



The New Generation in Signal Analysis

SignalShark
seven senses for signals



- ▶ Real-Time Monitoring Receiver
- ▶ RF Direction-Finding and Localization System

SignalShark® – The New Generation in Signal Analysis

**SignalShark® –
Seven Senses for Signals**

SignalShark® – the name says it all. Just like its namesake, the SignalShark is an extremely efficient hunter, perfectly equipped for its task. Its prey: Interference signals. Its success rate: Exceptional. The real time analyzer is a successful hunter, thanks to the interaction of its highly developed sensory functions. Senses that don't miss a thing, and that make it easy for you to identify and track down interferers in real time.

1 SIGHT

Thanks to its large dynamic range, the SignalShark can "see" even extremely weak signals even in the presence of very strong signals without problems.

2 SMELL

The automatic DF antenna lets the SignalShark "sniff out" the direction of a detected signal in seconds.

3 HEARING

Thanks to its high signal sensitivity, the SignalShark can "hear" even very distant signals, and separate and demodulate them.

4 TOUCH

The slightest "touch" on the user defined trigger mask causes the SignalShark to record the corresponding signal.

5 TASTE

The SignalShark analyzes and evaluates the recorded signal using various classification criteria.

6 TRACK

40 MHz real-time measurement enables continuous, reliable detection of even extreme short and infrequent signals.

7 CAPTURE

The SignalShark's continuous real time persistence view displays every change in the signal – even in hidden signals.

More and more devices have to share the available frequency spectrum as a result of new technologies such as the Internet of things (IoT), machine to machine (M2M) or car to car (C2C) communications, and the rapidly growing 4G/5G mobile networks. It doesn't matter whether you are making a wideband measurement of entire frequency ranges, or searching for hidden signals, or needing to reliably detect very short impulses, or localizing interference signals – SignalShark® gives you all the measurement solutions you need to keep the more and more densely packed radio frequency spectrum free of interference. Its design and excellent performance make the SignalShark® ideal for on-site measurements as well as for use as a "left behind" device for monitoring tasks.

- Frequency range: 8 kHz to 8 GHz
- Extremely high sweep rate of up to 50 GHz/s
- 40 MHz real-time instantaneous bandwidth
- High time resolution spectrogram
- Powerful, live persistence spectrum to find hidden signals
- Fully automatic direction finding
- High dynamic range (HDR) receiver

**Tailormade To Your Applications**

SignalShark is ready for the future. That is guaranteed by its open platform design and numerous facilities for expansion. So, it can be adapted optimally to every application.

SignalShark® – The Monitoring Receiver

The extremely high dynamic range (HDR) of the SignalShark ensures that you can reliably detect even the weakest signals in the presence of very strong signals. This is a basic requirement for most tasks in the field of radio monitoring. The real time spectrum analyzer at the same time also provides audio demodulation, modulation analysis, and level measurement at any frequency and channel bandwidth within the 40 MHz real-time bandwidth. And, if you need even more than the analysis tools of the SignalShark, you can analyze the I/Q data from the receiver internally by installing third party software. You can also stream the data as well as store them internally or externally.

SignalShark® – The Direction-Finding and Localization System

It is often necessary to locate the position of a signal transmitter once the signals have been detected and analyzed. SignalShark supports the new Automatic Direction-Finding Antennas (ADFA) from Narda, allowing you to localize the source very quickly and reliably. In fact, localization is child's play, thanks to the integrated maps and localization firmware. Conveniently, homing-in using an ADFA mounted on a moving vehicle is also supported. Powerful, state of the art algorithms minimize the effects of false bearings caused by reflections off urban surroundings in real time. Extremely light weight and easy to use manual direction-finding antennas are available for pinpointing a signal on the last mile.

SignalShark® – The 40 MHz Real-Time Spectrum Analyzer

Whether in the laboratory or out in the field: With the SignalShark, you have the right analysis tool to hand. It is a winner in both scenarios thanks to its really excellent RF performance and its straightforward application-oriented operating concept. The real-time bandwidth with very high FFT overlap ensures that you can reliably capture even extremely brief and infrequent signals. The unusually high sampling rate leads to very short measurement times, even if you have to cover a wider frequency band than the real-time bandwidth. Comprehensive evaluation tools ensure that you can perform both current and future measurement and analysis tasks reliably, more simply, and faster than before.



Handheld:
Weight: Approx. 4.1 kg / 9 lbs
(with one battery)
Dimensions: 230 x 335 x 85 mm
(9.06" x 13.19" x 3.35")

▶ SignalShark
www.narda-sts.com



▶ SignalShark –
Seven Senses for Signals



The Handheld Version



- ▶ 2 x smart technology lithium-ion internal and external rechargeable battery packs
- ▶ Hot-swappable for interruption-free long-term measurements

- Rugged design for mobile use, even in harsh environments
- ▶ MIL-PRF-28800F class 2

- Baseplate connectors
- ▶ Video display port for external monitor, touchscreen or projector
- ▶ USB 2.0 for keyboard, mouse, printer, etc.

