narda
Safety Test Solutions

Datasheet | SignalShark 3310 for EMF - Preliminary

SignalShark

Conforms to EMF Directive 2013/35/EU

5G

SignalShark® 3310 for EMF – The Professional Standard for Frequency-Selective EMF Analysis

High-Performance Real-Time Analyzer for Compliance, Safety, and Spectrum Measurements up to 29.5 GHz

The **SignalShark® 3310** is a portable, high-precision instrument for professionals evaluating electromagnetic field (EMF) exposure in complex RF environments. Covering **8 kHz to 8 GHz** — expandable to **29.5 GHz**, via optional FR2 antennas — it delivers high-resolution, frequency-selective measurements for **safety analysis, environmental monitoring**, and **compliance testing** in line with **ICNIRP, IEC 62232**, and other standards.
Ideal for use around high-power transmitters, in dense urban 5G areas, or long-term measurement campaigns, the SignalShark delivers **reliable, repeatable results — fast and field-proven**.

Purpose-Built for Professionals

- **Standard-Compliant Results:** Direct display of values as percentages of defined exposure limits like ICNIRP and national regulations.
- **Reliable Signal Analysis**: Traffic- and code-selective extrapolation of LTE-FDD, LTE-TDD, and 5G NR signals ensures accurate exposure evaluation under real traffic conditions.
- **Channel Meter**: Editable tables and predefined routines allow automatic correlation of results and support structured field measurements and data handling.
- **Rugged & Ready**: With ergonomic, **IP54-rated housing, high field immunity up to 200 V/m**, hot-swappable rechargeable batteries, GNSS, and voice recorder, it's built for rough environments and long days

Flexible Architecture and Powerful Insight

- **Dual Receiver Paths:** Analyze, record, and demodulate in parallel — perfect for short-duration or overlapping signals.
- **40 MHz Real-Time Bandwidth**: With a high dynamic range and powerful FFT processing, short-duration events are reliably captured.
- **Embedded Windows Platform**: Supports third-party software and full automation via SCPI and remote interfaces.
- **Efficient Workflows**: Predefined setups and guided routines ensure structured, repeatable, high-throughput measurement campaigns

The **SignalShark 3310 EMF** is the ideal solution for RF engineers, regulators, and telecom operators who demand **reliability, precision, and efficiency** in EMF analysis.

Device Features

“SignalShark 5G Analyzer” (Sk5G) Software

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 end device (e.g., smartphone). This ensures that the base station directs a traffic beam with maximum power at the end device. 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.

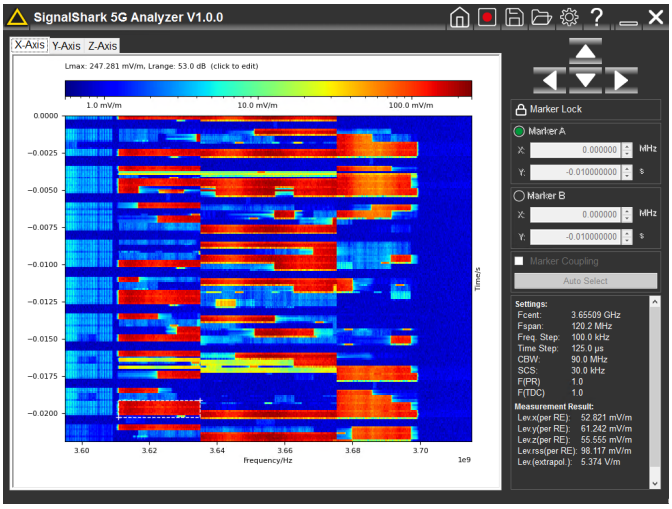


Fig. 1. SignalShark 5G Analyzer Software, 5G EMF Extrapolation view

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.

To use the software for measurements an isotropic antenna is required. The options ‘Spectrogram’ and ‘SCPI Remote Control’ and the option ‘SignalShark 5G Analyzer Measurement’ must as well be installed on the designated SignalShark. Also needed is a 5G-capable device (e.g. smartphone), to create a traffic beam directed to the measurement antenna.

With the software alone, without the ‘SignalShark 5G Analyzer Measurement’ option installed, the user can still load and analyze stored measurements to evaluate these measurements.

5G FR2 LNB Antennas
Two different antenna models are available for 5G FR2. A directional antenna with high sensitivity and an omnidirectional antenna. Both antennas include a downconverter that converts the millimeter wave between 24.25 GHz to 29.5 GHz into the SignalShark's receive band. This means that the RF cable between antenna and basic unit only transmits frequencies up to a maximum of 8 GHz, which greatly reduces the cable loss compared with a 20 GHz cable. In addition, the downconverter in the antenna avoids the need to modify the base unit, so the antenna can be used on all SignalShark devices without hardware modifications.

The antennas have their own batteries, independent from the basic unit. So the runtime of the SignalShark is not affected by the operation of the downconverter antenna. The battery integrated in the antenna can be charged via an USB-C socket. Connected to a USB power bank, long-term measurements can also be performed.

Narda recommends to operate the antennas only via an extension cable with the SignalShark.

Measurement of weak signals (e.g. indoors):
For measurements inside buildings, the field strengths are often very low. For example, a modern, coated glass window can attenuate a signal at 24 GHz by about 30 dB. To be able to detect such a field strength, a high gain antenna is needed. However, such antennas have a high directivity due to their principle. The antenna model 3591/01 has such a characteristic.

In addition, the directional characteristic can be used to detect the field strength of geographically separated base stations.

Outdoor environmental measurements:
For EMF measurements, national as well as international standards recommend an isotropic measurement. Such antennas are not available for the FR2 frequency range. The antenna 3591/02 offers an omnidirectional reception characteristic that roughly corresponds to that of a donut. Ideal reception results are therefore obtained from an X-Y spatial plane. To cover all three spatial axes for isotropic measurements, the antenna must be connected to the basic unit via an RF cable and moved accordingly during the measurement.

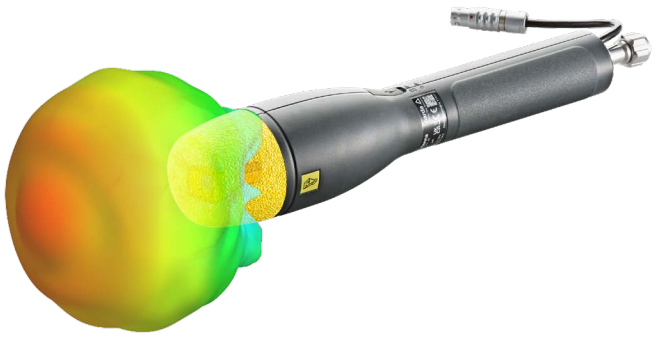


Fig. 2. 3591/01 Directional Antenna (Horn antenna)

Fig. 3. 3591/02 Omnidirectional

Setups and Scripts

Thanks to a wide range of optional functions and additional Python scripts, SignalShark can be optimally adapted to the individual measurement tasks and requirements of everyday work.

Predefined setups ensure that the device remains easy and intuitive to use.

Setups and associated options

Scan Spectrum (included in all App. Packages)
Enables spectrum analysis and monitoring in the full frequency range of the receiver (8 kHz to 8 GHz) depending on the connected antenna and RF cable.

Recommended option(s): 3310/95.002 'Spectrogram'

RT Spectrum
Enables 40 MHz real-time spectrum measurement for gap-less signal acquisition and analysis.

