIPSQ135M150</td><td>6772A-SQ135M150</td></tr><tr><td>220</td><td>UIPSQ215M141</td><td>6772A-SQ215M141</td></tr><tr><td>400</td><td>UIPSQ400M1311</td><td>6772A-SQ400M1311</td></tr><tr><td>450</td><td>UIPSQ450M140</td><td>N/A</td></tr><tr><td>700</td><td>UIPSQ757M160</td><td>N/A</td></tr><tr><td>896</td><td>UIPSQ896M141</td><td>6772A-SQ896M141</td></tr><tr><td>928</td><td>UIPSQ928M141</td><td>6772A-SQ928M141</td></tr></tbody></table>	Band	FCC ID	IC	135	UIPSQ135M150	6772A-SQ135M150	220	UIPSQ215M141	6772A-SQ215M141	400	UIPSQ400M1311	6772A-SQ400M1311	450	UIPSQ450M140	N/A	700	UIPSQ757M160	N/A	896	UIPSQ896M141	6772A-SQ896M141	928	UIPSQ928M141	6772A-SQ928M141
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EMC	FCC CFR47 Part 15, EN 301 489-5, ICES-003																								
Safety	EN/UL/IEC 62368-1, CB Certified, UL listed																								
Hazardous Locations	Class 1 division 2																								
Environmental	ETS 300 019-2-3 Class 3.4, Ingress Protection IP51																								
Electric Substation	IEEE 1613 Class 2, IEC 61850-3																								

- Notes:
- [1] 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.
  - [2] Please consult Aviat Networks for availability
  - [3] The gross data rate for the 12.5 kHz channel size varies with regulatory compliance
  - [4] The 450 MHz and 700 MHz bands are only available for FCC.
  - [5] The receive tuning range is specified. The transmit tuning range is 896 - 960 MHz.
  - [6] 256 QAM available in selected frequency bands and channel sizes. Please consult Aviat Networks for availability

## Disclaimer

This material is for informational purposes only and does not constitute a legal obligation to deliver any product, feature or functionality and should not be relied upon in making purchasing decisions. All specifications are subject to change without notice. The development, release and timing of any features or functionality described for our products is at Aviat Networks' sole discretion.

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