- 10.4" resistive touch screen
- ▶ Intuitive operation, even when wearing gloves
- ▶ Selectable day / night view
- ▶ Customizable GUI with several views for application-oriented, fast, convenient measurement

Microphone to record voice comments



- Top panel connectors
- ▶ Four switchable RF Inputs (1 x N connector, 3 x SMA)
- ▶ PPS / Trigger Input
- ▶ 10 MHz reference input
- ▶ Antenna control connector
- ▶ Input for additional, external global navigation satellite system antenna
- ▶ USB 3.0 host for keyboard, mouse, printer, USB mass storage, WiFi modem, LTE modem, etc.
- ▶ 1 Gig Ethernet connector for remote control and I / Q streaming
- ▶ MicroSD card (microSDXC)
- ▶ 3.5mm headphone jack
- ▶ DC input / charging connector, plug in / screw on

- ▶ Illuminated keyboard for operation in low ambient light

- ▶ Built-in help function
- ▶ Stealth and keyboard lock

Built-in loudspeaker gives clear, loud sound reproduction, even in noisy environments

Intuitive smartphone style touch operation:

Zoom in – Zoom out



SignalShark
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The Rack Mounted Version, DF Receiver Module

The modular design allows it to be used as a built-in device in a standard 19" rack (single / double) or as a stand-alone solution (desktop device), for example.

- ▶ Additional analysis software can be run on the internal PC, so communication is only required when an event occurs
- ▶ Analyzer operates autonomously
- ▶ Scalable real-time bandwidth from several analyzers in one rack

PC is integrated: Just connect screen, keyboard,...

- ▶ Power supply 10 to 48 VDC
- ▶ Power consumption < 45 W, typ. 33 W
- ▶ Very compact design 43.5 × 220 × 205 mm
- ▶ 4 Inputs: no need for an external switch
- ▶ 1 Gig Ethernet: for easy high speed integration and streaming into your system
- ▶ External GPS antenna: for perfect integration into a vehicle
- ▶ 24/7 spectrum monitoring
- ▶ TDOA network control
- ▶ Hybrid TDOA/AOA localization with ADFA
- ▶ Scalable real-time performance
- ▶ Sophisticated airflow concept for optimal cooling, even in confined spaces
- ▶ Modular design for easy integration into a 19" rack
- ▶ Also available as extremely powerful XT version, perfectly suited for third-party applications.

DF Receiver Module – Flexible Integration for OEM Systems

Easy to integrate into third-party or OEM solutions for a wide range of applications.

- ▶ Open platform: Windows Embedded system for running your own applications.
- ▶ Reliable and maintenance-free: Fanless design with efficient heat dissipation through the housing.
- ▶ Modular and versatile: Supports touchscreen control (USB + DisplayPort) or Remote Desktop operation.
- ▶ Expandable: Connect USB devices such as storage, LTE modem, printer, sensors.
- ▶ Also available as extremely powerful XT version, perfectly suited for third-party applications.



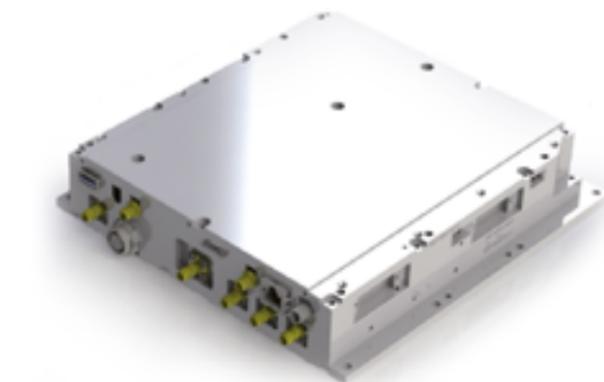
STAND-ALONE with rubber feet for desktop use



SINGLE DEVICE mounted with blank module for 19" rack usage



DUAL DEVICE mounted for 19" rack usage



* SignalShark XT version

The Outdoor Version

The smart remote controlled SignalShark® Outdoor Unit boasts a robust, weatherproof diecast aluminum casing. The low power consumption and wide temperature tolerance make it ideal for continuous outdoor use. The built-in Windows computer means that much of the preprocessing and analysis can be done by the analyzer itself, which reduces the load on the data connection to the analyzer.

- ▶ Spectrum monitoring
- ▶ Bearing of signals or interference in conjunction with automatic antenna ADFA
- ▶ For angle of arrival (AOA), time difference of arrival (TDOA) and hybrid systems
- ▶ Power supply from power over Ethernet (PoE) or solar panel
- ▶ Communication via Ethernet or modem
- ▶ Also available as extremely powerful XT version, perfectly suited for third-party applications.

Ethernet*

Power supply*

External GNSS antenna and modem, e.g. LTE

Antenna control connector

3 N connector inputs



- ▶ Fanless design
- ▶ Temperature range: -20 °C to +65 °C
- ▶ IP65 rated



Mast mounted Outdoor Unit with solar panel – also available as a wall mounted unit

*

SignalShark^{XT} More power. More precision. More future.

