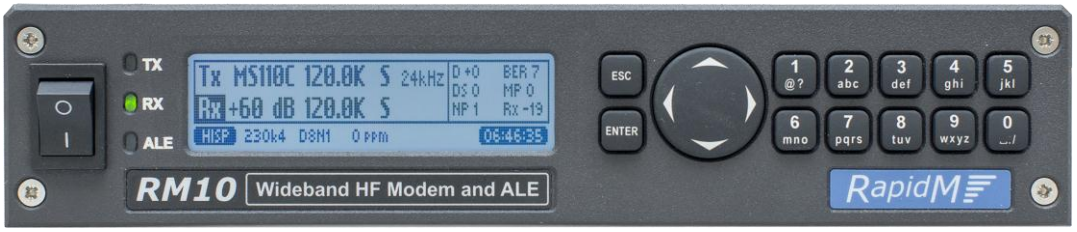
RM10

Wideband SDM & ALE – 24 kHz Data Modem: NB & WBHF

DATASHEET

WBHF 24 kHz | ALE 4G, 3G & 2G | V/UHF 25 kHz



Features & Benefits:

- **Wideband HF Data Modem Waveforms**
  - MIL-STD-188-110C (24 kHz), C-L 7 & 9 FEC
  - Data rates up to 76,800 bps, Sky-wave / BLOS ch.
  - Data rates up to 120,000 bps, Ground-wave ch.
- **Narrowband HF/LF Data Modem Waveforms**
  - MIL-STD-188-110A (3 kHz)
  - MIL-STD-188-110B (3 kHz) & App. F (2x 3 kHz)
  - STANAG 4539 (QAM), incl. Annex D TDMA
  - STANAG 4285 (PSK), STANAG 4529 (NB PSK)
  - STANAG 4415 (robust), STANAG 4197 (ANDVT)
  - STANAG 4481 (shore-to-ship)
  - STANAG 5065 (MSK, LF mode)
- **Split-Site Operation**
  - Data Modems – Circuit and Packet
  - ALE Controllers - ALE 2G, 3G & 4G (WALE)
- **Interfaces**
  - DTE port: EIA 530A Synchronous / Asynchronous
  - Remote control: Serial and Ethernet
  - Audio: USB (3 to 24 kHz) , LSB (3 kHz) and AUX
  - Local configuration & control: Menu-driven
- **Excellent Environmental specifications**
  - Low power consumption, High temperature range
  - Tested for high Shock and Vibration,
  - High MTBF
  - 20 Year product and spares availability period

Other Software Options (Datasheets Available):

- **HF Automatic Link Establishment (ALE)**
  - MIL-STD-188-141D (4G ALE / WALE up to 24 kHz) - Future
  - STANAG 4538 (3G ALE/FLSU) – LDL, HDL & RDL
  - MIL-STD-188-141C App. A/B (2G ALE)
- **WB Packet data (Future)**
  - WB-LDL & WB-RDL used with WALE (RM proprietary)
- **V/UHF Modem Waveforms (Alternative S/W Suite)**
  - RapidM proprietary VHF (≤ 25 kHz; 128,000 bps)
  - STANAG 4691 Annex B (25 kHz; 96,000 bps)

Wideband SDM & ALE Overview

The RM10 Wideband SDM & ALE product was developed in response to the emerging Wideband HF Data Modem and ALE standards for strategic and maritime BLOS radio communications. The RM10 addresses the need for higher throughput data communications over contiguous wideband radio channels in the HF, VHF and UHF bands.

Wideband HF Data Modem

The RM10 features a Wideband HF data modem as specified in MIL-STD-188-110C Appendix D, providing waveforms occupying bandwidths from 3 kHz to 24 kHz, and user data rates between 75 bps and 120 kbps. The RM10 also offer all the narrowband HF modem available in the RM8 product.

The RM10's purpose-built hardware is aimed at operation on crowded marine platforms where space, power consumption, temperature and EMC considerations are paramount. The RM10 has a flexible and compact ½ of 1U 19-inch rack-mountable form factor.

The RM10's proven interface configuration reflects the requirements posed by HF radio communication systems using bulk or IP encryption equipment.

Wideband ALE

The RM10 offers as a software option, Wideband Automatic Link Establishment (WALE / 4G ALE), compliant with MIL-STD-188-141D Appendix G. A software update will be provided after possible future updates to the standard. The WALE option on the RM10 includes 2G ALE and 3G ALE/ FLSU.

Companion Product

The companion product of the RM10 is the RC10 Wideband ARQ and IP Controller which provides Automatic Repeat reQuest (ARQ) services based on STANAG 5066 WB & STANAG 5070.