Recommended option(s): 3310/95.002 'Spectrogram'

Predefined Setups EMF

EMF Spectrum % of Std.
Makes an isotropic spectrum measurement and evaluates the signals according to ICNIRP and national and international standards with an exact display in percent in relation to the permissible limit value.

Recommended option(s): 3310/95.002 'Spectrogram'

EMF Ch. Power Meas.
In wireless communication, signals are often assigned to specific frequency ranges or channels. This measurement allows you to determine the isotropic channel power of a given signal out of a spectrum measurement.

EMF - Radar
Radar field emission measurements pose special challenges. This measurement setup enables the spectral recording of a radar signal using a manual three-axis measurement.

Recommended option(s): 3310/95.002 'Spectrogram'

EMF 4G Decoding
This measurement allows the decoder based extrapolation of a LTE (4G) signal to a maximum power worst case scenario.

Required option(s): *3310/95.021 '4G EMF Decoder'*

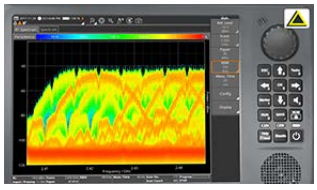
EMF 5G Decoding
This measurement allows the decoder based extrapolation of a 5G signal to a maximum power worst case scenario.

Required option(s): *3310/95.022 '5G EMF Decoder'*

EMF 5G Analysis
This measurement 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 end device (e.g., smartphone).

Required option(s): *3310/95.002 'Spectrogram'*
3310/95.012 'SCPI Remote Control'
3310/95.020 'SignalShark 5G Analyzer Measurement'

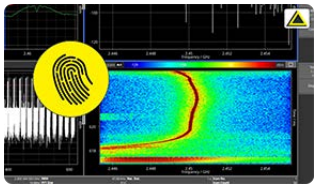
Predefined Setups Radio Monitoring, Direction Finding (DF) and Interference Finding



Persistance Spectrum
Enables the detection of interference signals in the spectrum that would otherwise be hidden by traffic signals.

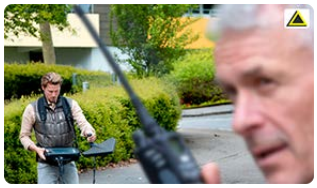
Required option(s): *3310/95.004 'Persistence (of real time Spectrum)'*

Recommended option(s): *3310/95.002 'Spectrogram'*



HiRes IQ Signal Analysis
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.

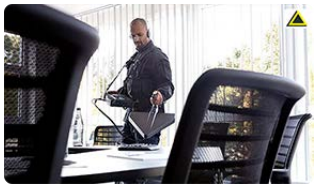
Time-gated Measurement
For time division multiplex signals like TDD, where the uplink and downlink are transmitted on the same frequency but at different time slots, this function enables 'filtering' to a specific time slot to easily reveal interference signals.



Manual DF Horizontal Scan
Supports direction finding of signals with a Narda hand-held direction-finding antenna. Enables last-mile searches for interference signals and jammers.

Required option(s): *3310/95.011 'Horizontal Scan'*

Recommended option(s): *3310/95.002 'Spectrogram'*



Manual DF Tone Search
Supports direction finding of signals with a Narda hand-held direction-finding antenna. Tone pitch is determined by the signal level. Enables precise location of interferers and bugs in rooms.

Required option(s): *3310/95.003 'Level Meter incl. Compass values'*

Recommended option(s): *3310/95.002 'Spectrogram'*

Automatic DF
The direction of a signal, as defined by the center frequency and bandwidth, can be automatically determined by connecting an ADFA to a SignalShark. Depending on the settings, this can result in several hundred bearings per second, which can be filtered according to various criteria.

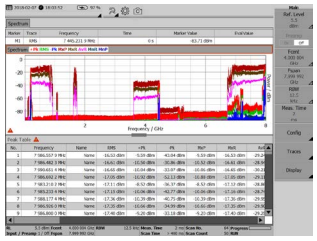
Required option(s): *3310/95.005 'Automatic DF Antenna Control, Bearing View'*

Recommended option(s): *3310/95.006 'Mapping and Localization'*

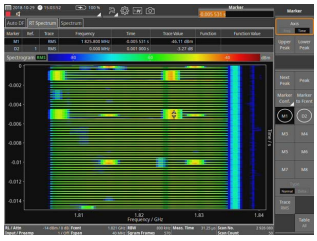
Heatmap Auto DF
When mounted on a vehicle, the ADFA, together with the integrated heat map algorithm, enables the automatic and rapid localization of transmitters and interference signals in larger areas.

Required option(s): *3310/95.005 'Automatic DF Antenna Control, Bearing View'*
3310/95.006 'Mapping and Localization'

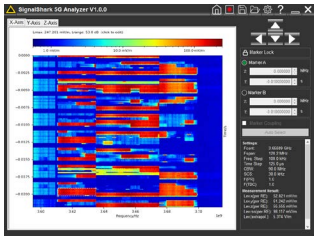
Options



40 MHz real-time Spectrum, Marker and Peak Table (included in all App. Packages)
A Panorama scan display that provides extremely fast scanning over the entire frequency range and is ideal for detecting, monitoring and analyzing any kind of signal.
An ideal complement: Mark suspect signals in the spectrum and save them in a transmitter table with relevant parameters such as center frequency, bandwidth, antenna type, and polarization. This table can then be recalled and worked through successively at each measurement location and in every operating mode of the instrument.

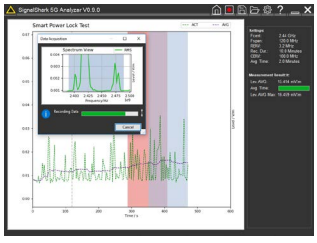


Spectrogram [option]
The Waterfall diagram is ideal for long term monitoring of the RF spectrum and for detecting permanent, sporadic or frequency hopping signals. Transmitters with variable output power and/or bandwidth can also be identified.
Visual representation of the recorded spectra versus time. Colors represent the signal level. The smallest selectable time resolution is 31.25 µs. The high resolution makes it possible to display even the frame structures from for services like UMTS, LTE 5G.

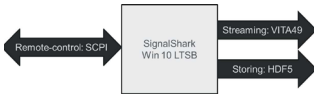


5G EMF Extrapolation
The 5G EMF extrapolation View allows the maximum channel field strength to be extrapolated directly from a 5G traffic signal.

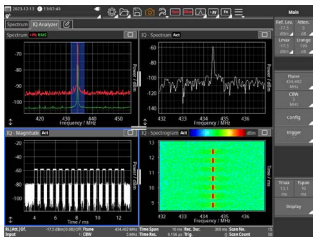
A downstream with maximum power is requested using a suitable user equipment (e.g. a smartphone). The Signal-Shark 5G Analyzer records an isotropic spectrogram and calculates the average field strength of a 5G resource element as well as the extrapolated maximum channel field strength.



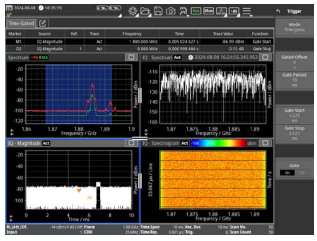
5G 'Smart Power Lock' Test
The 5G Smart Power Lock test feature measures the isotropic channel power of a given 5G channel over an adjustable time and displays this value as a line graph. It also calculates a moving average value that can indicate whether the Smart Power Lock function of the given base station is working correctly.
A downstream with maximum power is requested using a suitable user equipment (e.g. a smartphone).



