

Radio Direction Finder RT-1000

The compact solution
for ATC and VTS stations



The Leader in DF

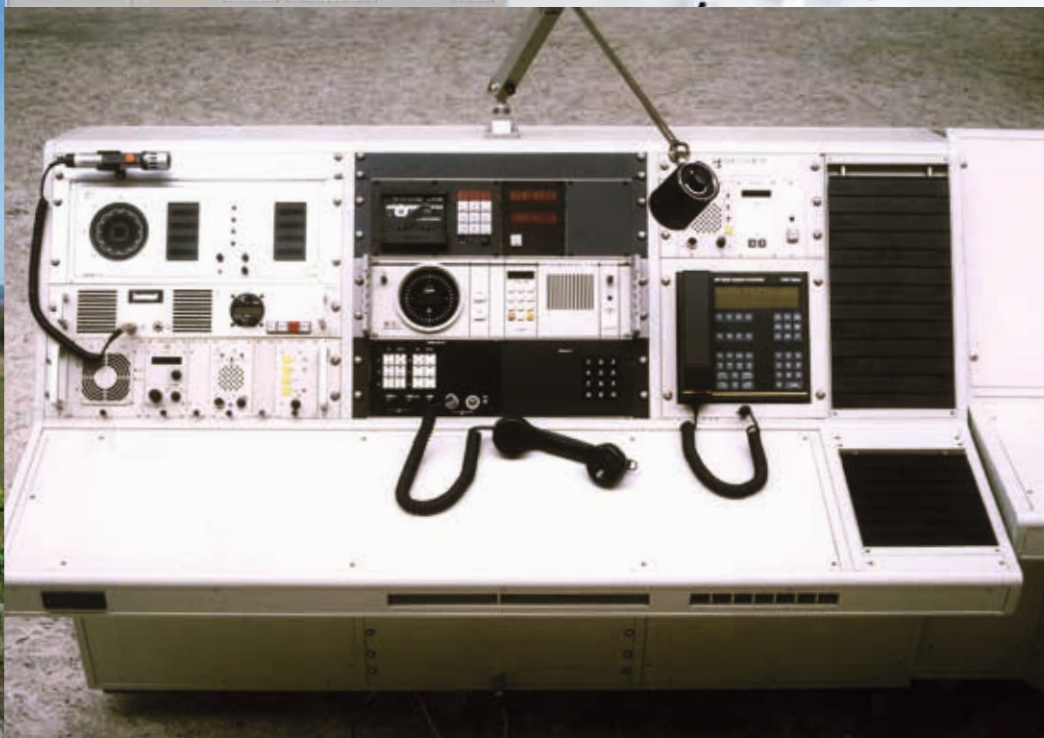
The product

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.





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

Technical data

Frequency range air band		118.000 to 136.975 MHz
Frequency range marine band		156.000 to 174.000 MHz
Operating channels air band		760 (25 kHz); 2278 (8.33 kHz) ² ; 10 preselected
Channel spacing		25 kHz / 8.33 kHz ¹
Type of modulation to be detected		A3E, F3E, A2X (ELT modulation)
System accuracy ²		±2° (± 1°) RMS ³
Sensitivity ⁴		3 µV/m typical
Polarization		vertical
Polarization error		1° (with field vector rotation up to 45°)
Cone of silence	Bearing error ≤ 5°	45°
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	Receiver unit RTR 1200.A	15 VA (65 VA with heater, 300 VA peak)
	Controller RTC 1100.A	15 VA
Bearing display	Dual compass dial	QDM; QDR; QU; QTE; (Resolution 1°; Response time ≤ 400 ms) QDR; 2 concentrical 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	Receiver unit RTR 1200.A	Plastic cabinet for wall mounting (IP 65) Dimensions (H x W x D) 271 x 355 x 236.7 mm; 6.5 kg
	Controller RTC 1100.A	19" desktop model 3 UH, prepared for rack installation Dimensions (H x W x D) 132.5 x 482.6 x 377 mm; 7.4 kg
	Antenna system	RT-1000 Antenna RTA 1300.A (H x W) 3120 x 400 mm; 10.2 kg RT-1000 Antenna RTA 1300.A + Antenna mast RTA 1306.A (H x W) 5700 x 1420 mm; 120 kg
Lateral thrust due to wind with constant wind speed		180 km/h; 195 N (data with lightning rod and mast)
Options:		<ul style="list-style-type: none"> - 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. - 2nd simultaneous DF channel - Bearing precision improvement - Display and Control Software "DF Commander" - Service Kit - Multi-channel DF system with up to 34 simultaneous DF channels

¹ Option (for VHF air band 118.000 ... 136.975 MHz)

² 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.

³ With Option "bearing precision improvement"

