



# RT-1000

## All features at a glance

- Doppler direction finder
- Extremely high rotation frequency for fast signal processing
- Compact antenna system for simple installation and very high reliability
- Best price-performance ratio
- Antenna location independent of controller workstation
- No infrastructure for relocated antenna is required
- Maintenance-friendly modular design
- RS 232 interface to permit system integration
- Two simultaneous channels available (option)
- Frequency range: 118.000 ... 136.975 MHz  
156.000 ... 174.000 MHz
- Special antenna mast with test and maintenance functionality
- Special Display and Control Software "DF Commander" available

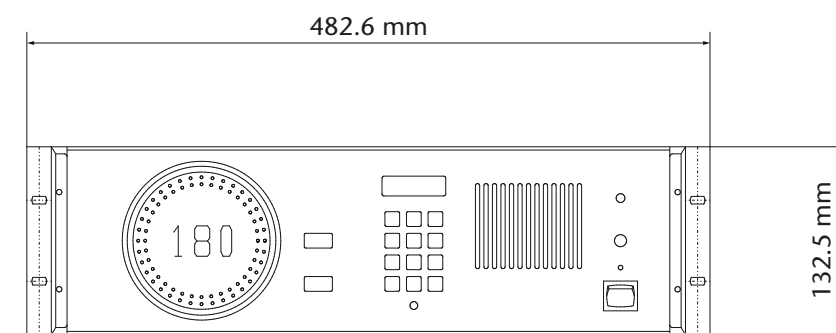
*The Leader in DF*



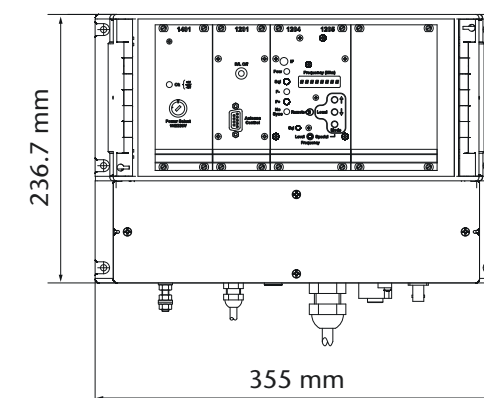
### Mechanical characteristics

	Controller Unit	Receiver Unit	Antenna
Weight:	Approx. 8.1 kg	Approx. 6.9 kg	Approx. 10.2 kg
Operating temperature:	-20°C to + 55°C	-40°C to + 60°C	-40°C to + 80°C
Storage temperature:	-40°C to + 60°C	-40°C to + 60°C	-40°C to + 60°C

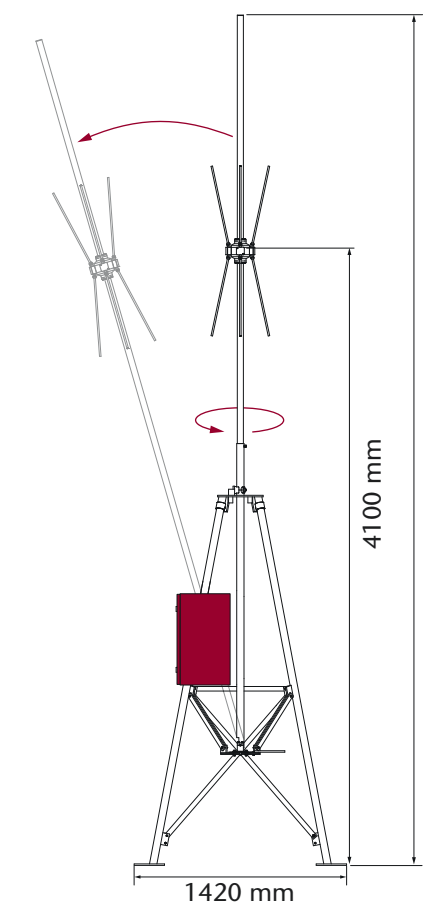
### Controller



### Receiver Unit



### DF Antenna with optional mast



All product specifications subject to change without notice. All dimensions are in mm.



