中国工信部/ETSI / FCC / IC licensed bands
VHF, 230 MHz, UHF, 900 MHz

Private market spectrum
700,800,and 900 MHz

SMART, SECURE POINT-TO-MULTIPOINT RADIO

Smart, secure, industry-leading speed licensed point-to-multipoint 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 Super-LoRa provides data rates of up to 216 kbit/s in 50 kHz licensed channels.

- **Secure:** with its defense in depth approach, including AES encryption, authentication, address filtering and user access control including RADIUS, the Super-LoRa protects against vulnerabilities and malicious attacks.

- **Future-proof:** the Super-LoRa 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, 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.

- **Adaptable:** the Super-LoRa integrates into a range of network topologies, with each unit configurable as a master 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. 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 the Super-LoRa network.

- **Reliable and robust:** the Aprisa SR+ 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 variety ofsupported third party network management systems.

The Super-LoRa in brief

- Frequency bands of 135 – 175, 215 – 240, 400 – 520, 757 – 758 and 787 – 788, 896 – 902 and 928 – 960 MHz
- RS-232 and IEEE 802.3 protocols with multiple port options
- Software selectable 12.5 kHz, 15 kHz, 25 kHz 30 kHz and 50 kHz channel sizes. For other channel sizes please consult WDS
- Full and half duplex operation
- Single or dual frequency
- Gross data rates greater than 200 kbit/s
- 256, 192 or 128 bit AES encryption
- Adaptive Coding and Modulation: QPSK to 64 QAM
- Advanced forward error correction
- Ethernet and IP / TCP / UDP header compression
- (ROHC) and payload compression
- Software selectable dual / single antenna port operation
- Transparent to all common SCADA protocols
- Dedicated alarm port
- Protected master station and remote station options
- Power optimized 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
- Seamlessly integrates with Aprisa XE point-to-point radio

Super-LoRa applications

- Electricity grid: distribution automation control and protection in MV / HV distribution / transmission
- Smart grid: concentrator communications and GPRS replacement
- 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

Super-LoRa

ETSI / FCC and IC licensed bands

GENERAL	
NETWORK TOPOLOGY	Point-to-multipoint(PMP),Master,Remote,Repeater
NETWORK INTEGRATION	Serial and Ethernet(router or bridge mode)

PROTOCOLS	
ETHERNET	IEEE802.3， 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		150 MHz	135 – 175 MHz	0.625 kHz
		230 MHz	215 – 240 MHz	0.625 kHz
		400 MHz	400 – 470 MHz	6.25 kHz
	(Note 4)	450 MHz	450 – 520 MHz	6.25 kHz
	(Note 4)	700 MHz	757 – 758 & 787 – 788 MHz	6.25 kHz
	(Note 5)	896 MHz	896 – 902 MHz	6.25 kHz
	(Note 5)	928 MHz	928 – 960 MHz	6.25 kHz
CHANNEL SIZE		12.5 kHz, 15 kHz, 25 kHz, 30 kHz and 50 kHz software selectable		
DUPLEX		Single frequency half-duplex Dual frequency half-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		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)
	(Note 2)	4-CPFSK 0.01 – 10.0 W (+10 to +40 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
EMISSION DESIGNATOR SUFFIX		QPSK G1D, QAM D1D

RECEIVER			12.5 kHz	25 kHz	50 kHz
SENSITIVITY (BER < 10-6)	max coded	64 QAM	–103 dBm	–99 dBm	–96 dBm
	max coded	16 QAM	–110 dBm	–107 dBm	–104 dBm
	max coded	QPSK	–115 dBm	–112 dBm	–109 dBm
	max coded	4-CPFSK	–113 dBm	–110 dBm	–107 dBm
ADJACENT CHANNEL SELECTIVITY			> –47 dBm	> –37 dBm	> –37 dBm
	(Note 1)		[> 48 dB]	[> 58 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 1]]		
BLOCKING OR DESENSITISATION			> –17 dBm [> 78 dB [Note 1]]		
SPURIOUS RESPONSE REJECTION			> –32 dBm [> 63 dB [Note 1]]		

MODEM	12.5 kHz (Note 3)	15 kHz	25 kHz	30 kHz	20 kHz
GROSS DATA RATE					
BAND	220, 400, 450, 700,896, 928	135 220	220, 400,450 700 896,928	135	135, 220, 400, 700 896, 928
64 QAM	54 kbit/s 60 kbit/s	54 kbit/s 60 kbit/s	96 kbit/s 120 kbit/s	96 kbit/s	216 kbit/s 240 kbit/s
16 QAM	36 kbit/s 40 kbit/s	36 kbit/s 40 kbit/s	64 kbit/s 80 kbit/s	64 kbit/s	144 kbit/s 160 kbit/s
QPSK	18 kbit/s 20 kbit/s	18 kbit/s 20 kbit/s	32 kbit/s 40 kbit/s	32 kbit/s	72 kbit/s 80 kbit/s
4-CPFSK	9.6 kbit/s 9.6 kbit/s	9.6 kbit/s 9.6 kbit/s	19.2 kbit/s 19.2 kbit/s	19.2 kbit/s	38.4 kbit/s 38.4 kbit/s
OCC BW	10.7 kHz 12.0 kHz	10.7 kHz 12.0 kHz	19.8 kHz 24.5 kHz	19.8 kHz	43.0 kHz 48.0 kHz
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	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
POWER OPTIMIZED	Providing optimized power and sleep mode
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, 700, 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

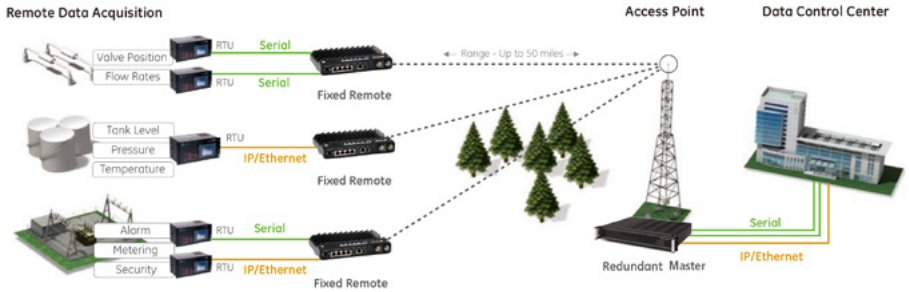
ENVIRONMENTAL	
OPERATING TEMPERATURE	–40 to +70 ˚C (–40 to +158 ˚F)
HUMIDITY	Maximum 95 % non-condensing

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 24 / 27 / 90 / 101, IC RSS 119 / RSS 134		
	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
EMC	FCC CFR47 Part 15, EN 301 489-5, ICES-003		
SAFETY	EN 60950, Class 1 division 2 for hazardous locations		
ENVIRONMENTAL	ETS 300 019 Class 3.4, IEEE 1613 Class 2 IEC 61850-3, Ingress Protection IP51		

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 4RF 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.



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