

RM2-HVM: HF & V/UHF Modem [Prelim.]

HF & V/UHF Data Modem

The **RM2-HVM** is a compact HF and V/UHF data modem for governmental and NGO use. The unit is suitable for long distance data communications links in mobile and marine environments. The maximum data rate is 9600 bps.

Key Features & Benefits

- 9600 bps data rate in 3 kHz
- Compatible with RapidM RC50 Government Communications Suite
- Icom, Kenwood & Vertex Standard radio compatibility
- STANAG 4593 (high speed)
- STANAG 4415 (robust)
- MIL-STD-188-110A
- Vehicle Surge Protected DC Power Input (MIL-STD-1275B)
- Rack mount or mobile variants
- PC configuration utility
- Ethernet interface

The **RM2-HVM** supports data rates of up to 9600 bps over a standard 3 kHz HF or V/UHF radio link.

Adaptive equalization mitigates the effects of channel multi-path. Convolutional encoding combined with soft-decision Viterbi decoding provides forward error correction (FEC). Cancellation of narrowband co-channel interference is accomplished via adaptive tone excision.

For easy system configuration a PC-based configuration application (GUI) is provided. Modem settings include waveform selection, data rate, audio levels and port configuration.

HF & V/UHF E-mail

The **RM2-HVM** is designed to operate in conjunction with an external automatic repeat request (ARQ) server, for example **RapidM's RC50** Government Communications Suite. For more information please refer to the **RC50** product brochure.

Mobile & Rack Installation

The **RM2-HVM** is available in two variants. The rack mount version shown below is intended for installation into 19" rack systems.



The smaller mobile version is intended for installation in vehicle & marine environments using the supplied mounting bracket.



Interfaces

The **RM2-HVM** offers a choice between serial and Ethernet control interfaces. The **RapidM RIPC/RAP1** protocol is used (control and data).

The unit offers raw data interfacing via a standard TCP socket interface using the Ethernet interface. Four dedicated pins of the remote control port can also be used for raw serial data. The raw data interfaces offer FEC but no ARQ. Flow control is handled by the normal TCP flow control mechanism and CTS/RTS lines respectively (TBC).

Radio interfacing is accomplished using industry standard 600 Ohm audio transmit and receive lines as well as a PTT line.

The DC power supply of the **RM2-HVM** is designed according to MIL-STD-1275B and caters for harsh mobile & marine power supply environments.

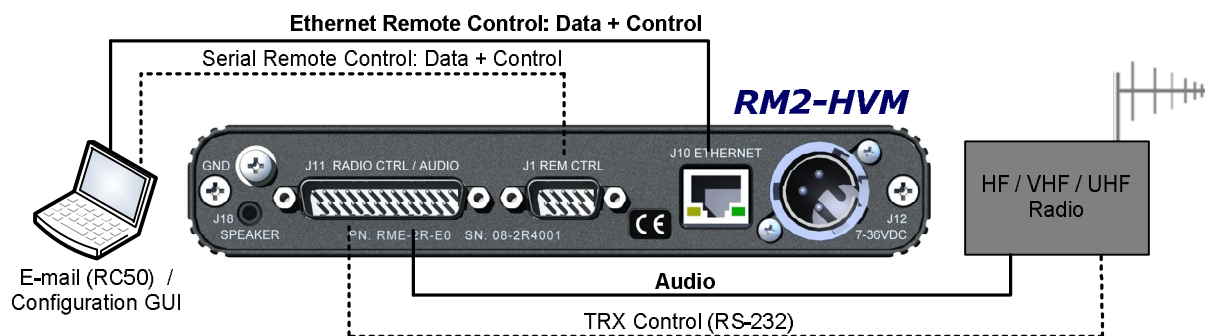


Figure 1: Typical system configuration.

MODEM WAVEFORM	MODULATION	CODING	DATA RATES
STANAG 4539	PSK / QAM	C	75, 150, 300, 600, 1200, 2400, 3200, 4800, 6400, 8000, 9600 bps
STANAG 4415	PSK	C	NATO robust: 75 bps
MIL-STD-118-110A	PSK	C	75, 150, 300, 600, 1200, 2400 bps

GENERAL	
ALL WAVEFORMS	Carrier capture range ± 200 Hz Frequency tracking of up to 75 Hz changing at 3.5 Hz per second (triangular sweep)
BIT	Comprehensive BIT (Built-In-Test) and continuous error detection
PRESETS	10 Factory Presets, 10 Custom Presets
REMOTE CONTROL	Waveform settings are remote controllable via Ethernet or Remote Control Port
AUTOBAUD	All waveforms have Auto baud capability (automatic detection of bit rate)
SYNC ON DATA	All waveforms are able to synchronise on a data stream (late entry)
TONE EXCISION	Narrowband Interference cancellation

