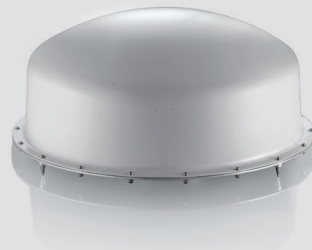# narda

Safety Test Solutions

SignalShark – Simply Integrated

SignalShark

seven senses for signals

Most impairments in communications paths cannot be predicted. This applies equally to when and where they may occur and which particular service may be affected. But, wherever interference occurs or is to be avoided, quick reactions and flexible operation are essential, as functioning communications in a crisis can often be the difference between life and death.

SignalShark is a family of receivers designed for spectrum monitoring up to 8 GHz, which is characterized by excellent RF performance. Everyone involved will find their perfect solution in the SignalShark family: the 19" Rack Unit for the task force in their truck or in the monitoring station, the Handheld Unit for the interference tracer on site, or the Outdoor Unit for unmanned operations on a rooftop or mast. The perfect solution always, regardless of whether critical communications, mobile radio, broadcasting, or satellite communications are involved. Modern solutions to interference tracing also need to be more mobile than before. Small, powerful, and with the facility for local networking if required in order to solve the problem. SignalShark offers the ideal foundation for this.

SignalShark is available in three versions:
• as a Rack Mount Unit,
• an Outdoor Unit,
• and a Handheld Unit.

Regardless of your particular application, one of the SignalShark versions will fit the bill. Whether for 24/7 operation fixed to a lamp post or fitted in a fully air-conditioned rack, the SignalShark always fits.

Rack Mount Unit

Scalable real-time performance in a rack – the Remote Unit

Rack-mounted for mobile or stationary control rooms. Examples:
• 24/7 spectrum monitoring
• TDOA* network control
• Hybrid* TDOA/AOA* localization by means of ADFA type automatic antennas
• Scalable real-time performance with SignalShark Remote Unit

STAND-ALONE

SINGLE 19" rack mounted 1 HU single

DUAL 19" rack mounted 1 HU dual

Outdoor Unit

24/7 mast, stand, or wall-mounted – the Outdoor Unit

Mast mounting with power supply from external power supply or PoE. Communications via Ethernet or LTE/5G.
Examples:
• 24/7 spectrum monitoring
• AOA, TDOA and hybrid network integration
• Smart sensor technology, thanks to data processing by integrated Win 10 computer and installed OEM application, for example


Handheld Unit

On the move both indoors and out – the Handheld Unit

Handheld / mobile solution.
For example: as a fully autonomous solution without external support.
• Homing in on interferers within buildings or difficult terrain
• For AOA, TDOA and hybrid localization: as a flexible smart sensor linked to the control room via modem
• For drive tests: on land, sea, or air
• For rapid response groups: linked to colleagues via modem; one SignalShark takes up the bearings from the others and thus forms a mini control center with heatmap representation.
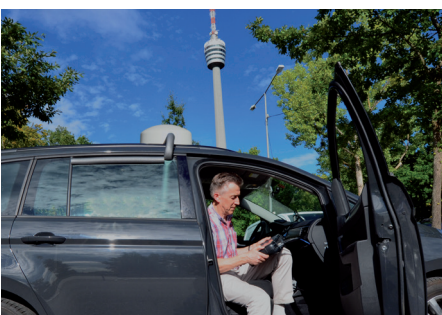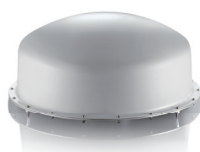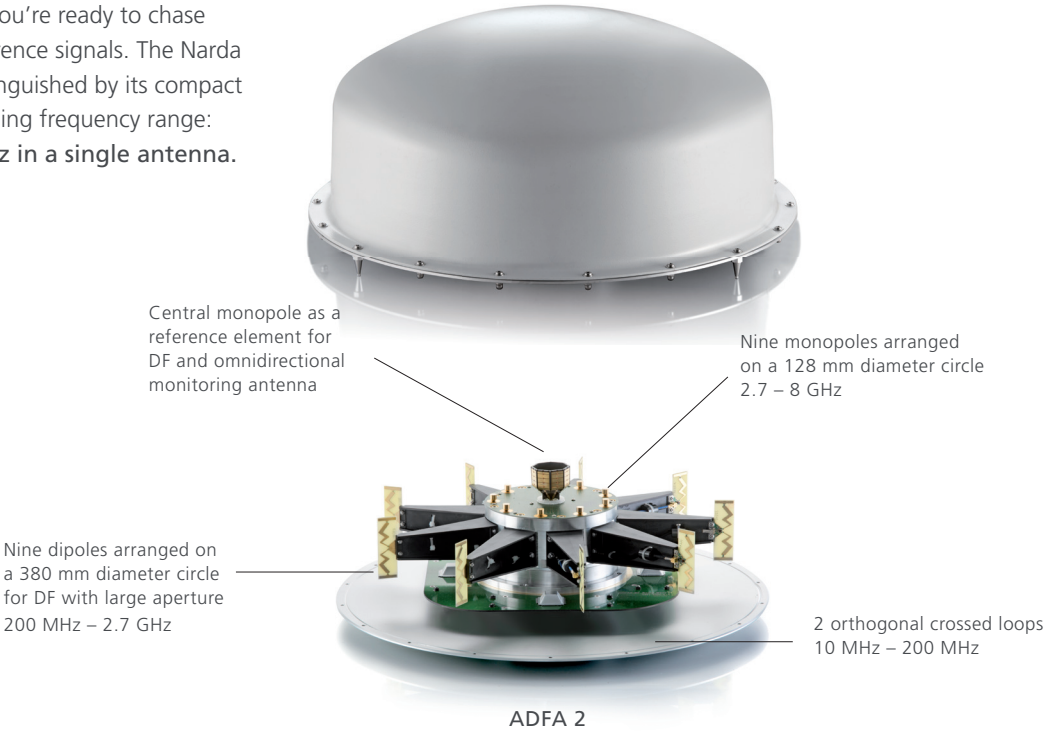
Automatic DF antenna