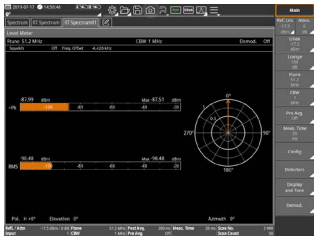
SCPI Remote Control (included in all App. Packages)
SCPI (Standard Commands for Programmable Instruments) is a language that makes it possible to control the SignalShark using standard syntax, command structure and data interchange format. All remote commands are described in Command reference guide for SignalShark.
The SCPI Remote Control allows the Narda Script Launcher to be installed.



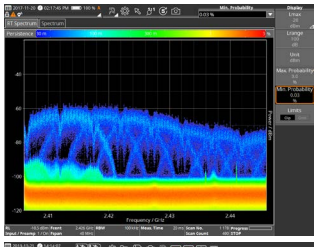
IQ Analyzer, Recorder, Trigger, Magn. View [option]
In the IQ Analyzer Task, recorded IQ values can be displayed simultaneously as an IQ Spectrum View, IQ Spectrogram View and IQ Magnitude View. The special feature here is that it is possible to switch between a high time resolution and a high frequency resolution even after the measurement. This allows a signal to be analyzed in its entire depth. Therefore it is optimal when it comes to detection, analysis and documentations of hopping signals as well as of interference signals caused by faulty oscillator, welding systems, defective relays or lamps, jammers etc. It trigger on short pulsed signals down to ns and has a high time resolution analysis in IQ Spectrogram View and IQ Magnitude View. Up to eight markers support the determination of signal parameters.



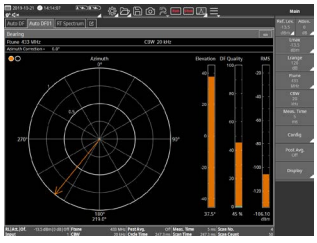
“Time-Gated Measurement” function
The “Time-Gated Measurement” function is a built-in key component of the IQ analyzer, facilitating precise measurement of signals at designated time slots. For time division multiplex signals, such as TDD, where the uplink and downlink are transmitted on the same frequency but at different time slots, the function enables targeted filtering to a specific time slot, enabling effective interference analysis. The time slot can be defined through the Magnitude View, allowing for precise control over the measurement process.



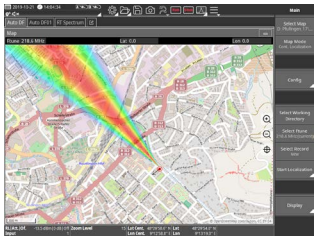
Level Meter incl. Compass values [option]
The option allows you to make selective measurements at a defined frequency (Fcent) e.g. for monitoring the field strength of a communications channel. The measurement is in real-time and there are no time gaps.
The results are shown from an independent receiver path with steep channel filters for clean separation of even closely spaced frequencies and has a CBW range from 25 Hz to 40 MHz for detection and evaluation of pulsed signals (radar) as well as broadband signals.



Persistence (of real-time Spectrum) [option]
The Polychrome spectrum displays spectra as level versus frequency where color indicates rate of occurrence. Persistence allows sporadic to CW (continuous waveform) signals to be detected easily. It can also be described as a visual detection of signal under signal, e.g. a detection of interferers/jammers hidden under a signal.

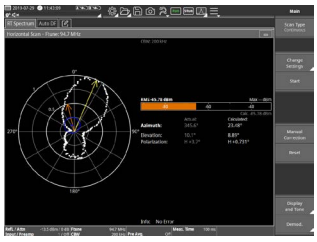


Automatic DF Antenna Control, Bearing View [option]
A view for Direction finding, showing azimuth, elevation, DF quality, and omnidirectional RMS level derived from the Narda automatic DF antenna (ADFA). The ADFA elevation is calibrated between +40° und -20°.

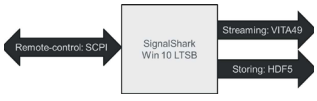


Mapping and Localization [option]
SignalShark simplifies localization of transmitters by autonomously evaluating all the available bearing results and plotting them as a heatmap. It uses a statistical distribution of bearing lines that represents the uncertainty in the bearing. The result is a map on which the possible locations of the transmitter are plotted and color-coded according to their probability.
Make a drive test using a vehicle mount-adapter, combine bearings from more than 2 SignalSharks (NSL Remote DF) or mount the ADFA 2 180° upside down. There are many features developed to facilitate and broaden the possibilities for most individual cases.

Analog Demodulation [option]
for signal identification and decoding. AM, Pulse, CW, ISB, USB, LSB, FM, PM, or IQ signals can be demodulated with squelch and AGC function. The demodulated signal can be stored as WAV-file.



Horizontal Scan [option]
plots the signal strength versus the angle of incidence on a polar diagram. The display allows you to more easily see the difference between the received signal and the reflections that occur. The SignalShark automatically calculates the bearing of the signal source based on the horizontally measured values.

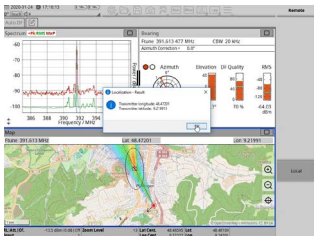


VITA 49 [option]
is a packet-based exchange protocol for RF devices. The Vita49 standard provides a communications format that is hardware and supplier-independent
Shows the basic measurement parameter settings while streaming IQ data according to the Vita 49 standard.
IQ Data stream can be used for classification, decoding (3rd party SW) of signals.

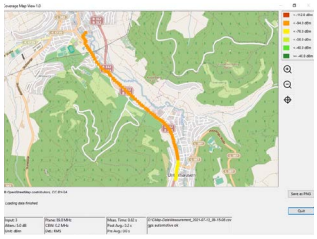
Narda Python Scripts

NSL (NardaScriptLauncher) is a free software from Narda that allows SignalShark users to select and run Python scripts from within the SignalShark application. To control the handheld SignalShark analyzer the “Option, SCPI Remote Control” is required.

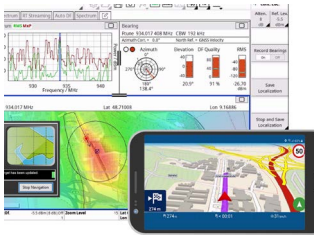
- Automate routine tasks
- Provide guided measurements for novices using message boxes or wizards
- Add new measurement evaluation functions
- Provide complete measurement automation
- New scripts constantly released to be downloaded for free
- Possibility to write programs or additions via Python, using a Narda template, customized for specific needs



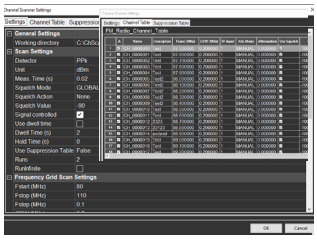
NSL Remote DF (NSL Net DF)
makes it possible to create a localization with several SignalShark devices in a network. The user can scan the network to obtain information on all available SignalShark devices, synchronize all devices with configuration settings of the master device, monitor spectrum reception on all devices simultaneously, and use the bearing information to perform localization on the master SignalShark device.



