

WIDE-BAND Radio Direction Finder RT-500-M

For professional
maritime and mobile SAR



The Leader in DF



The product

The RT-500-M is a high performance, wide-band radio direction finder designed for professional shipboard and mobile SAR and radio monitoring operations in the harshest conditions. It operates between 118 and 470 MHz, including COSPAS-SARSAT (CP-SS) and all other V-UHF international distress frequencies. MOB-functionality for crew safety is a standard feature. Extended V-UHF air bands support cooperation with civil and military airborne forces, and the extended UHF FM band covers LMR, PMR and

LPD radio frequencies, often used by smugglers and pirates. Scan functions allow creating a scan list, scan all 19 CP-SS channels, or scan multiple SAR frequencies sequentially (CP-SS...121.5...243.0). Additionally it decodes CP-SS data from an emergency beacon and thereby displays the beacon's ID, its latitude-longitude location, as well as direction and distance to the beacon. The RT-500-M calculates the bearing to an incoming radio signal with an accuracy of 5° RMS.

Standard serial, NMEA, and Ethernet interfaces allow integration with ECDIS systems, sharing DF bearing and location data in real time. The installation of the light weight compact antenna (AU) system requires no RF cables. A distance of 100 m between AU and Display Control Unit (DCU) is no problem. The RT-500-M direction finding system is ideal for SAR, Coast Guard, and Law Enforcement organizations, easy to install on any size of vessel and practically maintenance free.



Photo: RNLI, Nigel Willard



RT-500-M

All features at a glance

- Wide-band radio direction finder, 118 to 470 MHz
- MOB functionality
- High reception sensitivity to permit detection of extremely weak and distant signals
- Designed for use under very rough conditions at sea
- Easy installation, no RF cables required
- Compact wide-band antenna system (Patent DE 4421759 C1)
- NMEA, RS-422 and RS-232 interfaces for system integration and remote control
- DF of all 19 COSPAS-SARSAT channels
- Decode of COSPAS-SARSAT messages
- Shows direction and distance to GPS-position of COSPAS-SARSAT beacons
- VHF Air band in 8.33 kHz steps available
- UHF band including frequencies of SRD/LPD and PMR devices (used by pirates and smugglers)

The Leader in DF

System Characteristics

Parameter	Condition	Data
Method of bearing		Doppler
Bearing reference		Relative bearing True/magnetic bearing ¹
Bearing indication		Digital and by a pointer in a wind rose
Bearing accuracy ²		≤ 5° RMS
Display resolution		1°
Available frequency range		118 – 470 MHz
Reception frequency	VHF Air Band	118.000 – 124.000 MHz (Basic) 118.000 – 136.992 MHz (Option F1)
	VHF Marine Band	154.000 – 163.000 MHz (Basic) 137.000 – 224.995 MHz (Option F2)
	UHF Air Band	240.000 – 246.000 MHz (Basic) 225.000 – 399.975 MHz (Option F3)
	COSPAS-SARSAT	400.000 – 406.092 MHz (Basic)
	UHF FM-Band	406.100 – 410.000 MHz (Basic) 406.100 – 470.000 MHz (Option F4)
	Bearing sensitivity Continuous signal ±5° bearing fluctuation	VHF Air Band VHF Marine Band VHF Marine Band above 174 MHz UHF Air Band COSPAS-SARSAT UHF FM Band
Bearable kinds of modulation	A3E, F3E, A3X (distress signal modulation)	Bearing largely independent of modulation
Min. signal duration		≤ 100 ms
Polarisation	Vertical	
Scanning	Multiple scanning and monitoring functions available	
COSPAS-SARSAT functionality	<ul style="list-style-type: none"> • Decoding of COSPAS-SARSAT message: shows beacon ID, GPS position and whole message string (short and long) • Displays direction and distance to beacon ³ • All 19 COSPAS-SARSAT channels available • Scanning of all 19 COSPAS-SARSAT channels 	
TFT graphic display	<ul style="list-style-type: none"> • 5" (127 mm), 24 bit RGB 800 × 480 × 3 dots • Max. brightness: >500 cd/m²; 800 cd/m² typical • Dimming: manual and automatic 	
Audio	<ul style="list-style-type: none"> • Internal speaker: 1 W; 8 Ohm • External speaker: 1 W; 8 Ohm • Line out: adjustable from 200 mV_{pp} to 2 V_{pp} 	
Operating voltage	12V to 30V DC	
Power consumption	Max. 15W; typical 8W; standby 7W	
Current consumption	Max. 1.5 A	
Interfaces	<ul style="list-style-type: none"> • 3× NMEA 0183 (RS422) 3× RS232 • Ethernet LAN (NMEA over LAN) • Alarm relay output (1 A, 30 V DC 0,3 A, 125 V AC) • PTT input for self-bearing suppression • Squelch output for external audio controlling • 2× programmable I/O ports 	
Standards	<ul style="list-style-type: none"> • EN 60945; EN 60950-1; EN 60950-22; FCC Part15 ⁴ 	

