Wideband Radio Direction Finder RT-800

The compact solution for VTS coastal surveillance, mobile ATC stations and SAR purposes

The Leader in DF
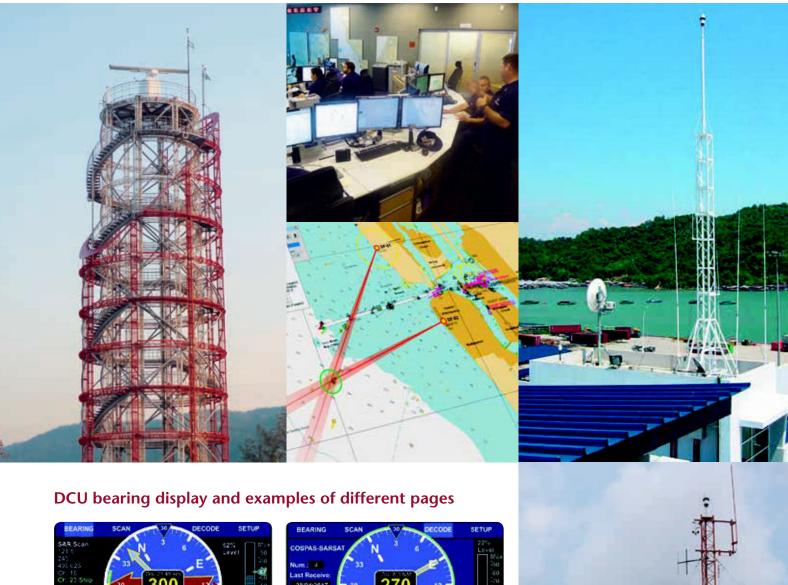
RHO THETA Elektronik GmbH

The product

The RT-800 is a radio direction finder for stationary coast surveillance and identification of ships transmitting on the VHF radio band.

The bearing information from transmitters can be correlated with the corresponding radar target and AIS-position information at a VTS / (Vessel Traffic Service) center.

Two or more RT-800 systems on different locations can be used to locate a ship's exact position by triangulation.

The RT-800 is also a perfect solution for mobile ATC stations. This direction finder can operate on frequency bands as follows:

- Civil VHF air band from 118 to 137 MHz
- Extended Marine VHF band from 137 to 225 MHz
- Military air band from 225 to 400 MHz
- All 19 COSPAS-SARSAT frequencies between 406.022 to 406.076 MHz
- UHF FM band from 406.100 to 470.000 MHz

DCU bearing display and examples of different pages

RT-800
All features at a glance

- Best price-performance ratio
- Decoding of transmissions on all 19 COSPAS-SARSAT channels
- Bearing of the COSPAS SARSAT signal on all 19 channels
- Full manual operational functionality at installation site for calibration and service
- Fast frequency monitoring by scanning of up to 8 frequencies

- Easy and reasonably priced installation as no patched HF antenna cable has to be used
- Effective remote operation via LAN / Ethernet or RS-232
- Extreme compact, rugged and lightweight DF antenna for easy installation and use in maritime weather conditions
- Maintenance-free due to no moving parts
- Lightning protection rod