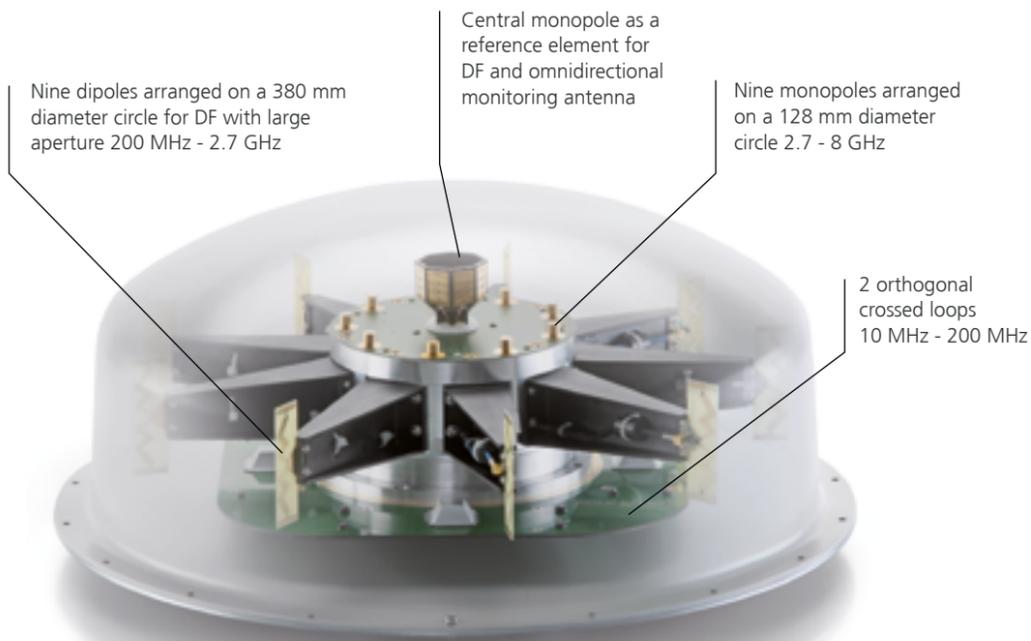
- ▶ The new SignalShark impresses with significantly increased computing power and future-proof features.
- ▶ A powerful processor, 2.5 Gb/s Ethernet, 16 GB RAM, and a 512 GB SSD (128 GB system, 384 GB data) ensure maximum performance and fast data processing.
- ▶ With the modern Windows and improved frequency accuracy of 0.2 ppm, the SignalShark XT is ideally equipped for precise, reliable, and sustainable measurement tasks.
- ▶ The powerful XT Version is available as Rack Mount Module, Outdoor Unit and DF Receiver Module.

The Automatic Antenna

Narda offers various automatic and directional antennas for the SignalShark®. Their unique characteristics combined with the SignalShark® makes them unbeatable.



- High bearing accuracy
- High immunity to reflections
- Built-in omnidirectional reference antenna
- Also takes the elevation bearing. This guarantees that the ADFA DF antenna also deliver stable, precise and reliable data when they get close to the source. You can find more information about the elevation measurement in the Application Note: "Elevation measurement".



▶ **ADFA antenna**



▶ **ADFA mounting instructions download**



Automatic DF Antenna ADFA
 Direction finding method:

- ▶ 200 MHz - 8 GHz correlative interferometer
- ▶ 10 MHz - 200 MHz Watson-Watt
- ▶ Built-in electronic compass
- ▶ Built-in GNSS receiver with antenna and PPS output
- ▶ Diameter: 480 mm
- ▶ Fixing: Stand, mast, magnetic plate for fitting to any steel vehicle roof

ADFA
 Broad frequency range for a wide range of localization tasks:

- ▶ Frequency range: 10 MHz - 8 GHz
- ▶ Bearing uncertainty: 10 MHz - 200 MHz 1,5° RMS (typ.) 200 MHz - 8 GHz 1° RMS (typ.)

The Handheld Antennas

After you have localized the interfering signal using the SignalShark with an ADFA, you will often have to enter a building to find the apartment or office where the source is located. Narda's handy, feather-light directional antennas and active antenna handle are the ideal choice in this situation. The antenna handle does more than just hold the antenna. Among other features, it has a built-in 3D compass to reference the direction of a signal, a low noise pre-amp do even cover weak signals and an operating button that allows operation without looking at the display.



- ▶ The handle and the antenna are extremely light, making signal searches less tiring.
- ▶ The convenient plug-in system allows you to change antennas very quickly.
- ▶ The SignalShark recognizes the antenna and applies the appropriate antenna factors for field strength measurements automatically.
- ▶ The SignalShark receives the azimuth, elevation and polarization of the antenna from the 3D electronic compass built into the handle, so manual direction finding could hardly be simpler.
- ▶ The preamplifier built into the handle is activated and deactivated by SignalShark, so you can further reduce SignalShark's low noise figure to detect and take bearings on very weak or distant signals. The preamplifier gain is accounted for automatically when you make field strength or level measurements.
- ▶ The integrated operating button lets you make the main steps in the manual direction-finding process.
- ▶ A plug-in adapter with male N connector allows you to take advantage of the features of the handle even when you are using third-party antennas or external filters.



Active antenna handle with integrated compass and preamplifier
 8 kHz - 8 GHz
 470 g / 1.04 lbs



Feather-light handle and antenna module for fatigue-free interference localization. Display / operation is possible from any smartphone with the help of remote control software.



