

RM6 LF & HF Data Modem & ALE Controller

Data Modem & 2G ALE

The **RM6** is a high data rate LF & HF data modem & ALE controller for standards-based naval and military data communications. The **RM6** is suitable for long distance point to point data links. The maximum data rate is 9600 bps over a standard 3 kHz HF radio link and **19200 bps over an ISB link**. The **RM6** is intended for installation into 19" rack systems.



Key Features & Benefits

- High Data Rate Modem
- Up to 9600 bps in 3 kHz (SSB)
- Up to 19200 bps (ISB radio)
- HF Modem & ALE controller in one unit
- ALE function is optional
- MIL-STD-188-141B App. A
- MIL-STD-188-110 A/B
- STANAG 4539 (QAM)
- STANAG 4285 (PSK)
- STANAG 4529 (NB PSK)
- STANAG 4415 (robust)
- STANAG 4481 (P/FSK)
- STANAG 5065 (MSK)
- STANAG 5066 compliant interface
- Synchronous DTE port for interfacing with high grade cryptographic equipment
- Ethernet interface

The **RM6** is designed to operate in conjunction with an external **STANAG 5066** compliant ARQ server, for example *RapidM's RC66* HF email suite. A PC Configuration utility is provided for remote control.

The additional software option **ALE** is built-in and can be activated with the appropriate *RapidM* license key. For more information on this function, please approach *RapidM* for a brochure.

Waveforms

MIL-STD-188-110B, STANAG 4539, 4285, 4529, 4415, 4481 and 5065.

Adaptive equalization mitigates the effects of HF channel multi-path.

Convolutional encoding combined with soft-decision Viterbi decoding provides **forward error correction**. Cancellation of narrowband co-channel interference is accomplished via adaptive **tone excision** capable of eliminating up to four signals.

Modem Software Packs

The waveforms that are included in the **RM6** can be customised by choosing from two software packs. Please see the reverse page for more details.

Secure System

In a secure system, data is routed through a crypto unit and into the **synchronous DTE port** of the **RM6**. The modem Tx and Rx audio signals are fed to the HF radio. The radio is keyed by the **RM6**, while the unit monitors independent PTT activity on the radio.

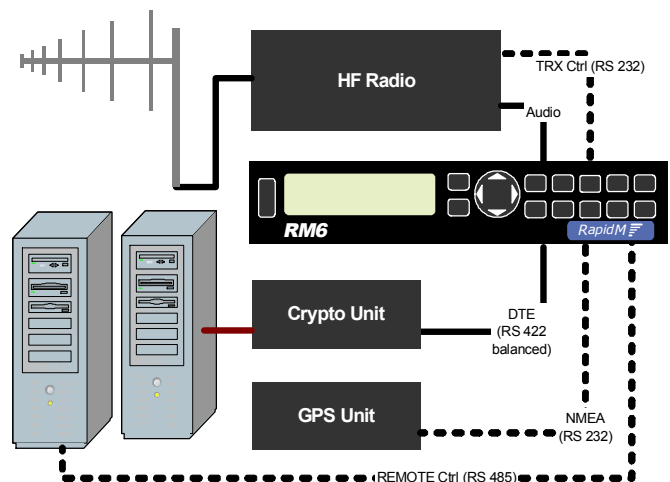


Fig 1: Secure System Configuration with **RM6** Unit

Optionally the radio can be controlled by the ALE radio control protocol embedded in the **RM6** (ALE brochure).

The unit supports split-site operation. Two radio control ports are available to support this option.

The **RM6** unit provides two independent audio ports to support the ISB mode.

The REM Ctrl, GPS and Ethernet ports are routed to a **Security processor**. 5V supply for fiber optic line drivers is provided on DTE & REM Ctrl ports.