The Leader in DF
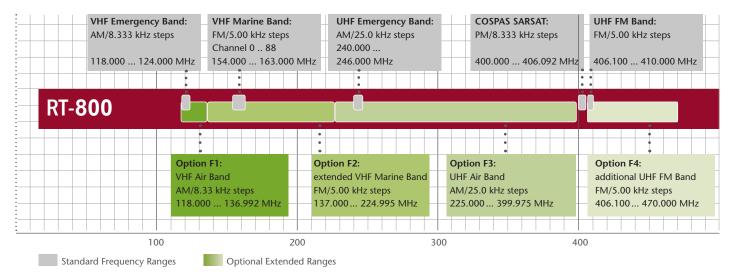
Technical data

Method of bearing:	Doppler principle	
Bearing accuracy[1]:	2°RMS	
Internal resolution:	1°	
Frequencies range[1]:	VHF Air Band	118.000 to 124.000 MHz
		118.000 to 136.992 MHz (Option)
	Marine Band	154.000 to 163.000 MHz
		137.000 to 224.995 MHz (Option)
	UHF Air Band	240.000 to 246.000 MHz
		225.000 to 399.975 MHz (Option)
	COSPAS-SARSAT	400.000 to 406.092 MHz
	UHF FM-Band	406.100 to 410.000 MHz
		406.000 to 470.000 MHz (Option)
Frequency stability:	±2.0 ppm	
Receiving frequencies tuning steps:	VHF Air Band	8.33 kHz
	Marine Band	5 kHz
	UHF Air Band	25 kHz
	COSPAS-SARSAT	8.33 kHz
	UHF FM-Band	5 kHz
Bearing sensitivity:	Air Band ±5° bearing fluctuation:	≤ 4 µV/m / 2.5 µV/m (typical)
	Marine Band ±5° bearing fluctuation:	≤ 3 µV/m / 2 µV/m (typical)
	UHF Air Band ±5° bearing fluctuation:	≤ 6 µV/m / 4 µV/m (typical)
	COSPAS-SARSAT ±5° bearing fluctuation:	≤ 6 µV/m / 4 µV/m (typical)
	UHF FM-Band ±5° bearing fluctuation:	≤ 6 µV/m / 4 µV/m (typical)
Marine channels:	Channel 0 … 28 / 60 … 88 (ship / coast stations)	
COSPAS-SARSAT freq.:	19 Channel A to S (406.022 to 406.076 MHz)	
COSPAS-SARSAT fast scan	Full automatic detection of any active COSPAS-SARSAT channel A to S within 400 ms	
COSPAS-SARSAT decoding:	Reception and decoding of COSPAS-SARSAT data signal (112 or 144 bit, 400 baud, biphase L encoded, phase modulation, with Bose-Chaudhuri-Hocquenghem error-correcting code, specified according to COSPAS-SARSAT)	
Monitoring / Scanning modes:	Monitoring - 121.5 MHz and three selectable frequencies are monitored during normal operation. Standby: - COSPAS-SARSAT and 121.5 MHz emergency frequencies are monitored. Fast Marine Ship Band Scan: - Fast scan (without gap) of all ship channels [01 … 88] within approx. 3 sec. Fast Channel Scan: - Fast scan of up to eight freely selectable frequencies / channels within approx. 2 sec.	

Technical data

Signal filtering:	Frequencies can be filtered for distress signal modulation (false alarms disabled) A3E
Bearable modulation:	F3E, A3X (Distress signal modulation), F1 D, G2D, COSPAS-SARSAT
	Bearing largely independent of modulation
Polarization:	Vertical
Polarization error:	≤ 5° at 60° field vector rotation
Cone of silence:	30° to the vertical
Response time[2]:	≤ 50 ms (with sufficient reception field strength)
TFT graphic display:	800 x 480 pixel (max. brightness 950 cd/m2, continuously / automatic control)
Power supply:	115 to 230 VAC ± 10 % / 50 to 60 Hz
Power consumption:	Nominal 30 W @ 230 VAC
Audio out:	Internal speaker 4 W
	Line out (adjustable from 100 mVPP to 2000 mVPP)
Interface:	Ethernet Interface for complete remote control
	(NMEA Protocol: Input / Output)
	Ethernet Interface for IP streaming audio out
	RS232 (NMEA Protocol: Input / Output)
	PTT input (for ground transmitter suppression)
	Alarm Relay Output
	Input for optional external GPS (RS422)
Options:	Software "DF Commander"	Lightning Protection Rod	UTC time base

Frequency options

VHF Emergency Band:
AM/8.333 kHz steps

118.000 ... 124.000 MHz

VHF Marine Band:
FM/5.00 kHz steps
Channel 0 .. 88

154.000 ... 163.000 MHz

UHF Emergency Band:
AM/25.0 kHz steps
240.000 ...
246.000 MHz

COSPAS SARSAT:
PM/8.333 kHz steps

400.000 ... 406.092 MHz

UHF FM Band:
FM/5.00 kHz steps

406.100 ... 410.000 MHz

RT-800

Option F1:
VHF Air Band
AM/8.33 kHz steps
118.000 ... 136.992 MHz

Option F2:
extended VHF Marine Band
FM/5.00 kHz steps
137.000 ... 224.995 MHz

Option F3:
UHF Air Band
AM/25.0 kHz steps
225.000 ... 399.975 MHz

Option F4:
additional UHF FM Band
FM/5.00 kHz steps
406.100 ... 470.000 MHz

100   200   300   400

■ Standard Frequency Ranges   ■ Optional Extended Ranges

[1] With undisturbed wave field and sufficient field strength. Measured by changing the angle of incidence with the antenna rotating on a revolving table in order to eliminate environment influences on the result.

[2] Very weak signals can increase response time considerably!

Mechanical characteristics

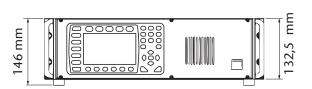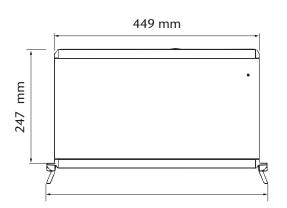|	Display Control Unit (DCU)	Antenna Unit (AU)
Weight:	5.9 kg	5.2 kg
Storage temperature:	- 30 °C to + 80 °C	- 55 °C to + 80 °C
Operating temperature:	-20 °C to + 60 °C	- 40 °C to + 60 °C
Ingress protection:		IP 67

Display Control Unit

Antenna Unit

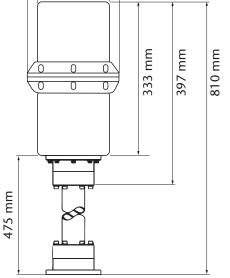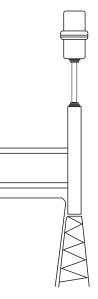## Antenna Unit
installed with optional RHOTHETA Lightning Protection Rod

All product specifications subject to change without notice.

www.rhotheta.com