Adapter, male N connector for OEM antenna



Loop antenna
 9 kHz - 30 MHz
 380 g / 0.84 lbs



Directional antenna 1
 20 MHz - 250 MHz
 400 g / 0.88 lbs



Directional antenna 2
 200 MHz - 500 MHz
 300 g / 0.66 lbs



Directional antenna 3
 400 MHz - 8 GHz
 350 g / 0.77 lbs

Localization Made Easy

Once the signals have been detected or analyzed, the location of the transmitting source needs to be found. The SignalShark combined with Narda's new automatic direction-finding antennas (ADFA) and the very powerful map and localization firmware provides reliable bearings in the twinkling of an eye. The bearing results are processed by the SignalShark without needing an external PC. Reliable localization of transmitters has not been possible before with so few hardware components.

Transmitter Localization

The SignalShark simplifies transmitter localization by autonomously evaluating all the available bearing results and plotting them on a map, using a statistical distribution of bearing lines. The result is a so-called heat map, on which the possible location of the transmitter is plotted and color-coded according to probability.

The SignalShark also draws an ellipse on the map centered on the estimated position of the transmitter that indicates the area where the transmitter has a 95% probability of being located.

The algorithm used by the SignalShark to calculate the position of an emitter is extremely powerful. It can determine the position of the emitter by continuous direction finding even from a moving vehicle in a complex environment such as an inner-city area.

The calculation is continuous in real time, so you can view the changing heat map on the screen of the SignalShark.

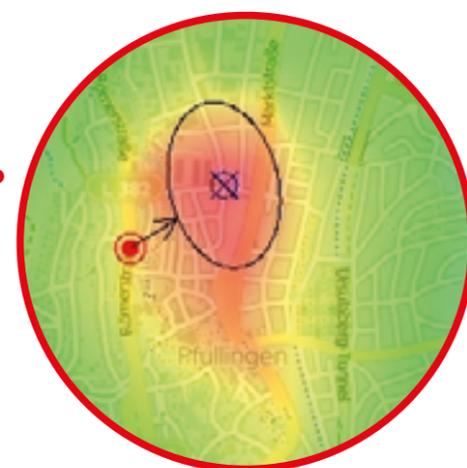
Rapid Automatic Direction Finding

The SignalShark supports the automatic direction-finding antennas (ADFA) from Narda, which let you take a complete bearing cycle in as little as 1.2 ms. The omnidirectional channel power and the spectrum are also measured during a bearing cycle, so you can monitor changes in the signal level or spectrum concurrently with the bearings.

The AFDA use different antenna arrays, depending on the frequency range. At low frequencies, a pair of crossed coils are used for the Watson-Watt method of direction finding. At medium and high frequencies, a circular array of nine dipoles or monopoles is used for the correlative interferometer direction finding method.

Interconnected localization

Multiple SignalShark ADFA systems can be linked together in a localization network to provide localization of moving transmitters.

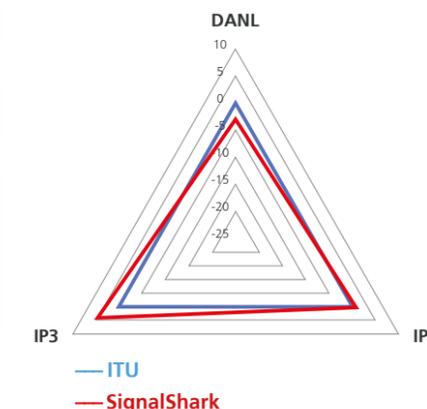


ADFA
Localization

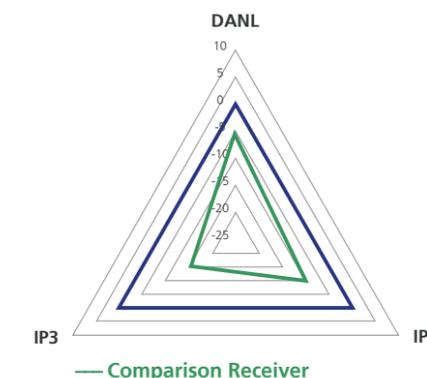


SignalShark® – The Ideal Receiver

According to the standards of the International Telecommunication Union (ITU), the SignalShark® is very close to being an ideal receiver. This is mainly due to its extremely large dynamic range.



Direct graphic comparison using two superimposed triangles clearly shows that Narda's specifications are almost identical to the theoretical ideal valued determined by the ITU.



A comparison with a usual standard receiver shows the differences and deviations from the ITU specification. There are clear weaknesses, particularly with the IP3 intermodulation value.

Extremely High Dynamic Range Brings Clear Advantages

The extremely high dynamic range (HDR) of the SignalShark guarantees that it can reliably measure even the weakest signals in the presence of very strong signals. Along with its excellent mixers and amplifiers, a preselector is also used to achieve this. The excellent dynamic range of the SignalShark is reflected in its intrinsic noise level (DANL) and the so-called large signal immunity parameters, which are the second and third order intermodulation products (IP2 and IP3). It is important that these three parameters are always stated for the same settings of the instrument (e.g. no attenuation, no preamplifier) as they vary considerably according to the settings.