Automatic direction-finding antennas – ADFA

When it comes to choosing antennas for a monitoring system, there is a bewildering variety: monopoles, dipoles, log-periodic, and so on. And it's hard to see just what they offer. But, when it comes to the elite class, the automatic direction finding antenna, there's really no competition. The Narda ADFA antenna is really the complete solution. Perfectly matched to the SignalShark, they can be attached to masts, vehicle roofs or movable stands for mobile, semi-fixed or fixed operation. Whether based on a Handheld, Remote, or Outdoor Unit, every ADFA works with every SignalShark in the same way, no system-calibration required. There's no need even for any special driver: just connect up and you're ready to chase down the interference signals. The Narda ADFA is also distinguished by its compact size and outstanding frequency range: **10 MHz to 8 GHz in a single antenna.**

Central monopole as a reference element for DF and omnidirectional monitoring antenna

Nine monopoles arranged on a 128 mm diameter circle 2.7 – 8 GHz

Nine dipoles arranged on a 380 mm diameter circle for DF with large aperture 200 MHz – 2.7 GHz

2 orthogonal crossed loops 10 MHz – 200 MHz

ADFA 2

The SignalShark is a marvel of German engineering. German quality certainly applies to everything Narda designs, develops and produces here. A look behind the scenes reveals the inner strengths of the SignalShark:
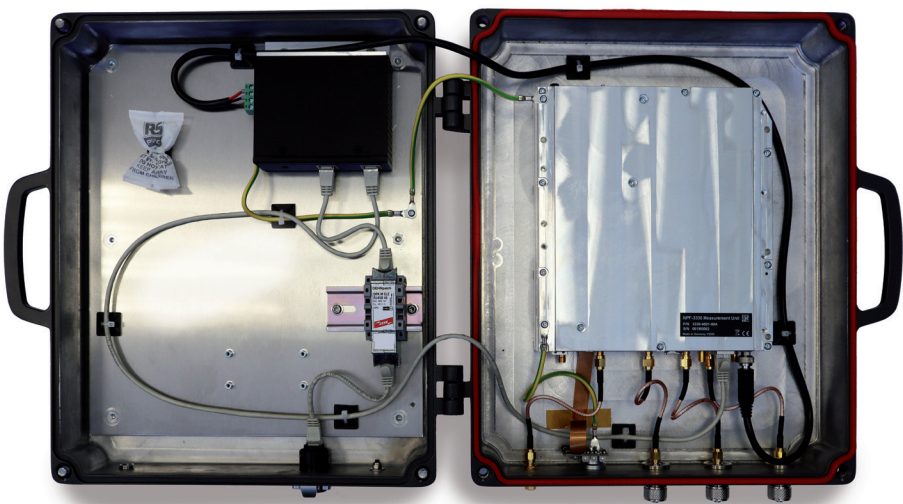
A look inside the opened RF Module