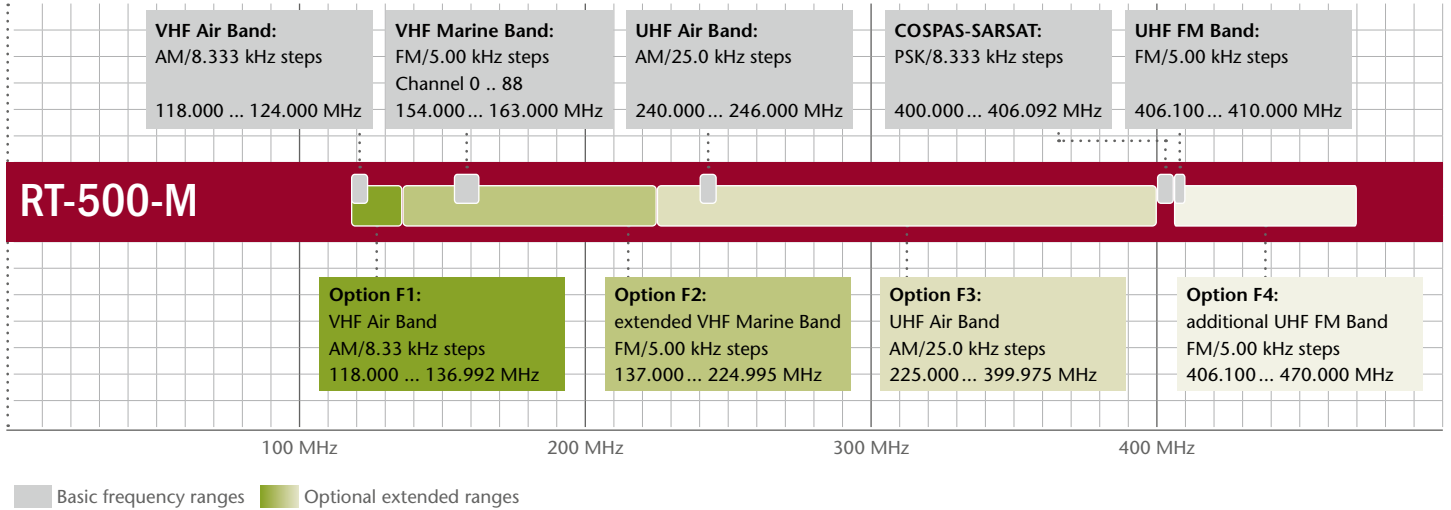
¹ If heading data available

² Measured with unmodulated, undisturbed wave field at field strength ≥ 20 dB above sensitivity level by changing the angle of incidence with the antenna rotating on a revolving table in order to eliminate environmental influences on the results.

³ If GPS information is available at NMEA interface

⁴ Other standards on request

Frequency options



Accessories



DC/DC Converter



DCU Mounting Kit



Antenna Measurement Device



External GPS- and Compass Module



Waterproof D-Sub and LAN-connectors

Operation Examples



Standard bearing display shows bearing (true/magnetic or relative); signal level strength; working frequency or channel; heading status



Decode page with direction and distance indication to COSPAS-SARSAT GPS-Position



Decode page with direction and distance indication to COSPAS-SARSAT GPS-Position and list of reception history



Standard bearing display with additional COSPAS-SARSAT GPS-direction indicator (indications can be different)



When MOB function is activated, the pink indicator shows the direction to the MOB position. The distance is indicated in the window.

