# RM6-A High Data Rate Modem and 2G ALE Controller

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Used for long distance, point-to-point, and point-to-multipoint data links, the RM6-A for low frequency (LF) and high frequency (HF) radios is a high data rate, standards-based strategic and maritime communications modem.


As an option, The RM6-A modem can include a 2nd Generation (2G) automatic link establishment (ALE) Controller that is activated by the user with a key selection for LF and HF modem software bundles and offers a compact solution for networking. The 2G ALE function can operate in combination with the RC66 or RC8 5066 Server and IP Controller directly through the remote control port.

**Better Connectivity, Security with 2G ALE Networking**

To overcome variable HF propagation conditions, the RM6-A 2G ALE Controller provides better connectivity over a greate number of frequencies and allows linking to other HF stations in a network without operator intervention.

Performing all the basic protocol functions for individual calling, one-to-many calling, sounding and scanning up to 5 channels per second, the 2G ALE Controller provides advanced features with greater reliability than using a single frequency.

The 2G ALE Controller continually scans the pre-selected set of channels, and improves linking quality analysis by continuously listening to sounds and calls from other stations, when not otherwise committed.

MIL-STD-188-141B, App. B Linking protection provides additional security to your HF network.

**Features**

- [x] HF Data Modem Waveform Standards:
  - [x] MIL-STD-188-110A/B and App.f

- MIL-STD-1880141B, App. B
- STANAG 4539 (QAM), incl. Annex D TDMA
- 4285 (PSK)
- 4529 (NB PSK)
- 4415 (robust)
- 4481 (shore-to-ship)

- LF Data Modem Waveform Standards
  - STANAG 5065 (MSK)
- Configuration and Control Protocols
  - RAP1/RIPC protocol
  - STANAG 5066 (ANNEX E)



- Waveform Performance
  - Field hardened performance
  - Incl. tests with STANAG 4203 Filter
- Automatic radio control and channel selection
- Built-in GPS with time updates
- Menu-driven configuration and control
- Individual, Group & Net Calls
- All, Any, Wildcard Call
- AMD, DTM, UUF
- LQA Sounding & Polling
- Emergency Operator break-in
- Automatic Hand-Off to Modem
- Security Level (AL-1, AL-2)
- Time Exchange
- Serial and Ethernet remote control and data input
- AC and DC power
- DTE port – EIA 530A Synchronous/Asynchronous

**2G ALE Front Panel Configurations and Controls**

The RM6-A offers 2G ALE configurations and control via the front panel menu interface.



The RM6-A will operate with most legacy LF and HF voice radios and control protocols for additional radios can be added as needed.

| CHARACTERISTIC | DESCRIPTION |
|---|---|
| ALE Waveforms | 8-FSK according to MIL-STD-188-141C App A. & FED-STD 1045<br>Doppler lock and track (capture range up to ± 100 Hz, configurable)<br>Adaptive multi-path tracking, Soft Golay decoding<br>Adaptive triple word-phase synchronization, lock and track<br>Linking probability performance 2-3 dB better than MIL-STD-188-141C specification<br>No LP mode degradation |
| ALE Protocol | Calling (IND, GRP, NET, All, Any, Wildcard Call), UUF, AMD, DTM (with or without CRC), (excluding: DBM, AQC-ALE)<br>Calling POLLING, INLINK, RELINK (ALM support commands)<br>Link Quality Analysis (LQA), Scanning (2 or 5 channels per second), Auto Sounding<br>Automatic Hand-Off to Internal Modem (integrated with 3G Traffic Manager)<br>Concurrent operation within 3G Network environment (integrated Session Manager) |
| Linking Protection | According to MIL-STD-188-141C App B. & FED-STD 1049<br>LP key-tables (256) and key select function<br>Automatic key management (Time of day based key selection), LP up to AL-2<br>Can use PPS interface for Time reference. Time Exchange protocol support (AL-1)<br>Key Storage: 2 x 32 LP Keys<br>Key Selection: Manual or Automatic (Daily) |
| Occupancy Detection | MS 110A/B, S4539, S4285, S4415, S4529, S4481, 8-FSK, SSB Voice |
| Remote Control | Configuration Protocol RAP1/RIPC, REMOTE Control Protocol RAP1/RIPC |
| Radio Control Protocol | Integrated with Radio Control Manager (Radio Control Protocol)<br>Integrated with Modem Controller (Radio baseband control, ATU & keyline delay settings, matched volume control etc.)<br>RADIO Control Protocol RAP1/RIPC or Programmable Radio Selection |
| Configuration For Non-Volatile RAM | Network Table: Up to 100 Other IDs, 20 Self IDs<br>LQA Table continuous (compressed) Non-volatile storage. Re-load at start-up. LQA Table pre-load (RAP1/RIPC)<br>20x 2G ALE Full Network Configuration Presets (MIB in Non-volatile storage) |

| INTERFACES | |
|---|---|
| DTE (Data) Port (DB25F) | RS-422 balanced, RS-423, RS-232 unbalanced., MIL-STD-188-114 (interoperable), EIA 530A compliant<br>Half & Full Duplex operation, Synchronous, Standard and High-speed Async modes |
| Remote Control / GPS Port (DE9M) | Remote Control Pins: RS-485 Multi-drop, RS-422 balanced or RS-232<br>Protocol: Control Protocol (RAP1 + RIPC, ASCII S5066 Annex E) |
| | External GPS Control Pins: RS-232 (nominally input)<br>Data Rate: 300 to 19200 bps, 1/2 stop bits, 7/8 bit data. PPS line: RS 232/422 (NMEA) or TTL |
| Ethernet CTRL Port (RJ45) | Remote Control: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack<br>Protocol: Control Protocol (RAP1 + RIPC) |
| Ethernet Data Port (RJ45) | IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack<br>Protocol: Raw IP packet data, requires 3G ALE. |
| Local Control | Local control via 32x202 pixel graphical LCD display and 16-key keypad. 3 bi-colour LED indicators<br>Alphanumeric and digit keypad for fast data entry, 4-way navigation button |
| Radio Control & Audio Ports (DB25M) | Radio Control Pins (2 channels): RS-232, up to 115200 bps, 1/2 stop bits, 7/8 bit data<br>Supports for various radio control protocols are built-in. |
| | Input Audio (2 channels): 600 Ohm balanced, –20 to +10 dBm without adjustment<br>Output Audio (2 channels): Balanced, –40 to +10 dBm adjustable into 600 ohm load<br>Keyline: Non-polarized contact closure (<45 V, 200 mA).<br>PTT Sense Input: Pull to ground to indicate external PTT. |
| | Aux Audio Pins: Connection of microphone for ALE voice calling |

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|---|---|
| | Input Audio: 600 ohm balanced, –20 to +10 dBm without adjustment or MIC input (selectable)<br>Output Audio: Balanced, –40 to +10 dBm adjustable into 600 ohm load |
| Power Supply | **Variant 1, AC Supply**: 90-264 VAC, 40–440 Hz, 2A; 100-370 VDC<br>**Variant 2, AC + DC**: 90-264 VAC, 40–440 Hz, 2A; 100-370 VDC & 6–36 VDC MIL-STD 1275B protection |

**RM6A HF Modem - ALE**