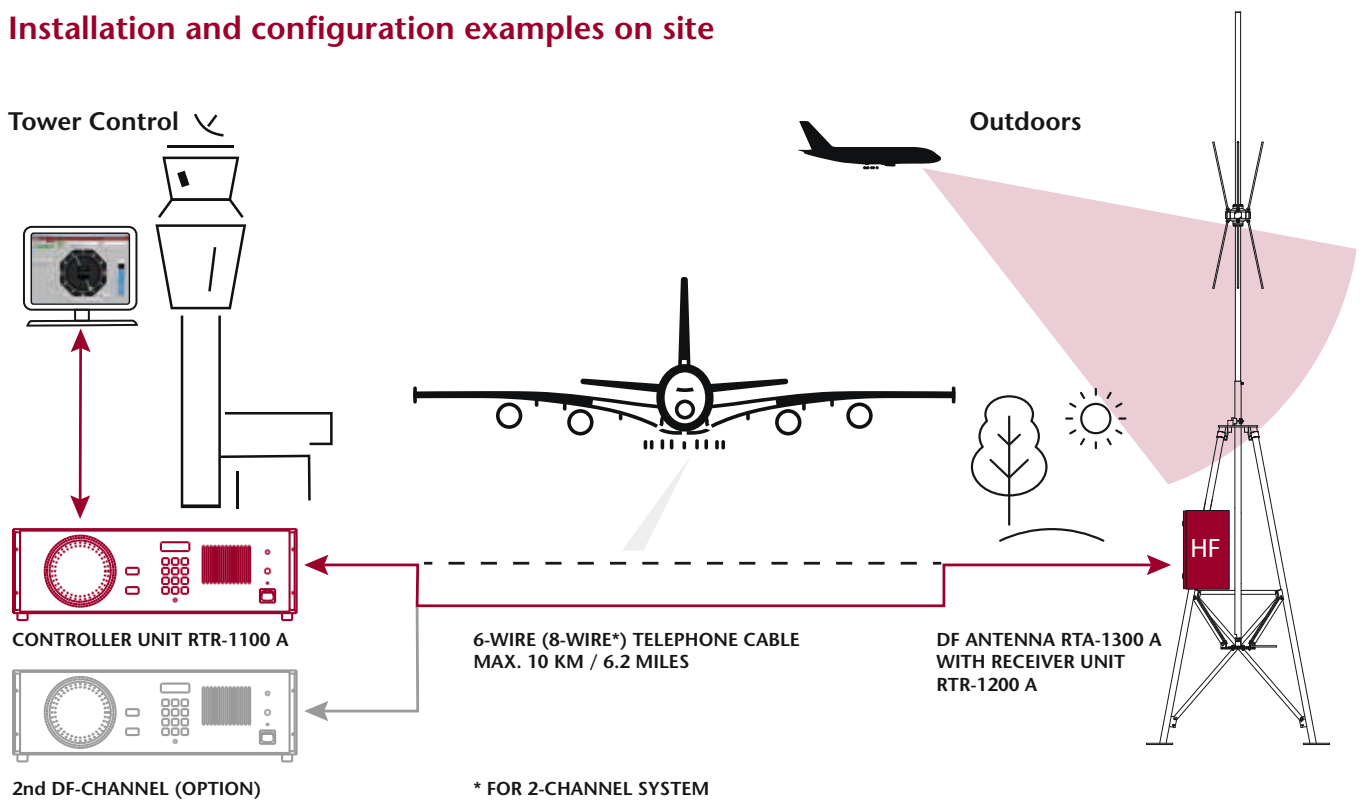
⁴ System sensitivity for 1° bearing fluctuations (cable attenuation of less than 2 dB between antenna and the receiver, received signal vertically polarized).

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).

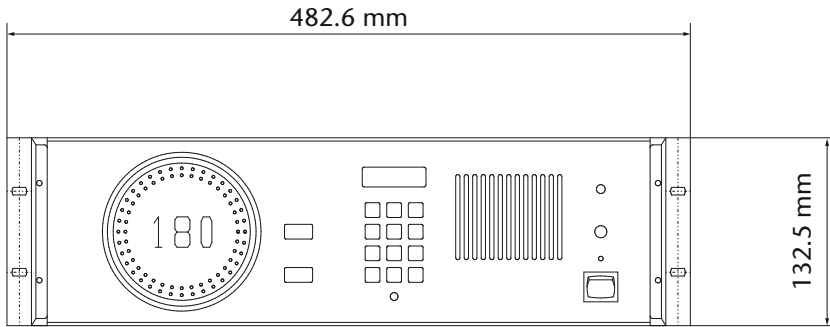
Your benefit:

- 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.

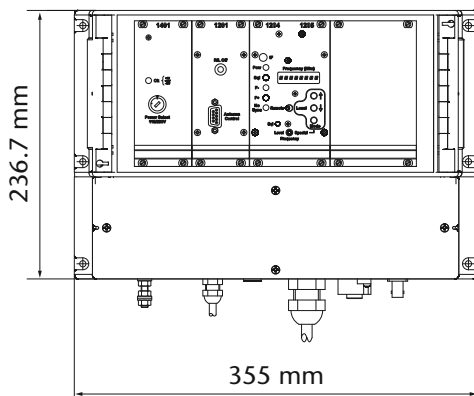
Mechanical characteristics

	Controller Unit	Receiver Unit	Antenna
Weight:	7.4 kg	6.5 kg	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 + 80°C

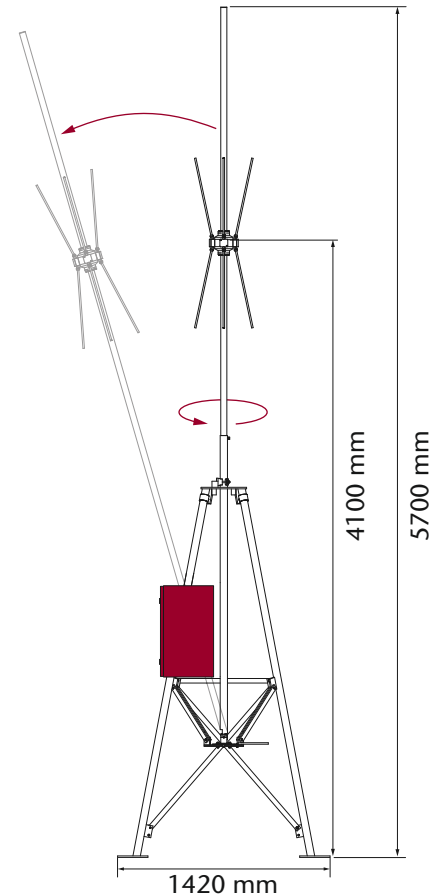
Controller



Receiver Unit



DF Antenna with optional mast



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

Rev 3.00



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

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