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

RHOTHETA International  
8201 Peters Road Suite 1000  
33324 Ft Lauderdale FL  
USA

Tel.: +1 954 - 495-8700  
Fax: +1 954 - 495-8477  
E-Mail: info@rhothetaint.com  
www.rhothetaint.com



# Radio Direction Finder RT-1000

## The compact solution for ATC and VTS stations



*The Leader in DF*



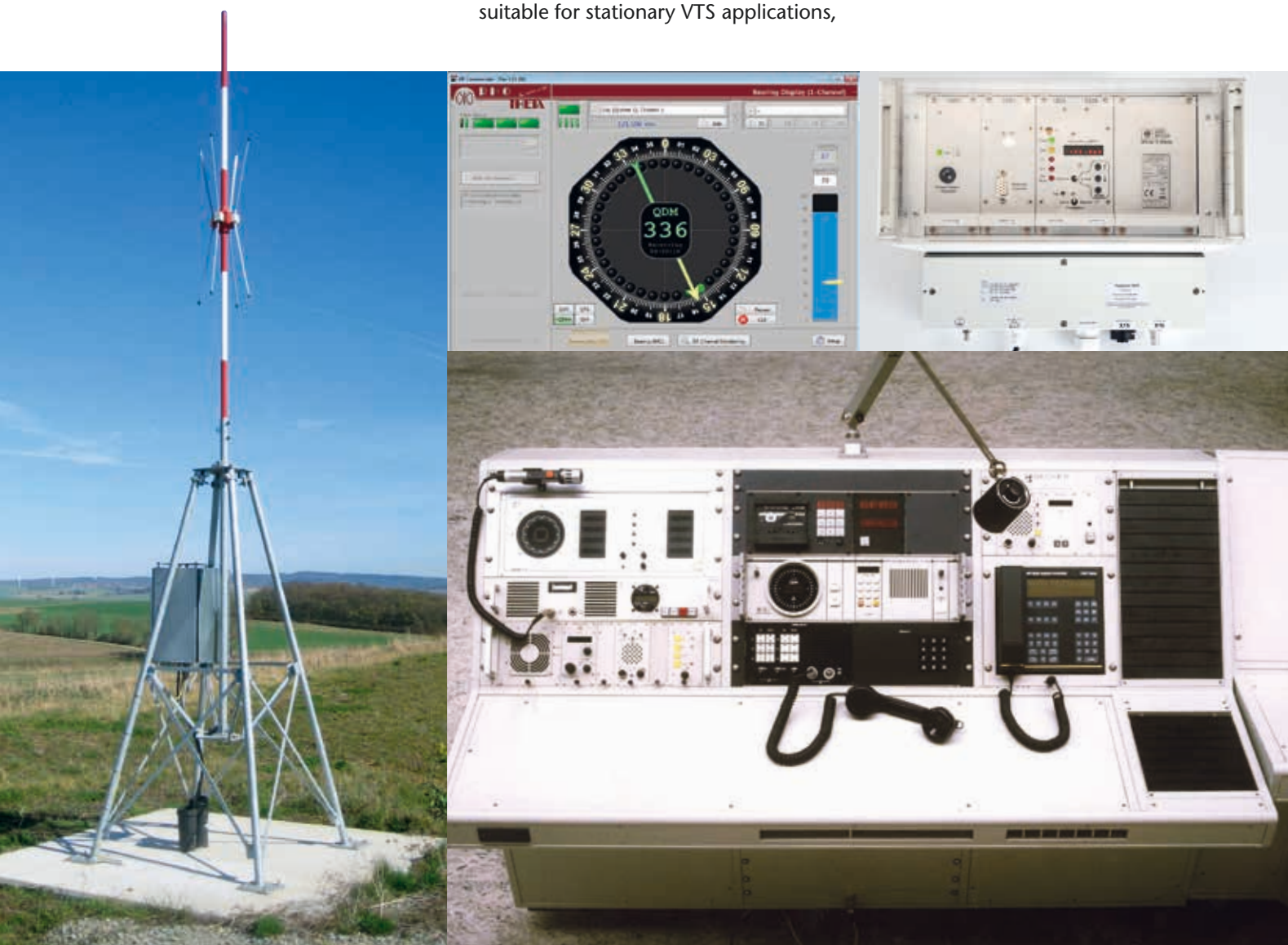
## The product

The RT-1000 radio direction finder system is designed specifically for ATC (Air Traffic Control) and VTS (Vessel Traffic Service) applications and complies with ICAO requirements.

