

# **RMS** Software Defined Modem & ALE Controller

## **LF, HF & V/UHF Data Modem & ALE Controller**

The **RMS** is a high data rate LF, HF & V/UHF data modem & ALE controller unit for standards-based naval and military data communications. The **RMS** is suitable for long distance point-to-point data links. The **RMS** extends the capabilities of the **RM6** to include **3G ARCS** and **V/UHF** data modems.

The **RMS** is intended for installation into 19" rack systems requiring STANAG 4538 capability.



## **Key Features & Benefits**

- **High Data Rate HF Modem**
  - Up to 9600 bps in 3 kHz (SSB)
  - MIL-STD-188-110A & B, STANAG 4539
  - Up to 19200 bps in 6kHz (ISB)
  - MIL-STD-188-110B-F
- **High Data Rate V/UHF Modem**
  - Up to 76800 bps in 25 kHz (V/UHF)
- **Synchronous DTE port for secure data**
- **ALE controller**
  - 2G ALE based on MIL-STD-188-141B
  - 3G ALE based on STANAG 4538
  - Concurrent 3G/2G ALE operation
- **Ethernet interface for remote control**
- **Ethernet interface for packet data (3G ARCS)**
- **AC & DC Power Supply**

## **Data Modem Operation**

The maximum data rate is **9600 bps** over a standard 3 kHz (SSB) HF radio channel and **19200 bps** over an ISB channel. The **RMS** unit provides two independent audio ports to support the ISB mode. For V/UHF operation the maximum data rate is **76800 bps** in a 25 kHz audio channel.

## **Secure Synchronous Data**

The **RMS** unit provides a data secure system, data is routed through a bulk crypto unit and into the **synchronous DTE port**.

## **Automatic Link Establishment**

Additional software options for **2G ALE (MS 141B)** and **3G ALE (STANAG 4538)** are built-in and can be activated with the appropriate RapidM license keys.

- **2G ALE Link Setup Controller (MS 141B)**
  - Individual, Group & Net Calls
  - All, Any, Wildcard Call
  - AMD, DTM, UUF
  - Sounding & LQA Polling
  - Automatic channel selection
  - Linking Protection (AL-1, AL-2)
  - Time exchange
  - Split-site operation
- **3G ALE Link Setup Controller (S 4538)**
  - Fast Link Setup (FLSU)
  - Circuit Link Controller (CLC)
  - LDL & HDL+ Data Link Protocols
  - Linking Protection
  - Occupancy Detection
  - Time exchange

## **Circuit Switched Data**

The **RMS** offers improved circuit switched operation by using 3<sup>rd</sup> Generation link setup. The selection of waveforms is determined by the **RMS** software pack. Please see the reverse page for more details.

## **Packet Switched Data**

The data link protocols ensure **efficient error-free IP packet data delivery**.

- High rate Data Link protocol (**HDL/HDL+**)
  - Suitable for large data volumes
  - High data throughput
  - Optimized for good channel conditions
- Low-latency Data Link protocol (**LDL**)
  - Small data volumes
  - Optimized for adverse channel conditions.