RF module with integrated Windows 10 computer. This module is used both in the Remote Unit and the Handheld Unit. It is so stable mechanically that it can survive the rough handling of a MIL-spec handheld device. The challenge regarding temperature range is provided by the Outdoor Unit. With its less than 40 Watt power consumption, there's no need for any ventilation slots in its solid aluminum diecast casing. Convection cooling by the large aluminum fins is sufficient to dissipate the heat generated by the device. Despite this, the Outdoor Unit can be exposed to temperatures of up to +55 °C. And the completely sealed enclosure is reflected in the protection class of IP65.

SignalShark & ADFA, the right choice. Because spectrum monitoring is your mission.

Facts and figures: Right now, what is needed are mobile components with open platform features that can be utilized as smart sensors in large systems. They also need to be able to operate autonomously and capable of using all types of communications for networking purposes.

SCPI –
the industry
standard for
remote control

REMOTE CONTROL: SCPI

SIGNALSHARK –
THE OPEN
PLATFORM

STREAMING: VITA49

STORING: HDF5

VITA 49 Streaming,
standardized, easy
to understand

HDF5 is the format
used in science to
store large quantities
of data

OPERATING SYSTEM
WINDOWS 10

INSTALLATION OF
3rd PARTY SOFTWARE

PYTHON
SCRIPTING

Outdoor example:

SignalShark 3330:
▶ Robust, compact housing:
  151 mm x 356 mm x 353 mm
  (5.94" x 14.02" x 13.90") H x W x D
▶ Weight: approx. 13 kg / 28.66 lb
▶ Low power consumption
  (10 to 30 VDC, max 45 W)
▶ IP 65
▶ Operating temperature -20 to +55 °C

Performance for all SignalShark models:
▶ Spectrum monitoring from 8 kHz
  to 8 GHz
▶ Up to 40 MHz real-time bandwidth –
  scalable and expandable with several
  SignalSharks in parallel
▶ Scan speed up to 50 GHz/s at 1.6 MHz
  RBW
▶ 100% POI without attenuation and
  spectral growth: 3.125 µs; >2 ns
  with attenuation proportional to
  spectral growth
▶ Measures weak signals in the presence
  of strong transmitters with receiver
  based high dynamic range (HDR) IP2:
  +40 dBm, IP3: +14 dBm, NF: 12 dB

All communications facilities are provided in the SignalShark, and every SignalShark version behaves in the same way regardless of how it is addressed. One driver, always the same response.
For example:
▶ SCPI remote control
▶ VITA49-2 streaming
▶ Python preinstalled: Integrated develop-
  ment environment (IDE) PyCharm
• Numerous examples that can be used
  as starting points: Show base scripts
  and list possible extensions / adaptions
• Alarming and data transfer via email,
  SMS, SNMP-trap and other protocols
  easily implemented
▶ Open platform with integrated
  Windows10 computer provides all
  the standard interfaces, such as:
  • USB 3.0 host
  • Ethernet
  • DisplayPort

All this also provides facilities for
▶ Remote Desktop / AnyDesk /
  TeamViewer
▶ Share / enable network drive
▶ Wake up over LAN (WOL)
▶ Power over Ethernet (PoE)