The International Telecommunication Union (ITU) has described what an ideal receiver should in their opinion look like in their Handbook of Spectrum Monitoring: Minimal noise and insensitive to intermodulation. It is defined by three parameters which are measured between 20 MHz and 3 GHz using the same instrument settings:

DANL = -162 dBm/Hz
IP2 = +40 dBm
IP3 = +10 dBm

The SignalShark has the following values at frequencies between 20 MHz and 3 GHz:

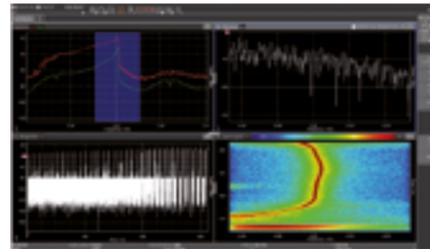
DANL = -159 dBm/Hz
IP2 = +40 dBm
IP3 = +14 dBm

SignalShark® – Options Tailored to Specific Requirements

SignalShark® can be expanded with a range of options that adapt it to diverse applications and challenges. Two key enhancements, the IQ Analyzer and the 5G Analyzer, deliver exceptional capabilities for precise signal analysis and optimization of modern networks.

IQ Analyzer

The IQ Analyzer task is a powerful tool for the detection, analysis and documentation of unknown signals. In particular, sporadic signals and signals with very short pulse durations, which are almost impossible to capture with a normal spectrum analyzer, can be revealed in full detail with the IQ Analyzer.



This is achieved by first recording RF raw data, so-called IQ data, in a ring buffer at a very high sample rate and then postprocessing it in several stages. Like squaring the circle, it makes possible to achieve what would be impossible with the direct display in a conventional spectrum analyzer: An excellent frequency resolution combined with an extremely high time resolution. This makes it possible to analyze the signal behavior in the frequency and time domains with great precision.

Basic Features

Up to 1.6 GB of IQ data can be continuously recorded in a ring buffer. This allows recording of a 40 MHz channel over 5 seconds. Narrower channels can be recorded for a correspondingly longer time. Short-term or sporadic signals can be detected via various trigger functions.

In the IQ Analyzer Task, recorded IQ values can be displayed simultaneously as an IQ Spectrum View, IQ Spectrogram View and IQ Magnitude View.

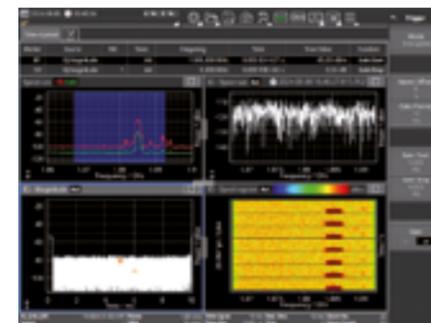


Time-gated Measurement

“Time-Gated Measurement” enables signals to be measured at specified time slots. For time division multiplex signals like TDD, where the uplink and downlink are transmitted on the same frequency but at different time slots, the function enables ‘filtering’ to a specific time slot. Since the uplink signals from the end devices usually have low levels, interference signals can be made particularly visible here, as they are usually not covered by the payload signal.

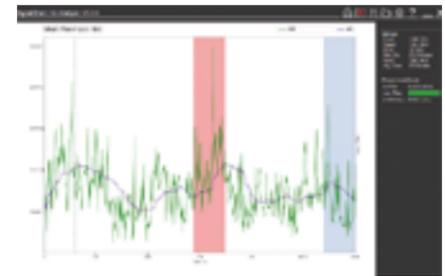
Examples of signals that can be more effectively analyzed:

- ▶ Faulty oscillator
- ▶ Welding systems
- ▶ Defective relays
- ▶ Defective lamps
- ▶ Jammers
- ▶ Hopping signals
- ▶ Mixed signal scenarios