The RT-1000 has become the benchmark in its class. Hundreds of systems are currently in use worldwide.

The RT-1000 is used as an ATC navigation aid that allows controllers on the ground to give QDM information to the pilot or verify position reports received from aircraft. Bearing information can also be integrated into a radar screen, which makes it possible to identify the target, which is speaking on the radio. The RT-1000 is also suitable for stationary VTS applications,

even for triangulation. The system operates in "relocated mode". The DF antenna is installed relocated from the controller, at a place favourable for direction finding. It can be equipped with a second simultaneous DF channel. A single block unit for mobile towers is available as well as a multi-channel system.



## Technical data

Frequency range air band <sup>1</sup>	118.000 to 136.975 MHz	
Frequency range marine band <sup>1</sup>	156.000 to 174.000 MHz	
Operating channels air band	760 (25 kHz); 2278 (8.33 kHz) <sup>2</sup> ; 10 preselected	
Channel spacing	25 kHz / 8.33 kHz <sup>2</sup>	
Type of modulation to be detected	A3E, F3E, A2X (ELT modulation)	
System accuracy <sup>3</sup>	±2° (± 1°) RMS <sup>4</sup>	
Sensitivity <sup>5</sup>	3 µV/m typical	
Polarization	vertical	
Polarization error	1° (with field vector rotation up to 45°)	
Cone of silence	approx. 35° referred to the vertical	
Power supply AC	115 / 230 V ±15%; 47 to 63 Hz	
DC	24 V -10% / +20%; automatic switch-over to DC voltage at AC mains failure	
Power consumption	Controller unit	max. 15 VA
	Receiver unit	max. 10 VA (52 VA with heater)
Bearing display	Dual compass dial	QDM; QDR; QUJ; QTE; (Resolution 1°; Response time < 0.3 s) QDR; 2 concentric circles of LED points; (Resolution 10°)
Monitoring		Built-in loudspeaker; A3E; 500 mW; Line output 600 Ω, balanced, 0 dBm, m = 0.6
Ground transmitter suppression		with external contact to ground
Dimensions / Mass	Controller	19" desktop model 3 UH, prepared for rack installation Dimensions (H x W x D) 132.5 x 448 x 370 mm; 8.1 kg
	Receiver unit	Plastic cabinet for wall mounting (IP 65) Dimensions (H x W x D) 250 x 340 x 285 mm; 6.9 kg
	Antenna system	Dimensions (Diameter x H) 400 x 1120 mm with lightning rod and mast 400 x 3400 mm Weight antenna complete with mast and lightning rod 10.2 kg
Lateral thrust due to wind with constant wind speed		180 km/h; approx. 195 N (data with lightning rod and mast)
Options:	<ul style="list-style-type: none"> <li>- Antenna mast construction, antenna turntable to check DF accuracy without environmental influences. It provides a folding mechanism to bring down the antenna to a level for easy maintenance.</li> <li>- 2nd simultaneous DF channel</li> <li>- Bearing precision improvement</li> <li>- Display and Control Software "DF Commander"</li> <li>- Service Kit</li> <li>- Multi-channel DF system with up to 34 simultaneous DF channels</li> </ul>	

<sup>1</sup> Depends on the software configuration (Not for configuration B / dependent on the type of receiver).

<sup>2</sup> Option (for VHF air band 118.000 ... 136.975 MHz)

<sup>3</sup> For undistorted wave reception and sufficient field strength. Measurement is made with continuous vertical polarized signal, without modulation at constant frequency by changing the angle of incidence; in order to exclude site errors, angle variation is done by rotating the DF antenna on a rotator.

<sup>4</sup> With Option "bearing precision improvement"

<sup>5</sup> System sensitivity for 1° bearing fluctuations (cable attenuation of less than 2 dB between antenna and the receiver, received signal vertically polarized).

