



### RM8 Product Overview

The *RM8 Software Defined Modem & ALE Controller* is a standalone unit intended for strategic and maritime data communications and is aimed at both naval and governmental end-users. The *RM8* offers a wide range of standards-based waveforms and protocols for interoperable data modem and link setup operations, whether point-to-point or point-to-multipoint.

The 2nd Generation (2G) *ALE Controller* (this datasheet) is available as a software option for the *RM8*. The use of 2G ALE allows for linking with other HF stations in a HF radio network without operator intervention. The 2G ALE Controller performs all the basic protocol functions for individual calling, one-to-many calling, sounding and scanning up to 5 channels per second.

2G ALE can be combined with Modem software packs (M1 or M2). Software options Are accessible with the appropriate *RapidM* activation key.

### Key Features

- **Standards compliance**
  - MIL-STD 110B, 141C and STANAG 4539, 4538
- **High Data Rate HF & V/UHF Modems**
- **DTE port** – EIA 530A Synchronous/Asynchronous
- **Remote control interfaces** – Serial and Ethernet
- **Local configuration & control** – Menu-driven
- **Power supply variants** – AC and AC + DC
- **GPS unit built-in & I/F** – for ALE time (Link Prot.)
- **2G ALE option** – datasheet available
- **3G ALE FLSU option** – current datasheet
- **3G Packet data option** – datasheet available
- **Works with RC8 ARQ** – datasheet available

### 2G ALE Network

Using a 2G ALE network that scans a number of frequencies offers a much higher level of HF radio network connectivity compared with using a single frequency. Using 2G ALE will substantially upgrade the availability of service.

### 2G ALE Channel Scanning

When not otherwise committed, the 2G ALE Controller continually scans the pre-selected set of channels, listening for calls. Link Quality Analysis (LQA) is obtained by continuously listening to sounds and calls from other stations.

### 2G ALE Linking Protection

MIL-STD-188-141C, App. B Linking Protection provides additional security to The HF Radio network. The *RM8* unit has a built-in GPS unit that provides the time reference required for secure linking. The *RM8* supports the standard Time Exchange protocol.

### 2G ALE Additional Features

- Individual, Group, Network, All, Any, Wildcard Calls
- AMD, DTM, UUF
- LQA Sounding & Polling
- Automatic channel selection
- Emergency Operator break-in
- Automatic Hand-Off to Modem
- GPS Time updates & OTA Time Exchange
- Security Level (AL-1, AL-2)

### 2G ALE Front Panel

The *RM8* offers 2G ALE configuration and control via the front panel menu interface.

Call	2G	HFNET	LP	Off
Scan	3	Net HFBASE	In	0/0
			Out	1
+0	2G	HFNET	LP	Off
Tx			In	0/0
Calling		Net HFBASE	Out	1
	2G	HFNET (HFM)	LP	Off
1 Link		Net HFBASE	In	0/0
			Out	1

### 2G ALE Radios Supported

The control protocols for various radios are embedded. The radio manufacturer and model are selectable via the front panel and remote control interface.