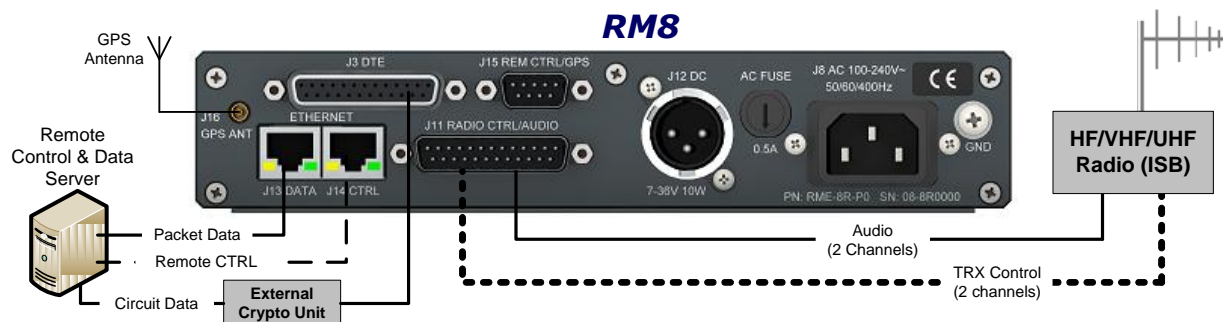


Figure 1: Typical system configuration

WAVEFORM	MODULATION	CODING	DATA RATES & CHARACTERISTICS	MODEM SOFTWARE PACK		
				M1	M2	V1
<b>MIL-STD-188-110B</b> <b>APPENDIX C</b>	PSK/QAM	C	3200, 4800, 6400, 8000, 9600 bps	•	•	-
		U	12800 bps	•	•	-
<b>STANAG 4539 / MS 110B</b>	PSK/QAM	C	75, 150, 300, 600, 1200, 2400, 3200, 4800, 6400, 8000, 9600 bps	•	•	-
		C	12800 bps	•	•	-
<b>MIL-STD-188-110B APPENDIX F</b>	PSK / QAM	C	ISB: 9600, 12800, 16000, 19200 bps	•	-	-
<b>MIL-STD-188-110A</b>	PSK	C	75, 150, 300, 600, 1200, 2400 bps	•	•	-
		U	4800 bps	•	•	-
<b>STANAG 4415</b>	PSK	C	NATO robust: 75 bps	•	•	-
<b>STANAG 4285</b>	PSK	C	75, 150, 300, 600, 1200, 2400 bps	•	•	-
		U	1200, 2400, 3600 bps	•	•	-
<b>STANAG 4529</b>	PSK	C	75, 150, 300, 600, 1200 bps	•	•	-
		U	600, 1200, 1800 bps	•	•	-
<b>STANAG 4481 PSK</b>	PSK	C	300 bps	•	•	-
<b>STANAG 5065</b>	FSK/MSK	C	75 bps (FSK) / 300 bps (MSK)	•	-	-
<b>STANAG 4481 FSK</b>	FSK	C	Single channel: 75 bps	•	•	-
		C	Multi-channel: 75 bps selectable carrier	•	•	-
<b>RAPIDM V/UHF WAVEFORM</b>	PSK / QAM	C	2400, 4800, 9600, 16000, 32000, 48000, 64000 and 76800 bps	-	-	•

STANDARD	CHARACTERISTICS
<b>2G ALE</b>  <b>MIL-STD-188-141B</b> <b>APPENDIX A, B</b> <b>FED-STD 1045</b> <b>FED-STD 1049</b>	Automatic Link Establishment 2nd Generation (2G ALE) Occupancy detection waveforms supported: MS 110A/B, S 4539, S 4285, S 4415, S 4529, S 4481, 8-FSK and SSB Voice Protocol: Calling, AMD, DTM, Excluding: DBM, AQC-ALE <ul style="list-style-type: none"> <li>• Programmable Radio Selection</li> <li>• Link Quality Analysis (LQA)</li> <li>• Linking Protection up to AL-2 (Appendix B). Can use GPS interface for Time reference</li> </ul>

<b>STANAG 4538 – 3G ALE &amp; XDL</b>		
<b>LINK SETUP</b>	<b>FLSU / FTM</b>	Fast Link Set-up, fast traffic manager. Uses physical layer BW5.
	<b>OD</b>	Occupancy detection of STANAG 4539 / MS 110B, MS 110A, S4415 S4285, FSK, ALE 2G (8-FSK), SSB voice
	<b>LP</b>	Linking Protection, Time distribution protocol
<b>PACKET TRAFFIC</b>	<b>LDL</b>	Low-latency Data Link protocol. Uses physical layer BW3 (packet data), BW4 (ACK, EOM, etc.)
	<b>HDL/HDL+</b>	High rate Data Link protocol. Uses physical layer BW2, BW1, BW6, BW7 (ACK, EOM, etc.)
<b>CIRCUIT DATA</b>	<b>CLC</b>	Circuit Link Controller. This is used to operate data (or voice) circuits using STANAG 4539, STANAG 4285 etc.