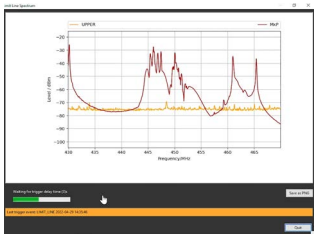
NSL Coverage Map
The user can configure settings for the coverage map and take location-dependent level measurements with distinct color-coding.
Drive test for coverage, field strength correlated to color scheme.



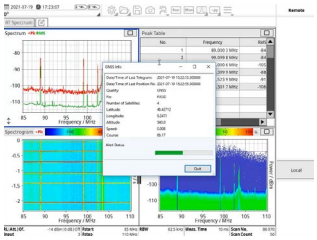
NSL DF Autopilot
The function allows the SignalShark to be connected to a navigation system. The coordinates determined by the SignalShark heatmap localization are set as target in the navigation system, thus *There is no need to look at the heatmap while driving and only one person is needed*.



NSL Channel Scanner
A memory/frequency scan that makes it possible to monitor predefined channels in the spectrum. It is comparable to a channel scan on a radio. If one of the monitored channels exceeds a definable level value, an action (“Action”) previously defined by the user can be executed. It is also possible, to scan a frequency grid. This can be used to create a channel table.

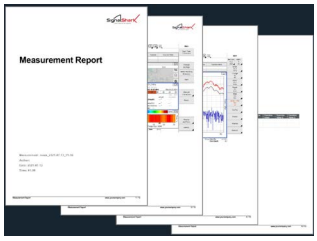


NSL Limit Line
enables triggering on signals in the spectrum. The trigger level can be defined by a horizontal line or by a trigger mask. The trigger mask can be created and edited in the settings editor in various ways.



NSL GNSS

displays information about the current GNSS reception and issues a warning message if the quality of the GNSS reception falls below a certain level.



NSL MS Word

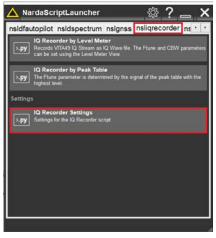
takes a Word (.docx) template file as the basis for a measurement report. It reads all settings from the current measurement, makes a screenshot of each view and generates a measurement report as MS Word document.

NSL Tools

- NSL Copy Settings, copies selectable parameters such as Fcent, RBW and Attenuator from one task to another task.
- NSL Go 2 desktop, emulates the Windows-Key + “D-Key” keystroke to go to the Windows desktop.
- NSL Save Peak Table, allows to save the information of a peak table in CSV format.
- NSL IQ Stream Control, allows to configure and start an IQ stream easily.
- NSL Peak trigger, uses the peak table view of SignalShark to stop the measurement when reaching or exceeding a user defined level.
- NSL SignalShark WOL, allows to switch on a network connected SignalShark via WakeOn-LAN.

NSL Converter

- Convert SignalShark Spectrum Data (from HDF5 (.h5) file format to csv file format).
- Convert SignalShark Spectrogram Data (from HDF5 (.h5) file format to csv file format).
- Convert IDA (csv-based transmitter tables) to SignalShark (xml-based transmitter tables).
- Convert SRM (csv-based transmitter tables) to SignalShark (xml-based transmitter tables).
- Convert a Template Generated CSV Table (from csv-based transmitter tables to xml-based transmitter tables).



NSL IQ Recorder

enables the recording of IQ data in WAV format.
Allows the user to setup and start/record the IQ streams by using SignalShark SCPI commands and save them as an IQ WAV file. The WAV file format is a universal format supported by many monitoring software products and SDR programs.

Definitions and Conditions

Conditions
Unless otherwise noted, specifications apply after 30 minutes warm-up time within the specified environmental conditions. The product is within the recommended calibration cycle.

Specifications with limits
These describe product performance for the given parameter covered by warranty. Specifications with limits (shown as <, ≤, >, ≥, ±, max., min.) apply under the given conditions for the product and are tested during production, considering measurement uncertainty.

Specifications without limits
These describe product performance for the given parameter covered by warranty. Specifications without limits represent values with negligible deviations, which are ensured by design (e.g. dimensions or resolution of a setting parameter).

Typical values (typ.)
These characterize product performance for the given parameter that is not covered by warranty. When stated as a range or as a limit (shown as <, ≤, >, ≥, ±, max., min.), they represent the performance met by approximately 80% of the instruments. Otherwise, they represent the mean value. The measurement uncertainty is not taken into account.

Nominal values (nom.)
These characterize expected product performance for the given parameter that is not covered by warranty. Nominal values are verified during product development but are not tested during production.

Uncertainties
These characterize the dispersion of the values attributed to the measurands with an estimated confidence level of approximately 95%. Uncertainty is stated as the standard uncertainty multiplied by the coverage factor k=2 based on the normal distribution. The evaluation has been carried out in accordance with the rules of the “Guide to the Expression of Uncertainty in Measurement” (GUM).

Specifications[a]

SignalShark Basic Unit (40 MHz RTBW)

Frequency						
Frequency range		8 kHz to 8 GHz				
Scan rate		> 50 GHz/s		@ RBW = 1.6 MHz (resolution 800 kHz)		
(basic unit, full span)		30 GHz/s (typ.)		@ RBW = 100 kHz (resolution 50 kHz)		
RBW (RT Spectrum)		1 Hz to 800 kHz				
RBW (Scan Spectrum)		1 Hz to 6.25 MHz				
CBW (Level Meter)		25 Hz to 40 MHz				
EMC filter bandwidth (Spectrum and Level Meter)		10 Hz, 100 Hz, 200 Hz, 1 kHz, 9 kHz, 10 kHz, 100 kHz, 120 kHz and 1 MHz				
Detectors (Spectrum and Level Meter)		+Pk, RMS, -Pk, Avg and Sample				
CISPR Detectors (Level Meter)		Cpeak (quasi-peak), CRMS & CAvg (EMC filter with CISPR bandwidth must be selected				
SSB phase noise	**f_c**	**df = 1 kHz**	**df = 10 kHz**	**df = 100 kHz**	**df = 1 MHz**	**df = 10 MHz**
	10 MHz	< -120 dBc (1/Hz)	< -130 dBc (1/Hz)	< -135 dBc (1/Hz)		
	1 GHz	< -90 dBc (1/Hz)	< -101 dBc (1/Hz)	< -101 dBc (1/Hz)	< -112 dBc (1/Hz)	< -132 dBc (1/Hz)
Internal reference frequency		Deviations:		< 1 ppm		
		(includes initial deviation, aging within the first 2 years, and temperature response)				
	GPS aided, averaged over 24 h	Deviations:		< $1 \cdot 10^{-11}$	$1 \cdot 10^{-12}$ (typ.)	
		(requires adequate GNSS signal and constant GNSS antenna position)				
Amplitude						
HDR (High Dynamic Range)		SignalShark can detect low level signals even in the presence of very strong signals. It does this by combining high sensitivity with a wide intermodulation-free dynamic range. The DANL and IP2 / IP3 values stated below are valid at the same setting.				
	DANL (Noise Figure) @ attenuator = 0 dB, no preamp	1 MHz ≤ f ≤ 44 MHz	< - 160 dB (mW/Hz)	(resultant noise figure < 14 dB)		
		44 MHz < f ≤ 3 GHz	< - 159 dB (mW/Hz)	(resultant noise figure < 15 dB)		
		44 MHz < f ≤ 3 GHz	- 162 dB (mW/Hz) (typ.)	(resultant noise figure 12 dB)		
		3 GHz < f ≤ 8 GHz	< - 152 dB (mW/Hz)	(resultant noise figure < 22 dB)		
	2nd order intercept point (IP2, 2 tones) @ attenuator = 0 dB, no preamp	4 MHz ≤ f < 42 MHz[b]	> 60 dBm			
		42 MHz ≤ f ≤ 8 GHz	40 dBm (typ.)			
	3rd order intercept point (IP3, 2 tones) @ attenuator = 0 dB, no preamp	3 MHz < f ≤ 44 MHz	> 20 dBm			
		3 MHz < f ≤ 44 MHz	26 dBm (typ.)			
		44 MHz < f ≤ 630 MHz	> 4 dBm			
		630 MHz < f ≤ 3 GHz	> 6 dBm			
		44 MHz < f ≤ 3 GHz	14 dBm (typ.)			
		3 GHz < f ≤ 8 GHz	> 5 dBm			
		3 GHz < f ≤ 8 GHz	12 dBm (typ.)			
Level uncertainty		9 kHz ≤ f ≤ 8 GHz	< 2 dB			
Residual spurs[c] @ attenuator = 0 dB		8 kHz ≤ f ≤ 44 MHz	< -120 dBm	exceptions < -100 dBm		
		44 MHz < f ≤ 3 GHz	< -115 dBm	exceptions < -100 dBm		
		3 GHz < f ≤ 6 GHz	< -110 dBm	exceptions < -95 dBm		
		6 GHz < f ≤ 8 GHz	< -105 dBm	exceptions < -85 dBm		
IF rejection		> 80 dB				
Image rejection		> 80 dB				