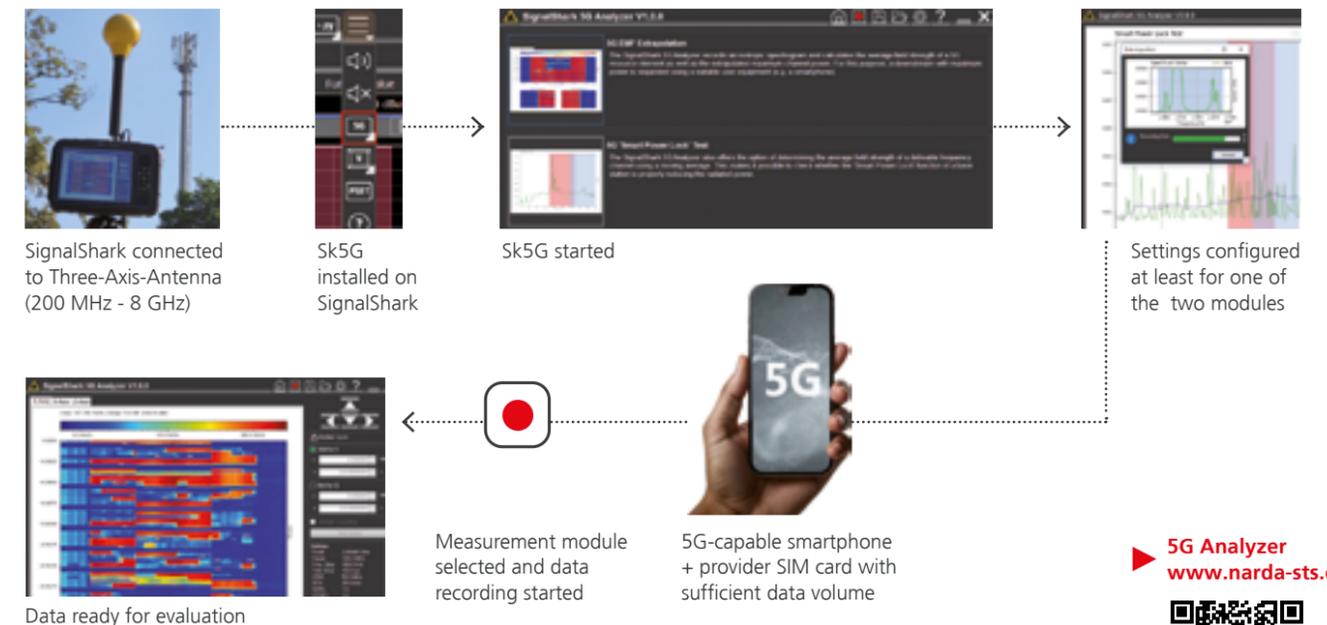
5G Analyzer

SignalShark 5G Analyzer (Sk5G) is an EMF analysis and measurement software for 5G signals in the FR1 band that can be installed on SignalShark. It allows the maximum channel field strength to be extrapolated directly from a 5G traffic signal. To do so, a speed test is initiated on an user equipment (e.g., smartphone). This ensures that the base station directs a traffic beam with maximum power at the user equipment. The beam is captured by the isotropic measuring antenna. The software then records a spectrogram of the traffic signal for each antenna axis, automatically selecting the resource blocks with maximum power, calculating the averaged power per resource element, and then extrapolating to the maximum possible channel power.



The measurement takes some seconds and runs mostly automatically, significantly reducing the required working time and eliminating the potential sources of error associated with the various mechanical measurements that would be needed using the conventional method. In addition, the software enables an isotropic measurement of the channel power over time to verify the smart power lock function of the base station.

▶ IQ Analyzer
www.narda-sts.com



▶ 5G Analyzer
www.narda-sts.com



Open Platform – High-Performance Analyzer Without Limits

The SignalShark® Real-Time Spectrum Analyzer is designed as an open platform. It uses an embedded Windows operating system. In contrast to the usual closed systems, this gives test technicians and systems integrators practically unlimited scope thanks to the flexibility of an open platform. Most applications these days run on Windows computers, and so they also will run on the SignalShark®. Users can therefore simply install their own software packages on the analyzer for custom measurement tasks. In the same way, any peripheral devices such as printers, displays, camera or a mouse can also be connected.

The open platform with the Windows operating system gives you practically unlimited scope to use other, individual applications.

Standard Languages and Formats

The SignalShark family is based on an open platform, so it communicates using standard languages and uses or supports the usual formats that are also in common use in the scientific world. To give some examples:

- ▶ The remote control function makes use of the SCPI command set.
- ▶ Streaming uses the VITA49 I/Q data format.
- ▶ The map materials used during localization can be imported using the well-known Open Streetmap Slippy tiles map format.

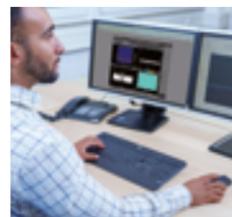
be addressed via Python functions.

With the aid of a standard script editor, it enables simple scripting, that is the creation of smaller programs or scripts. These are ideal for tasks such as autonomous control of the instrument or to perform routine jobs automatically for the test technician.

Of all the many possibilities, the example of so-called screen recorder applications particularly well illustrates the advantages of an open platform. These useful features can be installed on the SignalShark as required. In this way it is possible to make a live recording of the measurement process that is actually being performed on the instrument, and even for the test technician to commentate on the proceedings by speaking into an integrated microphone. It is then simple to play back these recordings either directly on the SignalShark itself or to export them as files. The high information content of such recordings means that they have great potential to be used as training videos, or for documentation purpose.

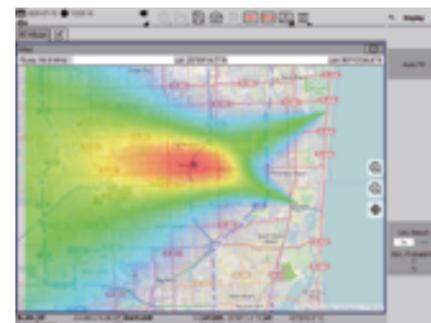
Remote Connection: Work in Virtual Team

- ▶ Field Technician
- ▶ Expert in the office
- ▶ Measure together with SignalShark via AnyDesk, TeamViewer, Teams ...



Script: Report Generator

The Report Generator script maximises and creates a screenshot of each view in sequence and copies it along with the measurement settings into a user definable Word template.



Script: Cooperative Bearing

Several SignalSharks linked together via the Internet. One SignalShark takes over remote control of the others and receives the bearing results from them, which it combines as triangulations. This enables highly agile localization without the need for a central computer, with minimal outlay.



Script: Coverage Map

The SignalShark synchronously records the level and position. These can be displayed as a coverage map on the internal map, or imported e.g. into Google Earth by exporting in *.kml format.



Third party software and hardware Measuring S parameters

What about a simple test to see if the antenna is working properly? By using the internal Windows computer together with a USB test box for S parameters, generators, etc., the SignalShark can be expanded to perform an almost unlimited range of tasks.

