

RM34

Ultra-Wideband SDM | 70 MHz – 500 kHz



V/UHF MODEM

Features and Benefits

- **V/UHF Data Modem Waveforms**
 - STANAG 4691, Annex E: 500 kHz; ≤ 1920 kbps
 - STANAG 4691, Annex D: 300 kHz; ≤ 1152 kbps
 - STANAG 4691, Annex C: 100 kHz; ≤ 384 kbps
 - STANAG 4691, Annex B: 25 kHz; ≤ 96 kbps
 - STANAG 4691, Annex B*: 20 kHz; ≤ 76.8 kbps
 - Proven Interoperability with BFTN-UHF (20 kHz)
- **External Control Interfaces**
 - Remote: Serial and Ethernet I/F
 - Local: Front Panel - Operator I/F
- **External Data Interfaces**
 - Serial Data: EIA 530, RS-232, RS-422 Sync./Async I/F
 - Ethernet Data: Alternative Data Connection, Eth. I/F
- **External Radio Interfaces**
 - 70 MHz RF (≤ 500 kHz)
 - Analog Baseband Audio (≤ 25 kHz)
 - VITA-49.2 (≤ 100 kHz)
- **External Time Interfaces**
 - GPS: Accurate Time Updates from External GPS
 - Network Time: Accurate Time Updates via NTP Time Server
- **High-Build Quality**
 - Excellent Environmental Specifications
 - Wide Operational Temperature Range
- **High Reliability**
 - High MTBF: > 40 000 hours
- **Deployment**
 - 19-Inch Rack Mount for Strategic Use
 - Mobile Platform (Ship, Aircraft)
- **Extended Product Life-Cycle**
 - Product Availability: > 15 years
 - Availability of Spares: > 20 years

RM34 Product Overview

The RM34 Ultra-Wideband (UHF) Software Defined Modem (SDM) is a purpose-built standalone hardware platform for high-capacity data communication over V/UHF radio channels. Equipped with a 70 MHz intermediate-frequency (IF) digitiser, the RM34 supports the STANAG 4691 V/UHF Time-Division Multiple Access (TDMA) waveform family, enabling data rates of up to 1.92 Mbps across 500 kHz V/UHF radio channels.

Designed to meet the requirements of naval and government end-users, the RM34 delivers high-performance, long-distance line-of-sight (LOS) data communications for strategic and maritime operations. With its ability to achieve data rates of up to 1.92 Mbps in 500 kHz UHF LOS channels, the RM34 offers data speed, quality, and security comparable to SATCOM systems – without the associated infrastructure.

The integrated V/UHF waveforms address the increasing need for higher throughput to support internet protocol (IP)-based data exchange and emerging high-capacity applications. These include naval and strategic situational awareness systems, enabling effective command and control (C2) across diverse operational environments.

V/UHF Data Modem

The RM34 modem implements STANAG 4691/AComP-4691 (Edition 1) Annex B to E, which specifies a family of V/UHF waveforms. These waveforms, described in Annex B to E of the STANAG 4691 specification, cover 25, 100, 300 and 500 kHz bandwidths.

The waveform family incorporates a block interleaver supporting four different interleaver lengths, with the length determined by the selected waveform family (bandwidth). Phase Shift Keying (PSK) and Quadrature Modulation (QAM) techniques are employed for encoding user data. Crucially, data rate and interleaver settings are explicitly transmitted as part of the waveform, included in the initial and periodically reinserted preambles. This feature allows the receiving modem to extract data rate and interleaver settings from incoming transmissions.

System Integration

The RM34 is the cornerstone of the Rapid Mobile recommended STANAG 4691 MARLIN V/UHF system solution. Seamlessly integrating with the RC34 MARLIN Node Controller, the RM34 facilitates high-capacity data transmission over V/UHF radio channels via the 70 MHz radio interface.

The RC34 Ultra-Wideband Network Controller complements the RM34 by conforming to STANAG 4691 Annex A, which includes functionalities such as automatic network discovery and error-free data delivery using the embedded ARQ protocol. Together, the RM34 and RC34 provide a robust, integrated solution tailored to the needs of naval and government end-users.

Deployment

The RM34 features a compact ½ 1U, 19-inch rack-mountable form factor, offering flexible deployment across a wide range of platforms—including surface vessels, submarines, airborne assets, and fixed land-based installations. The standard interfaces offered by the RM34 seamlessly integrate with V/UHF transceivers, cryptographic equipment, and management systems, facilitating convenient deployment in various operational environments.



