

**ROHDE & SCHWARZ**

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# HANDHELD DIRECTIONAL ANTENNAS

Experts in interference hunting

Product Brochure | Version 02.00



# AT A GLANCE

Rohde & Schwarz handheld directional antennas can dependably detect and locate transmitters and interference sources from 8 kHz to 44 GHz.

The following antennas are available for various frequency ranges and applications:

## R&S® HE400 HANDHELD DIRECTIONAL ANTENNA FAMILY

The antenna family uses a modular concept consisting of several antenna handles and antenna modules covering an overall frequency range from 8 kHz to 20 GHz. Supported instruments include the R&S®PR200 portable monitoring receiver as well as portable spectrum analyzers.<sup>1)</sup>



## R&S® HE800-DC30 HANDHELD DIRECTIONAL ANTENNA WITH DOWNCONVERTER

The R&S®HE800-DC30 operates in a wide frequency range from 18 GHz to 33 GHz. The handheld antenna can be used together with the R&S®PR200 portable monitoring receiver.



## R&S® HE800-PA HANDHELD DIRECTIONAL ANTENNA WITH PREAMPLIFIER

The handheld antenna covers a very wide frequency range from 18 GHz to 44 GHz. The R&S®Spectrum Rider FPH handheld spectrum analyzer as well as suitable third-party handheld analyzers or receivers are supported.



<sup>1)</sup> The legacy R&S®PR100 portable receiver and the legacy R&S®MNT100 RF interference locator are also supported.

# APPLICATIONS



General interference hunting.



Spectrum monitoring and spectrum surveillance.



Mobile network testing and interference hunting.

## General interference hunting

Rohde&Schwarz handheld antennas have directional radiation patterns, allowing users to detect and locate a potential interference source based on triangulation of multiple bearings. In highly reflective environments, i.e. indoors, the last few meters to the target are often found more easily by gradually approaching the transmitter (homing mode).

## Spectrum monitoring and spectrum surveillance

The radio frequency spectrum is a limited natural resource and it is important that it be used in the most effective and efficient way. Smart planning of frequency usage and well-designed frequency allocation schemes are crucial. Spectrum monitoring can effectively help enforce compliance with international radio traffic regulations.

Rohde&Schwarz handheld antennas in combination with a receiver or an analyzer allow users to monitor and analyze relevant signal parameters such as the frequency, spectrum occupancy, signal level and signal bandwidth.

## Mobile network testing and interference hunting in wireless communications networks

To ensure optimum performance of wireless communications networks, the network parameters are constantly monitored and analyzed. When an unknown or interfering signal is found, the source of the signal has to be identified. Highly accurate bearing results are needed to quickly locate and find the signal source.

Rohde&Schwarz handheld antennas are ideal for this task since they allow fast and reliable detection and localization of such sources over a very wide frequency range.

# R&S®HE400

## HANDHELD DIRECTIONAL

## ANTENNA FAMILY

### AT A GLANCE

The R&S®HE400 antenna family in combination with an analyzer or receiver reliably detects and locates transmitters and interference sources from 8 kHz to 20 GHz.

The R&S®HE400 handheld directional antenna family is used together with an analyzer or receiver to detect and locate transmitters and interference sources. Bearings are found by manually pointing the antenna in the direction where the signal is strongest.

It consists of four antenna handles, seven different antenna modules and accessories (cables, transport cases, transport bags, tripod, adapter, rain covers, etc.) that can be individually chosen for a specific application. Other antenna modules can be added at a later stage.

The antenna family is optimized for use with the R&S®PR200 portable monitoring receiver and portable spectrum analyzers.<sup>1)</sup>

<sup>1)</sup> The legacy R&S®PR100 portable receiver and the legacy R&S®MNT100 RF interference locator are also supported.