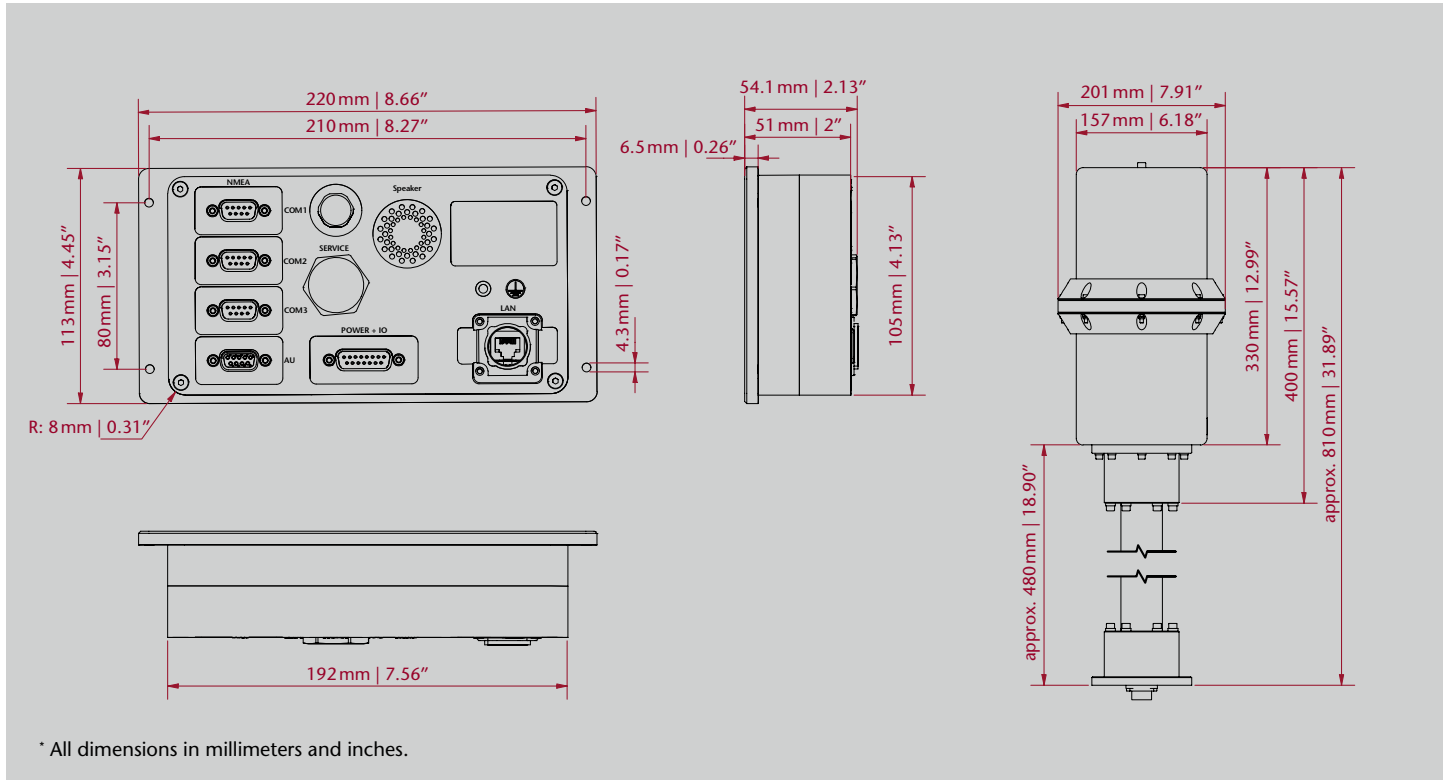


COSPAS-SARSAT decode page with list of all beacon information including indication to the GPS-Position (distance and direction)

Mechanical Characteristics

	DCU	Antenna
Weight	1500g 3.3 lbs	5200g 11.5 lbs
Operating temperature	-20 °C to +60 °C -4 °F to +140 °F	-40 °C to +60 °C -40 °F to +140 °F
Storage temperature	-30 °C to +80 °C -22 °F to +176 °F	-55 °C to +80 °C -67 °F to +176 °F
Ingress protection	IP67	IP67
Max. wind speed		270 km/h

Display Control Unit (DCU)



All product specifications subject to change without notice.



Coordinates: N 47.6842° / E 11.1982° / (WGS 84)

RHOTHETA Elektronik GmbH
 Dr.-Ingeborg-Haeckel-Str. 2
 82418 Murnau
 Germany

Tel.: +49 8841 4879 - 0
 Fax: +49 8841 4879 - 15
 E-Mail: email@rhotheta.de
www.rhotheta.com

RHOTHETA International
 8201 Peters Road, Suite 1000
 Fort Lauderdale, FL 33324
 USA

Tel.: +1 954 - 495-8700
 Fax: +1 954 - 476-5926
 E-Mail: info@rhothetaint.com
www.rhothetaint.com