V/UHF Modem Waveforms									
Waveform Standards	Annex	Bandwidth	Data Rates [kbps]						
			64-QAM	32-QAM	16-QAM	16-QAM	8-PSK	Q-PSK	B-PSK
STANAG 4691/AComp-4691	E	500 kHz	1920	1600	1280	960	720	360	180
	D	300 kHz	1152	960	768	600	450	225	112.5
	C	100 kHz	384	320	256	192	128	64	32
	B	25 kHz	96	80	64	48	32	16	-
STANAG 4691 (Scaled) *	B	20 kHz	76.8	64	51.2	38.4	25.6	12.8	-
Line of Sight VHF and UHF Radio Channel									
* Extension of standard implementation.									
Physical Characteristics									
Size, Weight and Color	Width: 212.2 mm Depth: 225.6 mm	Height: 41.1 mm (Excluding Front Panel) Height: 44.1 mm (Including Front Panel)	Weight: 1.97 kg			Colour: Saddlewood			
Environmental Specifications	Climatic	<ul style="list-style-type: none"> Storage: -30 °C to +70 °C (MIL-STD-810H, Methods 501.7 and 502.7) Operation: -30 °C to +50 °C (MIL-STD-810H, Methods 501.7 and 502.7) Humidity: 95% Non-Condensing at 30 °C to 60 °C Cycles (MIL-STD-810H, Method 507.6) 							
	Mechanical	<ul style="list-style-type: none"> Vibration: Mechanical Vibration of Shipboard Equipment (MIL-STD 810H, Method 528.1) Shock: 20 G, 11 ms; 40 G, 11 ms (MIL-STD-810H, Method 516.8) 							
	EMC	<ul style="list-style-type: none"> MIL-STD-461G (CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS103) 							
	Safety/CE Marking	<ul style="list-style-type: none"> CE Safety – EN62368-1 CE-EMC – Emissions: EN 55032 CE-EMC – Immunity: EN 55035 				<ul style="list-style-type: none"> LVD - Low Voltage Directive 2014/35/EU EMC - Electromagnetic Compatibility Directive 2014/30/EU 			
	MTBF	> 40 000 hours							
Environmental	RoHS (2011/65/EU + 2015/863); REACH (EC No. 1907/2006); WEEE (2012/19/EU); Ozone (EU 2024/590); Greenhouse Gases (EU 2024/573)								
Installation	The unit occupies less than half the width of a 1U 19-inch rack slot. A 19-inch rack-mount tray is available. A heat sink tray is required for thermal management.								
External Interfaces – Front and Rear Panels									
Rear J3 DTE (Data) Port (DB25F)	RS-422 Balanced, RS-423, RS-232 Unbalanced, MIL-STD-188-114 Interoperable, EIA-530-Compliant Half and Full Duplex Operation, Synchronous, Standard and High-Speed Async Modes								
Rear J15 Remote Control/GPS Port (DE9M)	Remote Control Pins: RS-422 Balanced or RS-232 Protocol: RAP1 + RIPC, ASCII S5066 Annex E (Control Protocol)				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 or Logic Level				
Rear J14 Ethernet CTRL Port (RJ45)	Remote Control: 10/100BASE-T (IEEE 802.3U Compatible), Embedded TCP/IP Stack Protocol: RAP1 + RIPC (Control Protocol)								
Rear J13 Ethernet DATA Port (RJ45)	IP Packet Data: 10/100BASE-T (IEEE 802.3U Compatible), Embedded TCP/IP Stack Protocol: Data over TCP/IP								
Rear J59 Ethernet RADIO Port (RJ45)	IP Packet Data: 10/100BASE-T (IEEE 802.3U Compatible), Embedded TCP/IP Stack Protocol: ANSI/VITA 49.2-2017 VITA Radio Transport (VRT)								
Rear J11 Radio Control and Audio Port (DB25M)	Radio Control 1: RS-232, Up to 115200 bps, 1/2 Stop Bits, 7/8 Bit Data Radio Control 2: RS-422 or RS-232 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 PTT Out: Non-Polarised Contact Closure (40 V, 200 mA)								
	Aux Audio: Connection of Intercom Input Audio: 600 Ohm Balanced, -20 to +10 dBm Without Adjustment Output Audio: Balanced, -40 to +10 dBm adjustable into 600 ohm load PTT In: Pull to Ground to Indicate External PTT								
J19 CLK IN	Stable Frequency Input from Accurate External Clock Reference (Optional)								
J21 RF OUT/J22 RF IN	70 MHz Interface to and from V/UHF Radio (-20 dBm Nominal)								
Rear J8 Supply	AC Supply: 85-264 VAC, 47-440 Hz, 100-370 VDC, 16 Watt Nominal, 2A Fuse, Designed to STANAG 1008:2004								
Front (User Interface)	Local Control via 16-Button Keypad and OLED Display								
Ordering Information	Stock Number	Description							
RM34 Ultra-Wideband SDM — 70 MHz	RME-MC-RA-U1V06	SDM: RM34 U1 (4691-E 500kHz 1.92 Mbps) V06							

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