#### Benefits and key features

- ▶ Modular product design to select the best antenna handle and antenna module for the customer application
- ▶ Compact with very wide frequency range from 8 kHz to 20 GHz to address a large range of applications
- ▶ Suitable for 5G New Radio FR1 frequency range
- ▶ Wideband antenna modules and optimized narrowband solutions available
- ▶ Distinct directional radiation pattern for precise location of interference sources
- ▶ Fast and convenient exchange of antenna modules
- ▶ Turnable antenna modules for reception of vertically or horizontally polarized signals
- ▶ Automatic antenna module and polarization detection<sup>2)</sup>
- ▶ Support of various Rohde & Schwarz receivers and analyzers
- ▶ Support of third-party receivers (with R&S®HE400BC)
- ▶ Trigger function for external triggering of the receiver or analyzer<sup>2)</sup>
- ▶ Integrated electronic compass delivers exact azimuth and elevation angles<sup>2)</sup>
- ▶ Built-in sensitive GNSS-capable receiver for precise location by triangulation and use of geolocation data for further processing<sup>2)</sup>
- ▶ Switchable built-in low-noise amplifier (LNA) for optimum sensitivity in active mode and wide dynamic range in passive mode<sup>2)</sup>
- ▶ Power for antenna supplied by connected receiver or spectrum analyzer; no battery needed
- ▶ Unique and sophisticated bearing detection mode for highly accurate bearing results allows fast localization of signal sources (with R&S®HE400CEL, R&S®HE400SCB antenna modules)
- ▶ Low antenna weight and attachable arm rest ensure fatigue-free operation
- ▶ R&S®HE400Z8 adapter to connect external antennas to R&S®HE400DC antenna handle

<sup>2)</sup> With R&S®HE400, R&S®HE400MW, R&S®HE400DC.

# ANTENNA HANDLES

R&S®HE400 handheld directional antenna with R&S®HE400VHF.



The R&S®HE400 antenna handle has an operational frequency range from 8 kHz to 8 GHz and supports all antenna modules up to this frequency. It is compatible with the R&S®PR200 portable monitoring receiver, the R&S®Spectrum Rider FPH handheld spectrum analyzer (models .02/.06), the R&S®FSH4 and R&S®FSH8 handheld spectrum analyzers and the R&S®CableRider ZPH cable and antenna analyzer (model .12).<sup>1)</sup>

R&S®HE400MW microwave handheld directional antenna with R&S®HE400LP.



The R&S®HE400MW antenna handle operates from 20 MHz to 20 GHz. It supports the R&S®HE400VHF, R&S®HE400UWB, R&S®HE400LP, R&S®HE400CEL, R&S®HE400SCB and R&S®HE400SHF antenna modules and is compatible with the R&S®Spectrum Rider FPH handheld spectrum analyzer (models .13/.23/.26/.36), the R&S®FSH13 and R&S®FSH20 handheld spectrum analyzers and the R&S®CableRider ZPH cable and antenna analyzer (model .12).

R&S®HE400BC basic handheld directional antenna with R&S®HE400HF.



The R&S®HE400BC antenna handle is the cost-effective basic version and covers the frequency range from 8 kHz to 20 GHz. It has a mechanical compass, is fully passive and does not require a power supply. The R&S®HE400BC supports the R&S®HE400HF, R&S®HE400VHF, R&S®HE400UWB, R&S®HE400LP and R&S®HE400SHF antenna modules. The R&S®HE400BC can be used with the R&S®PR200 portable monitoring receiver, the R&S®Spectrum Rider FPH and the R&S®FSH handheld spectrum analyzers, the R&S®CableRider ZPH cable and antenna analyzer (model .12) and any suitable third-party receiver or spectrum analyzer.<sup>1)</sup>

R&S®HE400DC handheld directional antenna with downconverter and R&S®HE400SHF.