Waveform Standards	B/width	Data Rates [bps]								
		256-QAM	64-QAM	64-QAM	32-QAM	16-QAM	8-PSK	Q-PSK	B-PSK	Walsh
MIL-STD-188-110C	24 kHz	120000	96000	76800	64000	51200	38400	25600	12800, 9600, 4800, 2400, 1200	600
	21 kHz	115200	76800	57600	48000	38400	28800	19200	9600, 4800, 2400, 1200, 600	300
	18 kHz	90000	72000	57600	51200	38400	28800	19200	9600, 4800, 2400, 1200	600
	15 kHz	76800	57600	48000	51200	32000	24000	16000	8000, 4800, 2400, 1200, 600	300
	12 kHz	64000	48000	38400	32000	25600	19200	12800	6400, 4800, 2400, 1200, 600	300
	9 kHz	48000	36000	28800	25600	19200	14400	9600	4800, 2400, 1200, 600	300
	6 kHz	32000	24000	19200	16000	12800	9600	6400	3200, 2400, 1200, 600, 300	150
	3 kHz	16000	12000	9600	8000	6400	4800	3200, 2400	1600, 1200, 600, 300, 150	75
MIL-STD-188-110B	3 kHz	-	-	9600	8000	6400	4800	3200, 2400	1600, 1200, 600, 300, 150	75
MIL-STD-188-110A	3 kHz	-	-	-	-	-	2400	1200	600, 300, 150	75
		Ground-Wave Channel		Sky-Wave Channel						

Additional HF Waveforms	STANAG 4539 (incl. App. D TDMA & App. F ISB), STANAG 4415, 4418, 4285, 4529, 5065 (LF) and FSK

Physical Characteristics				
Size, Weight & Color	Width: 212.2 mm Depth: 225.6 mm	Height: 41.1 mm (excl. front panel) Height: 44.1 mm (incl. front panel)	Weight: 2.2 kg	Color: Black Grey (RAL 7021), Saddlewood Powder (VX 7517)
Environmental Specifications	Climatic	○ Storage/Operation: -30 ˚C to +70 ˚C (MIL-STD-810F) ○ Humidity: 90% non-condensing at 30 ˚C (MIL-STD-810F)		
	Mechanical	○ Vibration: Surface Ship, Marine Vehicles, Aircraft, Min. Integrity (MIL-STD-810F) ○ Shock: 40 G, 11 ms (MIL-STD-810F)		
	EMC	○ MIL-STD-461E (RE101, RE102, CE102, CS101, CS114, RS101, RS103)		
	Safety/CE Marking	○ CE Marking - Directives 2006/95/EC as amended ○ SANS 60950-1:2010 / IEC 60950-1:2012		○ LVD - Low Voltage Directive 2014/35/UE ○ EMC - Electromagnetic Compatibility Directive 2014/30/UE ○ EDD – Eco-Design Directive 2009/125/EC
	MTBF	○ > 40,000 hours		
Installation	Compact design: The unit occupies a width less than ½ of an 1U 19" rack slot, *RapidM* 19" rack-mountable tray available.			
Presets	Factory and Custom Presets			

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
Remote Control/ GPS Port (DE9M)	Remote Control Pins: 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
GPS	Built-in GPS receiver: Time reference for 2G ALE Linking protection (AL-2).
Ethernet CTRL Port (RJ45)	Remote Control: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Control Protocol (RAP1 + RIPC)
Ethernet DATA Port (RJ45)	IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack Protocol: Raw IP packet data, requires 3G ALE
Ethernet AUX LAN Port (RJ45)	IP Packet Data: 10/100 Base T (IEEE 802.3U compatible), embedded TCP/IP Stack (Reserved)
User Interface	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
Supply	AC Supply: 90-264 VAC, 40–440 Hz, 2A; 100-370 VDC, 10 Watt

RM10 HF Modem Ordering Information		Stock Number	Description
HF	RM10 Wideband SDM - WBHF Modem *(MS-188-141C-D)*	RME-M0-RA-W1V06	SDM: RM10 W1 (110ABC 24kHz 120kbps) V06
	Option: 4G WALE up to 24 kHz (MS-188-141D), incl. 2G & 3G	M10-SW-O-4G-V06	SW MDL-4G (WALE 141D 24kHz 2G 3GLSU) V06

Other RM10 Variants		Stock Number	Description
V/UHF	RM10 Wideband SDM - UHF Modem (STANAG 4691)	RME-M0-RA-U4V06	SDM: RM10 U4 (UHF 4691-B, 25kHz) V06
	RM10 Wideband SDM - VHF Modem RM V6	RME-M0-RA-V6V06	SDM: RM10 V6 (V/UHF 24kHz 128kbps) V06

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