Monitoring, Classification, Demodulation, Decoding, Localization

If the analog demodulators integrated into the SignalShark® are not enough, you can add to them without problems using commercially available digital software solutions, such as from Decodio, Procitec or others.



Example Decodio spectrum monitoring software

- ▶ Runs directly on SignalShark
- ▶ Includes PMR decoding, e.g. DMR, P25, TETRA, TETRAPOL, dPMR, or NXDN



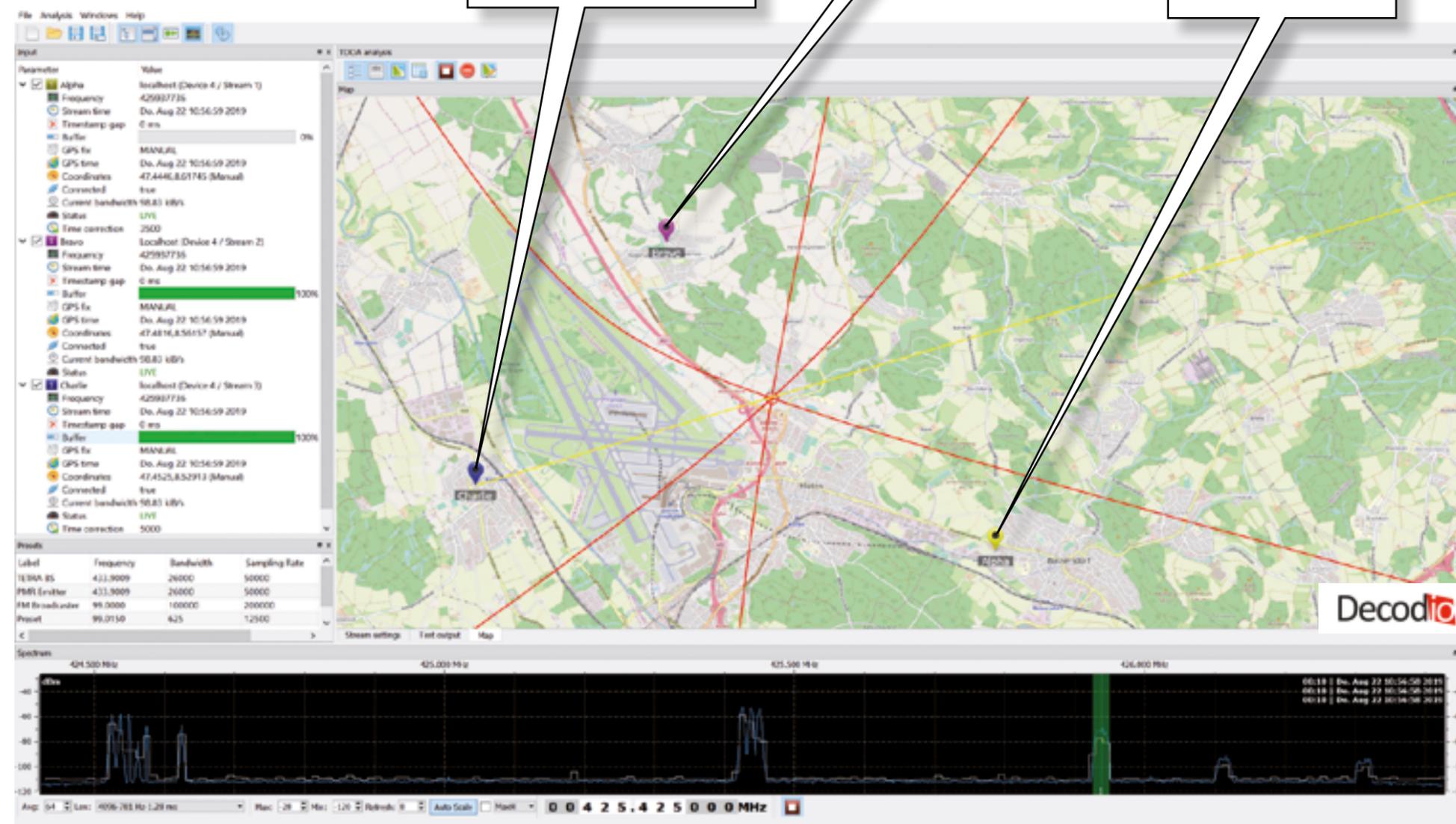
Example Procitec software

Broadband signal displayed as a waterfall and a FFT spectrum

- ▶ Production of the selected narrow band signal, method detection and decoding mode
- ▶ Classification results: Decoder / Modem
- ▶ Decoding of contents starts after classification

Example Decodio TDOA software solution

- ▶ Example realization of a hybrid AOA/TDOA network
- ▶ Several SignalSharks used as sensors for the network
- ▶ Evaluation and display of the localization results with the aid of Decodio Localizer software on a central PC



STATION CHARLIE (fixed installation):
 ▶ SignalShark Outdoor Unit
 ▶ ADFA
 ▶ LTE modem
 ▶ Software: Decodio ReX



STATION BRAVO
 ▶ SignalShark Outdoor Unit
 ▶ Omnidirectional antenna
 ▶ LTE modem
 ▶ Software: Decodio ReX