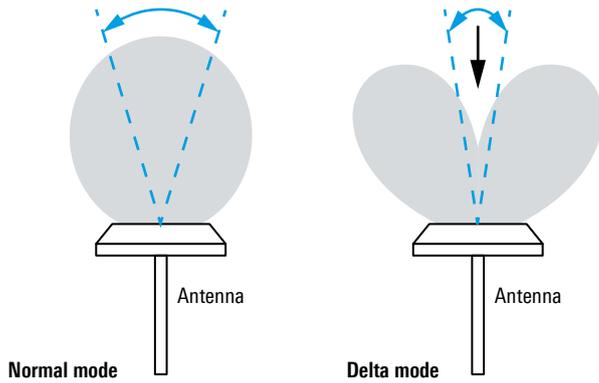


The R&S®HE400DC antenna handle has an integrated downconverter. The antenna handle covers a frequency range from 20 MHz to 20 GHz, extending the frequency range of the R&S®PR200 portable monitoring receiver from 8 GHz to 20 GHz. The downconverter is completely controlled by the R&S®PR200, allowing continuous operation. The antenna handle supports the R&S®HE400VHF, R&S®HE400UWB, R&S®HE400LP, R&S®HE400CEL, R&S®HE400SCB and R&S®HE400SHF antenna modules. The R&S®HE400DC is compatible with the R&S®HE400Z8 adapter, which allows external antennas to be connected.

<sup>1)</sup> It is also compatible with the legacy R&S®PR100 portable receiver and the legacy R&S®MNT100 RF interference locator.

# ANTENNA MODULES

## Operating modes (basic concept)



The R&S®HE400HF antenna module covers a frequency range from 8 kHz to 30 MHz and is supported by the R&S®HE400 and R&S®HE400BC antenna handles.

The R&S®HE400VHF antenna module has an operational frequency range from 20 MHz to 200 MHz. The antenna module can be used with all antenna handles.

The frequency range of the R&S®HE400LP antenna module spans from 450 MHz to 8 GHz. The antenna module operates with all antenna handles.

The R&S®HE400CEL cellular antenna module and the R&S®HE400SCB S/C band antenna module offer a unique and sophisticated bearing detection mode that delivers highly accurate bearing results over the wide frequency ranges from 700 MHz to 2.5 GHz and 1.7 GHz to 6 GHz, respectively.

The antennas can be switched between normal mode, with a distinct maximum pointing to the front, and delta mode, where the radiation pattern exhibits a steep-edge indent at the boresight. Direction finding based on the minimum signal in delta mode allows users to find the signal source much more accurately and quickly. Both antenna modules are supported by the R&S®HE400, R&S®HE400MW and R&S®HE400DC antenna handles.



R&S®HE400MW microwave handheld directional antenna with R&S®HE400CEL antenna module.



R&S®HE400MW microwave handheld directional antenna with R&S®HE400SCB antenna module.

The R&S®HE400UWB antenna module covers the extremely wide frequency range from 30 MHz to 6 GHz with a single module, addressing the VHF, UHF and lower SHF range. The antenna module operates with all antenna handles.

The frequency range of the R&S®HE400SHF antenna module extends from 5 GHz to 20 GHz. The antenna module works with all antenna handles. With the R&S®HE400 antenna handle, the R&S®HE400SHF antenna module can be used up to 8 GHz.

The operating frequency range of the system depends on the lower and upper frequency of the handheld directional antenna and the receiver or analyzer.



**R&S®HE400 handheld directional antenna with R&S®HE400UWB antenna module.**



**R&S®HE400MW microwave handheld directional antenna with R&S®HE400SHF antenna module.**

# R&S®HE800-DC30 HANDHELD DIRECTIONAL ANTENNA WITH DOWNCONVERTER AT A GLANCE

The R&S®HE800-DC30 handheld directional antenna with downconverter together with the R&S®PR200 portable monitoring receiver can detect and locate transmitters and interference sources from 18 GHz to 33 GHz with high accuracy.



R&S®HE800-DC30 handheld directional antenna with downconverter.

The antenna consists of an antenna handle with an integrated downconverter, a fixed antenna module behind the foam radome and an RF and supply cable to the receiver.

The integrated downconverter extends the operating frequency range of the R&S®PR200 to the 18 GHz to 33 GHz range. The downconverter is completely controlled by the R&S®PR200 (requires firmware version 05.00 or higher).

The R&S®HE800-DC30 in conjunction with the R&S®PR200 provides a powerful solution for interference hunting at higher frequencies.

