



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



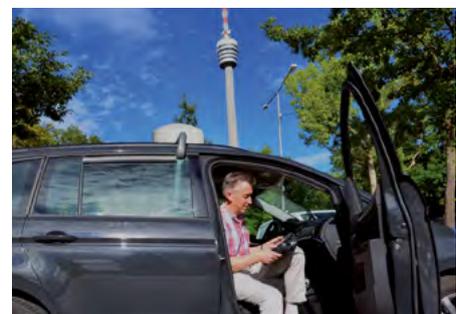
Handheld Unit

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

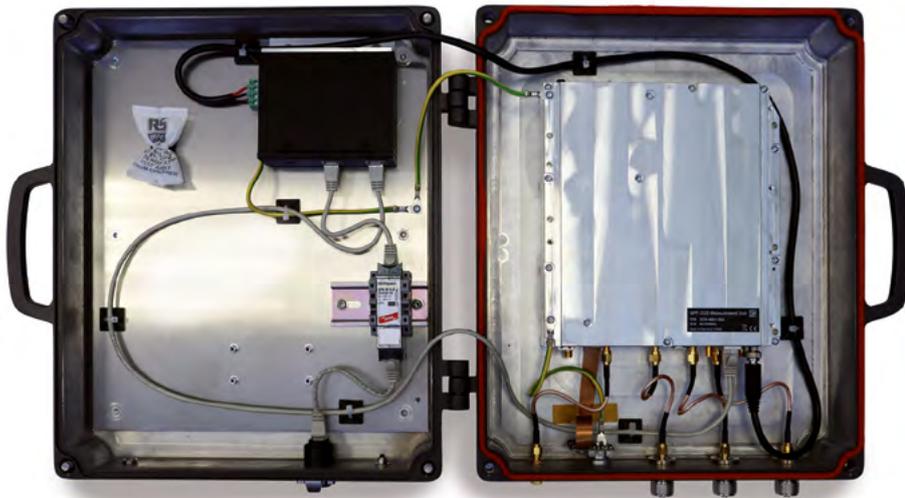
Nine monopoles arranged on a 128 mm diameter circle 2.7 – 8 GHz

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.

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 development environment (IDE) PyCharm
- Numerous examples that can be used as starting points: Show base scripts and list possible extensions / adaptations
- 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



SCPI – the industry standard for remote control

VITA 49 Streaming, standardized, easy to understand

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

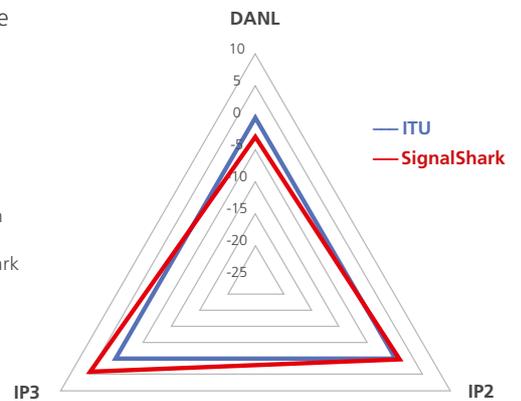
Win10 Long Term Servicing Branch (LTSB) hardened for industrial products. Provides support for all kinds of communication equipment, such as WiFi and mobile communication modems, etc.

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 pre-processing 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 transmissions 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.

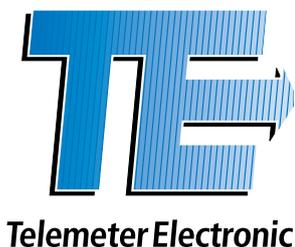




Narda is a leading supplier ...

... 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 electromagnetic compatibility of devices under the PMM brand. The range of services includes servicing, calibration, accredited calibration, and continuous training programs.



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