a RF data apply in the temperature range 20 °C to 26 °C at a relative humidity of between 25 and 75 %

b Component at f1 + f2 is measured in the direct band (Fcent ≤ 64 MHz in real-time mode)

c Typically with only few exceptions. These are documented in the calibration certificate

Real-Time Spectrum			
Signal duration for 100 % POI	RT Spectrum @ RBW = 800 kHz	> 3.125 µs without attenuation and spectral growth	
		> 2 ns with attenuation proportional to the spectral growth	
	IQ Analyzer @ CBW = 40 MHz, RBW = 1.532 MHz and 87.5 % FFT Overlap	> 1.41 µs with IQ Analyzer	
		> 2 ns with attenuation proportional to the spectral growth	
Spectrum rate	1.6 million spectra / s	@ RBW = 800 kHz and 75 % FFT Overlap	
FFT overlap	Fspan > 20 MHz	75 %	
	Fspan ≤ 20 MHz, RBW ≤ 400 kHz	87.5 %	
RF Input			
Type (switchable)	1 x N-connector, 50 Ω (female) 3 x SMA-connector, 50 Ω (female)		
RF destruction limit	20 dBm		
Max. nominal RF level	15 dBm		
Maximum DC voltage	25 V		
Return loss (VSWR)	12 kHz ≤ f ≤ 3 MHz	> 9.54 dB	(VSWR < 2.00)
	3 GHz < f ≤ 6 GHz	12 dB (typ.)	(VSWR = 1.67 (typ.))
	6 GHz < f ≤ 8 GHz	10 dB (typ.)	(VSWR = 1.93 (typ.))
Isolation between used and unused inputs	8 kHz ≤ f ≤ 1 GHz	60 dB (nom.)	
	3 GHz	50 dB (nom.)	
	8 GHz	35 dB (nom.)	
General Specifications			
Attenuator	0 to 30 dB (0.5 dB steps)		
Digitizer	16 bit		
GNSS	Embedded receiver and antenna (GPS / QZSS, GLONASS, BeiDou, Galileo) Coordinates representation as decimal degree (DegDec - ddd.ddddd)		
Internal non-removable memory	SSD, mSATA	30 GB system partition 28 GB configuration settings and user data	
Removable memory	microSD (SDXC) / USB 2.0 / USB 3.0		
External power supply	Basic unit, DC input: 10 to 48 VDC AC adapter, input: 100V-240VAC, output: 12VDC, 5.5A Plug type: Non-Locking Power Plug S1017		
Battery *In many countries, the battery is available from several public distributors.*	2 x Lithium-ion rechargeable battery pack, hot-swappable during operation Operating time: approx. 3 hours (typical, with both batteries) Charging time: approx. 4.2 hours (nominal, with both batteries charging in base device) Charging time: approx. 3 hours (nominal, with external charger)		
Dimensions (H x W x D)	230 mm × 335 mm × 85 mm (9.06" × 13.19" × 3.35")		
Weight	Approx. 4.1 kg / 9.04 lb (with one battery)		
Country of origin	Germany		
Recommended calibration interval	24 months		

Interfaces	
10 MHz Reference input	1 x SMA-connector, 600 Ω (female)
PPS/Trigger input	1 x SMA, 100 kΩ (female)
GNSS Antenna input (for additional, external GNSS antenna)	1 x SMA, 50 Ω, female (DC voltage for active antennas is supplied)
Display size and resolution:	10.4‘‘, 1024 x 768 pixels, Color Resistive touch
Video	1 x Display port
Audio	1 x 3.5 mm headphone jack Built-in loudspeaker Built-in microphone
Ethernet	1 x GigE (10/100/1000Base-T), RJ45
USB (Host)	1 x USB 3.0, 1 x USB.2.0
SD card slot	1 x microSD-card (SDXC)

Remote Control and Streaming	
Remote control protocol	SCPI
FFT streaming	VITA49 compliant
IQ streaming	VITA49 IQ streaming, sample rate up to 25.6 MHz[d]
Remote software	Remote Desktop for PC, Tablet and Smartphone (Windows, Android, IOS), AnyDesk, TeamViewer, VNC

d Applies for integrated 1 Gbit Ethernet interface.