## Benefits and key features

- ▶ Compact with wide frequency range from 18 GHz to 33 GHz to support a large range of applications
- ▶ Distinct directional radiation pattern for precise location of interference sources
- ▶ Integrated switchable LNA to increase system sensitivity
- ▶ Wide dynamic range due to switchable active and passive mode (LNA on/off)
- ▶ Trigger button for external triggering of receiver
- ▶ Minimum weight due to antenna design and materials used, ensuring fatigue-free operation
- ▶ GNSS receiver and electronic compass included
- ▶ Adapter thread for a smartphone holder, tablet holder or mechanical compass
- ▶ 10 MHz reference input to improve frequency accuracy

# R&S®HE800-PA HANDHELD DIRECTIONAL ANTENNA WITH PREAMPLIFIER AT A GLANCE

The R&S®HE800-PA handheld directional antenna with preamplifier together with an analyzer or receiver allows precise detection and location of transmitters and interference sources in the very wide frequency range from 18 GHz to 44 GHz.



R&S®HE800-PA handheld directional antenna with preamplifier.

The R&S®HE800-PA is optimized for use with the R&S®Spectrum Rider FPH handheld spectrum analyzer (models .44/.54) as well as suitable third-party handheld analyzers and receivers.

The support of handheld analyzers and receivers in the microwave range makes the antenna ideal for applications in this frequency range, such as interference hunting in 5G mobile networks.

The R&S®HE800-PA consists of an antenna handle, a fixed antenna module behind the foam radome and an RF and supply cable to the analyzer.

## Benefits and key features

- ▶ Compact with extremely wide frequency range from 18 GHz to 44 GHz to address various applications
- ▶ Distinct directional radiation pattern for precise location of interference sources
- ▶ Integrated LNA to increase system sensitivity
- ▶ Wide dynamic range
- ▶ Power for antenna supplied via USB port of connected spectrum analyzer or receiver (no battery needed)
- ▶ Low antenna weight ensures fatigue-free operation
- ▶ Can be mounted on a tripod (1/4" tripod thread)
- ▶ Adapter thread for a smartphone holder, tablet holder or mechanical compass