INTERFACES	
REMOTE CONTROL / RAW DATA PORT (DE9M)	Remote Control (5 pins): RS-485 Multi-drop, RS-422 balanced or RS-232 Data Rate: 1200 to 115200 bps, 1 or 2 stop bits, 8 bit character lengths Protocol: Control Protocol (RAP1 + RIPC) Raw Serial Data (4 pins) (To be confirmed): RS-232 (nominally input) Data Rate: 300 to 19200 bps (nominally 19200 bps), 1 or 2 stop bits, 7/8 bit data
ETHERNET CTRL & RAW DATA PORT (RJ45)	Remote Control: 10 Base T (IEEE 802.3U compatible), half duplex Protocol: RapidM Control Protocol (RAP1 + RIPC) over TCP/IP Raw Data Port: TCP Berkeley Socket interface for sending / receiving raw data <ul style="list-style-type: none"> Flow control handled by TCP Forward Error Correction (FEC) No ARQ
FRONT PANEL	8 bi-colour status LED indicators on front panel: <ul style="list-style-type: none"> Ethernet (Activity, Link) REM Ctrl (Activity, connected) RADIO Ctrl – not used SNR / INT (Bit Error Rate indication > BER 4) Audio IN (Signal level indication) Data (Tx / Rx Data) Tune status Power indicator (Power on, Fault indication)
RADIO CONTROL & AUDIO PORTS (DB25M)	Radio Control Pins: RS-232, 4800 to 115200 bps, 1 or 2 stop bits, 7/8 bit data (no Hardware flow control), used by RC50 Software Radio Audio Pins: Input Audio: 600 Ohm balanced, -20 to $+10$ dBm without adjustment Output Audio: Balanced, -40 to $+5$ dBm adjustable into 600 ohm load Keyline: Non-polarized contact closure (<45 V, 200 mA) PTT Sense Input: Pull to ground to indicate external PTT (used by RC20 to detect PTT override)

RADIOS		
HF	ICOM	IC-F7000, IC-M700PRO, IC-M710RT, IC-M802, IC-78, IC-703, IC-706MKIIG, IC-718, IC-710, IC-746PRO, IC-756PROII, IC-7800
	KENWOOD	TK-90, TK-80, TS-50, TS-480, TS-2000
	VERTEX STANDARD	VX-1700
	OTHER	Most HF radios with a 3 kHz audio bandwidth
V/UHF	ICOM	IC-M422, IC-M504, IC-M506
	OTHER	Most V/UHF radios with a 3 kHz audio bandwidth

INSTALLATION		ENVIRONMENTAL	
WEIGHT	1.25 kg	TEMPERATURE	-30°C to $+70^{\circ}\text{C}$ (operating)
COLOUR	Black, powder coat	HUMIDITY	0 to 90%, non-condensing
SIZE	RACK	SHOCK	MIL-STD-810E Method 516.4, Procedure 1, Funct. (40G, 11 ms)
	MOBILE		
MOUNTING	RACK	EMC	MIL-STD-461E
	MOBILE	SAFETY	IEC/EN 60950
POWER	7-36 V DC (designed for MIL-STD-1275B), XLR3 plug (supplied) GND Screw: Lug + copper braid (supplied)	VIBRATION	MIL-STD-810E Meth. 514.4, Cat. 9, Shipboard

RELATED PRODUCTS	FEATURES*
RM6	Rack Mount, Ethernet, DTE (Synchronous & Asynchronous), 2G ALE s/w Option, 9600 bps in 3kHz, 19200 bps in 2-15B, Security Processor, Front Panel (Control & Configuration), Email (using RC66 Combat Communications Suite).
RM4	Rack Mount, Ethernet, DTE (Synchronous & Asynchronous), 2G ALE s/w Option, 9600 bps in 3kHz, Email (using RC40 Government Communications Suite)
RM2-HVM	Rack Mount / Mobile, Ethernet, Email (using RC40 Government Communications Suite).
RM2-ALE	Standalone 2G ALE unit, DTMF Microphone I/F, ALE voice calling

* Please see the RapidM product guide (RM_Product_Guide.pdf) for more information.
Note: The names of actual companies and products mentioned herein are the trademarks of their respective owners.

Apex Corporate Park
Quintin Brand Street
Persequer Park
Pretoria, South Africa
0020

Rapid Mobile Pty (Ltd)
Tel: +27 (0) 12 349 0000
Fax: +27 (0) 12 349 0010
e-mail: info@rapidm.com
web: www.rapidm.com