Fig 2: Two **RM6** Units side-by-side in a 19-inch rack

STANDARD	CODING MODULATION		DATA RATES & CHARACTERISTICS	MODEM SOFTWARE PACK	
				M1	M2
MIL-STD-188-110B APPENDIX C	C	PSK/	3200, 4800, 6400, 8000, 9600 bps	•	•
	U	QAM	12800 bps	•	•
STANAG 4539	C	PSK/	75, 150, 300, 600, 1200, 2400, 3200, 4800, 6400, 8000, 9600 bps	•	•
	U	QAM	12800 bps	•	•
MIL-STD-188-110B	C	PSK/	75, 150, 300, 600, 1200, 2400, 3200, 4800, 6400, 8000, bps	•	•
MIL-STD-188-110B APPENDIX F	C	PSK/	ISB: 9600, 12800, 16000, 19200 bps	•	-
MIL-STD-188-110A § 5.3	C	PSK	75, 150, 300, 600, 1200, 2400 bps	•	•
	U		4800 bps	•	•
STANAG 4415	C	PSK	<i>NATO robust: 75 bps</i>	•	•
STANAG 4285	C	PSK	75, 150, 300, 600, 1200, 2400 bps	•	•
	U		1200, 2400, 3600 bps	•	•
STANAG 4529	C	PSK	75, 150, 300, 600, 1200 bps	•	•
	U		600, 1200, 1800 bps	•	•
STANAG 4481 PSK	C	PSK	300 bps	•	•
STANAG 5065	C	FSK/	75 bps (FSK) 300 bps (MSK)	•	-
STANAG 4481 FSK	U	FSK	<i>Single channel: 75 bps</i>	•	•
			<i>Multi-channel: 75 bps selectable carrier</i>	•	•
FSK VARIABLE	U	FSK	<i>Data Rates: 50, 75, 100, 150, 200, 300, 400, 600, 1200 bps</i> <i>Mark & Space Frequency: 350 to 3000 Hz</i>	•	•
GENERAL					
ALL WAVEFORMS	Carrier capture range ±200 Hz. Sync-on-Data				
BIT	Frequency tracking of up to 75 Hz changing at 3.5 Hz per second (triangular sweep)				
PRESETS	Comprehensive BIT (Built-In-Test), Continuous error detection				
AGC CONTROL	20 Factory Presets, 10 Custom Presets				
REMOTE CONTROL	Transceiver AGC control is necessary for optimum performance of QAM W/Fs				
AUTOBAUD	All W/Fs and 2G ALE settings are remote controllable via Remote Control Port				
TONE EXCISION	All PSK waveforms except for STANAG 4285 & 4529. Sync-on-Data capability.				
SOFTWARE OPTION	Narrowband Interference cancellation of up to 4 signals				
ALE 2G MIL-STD-188-141B APPENDIX A, B & FED-STD 1045 FED-STD 1049	CHARACTERISTICS Automatic Link Establishment 2 nd Generation (2G ALE) <i>Occupancy Detection: MS 110A/B, S 4539, S 4285, S 4415, S 4529, S 4481, FSK, 8-FSK, SSB Voice</i> <i>Protocol: Calling, AMD, DTM, Excluding: DBM, AQC-ALE</i> <ul style="list-style-type: none"> • Link Quality Analysis (LQA) • Scanning (2 or 5 channels per second) • Selective Calling • Automatic Sounding • Automatic Hand-Off to Internal Modem The unit may already support a particular radio protocol. If not, the radio control protocol must be made available to <i>RapidM</i> for integration & testing.				
INTERFACES					
DTE (DATA) PORT	RS-422 balanced, RS-423, RS-232 unbal., MIL-STD-188-114 compatible & EIA 530A compliant (DB25 female connector). Half & Full Duplex operation, Sync, Standard Async and High-Speed Async mode supported: <ul style="list-style-type: none"> • Synchronous: Data Rate: 50, 75, 100, 150, 200, 300, 400, 600, 1200, 1800, 2400, 3200, 3600, 4800, 6400, 8000, 9600, 12800, 16000, 19200 bps, Clock: Internal / Ext., data polarity: norm / inv. • Asynchronous: 75 to 115200 bps, Full Duplex, 5/6/7/8 bit data, 1, 2 stop bits, Flow ctrl: CTS/RTS, XON/XOFF, data polarity: norm / inv. 				
REMOTE CTRL PORT	RS-485 Multi-drop, RS-232D (DE9 male connector): Data Rate: 1200 to 115200 bps, 1 or 2 stop bits, 8 bit character lengths Protocol: RM6 Control Protocol RAP1 (proprietary)				
GPS/AUX PORT	RS-232 (DE9 male connector): Data Rate: 300 to 19200 bps, 1 or 2 stop bits, 7/8 bit character lengths Protocol: NMEA or Proprietary (Aux port), PPS line (RS232 or TTL, under software control)				
ETHERNET	Data & Control, 10/100 Base T , RJ 45 connector, embedded TCP/IP Stack, protocol: RM6 Ctrl Protocol RAP1				
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 CTRL PORTS	RS-232 (DE9 male connectors): 2 channels , 75 to 115200 bps, 1 or 2 stop bits, 7/8 bit character lengths. Supports for various radio control protocols are built-in. See the <i>RapidM</i> 2G ALE Product brochure for more details.				
RADIO AUDIO PORTS	2 channels. (DE9 female connectors) Input Audio: 600 Ohm balanced, -20 to +15 dBm without adjustment Output Audio: Balanced, -40 to +15 dBm (PMP) adjustable into 600 ohm load Keyline: Open collector to ground (<45 volts, 50 mA) & non-polarized contact closure (<45 V, 200 mA)				
INSTALLATION			ENVIRONMENTAL		
WEIGHT	2.5 kg		TEMPERATURE	-30°C to +70°C (operating) remote ctrl; -20°C to +70°C (operating) local ctrl	
COLOUR	Black, powder coat		HUMIDITY	0 to 90%, non-condensing	
SIZE	212.2 x 225.6 mm x 41.1 (w x d x h), Front panel height : 44.1 mm		SHOCK	MIL-STD-810F Method 516.5, Procedure 1, Funct. (40G, 18 ms)	
POWER	87 to 267 V AC, 47 to 440 Hz or optionally: 6-36 VDC according to MIL-STD-1275B		VIBRATION	MIL-STD-810F Meth. 514.5	
RACK MOUNTING	1 unit in ½ 19" Rack slot		EMC	MIL-STD 461-E	
	2 units side-by-side on shelf		SAFETY	IEC/EN 60950	

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