STATION ALPHA (mobile):
 ▶ SignalShark handheld
 ▶ Omnidirectional antenna
 ▶ LTE modem
 ▶ Software: Decodio ReX

▶ Available Driver Software
www.narda-sts.com



SignalShark Solutions – Applications for Signal Detection and Applications in Spectrum Monitoring

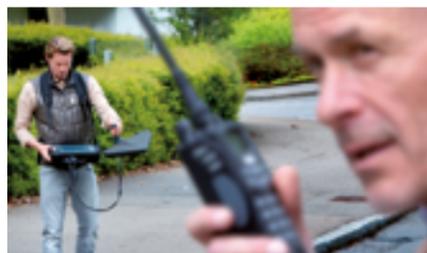
SignalShark is designed to provide powerful, reliable solutions for detecting and localizing RF interference, ensuring seamless communication and protecting critical infrastructure. Whether you're tracking unauthorized transmissions, supporting search and rescue operations, or monitoring large events, SignalShark offers precise tools to help you maintain clear and interference-free communications.

SignalShark® – Applications for Signal Detection and Localization

Detecting Illegal Transmitters

SignalShark identifies and localizes unauthorized transmitters that disrupt networks or violate spectrum regulations:

- **Monitoring Unlicensed Transmissions:** 40 MHz real-time detection to protect licensed spectrum users.
- **Fast Localization:** Advanced direction-finding quickly pinpoints signal sources for immediate action.



Monitoring of Major Events

SignalShark ensures stable communication during large-scale events such as concerts and sports:

- **Frequency Management:** Prevents overloads and ensures smooth communication for security and event teams.
- **Interference Elimination:** Detects and neutralizes potential disruptions, such as rogue transmitters.



Fault clearance / troubleshooting

SignalShark ensures the reliability of critical communication systems in aviation and emergency services:

- **Interference Suppression:** Detect and localize emissions from industrial plants or faulty devices.
- **Safety Assurance:** Monitor and protect frequency bands to ensure uninterrupted communication for pilots and air traffic controllers.
- **Precision Tools:** Identify and locate interference sources effectively to maintain operational safety.



Military and Defense Applications

SignalShark secures military communications with precise interference detection:

- **Communication Security:** Detect and eliminate jammers or unauthorized signals.
- **Operational Integrity:** Ensures uninterrupted function of critical defense systems.



Critical Infrastructure Protection

SignalShark protects critical infrastructure such as airports, power stations, and communication hubs:

- **High-Security Monitoring:** Real-time detection of unauthorized signals in sensitive areas.
- **Minimizing Disruptions:** Quickly localize and neutralize interference to prevent service interruptions.



Broadcasting and Telecommunications

SignalShark ensures uninterrupted service in broadcasting and mobile networks:

- **Interference Detection:** Identify and localize disruptions in real time.
- **Regulatory Compliance:** Monitor adherence to spectrum regulations.



SignalShark® – Applications in Spectrum Monitoring

Frequency Monitoring

Monitoring includes detecting and analyzing interference. The sources of interference can be localized through so-called drive tests and investigations in the 'last mile', i.e. the final section of the network to the customer.



Channel Assignment

Efficient channel management to avoid interference and identify white spots and bottlenecks. SignalShark supports third-party solutions such as Combit SIMon, ATDI, LS Telcom, Deocodio



Regulatory Compliance and Enforcement

Protect licensed spectrum from unauthorized use:

- **Spectrum Surveillance:** Continuous monitoring for violations.
- **Reporting:** Generate detailed reports for regulatory authorities.

Signal Coverage

SignalShark ensures reliable communication in mobile networks and critical infrastructures like TETRA for emergency services:

- **Service Availability:** Analyze coverage and signal quality to identify areas with insufficient service.
- **Data Collection:** Measure signal strength and quality to pinpoint coverage gaps.
- **Critical Support:** Ensure uninterrupted communication for emergency services in essential areas.



ELINT COMINT SIGINT

Signals Intelligence (SIGINT) SignalShark supports intelligence and military operations by:

- **Signal Analysis:** Monitor, classify, and decode signals to differentiate between trusted and hostile transmissions.
- **Jammer and Spoofing Detection:** Identify and localize threats to maintain communication security.
- **Emission Control (EMCON):** Ensure secure and undetectable communications by managing signal emissions.



Why SignalShark®?

- **Precise Detection:** Rapid and reliable localization of interference.
- **Flexibility:** Suitable for mobile and stationary applications.
- **Seamless Integration:** Compatible with third-party software and existing systems.
- **Future-Proof:** Expandable options and regular updates.

With SignalShark Interference and Spectrum Monitoring Solutions, you gain full control over the RF spectrum – ensuring clear, reliable communication and protecting sensitive systems.



More information
www.narda-sts.com





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.

narda 
Safety Test Solutions

Narda Safety Test Solutions GmbH
Sandwiesenstrasse 7
72793 Pfullingen, Germany
Phone +49 7121 97 32 0
info@narda-sts.com

www.narda-sts.com

Narda Safety Test Solutions
North America Sales Office
435 Moreland Road
Hauppauge, NY11788, USA
Phone +1 631 231 1700
info@narda-sts.com

Narda Safety Test Solutions S.r.l.
Via Benessea 29/B
17035 Cisano sul Neva, Italy
Phone +39 0182 58641
nardait.support@narda-sts.it