RA2

SECURE VOICE & DATA MODEM / MOBILE

RA
FAMILY

Loudspeaker

VOICE MODEM FEATURES:

o   Secure Communications

o   Mobile and Base Deployment

o   Asset Tracking

o   Email on Network with MessagePoint

o   Intranet Email and SMS with GatePoint

SPECIFICATIONS OVERVIEW:

o   Interoperates with RA devices: RA1, RA3, RA5, RA7

o   600 – 2400 bps Low rate Vocoder (TWELP*)

o   Automatic Vocoder Rate Adjustment

o   AES-256 Encryption (Voice, Position, Data)

o   Best-in-class Voice Modem

o   Private Line Voice, Link Setup (CALL Button)

o   Built-in Loudspeaker (10W)

o   Extended Range, BLOS Links especially

o   Noise Reduction Handset/Headset compatible

o   Built-In GPS, Antenna supplied

o   6 – 36 V DC Input, Vehicle Surge Protection

o   Compatible with any HF & V/UHF Transceiver

o   Works via 3 kHz Audio Channel

o   Built-In Data Modem, ARQ and Selective Calling

o   3 Year Warranty

ENCRYPTED VOICE & POSITION FOR ANY RADIO

The **RA2** is a high-performance digital secure voice modem. It is part of the **RA** family and is suitable for first responders, security agencies, governmental and paramilitary users. The **RA2** offers voice privacy or asset tracking and 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 RapidM'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 throughput.

* TWELP voice coding by DSP Innovations Inc.(www.dspini.com)

SECURE COMMUNICATIONS FOR ANY RADIO

RapidM

Included with RA2

- H-250/U style handset with passive noise reduction
- Magnetic mount GPS antenna
- DC power cable
- Mounting bracket
- User Manual

SCS & KMS - System Set-up

RapidM SCS (System Configuration Software) is used for configuration of the addresses and scan lists. The encryption keys on the *RA2* can also be updated using the *KMS* (Key Management Software) . *KMS* and *SCS* files are loaded onto the *RA2* with the Config Load Software (CLS) via the Ethernet or Serial interfaces.

MessagePoint - Email (Optional)

The *RA2* can connect to a Laptop running the *MessagePoint* Software. *MessagePoint* provides Email, Chat and File Transfer services. Compression increases the data throughput. The *RA2* can interoperate with other *RA* devices on Email using *MessagePoint* (Ethernet Cable included).

GatePoint - SMS & Email (Optional)

The *RA2* can become a gateway station by connecting with the *GatePoint* Software on a PC via the Ethernet port. The *GatePoint* software extends Email connectivity to fixed-net users and the internet (Ethernet Cable included). 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.

ENCRYPTION

Key Fill	99 Encryption keys selectable from the front panel. New keys loaded via *KMS*.
Algorithm	Advanced Encryption Standard (AES), 256-bit key length.

DIGITAL VOICE

Vocoder	**TWELP:** Tri-Wave Excited Linear Prediction high performance vocoder. 600, 1200 & 2400bps Low-rate Vocoder.
Modem	High performance serial tone BLOS modem (V/UHF compatible) featuring adaptive equalization and selective calling. 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)

	Vocoder Rate [bps]	End-to-End Latency [s]	PESQ	Channel Use	Speech Quality		Understand-ability Limit SNR [dB]	
Performance					Intelligibility	Speaker Recognition	CCIR Poor	AWGN
	2 400	1.6	3.1	Ground Wave	Very Good	Good	6.5	0.5
	1 200	2.2	3.0	Sky Wave	Good	Acceptable	4.0	-0.5
	600	2.2	2.4	Sky Wave	Acceptable	Fair	0.5	-3.0

HARDWARE / ENVIRONMENTAL

Weight	0.8 kg	**Safety**	IEC/EN 60950
Size	35 x 126 x 180 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	9 - 36 V DC, Vehicle surge protected. Dedicated 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.
Speaker	Internal speaker 10W		

FRONT PANEL INTERFACES

Power / Volume	Turn to switch unit ON/OFF and control phones and speaker volume.
Handset Port	300 Ω, 6 pin U-229 Male (U-283/U, U-183/U compatible). MIC input; PTT input; Phones outputt; 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.
Mode Button	Toggle between SECURE, CLEAR and ANALOG voice modes.
+ - Buttons	
Zeroize	Press orange-marked key button combination to erase all crypto keys in an emergency.

REAR PANEL INTERFACES

GPS Antenna	SMA Connector; Magnetic mount GPS antenna included.
Ethernet	RJ45 Socket; 10/100 Base T (IEEE 802.3U compatible)

REM CTRL (J1, DE9F)

Remote Control	RS-232, 115200 bps, 1 stop bit, 8 bit character lengths
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 / DATA (J20, 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. Contact RapidM for a selection of predesigned radio cables.
Radio Audio	Input Audio: 600 Ω bal., −35 to +3 dBm without adjustment. Output Audio: Bal., −40 to +3 dBm adjustable into 600 Ω load. 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.

Ordering Information	Stock Number	Description
RA2 Secure Voice Modem	RME-2A-RDA6CV04	SDM: RA2 AES-256, 600bps Vocoder V4
SCS System Configuration Bundle	RAP-BU-CFA2CVE4	Bundle: SCS 256b, USB Cbl EN V4
MessagePoint Email Software	RAP-PC-MASW-VE4	PC S/W: MessagePoint Email EN V4
Gateway Software	RAP-PC-GASW-VE4	PC S/W: GatePoint Email,GSM,UM EN V4