RM8

Software Defined Modem & ALE – 3, 6 kHz
3G ALE

DATASHEET

HF Modem | 2G ALE | 3G ALE



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 *3rd Generation Automatic Link Establishment (3G ALE, based on STANAG 4538 ARCS)* (this datasheet) is available as a software option for the *RM8*. *3G ALE* is the best choice for interoperating advanced HF data and voice services, especially in adverse channel conditions. *3G ALE* software options offers Fast Link Setup (FLSU) and Packet Data (xDL) which can be combined with LF & HF Modem packs (M1 or M2).

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
- **Split-Site Operation** – Modem & ALE 2G & 3G
- **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

3G Network

Using a *3G ALE* network with multiple frequencies offers a significantly higher level of connectivity compared to using a legacy 2G ALE network with a single frequency. *3G ALE* provides the following benefits over 2G ALE:

- Faster link setup times & linking at lower SNR ratios.
- Improved network channel efficiency.
- Improved management of traffic types
- Link setup for packet data (xDL) modems
- Circuit link controller for STANAG 4539 modems

3G Link Establishment

The *RM8* offers advanced *3G ALE* for HF networks (based on STANAG 4538), in the form of Fast Link Setup (FLSU). FLSU is a fast scanning link setup protocol for Packet, Circuit (legacy modem) and Voice links, using very robust HF burst waveforms (BW).

Both synchronous and asynchronous link setups are supported. Call and traffic frequencies can be the same or separate. Various HF voice radios can be controlled automatically.

3G Packet Data

The *RM8* offers error free data delivery, under a variety of HF channel conditions, by using 3G ALE and the built-in ARQ protocols. The High-rate Data Link protocol (HDL) provides superior throughput for larger packets under good to fair HF channel conditions, while the Low-latency Data Link protocol (LDL) provides superior throughput for smaller packets, and superior throughput for larger packets under fair to very poor HF channel conditions.

3G Circuit Switched Data

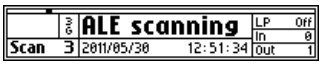
The *RM8* offers improved circuit switched operation by using *3G ALE* and the built-in Circuit Link Controller (CLC). The selection of waveforms is determined by the *RM8* software pack. *RapidM*, also offers two HF modem software packs (M1, M2).

3G Additional Features

- Automatic channel selection
- Automatic radio control
- Listen before transmit
- Channel history
- Individual calls
- Group calls, with or without roll-call
- Network calls
- Automatic hand-off to modem
- GPS time updates

3G Front Panel

The *RM8* offers 3*G ALE* configuration and control via the front panel menu interface.





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Characteristic	Description
General	○ Compliance to STANAG 4538 standard ○ Interoperability tested ○ Integrated with 2G ALE and Data Waveforms ○ Integrated with Tone Excision (TEX), some restrictions apply
ALE 3G Protocol	○ Fast Link Setup (FLSU) for fast link set up times. ○ Automatic channel selection. ○ Synchronous and asynchronous link set up. ○ Point-to-point, multicast and broadcast calls. ○ Combined or separate calling and traffic channels. ○ Reliable packet transfer by means of HDL and LDL. ○ Channel quality estimation by means of LQA exchanges. ○ Excellent performance in degraded HF channels by means of robust burst waveforms. ○ Concurrent operation with other RapidM waveforms ○ Concurrent operation with 2G ALE (MIL-STD-188-141C Appendix A ALE)
Linking Protection	○ LP key tables (56-bit) and key select function ○ Automatic key management (Time of day based key selection) ○ Time-of-day distribution by HF means, as a backup to GPS time-of-day distribution. ○ Linking protection (SoDark 3 and 6).
ALE 3G Waveforms	○ BW1, BW2, BW3, BW4 and BW5 according to STANAG 4538 and MIL-STD-188-141C. ○ Doppler lock and track (capture range up to ±100 Hz, configurable) ○ Adaptive multi-path tracking (up to 10 ms spread, for FLSU & LDL) ○ Linking probability performance 2-3dB better than specification ○ LDL: Low-Latency Data Link, reliable packet transfer ○ HDL: High-rate Data Link, reliable packet transfer ○ Concurrent operation with other RapidM waveforms
Occupancy detection (LBT)	○ Occupancy detection (listen before transmit (LBT)) in accordance with STANAG 4538 ○ MS 110A/B, S4539 / MS 110B, MS 110A, S4415, S4285, FSK, 2G ALE (8-FSK), SSB voice
REMOTE Control	○ Configuration Protocol RAP1/RIPC, REMOTE Control Protocol RAP1/RIPC
RADIO Control Protocol	○ Integrated with Modem Controller ○ Radio control protocol RAP1/RIPC or radio maker proprietary (with permission). ○ The control protocols for various radios are embedded.
Configuration for Non-volatile RAM	○ Network Table: Up to 100 Other IDs, 20 Self IDs ○ Channel History Table continuous (compressed) Non-volatile storage. ○ 20x 3G ALE Full Network Configuration Presets (MIB in Non-volatile storage)

Ordering Information	Stock Number	Description
RM8 (HF Modem M1)	RME-81-RA-M13.2	SDM: RM8 M1 (110B,F ISB 2x9600) V3.2
RM8 (HF Modem M2)	RME-81-RA-M23.2	SDM: RM8 M2 (HF S4285, S4539 9600) V3.2
3G ALE Software Option	RM8-SW-O-3A-5.3	SW MDL-3G ALE 4538 FLSU, xDL V5.3

*Other RM8 Software Options**	Stock Number	Description
2G ALE (MIL-STD-188-141B)	RM8-SW-O-2G-5.3	SW MDL-2G ALE / MS 141B, App. A, B V5.3

* Contact RapidM for datasheets.

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