And, for internal storage
▶ Integrated SSD
▶ USB stick
▶ MicroSD card
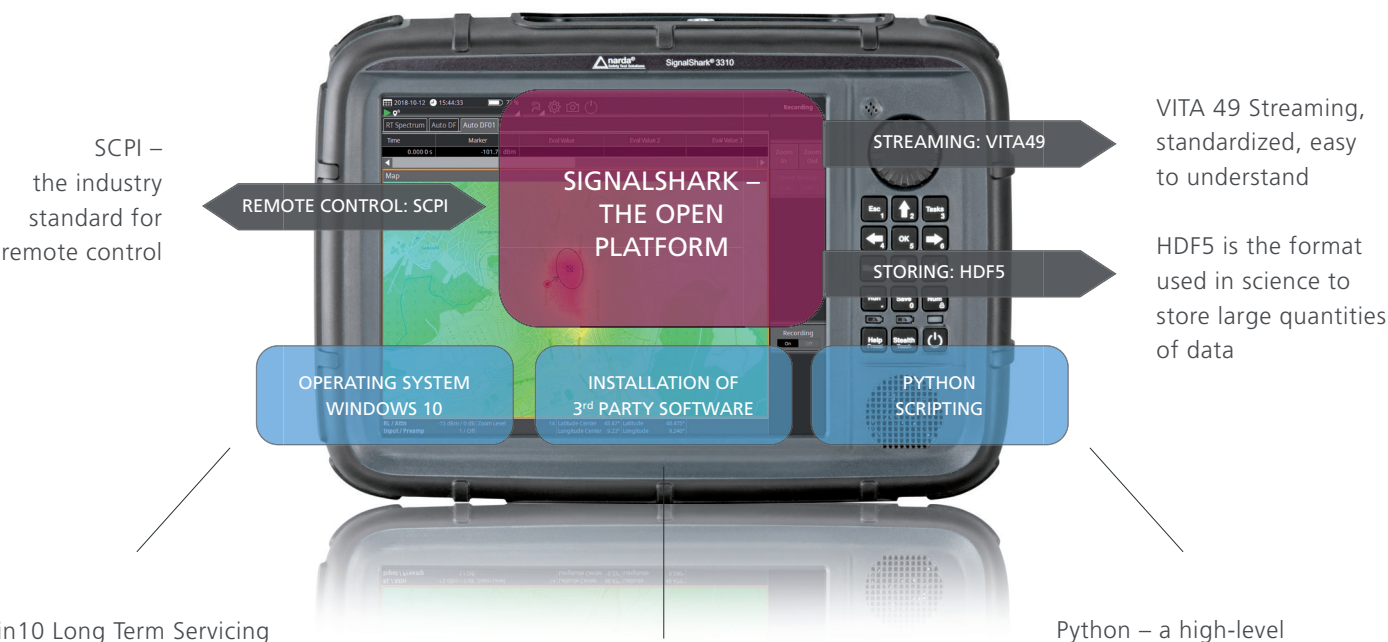
Win10 Long Term Servicing
Branch (LTSB) hardened for
industrial products. Provides
support for all kinds of
communication equipment,
such as WiFi and mobile
communication modems, etc.

Direct installation of 3rd party software on
the SignalShark's integral PC has several
advantages: there's no need to take along
a separate PC, so the SignalShark becomes
an independent mini system. Or prepro-
cessing of the captured data can be done in
the SignalShark itself when it is integrated
into a larger system. This considerably
reduces the capacity needed for trans-
missions to the system, for example, so
the SignalShark acts as a "smart sensor"

Python – a high-level
programming language
that makes developing
a program simpler and
more understandable.
Preinstalled, with a huge
number of open-source
applications available
from the Narda website

The ITU*-compliant dynamic range of the
SignalShark is unique. With its 40 MHz
real-time bandwidth, even the briefest
of transient interference has no chance
of staying undetected.

*ITU: The International Telecommunication Union
Spectrum Monitoring handbook describes the
dynamic range of an ideal receiver. The SignalShark
is "top of the class" in matching up to this ideal.

DANL

10
5
0
-10
-15
-20
-25

— ITU
— SignalShark

IP3

IP2
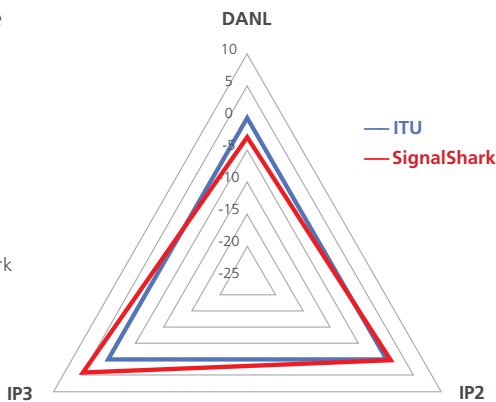
Narda is a leading supplier …

… of measuring equipment in the RF test and measurement, EMF safety and EMC sectors.

The RF test and measurement sector covers analyzers and instruments for measuring and identifying radio sources. The EMF safety product spectrum includes wideband and frequency-selective measuring devices, and monitors for wide area coverage or which can be worn on the body for personal safety. The EMC sector offers instruments for determining the electro-magnetic compatibility of devices under the PMM brand. The range of services includes servicing, calibration, accredited calibration, and continuous training programs.

narda
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