# ORDERING INFORMATION

Designation	Type	Order No.
<b>R&amp;S®HE400 handheld directional antenna family</b>		
<b>Antenna handles</b>		
Handheld directional antenna, 8 kHz to 8 GHz	R&S®HE400	4104.6000.02
Microwave handheld directional antenna, 20 MHz to 20 GHz	R&S®HE400MW	4104.6000.03
Basic handheld directional antenna, 8 kHz to 20 GHz	R&S®HE400BC	4104.6000.04
Handheld directional antenna with downconverter, 20 MHz to 20 GHz	R&S®HE400DC	4104.6000.05
<b>Antenna modules</b>		
HF antenna module, 8 kHz to 30 MHz	R&S®HE400HF	4104.8002.02
VHF antenna module, 20 MHz to 200 MHz	R&S®HE400VHF	4104.8202.02
UWB antenna module, 30 MHz to 6 GHz	R&S®HE400UWB	4104.6900.02
Log-periodic antenna module, 450 MHz to 8 GHz	R&S®HE400LP	4104.8402.02
Cellular antenna module, 700 MHz to 2.5 GHz	R&S®HE400CEL	4104.7306.02
S/C band antenna module, 1.7 GHz to 6 GHz	R&S®HE400SCB	4104.7606.02
SHF antenna module, 5 GHz to 20 GHz	R&S®HE400SHF	4104.8602.02
<b>Accessories</b>		
Cable set, for connecting R&S®HE400/HE400MW to R&S®PR100/FSH/FPH/ZPH	R&S®HE400-K	4104.7770.02
Cable set, for connecting R&S®HE400 to R&S®PR200	R&S®HE400-K	4104.7770.03
Cable set, for connecting R&S®HE400DC to R&S®PR200	R&S®HE400-K	4104.7770.05
RF cable, for connecting R&S®HE400BC to R&S®PR100/FSH/FPH/ZPH or third-party receivers	R&S®HE400-KB	4104.7770.04
Serial to USB adapter, for connecting R&S®HE400/HE400MW to R&S®FPH	R&S®HE300USB	4080.9440.02
Transport case, for R&S®HE400 antenna family	R&S®HE400Z1	4104.9009.02
Transport case, for R&S®HE400 antenna family, suitable for R&S®HE400SHF/HE400SCB	R&S®HE400Z5	4104.9015.02
Transport case, accommodates antenna handle, R&S®HE400VHF/HE400UWB/HE400SHF antenna module and 15" laptop	R&S®HE400Z7	4104.9021.02
Transport bag (small), for R&S®HE400 antenna family (recommended for one or two antenna modules)	R&S®HE400Z2	4104.9050.02
Transport bag (large), for R&S®HE400 antenna family (recommended for three or four antenna modules)	R&S®HE400Z3	4104.9080.02
Transport bag, for R&S®HE400 antenna family, suitable for R&S®HE400SHF/HE400SCB	R&S®HE400Z6	4104.9096.02
Tripod, for R&S®HE400 antenna family	R&S®HE400Z4	4104.9109.02
Adapter, for R&S®HE400DC for connecting an external antenna (diameter × length: 53 mm × 56 mm)	R&S®HE400Z8	4104.9980.02
Adapter, N (f) to SMA (f), for connecting R&S®HE400 to R&S®FPH model .26/.36/.44/.54	R&S®HE400Z9	3692.7660.00
Rain cover, for R&S®HE400/R&S®HE400MW/R&S®HE400BC antenna handle	R&S®HE400-RC	4104.9150.02
Rain cover, for R&S®HE400DC antenna handle	R&S®HE400DC-RC	4104.9150.03
Rain cover, for R&S®HE400HF antenna module	R&S®HE400HFRC	4104.9150.13
Rain cover, for R&S®HE400VHF antenna module	R&S®HE400VHFRC	4104.9150.10
Rain cover, for R&S®HE400UWB antenna module	R&S®HE400UWBRC	4104.9150.11
Rain cover, for R&S®HE400LP antenna module	R&S®HE400LPRC	4104.9150.12
Rain cover, for R&S®HE400CEL antenna module	R&S®HE400CELRC	4104.9150.15
Rain cover, for R&S®HE400SHF/HE400SCB antenna module	R&S®HE400S-RC	4104.9150.14
<b>R&amp;S®HE800-DC30 handheld directional antenna with downconverter</b>		
<b>Antenna</b>		
Handheld directional antenna with downconverter, 18 GHz to 33 GHz	R&S®HE800-DC30	4115.6006.03
<b>Accessories</b>		
Transport case, for R&S®HE800-DC30/R&S®HE800-PA	R&S®HE800Z1	4115.7660.02
Tripod, for R&S®HE400 antenna family	R&S®HE400Z4	4104.9109.02

Designation	Type	Order No.
<b>R&amp;S®HE800-PA handheld directional antenna with preamplifier</b>		
<b>Antenna</b>		
Handheld directional antenna with preamplifier, 18 GHz to 44 GHz	R&S®HE800-PA	4115.6006.02
<b>Accessories</b>		
Transport case, for R&S®HE800-DC30/R&S®HE800-PA	R&S®HE800Z1	4115.7660.02
Tripod, for R&S®HE400 antenna family	R&S®HE400Z4	4104.9109.02



R&S®HE400Z1 transport case.



R&S®HE400Z2 transport bag (small).



R&S®HE400Z3 transport bag (large).



R&S®HE400Z4 tripod.



R&S®HE400Z5 transport case suitable for R&S®HE400SHF/HE400SCB antenna module.



R&S®HE400Z6 transport bag suitable for R&S®HE400SHF/HE400SCB antenna module.



R&S®HE400Z7 transport case – accommodates antenna handle, R&S®HE400VHF/HE400UWB/HE400SHF antenna module and 15" laptop.



R&S®HE400Z8 adapter.



R&S®HE400 and R&S®HE400LP with R&S®HE400-RC and R&S®HE400LPRC rain covers.



R&S®HE800-PA in R&S®HE800Z1 transport case.



R&S®HE800-DC30 in R&S®HE800Z1 transport case.

## Rohde & Schwarz

The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

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ISO 9001

Certified Environmental Management

ISO 14001

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