Additional Functions		
Noise power density measurement		Can be measured with up to eight markers at a time.
Channel power measurement		Can be measured with up to eight markers simultaneously or via the channel meter function.
Occupied bandwidth measurement		According to ITU-R SM.443-4, with additional automatic center frequency and channel power measurement. Can be measured with up to eight markers at a time.
Field strength measurement		According to ITU-R SM.378-7
CISPR Detectors		Cpeak (quasi-peak), CRMS & CAvg (EMC filter with CISPR bandwidth must be selected)
Modulation detectors		AM, FM and PM. Up to 4 different detectors are available simultaneously
Frequency offset measurement		For CBW ≤ 1 MHz (using modulation detectors)
Analog demodulation and recording		AM, Pulse, CW, ISB, USB, LSB, FM, PM, or IQ signals can be demodulated with squelch and AGC function. The demodulated signal can be stored as WAV-file.
Tone search		For PIM and interference hunting. The level of one of the detectors modulates the pitch of an audible tone.
Automatic DF		Automatic bearing of transmitters using a Narda Automatic DF Antenna.
Automatic transmitter localization (Heatmap)		Automatic calculation of the transmitter location.
TDOA localization[e]		Integrated GPS with high-accuracy timestamp for TDOA applications. With additionally available software package.
Time-Gated Measurement (TGM)		Built-in in the IQ Analyzer Task. Enables signals to be measured at specified time slots.
5G ‘Smart Power Lock’ Test		Calculates a moving average value that can indicate whether the Smart Power Lock function of the given base station is working correctly.
Detection of Narda measurement antennas		Automatic consideration of antenna parameters after antenna is plugged in: antenna type, serial number, calibration date and antenna factors (see below). Automatic frequency range adjustment according to the connected antenna.
Antenna factors		Used to display measurement results in field strength units. Stored in all Narda antennas during calibration. Antenna factor lists for antennas from other manufacturers can be created and edited directly on the device. This can also be done on a PC using the SignalShark Tools software.
Detection of Narda Cables		Automatic consideration of cable parameters after cable is plugged in: Cable type, serial number, calibration date and loss factors (see below). Automatic frequency range adjustment according to the connected cable.
Cable loss factors		Used for frequency response compensation of the power level display. Stored in all Narda cables during calibration Cable loss lists for cables from other manufacturers can be created and edited directly on the device. This can also be done on a PC using the SignalShark Tools software.
Units	antenna with known antenna factor	% (of the standard), V/m, A/m, W/m², mW/cm², dBV/m, dBmV/m, dBA/m, dBµV/m, dBm, dBV, dBmV, dBµV
	without antenna factor	dBm, dBV, dBmV, dBµV
Isotropic Measurements		Automatic switching of the antenna axes when using one of Narda’s three-axis measurement antennas followed by computation of the isotropic result. Support for sequential measurements using single-axis antennas with subsequent computation of the isotropic result. Both results are directly displayed as a spectrum curve or as numerical values.
Weighted Display		In % of standard for human safety standards like ICNIRP, IEEE, FCC etc. New lists of exposure limits can be created and edited directly on the device. This can also be done on a PC using the SignalShark Tools software.
Correlation of results with telecom services		Transmitter Tables specify the used frequency band, the name and the required resolution bandwidth (RBW) of individual transmitters/services in a single list. Thus measurement results can be easily assigned to a transmitter even without the knowledge of the frequency (marker functions, peak table evaluation function, channel meter function). Transmitter tables can be created and edited directly on the device. This can also be done on a PC using the SignalShark Tools software.

e *Requires additional software*

Additional Functions		
Setups		Setups provide fast switching between different measurement configurations. Setups can be downloaded to a PC for archiving and uploaded back to the instrument.
Measurement Routines with Time Controlled and Conditional Storing		Q1 2026
Results Memory	Storage formats	Setups: XML Measurement data: HDF5 Screenshots: PNG
	Memory capacity	Internal: 28 GB configuration settings and user data, External: Storage on USB drive (USB stick or SSD)
Run		Button that “Freezes” the display; the measurement continues in the background.
Operating language		Selectable: English (Default), Simplified Chinese

Environmental Conditions		
MIL-PRF-28800F Class 2		Operating temperature Storage temperature Operating humidity Random vibration Functional shock Transit drop
Operating temperature		-10 °C to + 55 °C with battery
		-10 °C to + 55 °C with external power supply 0 °C to + 40 °C with external power supply when charging batteries
RF Immunity		200 V/m
Humidity		< 29 g/m³ (< 93 % RH at +30 °C), non-condensing
IP class		IP 54 (with antenna attached and interface protectors closed)
Climate	Storage	1K3 (IEC 60721-3) extended to - 20 °C to + 70 °C (batteries removed)
	Transport	2K4 (IEC 60721-3) restricted to - 20 °C to + 70 °C
	Operating	7K2 (IEC 60721-3) extended to - 10 °C to + 55 °C
Mechanical	Storage	1M3 (IEC 60721-3)
	Transport	2M3 (IEC 60721-3)
	Operating	7M3 (IEC 60721-3)

Compliance		
EMC	European Union	Complies with RED Directive 2014/53/EU and EN 301 489-1 V2.2.3, EN 301 489-52 V1.2.1, IEC/EN 61326 -1: 2021, IEC/EN 63000:2008, IEC/EN 18031-1
	Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-11
	Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55032 (CISPR 32) Class B
Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1:2010
Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018

RT Spectrum		
Measurement principle		FFT
Span		≤ 40 MHz
Resolution bandwidth RBW		1 Hz to 800 kHz
Filter	Type	Gaussian (Nuttall)
	Shape factor (-60 dB/ -3 dB)	3.8 typical
Traces	Trace Detectors	Detector 1: +Pk Detector 2: RMS Detetcor 3: -Pk, Avg or Smp
	Trace Modes	Clear/Write, Average, Max Hold, Min Hold, Max Afterglow, Min Afterglow, Blank
Evaluation functions		Peak table (list of up to 50 highest peaks) Integration over a user-specified frequency range (channel power)
Axis		X, Y, Z axis selection for single-axis measurements using a Narda three-axis antenna.

Level Meter (RT Spectrum)		
Measurement principle		Selective level measurement at a fixed frequency setting (Zero Span)
Filter	Normal	Steep cut-off channel filter (app. Raised-Cosine), Roll-off factor α = 0.16
	MIL	
	CISPR	
Channel bandwidth (CBW)		25 Hz to 40 MHz
Video bandwidth (VBW)		ToDo
Detectors	Default	Detector 1: +Pk Detector 2: RMS Detector 3: -Pk, Avg or Smp
	Cisper	Cpeak (quasi-peak), CRMS & CAvg (EMC filter with CISPR bandwidth must be selected)
	Modulation	AM, FM and PM. Up to 4 different detectors are available simultaneously
Axis		X, Y, Z axis selection for single-axis measurements using a Narda three-axis antenna.

Scan Spectrum		
Measurement principle		FFT
Span		< 8 GHz
Resolution bandwidth RBW		1 Hz to 6.25 MHz
Filter	Type	Gaussian (Nuttall)
	Shape factor (-60 dB/ -3 dB)	3.8 typical
Traces	Trace Detectors	Detector 1: +Pk Detector 2: RMS Detetcor 3: -Pk, Avg or Smp
	Trace Modes	Clear/Write, Average, Max Hold, Min Hold, Max Afterglow, Min Afterglow, Blank
Evaluation functions		Peak table (list of up to 50 highest peaks) Integration over a user-specified frequency range (channel power)
Axis		X, Y, Z axis selection for single-axis measurements using a Narda three-axis antenna or selection of isotropic measurements

Channel Meter (previously known as “Safety Evaluation”)	
Measurement principle	Spectrum analysis, followed by integration over user-defined frequency bands (“transmitters”)
Number of services	1 to 10 000 channels can be created and edited directly on the device. This can also be done on a PC using the SignalShark Tools software.
Name of transmitter	Must be unique per table and no longer than 50 characters.
Channel bandwidth of a transmitter (CBW)	Individually selectable for each channel, from 40 Hz to 8 GHz
Resolution bandwidth RBW, (-3 dB nominal)	Available bandwidths as for Wideband Spectrum. The following condition applies: $RBW \leq CBW_{(narrowest\ service)} / 4$ Automatic: RBW setting depending on of the narrowest service Manual: can be set in the range of available RBWs Individual: Q1 2026
Detection	Depends on selected Trace(s)
Filter	See Scan Spectrum
Result types	See Scan Spectrum
Evaluation function	Distribution (percentage contribution of each service)
Axis	X, Y, Z axis selection for single-axis measurements using a Narda three-axis antenna or selection of isotropic measurements
Display functions	Table view showing service names, the corresponding frequency bands, field strength per result type and RBW (when set to individual) Sort function according to various criteria
	Bar graph of transmitter showing contribution of the selected Result types
Others On/Off	Others On: field strength in the frequency gaps between the specified services is measured Others Off: field strength in the frequency gaps between the specified services is ignored

