RM6-A Product Overview
Strategic and maritime platforms have a need for long distance communications. Relying on satellites is not always an option. The RM6-A Data Modem & ALE Controller provides beyond-lone-of-site (BLOS) data links via HF radio. The RM6-A provides systems integrators with peace-of-mind stemming from RapidM’s commitment to long-term product availability and support.

The 2nd Generation (2G) ALE Controller is available as a software option for the RM6-A. 2G ALE can be combined with LF & HF Modem software packs (M1 & M2). The software options can be activated with the appropriate RapidM activation key.

The 2G ALE function can operate in combination with the RapidM RC66 or RC8 5066 Server and IP Controller. These external ARQ functions control the ALE on the RM6-A directly through the REMOTE CONTROL port.

Key Features
- **2G ALE** – Many HF radio protocols embedded
- **DTE port** – EIA 530A Synchronous/Asynchronous
- **Remote control interfaces** – Serial and Ethernet
- **Local configuration & control** – Menu-driven
- **Power supply variants** – AC and AC + DC
- **Works with RC66** – datasheet available
- **Compact solution** – Modem & ALE 2G Controller
- **HF modem operation** – datasheet available

2G ALE Network
Using an ALE network over a number of frequencies offers a much higher level of connectivity compared with using a single frequency. Using ALE will substantially upgrade the availability of service.

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

Automatic Link Establishment
Embedded Automatic Link Establishment (ALE) allows linking with other HF stations without operator intervention. A number of frequencies can be used to overcome variable HF propagation conditions.

The ALE Controller performs all the basic protocol functions for individual calling, one-to-many calling, sounding and scanning up to 5 channels per second.

For link set-up the 2G ALE Controller calls first on channels with the best Link Quality Analysis (LQA) score. The LQA information is obtained by continuously listening to sounds and calls from other stations.

Linking Protection

The RM6-A unit has a dedicated interface to connect a GPS unit as time reference. The RM6-A supports the standard Time Exchange protocol. Time exchange transfers the reference time to units without GPS.

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

2G ALE Radio Control
The control protocols for various radios are embedded. The radio manufacturer and model are selectable via the front panel and remote control interface.

Please contact RapidM to verify whether your radio is supported. The control protocols for additional radios can be added as needed.
<table>
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<tr>
<th>CHARACTERISTIC</th>
<th>DESCRIPTION</th>
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</table>
| **ALE WAVEFORMS** | ○ 8-FSK according to MIL-STD-188-141C App A. & FED-STD 1045  
○ Doppler lock and track (capture range up to ± 100 Hz, configurable)  
○ Adaptive multi-path tracking, Soft Golay decoding  
○ Adaptive triple word-phase synchronization, lock and track  
○ Linking probability performance 2-3 dB better than MIL-STD-188-141C specification  
○ No LP mode degradation  
○ Concurrent operation with other RapidM waveforms |
| **ALE PROTOCOL** | ○ Calling (IND, ORP, NET, ALT, Any, Wildcard Call), UUF, AMD, DTM (with or without CRC), (excluding: DBM, AQC-ALE)  
○ Calling POLLING, INLINK, RELINK (ALM support commands)  
○ Link Quality Analysis (LQA), Scanning (2 or 5 channels per second), Auto Sounding  
○ Automatic Hand-Off to Internal Modem (integrated with 3G Traffic Manager)  
○ Concurrent operation within 3G Network environment (integrated Session Manager) |
| **LINKING PROTECTION** | ○ According to MIL-STD-188-141C App B. & FED-STD 1049  
○ LP key-tables (256) and key select function  
○ Automatic key management (Time of day based key selection), LP up to AL-2  
○ Can use PPS interface for Time reference. Time Exchange protocol support (AL-1)  
○ Key Storage: 2 x 32 LP Keys  
○ Key Selection: Manual or Automatic (Daily) |
| **OCCUPANCY DETECTION** | ○ MS 110A/B, S4539, S4285, S4415, S4529, S4481, B-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)  
○ Integrated with Modem Controller (Radio baseband control, ATU & keyline delay settings, matched volume control etc.)  
○ RADIO Control Protocol RAP1/RIPC or Programmable Radio Selection |
| **CONFIGURATION FOR NON-VOLATILE RAM** | ○ Network Table: Up to 100 Other Ids, 20 Self Ids  
○ LQA Table continuous (compressed) Non-volatile storage. Re-load at start-up. LQA Table pre-load (RAP1/RIPC)  
○ 20x2G 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  
Half & Full Duplex operation, Synchronous, Standard and High-speed Async modes |
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 |
| ETHERNET CTRL PORT (RI45) | Remote Control: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack  
Protocol: Control Protocol (RAP1 + RIPC) |
| ETHERNET DATA PORT (RI45) | IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack  
| LOCAL CONTROL | 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 |
| RADIO CONTROL & AUDIO PORTS (DB25M) | 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 |
| POWER SUPPLY | Variant 1, AC Supply: 90-264 VAC, 40–440 Hz, 2A; 100-370 VDC  
Variant 2, AC + DC: 90-264 VAC, 40–440 Hz, 2A; 100-370 VDC & 6–36 VDC MIL-STD 1275B protection |

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<td>RM6-A (M1) AC SUPPLY</td>
<td>RM6-61-RA-M15.3</td>
<td>EDM: RM6-A M1 (110V, F ISB 2x4600) V5.3</td>
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<tr>
<td>RM6-A (M2) AC SUPPLY</td>
<td>RM6-61-RA-M25.3</td>
<td>EDM: RM6-A M2 (84285, 84539 9600) V5.3</td>
</tr>
<tr>
<td>RM6-A (M1) AC &amp; DC SUPPLY</td>
<td>RM6-61-RY-M15.3</td>
<td>EDM: RM6-A A/DC M1 (110V, F ISB) V5.3</td>
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<tr>
<td>RM6-A (M2) AC &amp; DC SUPPLY</td>
<td>RM6-61-RY-M25.3</td>
<td>EDM: RM6-A A/DC M2 (84285, 84539) V5.3</td>
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<td>2G ALE (MIL-STD-188-141B) SOFTWARE OPTION</td>
<td>RM6-SW-O-2G-5.3</td>
<td>SW MDL-2G ALE / MS 141B, App. A, B V5.3</td>
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<th>ACCESSORIES</th>
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<td>TELESCOPIC MOUNTING TRAY</td>
<td>RM6-AC-TREX-001</td>
<td>Tray: 19” Telescopic, RM6/RM6-A/RM6 V01</td>
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<td>CONNECTION KIT</td>
<td>RM6-GP-1001-SPC</td>
<td>Sparc Frame: RM6/RM6-A Connector Kit V01</td>
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* Contact RapidM for datasheets.