

# RA2 Secure Voice Modem

## RA2 Secure Voice Modem



### AES-256 Voice & Position For Any Radio

The RA2 is a high performance digital secure voice modem. The RA2 is suitable for first responders, security agencies, governmental, paramilitary and even military users requiring voice privacy and asset SECURE tracking. The RA2 easily integrates with HF, VHF and UHF radio transceivers via the audio interface. The RA2 is suitable for vehicle and desktop installations.

### Information Security

Beyond-Line-Of-Site (BLOS) communication is vulnerable to eavesdropping due to the vast areas covered. The RA2's built-in AES encryption means that all digital voice and data communications are secured by a trusted algorithm.

### Low-Rate Vocoder

The internal Vocoder digitizes the voice. The information is then encrypted and converted to an in-band signal by the data modem. The Vocoder dramatically improves voice quality in adverse channel conditions, extending the range of voice communications. The unit is also capable of detecting plain voice (analogue SSB or FM).

### Superior Modem Performance

Long-range communication is especially prone to channel fading. Both digital voice and data operation benefits from AT Comm's superior technology and experience in HF modem design. The modem features adaptive equalization and can deal with in-band distortion and interference resulting in extended range and increased data throughput.

### Features

- ✓ AES-256 Encryption (Voice, Position, Data)
- ✓ 600 – 2400 bps Low rate Vocoder
- ✓ Automatic Vocoder Rate Adjustment
- ✓ 256 Keys, updatable with SCS Software
- ✓ Cryptography independent of GPS
- ✓ Best-in-class Voice Modem
- ✓ Private Line Voice, Link Setup - CALL
- ✓ Extended Range, BLOS Links especially
- ✓ Noise Reduction Handset/Headset compatible
- ✓ Built-In Data Modem, ALE & ARQ
- ✓ Built-In GPS, Antenna supplied
- ✓ Cross-Banding with REBRO Cable
- ✓ 6 – 36 V DC Input, Vehicle Surge Protection



- ✓ Works in extreme temperature
- ✓ Compatible with any HF & V/UHF Transceiver
- ✓ Interoperates with RAPTAWC RA5
- ✓ 9,600 bps Serial Modem, MIL-STD-188-110B

### SEC SCS - System Set-Up (Included)

Although the RA2 comes pre-configured and can be used out of the box for straightforward applications, AT Communication offers SEC SCS (System Configuration Software) for AT Configuration. The addresses and scan lists. The encryption keys on the RA2 can also be updated using the SEC SCS. Configuration files and keys are securely transferred to multiple RA2 devices using the Serial Configuration Cable (incl. in SEC SCS) or using an Ethernet cable.

### MessagePoint - Email & Chat (Option)

The RA2 can connect to a Laptop running the MessagePoint Software for Email services. Compression increases the data throughput. The RA2 can interoperate with the RA5 on Email using MessagePoint. (Incl. Ethernet Cable).

### GateWay - SMS & EMAIL (Option)

The RA2 can provide a 'modem mode' in which it connects with the GateWay Software on a PC via the Ethernet port extending Email connectivity to fixed-net users and the internet. (Incl. Ethernet Cable) The GSM gateway enables SMSs to be sent to and from the Global GSM network. This uses a Third Party GSM modem located at the GateWay.

## Specifications

Encryption					
Key Fill	256 factory loaded keys in encrypted storage. Key selection automatic (lasts > 20 years). New keys loaded via SCS				
Algorithm	Advanced Encryption Standard (AES), 256-bit key length				
Random #	True random number generator based on physical events.				
Digital Voice					
Vocoder	600, 1200 & 2400bps Low-rate Vocoder.				
Modem	High performance serial tone BLOS modem (V/UHF compatible) featuring adaptive equalization. The modem is able to deal with in-band interference and multipath/fading (up to 10 ms, 30 Hz). MIL-STD 110B also available (MARS)				
Performance	Vocoder Rate (bps)	Latency (s)	Understandability Limit SNR [dB]		PESQ (Voice Quality)
			CCIR Poor	AWGN	
	2 400	1.6	6.5	0.5	3.2
	1 200	2.2	4.0	-0.5	3.0
	600	2.2	0.5	-3.0	2.4
Hardware			Environmental		
Weight	0.8 kg		Safety	IEC/EN 60950	
Size	35 x 126 x 180 x mm		FCC	Title 47 CFR, Part 15 Subpart B Class A Digital Device	
Colour	Charcoal (RAL 9005)		Shock	40G, 6-9 ms	
Mounting	Desktop/vehicle (mounting bracket included)		Vibration	Composite wheeled vehicle 10Hz – 2000Hz, @2.5g	
Power Input	6-36 V DC, Vehicle surge protected. XLR3 plug (fused cable supplied) or via radio interface.		Temperature	30°C to +70°C (operating), -40°C to +85°C (storage)	
GND Screw	M6 screw used for system grounding. Strap provided.		Humidity	0 to 90%, non-condensing.	
Front Panel Interfaces					
Power / Volume	Turn to switch unit ON/OFF and control phones/speaker volume				
Handset Port	300 Ω, 6 pin U-229 Male (U-283/U, U-183/U compatible). MIC input; PTT input; Phones output; REBRO (PTT) output (pin E, pulled down upon Carrier Detect)				
Call Button	Make and terminate private line calls to a preconfigured address (all-call per default). The CALL address can be programmed using SCS. The CALL button flashes when receiving an incoming call.				
Zeroize Button	Press to erase all crypto keys in an emergency.				
Rear Panel Interfaces					
GPS Antenna	MCX Connector; Magnetic mount GPS antenna included				
Ethernet	RJ45 Socket; 10/100 Base T (IEEE 802.3U compatible); Protocol: AT Comm Control Protocol (RAP1 + RIPC) over TCP/IP				
Remote Control / GPS (DE9F)					
Remote Control	RS-232, 115200 bps, 1 stop bit, 8 bit character lengths, Protocol: Control Protocol (RAP1 + RIPC)				
External GPS	300 to 115200 bps (4800 bps), 1/2 stop bits, 7/8 bit data. PPS line: RS 232 (NMEA) or TTL. For external GPS receiver.				
Radio Control, Audio Port (DB25F)					

Radio Control	Selectable RS-232, TTL and 1-wire modes (1-wire allows direct connection to Icom CI-V interface) The Port is automatically configured for the selected Radio.
Radio Audio	Input Audio: 600 $\Omega$ bal., -35 to +3 dBm without adjustment. Output Audio: Bal., -40 to +3 dBm adjustable into 600 $\Omega$ load. Speaker output (4 ohm 2W). PTT Sense Input: Pull to ground. Keyline Output: Open Collector (<36 V, 200 mA). Re-broadcast compatible.
Front Panel Dim	Pull To ground to dim front panel LED's for vehicle use at night.



**RA2 Secure Voice Modem - Data Communication - Military**