LTE Code-selective Measurement (FDD and TDD) (option) Q1 2026		
Measurement principle		Power level measurement of the cell specific and traffic independent signals PSS (Primary Sync Signal), SSS (Secondary Sync Signal) and RS (Reference Signal) of LTE cells.
LTE channel selection		By entering the center frequency (Fcent)
Frequency setting resolution		100 kHz (for Fcent frequency entry)
Uplink-downlink configuration (3GPP TS 36.211)		Seven uplink-downlink (0-6) configurations according to the standard 3GPP TS 36.211 are supported. To obtain a reliable result the instrument should be adapted to the uplink-downlink configuration of the base station.
Channel bandwidth CBW, (-6 dB nom.)		Can be set to the following values:

No. of subcarriers	72	180	300	600	900	1200
TBW (MHz)	1.08	2.7	4.5	9.0	13.5	18
CBW (MHz)	**1.4**	**3**	**5**	**10**	**15**	**20**

Transmit Bandwidth (TBW) is the occupied bandwidth of all subcarriers

Detection		Root mean square value (RMS), integration time = 10 ms (5 ms at CBW 15 MHz, 20 MHz)
Filter	Type	Steep cut-off channel filter (app. Raised-Cosine)
	Roll-off factor	α = 1 - (TBW/CBW)
Cell specific signals (Signal) *Display of the average power level per Resource Element out of all elements of the considered signal*		Individually selectable for: PSS (Primary Sync Signal) SSS (Secondary Sync Signal) RS Avg (Reference Signal Average) RS Sum (Reference Signal Sum) RS Max (Reference Signal Maximum) RS 0 (Reference Signal antenna 0) RS 1 (Reference Signal antenna 1) RS 2 (Reference Signal antenna 2) RS 3 (Reference Signal antenna 3)
Result types *Applicable to all cell specific signals*		Individually selectable for: Act: Displays instantaneous (actual) channel power Max: Maximum hold function Avg: Average over a selectable number of measurements (4 to 256) or a selectable time period of 1 to 30 minutes Max Avg: Maximum hold function after averaging Min: Minimum hold function Min Avg: Minimum hold function after averaging Standard: Display of the selected safety standard
Axis		X, Y, Z axis selection for single-axis measurements using a Narda Three-Axis Antenna or selection of isotropic measurements
Extrapolation function		Extrapolation factor adjustable from 1 to 10000 in steps of 0.001
Result display	Displayed items	Selection of individual Cell IDs
		Number of measurement runs since last reset
	Table layout	Up to 16 Cell IDs simultaneously Table format: Index, Cell ID, No. Ant. (number of antennas), selected signals shown for each selected result type (up to 54 columns + Standard)
		Total: Total power of all listed Cell IDs
		Analog: Analog measurement result for the selected LTE frequency channel
Setting parameters		Synchronization (Cell Sync): Sync/ No Sync Cyclic Prefix Length (CP Length): Normal/Extended
Noise threshold		In case of “Analog” results: values are displayed only if they are above the typical noise floor when activated. The threshold is selectable (0, 3, 6, 10, 15, or 20 dB relative to the typical DANL). Measurement values below the threshold are shown as the absolute threshold value marked with “<” (less than threshold).

5G NR Code-selective Measurtement (option) Q1 2026		
Measurement principle		Code selective power level measurement of the cell specific and traffic independent signals. SSS 0 to SSS 7 (Secondary Sync Signal) of 5G cells.
5G channel selection		By entering the center frequency (Fcent) of the SS/PBCH-Block (SSB)
Frequency setting resolution		5 kHz
Subcarrier spacing (SCS)		15 kHz, 30 kHz
CBW (is set automatically)		CBW = 320 * SCS
Detection		Root mean square value (RMS), integration time = 10 ms
Filter	Type	Steep cut-off channel filter (app. Raised-Cosine)
	Roll-off factor	α = 1 - (TBW/CBW)
Cell specific signals (Signal) *Display of the average power level per Resource Element out of all elements of the considered signal*		Individually selectable for: SSS Max (Maximum SSS average power level of SSS 0 to SSS 7) SSS Sum (ERP radiated power per resource element of all SS/PBCH beams summed over SSS 0 to SSS 7) SSS 0 to SSS 7 (Secondary Sync Signal 0 to 7 (depends on the beam configuration of the base station))
Result types *Applicable to all cell specific signals*		Individually selectable for: Act: Displays instantaneous (actual) channel power Max: Maximum hold function Avg: Average over a selectable number of measurements (4 to 256) or a selectable time period of 1 to 30 minutes Max Avg: Maximum hold function after averaging Min: Minimum hold function Min Avg: Minimum hold function after averaging Standard: Display of the selected safety standard
Axis		X, Y, Z axis selection for single-axis measurements using a Narda Three-Axis Antenna or selection of isotropic measurements
Result display	Displayed items	Selection of individual Cell IDs
		Number of measurement runs since last reset
	Table layout	Up to 16 Cell IDs simultaneously **Table format**: Index, Cell ID, No. SSSs, selected signals shown for each selected result type (up to 60 columns + Standard)
		Total: Total power of all listed Cell IDs
		Analog: Analog measurement result for the selected 5G NR frequency channel
Setting parameters		Sensitivity: Low, Normal und High

SignalShark 5G Analyzer (option)	
Measurement principle	The 5G EMF Extrapolation module makes it possible to determine the average level of a 5G resource element (RE). For this purpose, a downstream with maximum power is requested using a suitable user equipment (e.g. a smartphone). The SignalShark 5G Analyzer records an isotropic spectrogram and calculates the average level of a 5G resource element as well as the extrapolated maximum channel level.
5G channel selection	By entering the center frequency (Fcent) and channel bandwidth (CBW) of the 5G channel.
Subcarrier spacing (SCS)	15 kHz, 30 kHz, 60 kHz

Specifications - Isotropic antennas

Three-axis antenna (E-field) 3501/03

RF Data				
Frequency range		27 MHz to 3 GHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.		
Antenna type		E-field		
Sensor type		Three-axis design with scanned axes		
Dynamic range[f]		0.2 mV/m to 200 V/m (typ.)		
Maximum field strength (destruction limit)		435 V/m or 50 mW/cm² (nom.)		
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit		Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
		900 MHz (RBW = 1 kHz)	25 µV/m (typ.)	40 µV/m (typ.)
		2.1 GHz (RBW = 1 kHz)	40 µV/m (typ.)	70 µV/m (typ.)
Measurement range limit (for single CW signal)		300 V/m (typ.) 1000 V/m (typ.) for f ≤ 110 MHz		
RF connector		N-Connector, 50 Ω, male		

General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			450 g	
Dimensions			450 mm length; 120 mm antenna head diameter	
Calibration[g]			20 reference points: (26, 45, 75, 100, 200, 300, 433, 600, 750, 900) MHz (1, 1.2, 1.4, 1.6, 1.8, 2, 2.2, 2.45, 2.7, 3) GHz The SignalShark basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	