<b>INTERFACES</b>	
<b>DTE (DATA) PORT (DB25F)</b>	RS-422 balanced, RS-423, RS-232 unbalanced., MIL-STD-188-114 (interoperable) & EIA 530A compliant (DB25 female connector) Half & Full Duplex operation, Synchronous, Standard Async and High-speed Async mode supported: <ul style="list-style-type: none"> <li>• <b>Synchronous:</b> Data Rate: 50, 75, 100, 150, 200, 300, 400, 600, 1200, 1800, 2400, 3200, 3600, 4800, 6400, 8000, 9600, 12800, 16000, 19200, 32000, 48000, 64000, 76800 bps, Clock: Internal / Ext., data polarity: norm / inv. 3-wire sync. Activity detect mode supported</li> <li>• <b>Asynchronous:</b> 75 to 115200 bps, Full Duplex, 5/6/7/8 bit data, 1 or 2 stop bits, Flow ctrl: CTS/RTS or XON/XOFF, polarity: norm / inv.</li> </ul>
<b>REMOTE CONTROL/ GPS PORT (DE9M)</b>	<b>Remote Control Pins:</b> RS-485 Multi-drop, RS-422 balanced or RS-232, internally connected to Security Enforcing Function (SEF) micro. Data Rate: 9600 to 115200 bps, 1 or 2 stop bits, 8 bit character lengths Protocol: Control Protocol (RAP1 + RIPC) <b>External GPS Control Pins:</b> RS-232 (nominal input), internally connected to Security Enforcing Function (SEF) micro. Data Rate: 300 to 19200 bps (nominally 4800 bps), 1 or 2 stop bits, 7/8 bit data PPS line: (RS 232 / RS 422 (NMEA) or TTL)
<b>GPS ANTENNA (MCX)</b>	<b>Built-in GPS receiver:</b> Time reference for 2G ALE Linking protection (AL-2).
<b>ETHERNET CTRL PORT (RJ45)</b>	<b>Remote Control:</b> 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack, internally connected to SEF micro. Protocol: Control Protocol (RAP1 + RIPC)
<b>ETHERNET DATA PORT (RJ45)</b>	<b>IP Packet Data:</b> 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Raw IP packet data, requires 3G ALE, please see RM8 SDM & ALE: 3G ALE Option Transfer brochure.
<b>LOCAL CONTROL</b>	Local control via 32x202 pixel <b>graphical LCD display</b> and 16-key keypad. 3 bi-colour LED indicators Alphanumeric and digit keypad for fast data entry, 4-way navigation button
<b>RADIO CONTROL &amp; AUDIO PORTS (DB25M)</b>	<b>Radio Control Pins (2 channels):</b> RS-232, 75 to 115200 bps, 1 or 2 stop bits, 7/8 bit data (no Hardware flow control) Supports for various radio control protocols are built-in. See the RapidM 2G / 3G ALE Option brochures for more details.
	<b>Radio Audio Pins:</b> Input Audio (2 channels): 600 Ohm balanced, -20 dBm to +10 dBm without adjustment Output Audio (2 channels): Balanced, -40 dBm to +10 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
	<b>Aux Audio Pins (internally multiplexed with Audio2 port):</b> Connection of microphone for ALE voice calling Input Audio: 600 ohm balanced, -20 dBm to +10 dBm without adjustment or MIC input (selectable) Output Audio: Balanced, -40 dBm to +10 dBm adjustable into 600 ohm load or unbalanced LINE output (selectable)

<b>INSTALLATION</b>		<b>ENVIRONMENTAL</b>	
<b>WEIGHT</b>	2.5 kg	<b>TEMPERATURE</b>	-30°C to +70°C (operating); -10°C to +70°C (local control)
<b>COLOUR</b>	Black, powder coat	<b>HUMIDITY</b>	0 to 95%, non-condensing
<b>SIZE</b>	212.2 x 225.6 x 41.1 mm (w x d x h), Front panel height : 44.1 mm	<b>SHOCK</b>	MIL-STD-810E Method 516.4, Procedure 1, Funct. (40G, 11 ms)
<b>POWER</b>	87 to 267 V AC, 47 to 440 Hz 7-36 V DC (Designed for MIL-STD-1275B)	<b>VIBRATION</b>	MIL-STD-810E Meth. 514.4, Cat. 9, Shipboard
<b>RACK MOUNTING</b>	1 unit in ½ 19" Rack slot	<b>EMC</b>	MIL-STD-461E
	2 units side-by-side on shelf	<b>SAFETY</b>	IEC/EN 60950

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