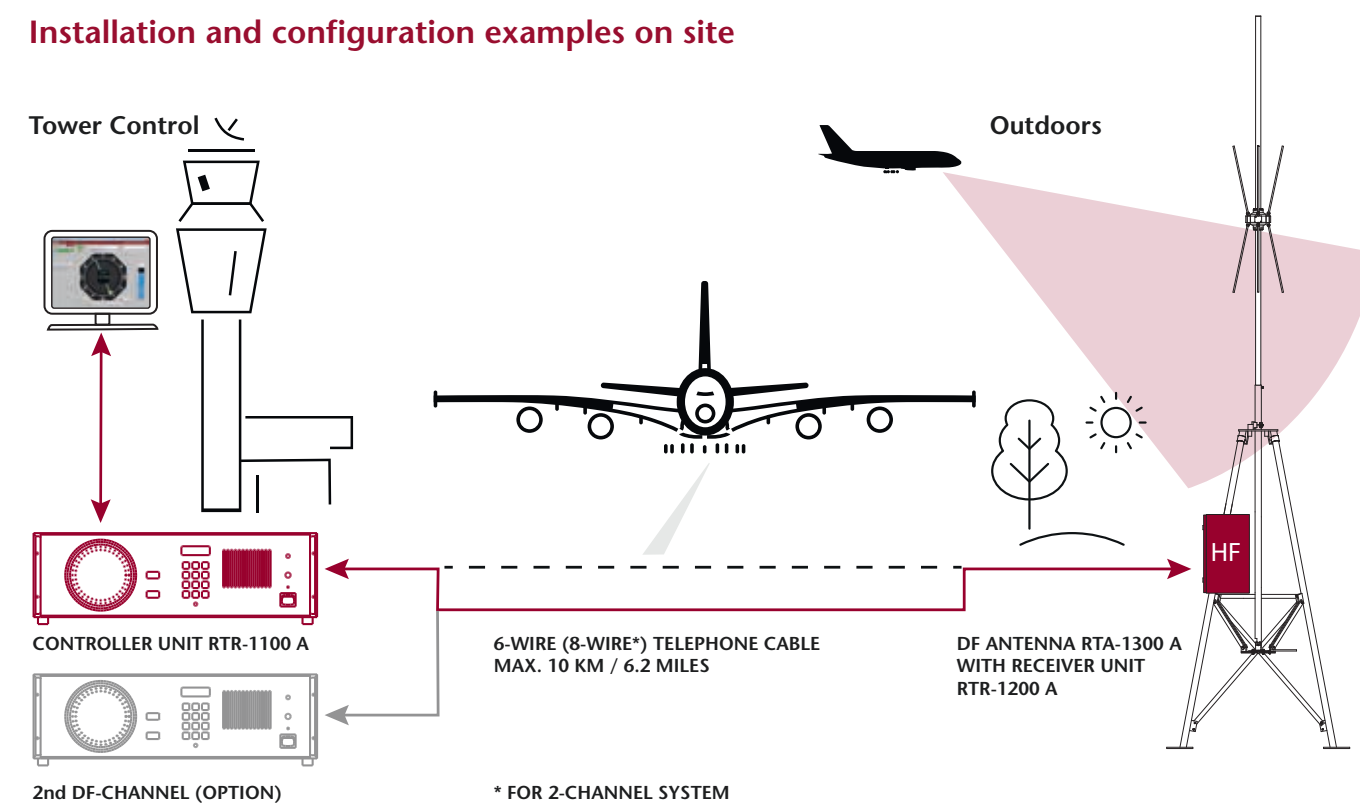
## Antenna location evaluation

RHOTHETA can support you in the evaluation of the optimal DF antenna location.

We have a lot of experience in these measurements. We developed special software for this purpose which provides a meaningful protocol. So you can be sure that the antenna position is ok, before you start with the antenna installation.



## Installation and configuration examples on site



## The RHOTHETA concept of relocated antenna:

To get the desired DF results, it is essential to choose a physically good DF antenna location. In classic DF systems, the antenna has to be located close to the DF electronics, which is placed at the tower side. The antenna has to be installed on the tower roof which is mostly the worst place for a DF-antenna at the airport.

RHOTHETA splits the DF electronics in a Receiver Unit which contains the antenna control electronics and the receiver. We designed it in a way that it can be located outside, close to the DF antenna, in a small compartment in the antenna mast construction. The Control Unit with the DF electronics can be located at the controller side on the tower. Both are connected via a standard telephone cable (3 pairs of wire).

### Your benefit:

- No large, heavy and expensive antenna construction is required to compensate poor antenna locations
- No additional infrastructure is required for locating the antenna away from the Controller side.
- No additional equipment is required to relocate the DF antenna
- Very high system reliability because of the compact construction with very few components.