CHARACTERISTIC	DESCRIPTION
<b>ALE WAVEFORMS</b>	<ul style="list-style-type: none"> <li>8-FSK according to MIL-STD-188-141C App A. &amp; FED-STD 1045</li> <li>Doppler lock and track (capture range up to <math>\pm 100</math> Hz, configurable)</li> <li>Adaptive multi-path tracking, Soft Golay decoding</li> <li>Adaptive triple word-phase synchronization, lock and track</li> <li>Linking probability performance 2-3 dB better than MIL-STD-188-141C specification</li> <li>No LP mode degradation</li> <li>Concurrent operation with other RapidM waveforms</li> </ul>
<b>ALE PROTOCOL</b>	<ul style="list-style-type: none"> <li>Calling (IND, GRP, NET, All, Any, Wildcard Call), UUF, AMD, DTM (with or without CRC), (excluding: DBM, AQC-ALE)</li> <li>Calling POLLING, INLINK, RELINK (ALM support commands)</li> <li>Link Quality Analysis (LQA), Scanning (2 or 5 channels per second), Auto Sounding</li> <li>Automatic Hand-Off to Internal Modem (integrated with 3G Traffic Manager)</li> <li>Concurrent operation within 3G Network environment (integrated Session Manager)</li> </ul>
<b>LINKING PROTECTION</b>	<ul style="list-style-type: none"> <li>According to MIL-STD-188-141C App B. &amp; FED-STD 1049</li> <li>LP key-tables (256) and key select function</li> <li>Automatic key management (Time of day based key selection), LP up to AL-2</li> <li>Can use PPS interface for Time reference. Time Exchange protocol support (AL-1)</li> <li>Key Storage: 2 x 32 LP Keys</li> <li>Key Selection: Manual or Automatic (Daily)</li> </ul>
<b>OCCUPANCY DETECTION</b>	<ul style="list-style-type: none"> <li>MS 110A/B, S4539, S4285, S4415, S4529, S4481, 8-FSK, SSB Voice</li> </ul>
<b>REMOTE CONTROL</b>	<ul style="list-style-type: none"> <li>Configuration Protocol RAP1/RIPC, REMOTE Control Protocol RAP1/RIPC</li> </ul>
<b>RADIO CONTROL PROTOCOL</b>	<ul style="list-style-type: none"> <li>Integrated with 3G Radio Control Manager (Radio Control Protocol)</li> <li>Integrated with Modem Controller (Radio baseband control, ATU &amp; keyline delay settings, matched volume control etc.)</li> <li>RADIO Control Protocol RAP1/RIPC or Programmable Radio Selection</li> </ul>
<b>CONFIGURATION FOR NON-VOLATILE RAM</b>	<ul style="list-style-type: none"> <li>Network Table: Up to 100 Other IDs, 20 Self IDs</li> <li>LQA Table continuous (compressed) Non-volatile storage. Re-load at start-up. LQA Table pre-load (RAP1/RIPC)</li> <li>20x 2G ALE Full Network Configuration Presets (MIB in Non-volatile storage)</li> </ul>

INTERFACES	
<b>DTE (DATA) PORT (DB25F)</b>	RS-422 balanced, RS-423, RS-232 unbalanced., MIL-STD-188-114 (interoperable), EIA 530A compliant Half & Full Duplex operation, Synchronous, Standard and High-speed Async modes
<b>REMOTE CONTROL/ GPS PORT (DE9M)</b>	Remote Control Pins: RS-485 Multi-drop, RS-422 balanced or RS-232 Protocol: Control Protocol (RAP1 + RIPC, ASCII S5066 Annex E) External GPS Control Pins: RS-232 (nominally input) Data Rate: 300 to 19200 bps, 1/2 stop bits, 7/8 bit data. PPS line: RS 232/422 (NMEA) or TTL
<b>GPS ANTENNA (MCX)</b>	Built-in GPS receiver: Time reference for 2G ALE Linking protection (AL-2).
<b>ETHERNET CTRL PORT (RJ45)</b>	Remote Control: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Control Protocol (RAP1 + RIPC)
<b>ETHERNET DATA PORT (RJ45)</b>	IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Raw IP packet data, requires 3G ALE.
<b>LOCAL CONTROL</b>	Local control via 32x202 pixel graphical LCD display 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>	Radio Control Pins (2 channels): RS-232, up to 115200 bps, 1/2 stop bits, 7/8 bit data Supports for various radio control protocols are built-in.  Input Audio (2 channels): 600 Ohm balanced, -20 to +10 dBm without adjustment Output Audio (2 channels): Balanced, -40 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.  Aux Audio Pins: Connection of microphone for ALE voice calling Input Audio: 600 ohm balanced, -20 to +10 dBm without adjustment or MIC input (selectable) Output Audio: Balanced, -40 to +10 dBm adjustable into 600 ohm load

ORDERING INFORMATION	STOCK NUMBER	DESCRIPTION
<b>RM8 (HF MODEM M1)</b>	RME-81-RA-M13.2	SDM: RM8 M1 (110B, F ISB 2x9600) V3.2
<b>RM8 (HF MODEM M2)</b>	RME-81-RA-M23.2	SDM: RM8 M2 (HF S4285, S4539 9600) V3.2
<b>2G ALE SOFTWARE OPTION</b>	RM8-SW-O-2G-5.3	SW MDL-2G ALE / MS 141B, App. A, B V5.3

OTHER RM8 SOFTWARE OPTIONS*	STOCK NUMBER	DESCRIPTION
<b>3G ALE (STANAG 4538) FLSU, xDL</b>	RM8-SW-O-3A-5.3	SW MDL-3G ALE 4538 FLSU, xDL V5.3

\* Contact RapidM for datasheets.

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