Measurement uncertainty		
Expanded measurement uncertainty[h] (in conjunction with SignalShark basic unit and 1.5 m RF cable)	Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
	27 to 85 MHz	+2.9 / -4.3 dB	+3.5 / -5.9 dB
	> 85 to 1400 MHz	+2.9 / -4.2 dB	+2.8 / -4.3 dB
	> 1400 to 1600 MHz	+2.7 / -3.8 dB	+2.9 / -4.4 dB
	> 1600 to 1800 MHz	+2.5 / -3.5 dB	+2.8 / -4.1 dB
	> 1800 to 2200 MHz	+2.4 / -3.3 dB	+2.8 / -4.2 dB
	> 2200 to 2700 MHz	+2.4 / -3.4 dB	+3.0 / -4.7 dB
	> 2700 to 3000 MHz	+2.4 / -3.4 dB	+3.5 / -6.1 dB

f For a signal to noise ratio of 10 dB (RBW = 1 kHz); 800 MHz to 1.8 GHz

g Antenna is oriented in the ortho-angle position (stem 54.7 to the electric field vector).

h Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12

Three-axis antenna (E-field) 3502/03

RF Data				
Frequency range		200 MHz to 8 GHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.		
Antenna type		E-field		
Sensor type		Three-axis design with scanned axes		
Dynamic range[i]		0.07 mV/m to 180 V/m (typ.)		
Maximum field strength (destruction limit)		435 V/m or 50 mW/cm² (nom.)		
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit		Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
		900 MHz (RBW = 1 kHz)	33 µV/m (typ.)	60 µV/m (typ.)
		2.1 GHz (RBW = 1 kHz)	25 µV/m (typ.)	43 µV/m (typ.)
Measurement range limit (for single CW signal)		200 V/m (typ.)		
RF connector		N-Connector, 50 Ω, male		

General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			400 g	
Dimensions			450 mm length; 120 mm antenna head diameter	
Calibration[j]			28 reference points: (200, 250, 300, 420, 600, 750, 900) MHz (1, 1.2, 1.4, 1.6, 1.8, 2, 2.2, 2.45, 2.7, 3, 3.5, 4, 4.5, 5, 5.5, 5.8, 6, 6.5, 7, 7.5, 8) GHz The SignalShark basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	

i For a signal to noise ratio of 10 dB (RBW = 1 kHz); typ. 1.8 GHz to 2.2 GHz

j Antenna is oriented in the ortho-angle position (stem 54.7 to the electric field vector).

Measurement uncertainty			
Expanded measurement uncertainty[k] (in conjunction with SignalShark basic unit and 1.5 m RF cable)	Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
	200 to 299 MHz	+2.5 / -3.5 dB	+3.2 / -5.1 dB
	300 to 750 MHz	+2.5 / -3.5 dB	+2.9 / -4.3 dB
	> 750 to 1800 MHz	+2.4 / -3.3 dB	+2.5 / -3.5 dB
	> 1800 to 2000 MHz	+2.3 / -3.2 dB	+2.4 / -3.4 dB
	> 2000 to 3000 MHz	+2.3 / -3.1 dB	+2.5 / -3.5 dB
	> 3000 to 4000 MHz	+2.3 / -3.1 dB	+2.5 / -3.6 dB
	> 4000 to 4500 MHz	+2.4 / -3.2 dB	+2.6 / -3.8 dB
	> 4500 to 5000 MHz	+2.4 / -3.2 dB	+2.8 / -4.1 dB
	> 5000 to 6000 MHz	+2.5 / -3.5 dB	+3.5 / -6.0 dB
	> 6000 to 7500 MHz	+2.5 / -3.6 dB	+3.6 / -6.1 dB
	> 7500 to 8000 MHz	+2.5 / -3.6 dB	+4.4 / -9.2 dB

k Valid for the temperature range -10 °C to +50 °C, according to the “Definitions and Conditions” on page 12

Three-axis antenna (H-field) 3581/02

RF Data				
Frequency range		9 kHz to 250 MHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.		
Antenna type		H-field		
Sensor type		Three-axis active magnetic loop design with scanned axes		
Dynamic range[l]		2.5 µA/m to 560 mA/m (typ.)		
Maximum field strength (destruction limit)		250 A/m / f [MHz] (nom.)		
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit		Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
		> 1 MHz (RBW = 1 kHz)	0.5 µA/m (typ.)	0.85 µA/m (typ.)
Measurement range limit (for single CW signal)		560 mA/m (typ.)		
RF connector		N-Connector, 50 Ω, male		

General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			470 g	
Dimensions			450 mm length; 120 mm antenna head diameter	
Calibration			178 reference points: The SignalShark basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	

Measurement uncertainty			
Expanded measurement uncertainty[m] (in conjunction with SignalShark basic unit and 1.5 m RF cable)	Frequency range	Single-axis measurement with isotropic antenna	Isotropic measurement
	0.009 to 0.5 MHz	2.8 dB	3.1 dB
	> 0.5 to 60 MHz	2.7 dB	3.0 dB
	> 60 to 250 MHz	2.8 dB	3.7 dB

l For a signal to noise ratio of 10 dB (RBW = 1 kHz); 3 MHz to 250 MHz

m Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12

Specifications - Single axis antennas

Single-axis antenna (E-field) 3531/01

RF Data				
Frequency range			27 MHz to 3 GHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.	
Antenna type			E-field	
Sensor type			Single-axis passive broadband dipole	
Dynamic range[n]			60 µV/m to 80 V/m (typ.)	
Maximum field strength (destruction limit)			> 300 V/m or 25 mW/cm² (nom.)	
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit			20 µV/m (typ.) from 100 MHz to 2.2 GHz with RBW = 1 kHz	
Measurement range limit (for single CW signal)			160 V/m (typ.)	
RF connector			N-Connector, 50 Ω, male	
General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			450 g	
Dimensions			460 mm length; 135 mm x 90 mm antenna head diameter	
Calibration			24 reference points: (26, 30, 40, 50, 60, 75, 100, 200, 300, 433, 600, 750, 900) MHz (1, 1.2, 1.4, 1.6, 1.8, 2, 2.2, 2.45, 2.6, 2.8 , 3) GHz The SignalShark basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	

Measurement uncertainty		
Expanded measurement uncertainty[o] (in conjunction with SignalShark basic unit and 1.5 m RF cable)	Frequency range	Single-axis measurement
	26 to 200 MHz	2.7 dB
	> 200 to 433 MHz	2.8 dB
	> 433 to 1600 MHz	2.7 dB
	> 1600 to 2500 MHz	2.4 dB
	> 2500 to 3000 MHz	2.5 dB

n *For a signal to noise ratio of 10 dB (RBW = 1 kHz); 100 MHz to 2.2 GHz*

o *Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12*

Single-axis antenna (E-field) 3531/04

RF Data				
Frequency range			9 kHz to 300 MHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.	
Antenna type			E-field	
Sensor type			Single-axis active broadband dipole	
Dynamic range[p]			50 µV/m to 16 V/m (typ.) for 300 kHz to 10 MHz 50 µV/m to 36 V/m (typ.) for > 10 MHz to 300 MHz	
Maximum field strength (destruction limit)			> 1000 V/m (nom.)	
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit			20 µV/m (typ.) for each frequency > 1 MHz with RBW = 1 kHz	
Measurement range limit (for single CW signal)			50 V/m (typ.)	
RF connector			N-Connector, 50 Ω, male	
General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			550 g	
Dimensions			460 mm length; 135 mm x 90 mm antenna head diameter	
Calibration			183 reference points: The SignalShark EMF basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	
Measurement uncertainty				
Expanded measurement uncertainty[q] (in conjunction with SignalShark basic unit and 1.5 m RF cable)			Frequency range	Single-axis measurement
			0.009 to 300 MHz	2.7 dB
			> 0.03 to 300 MHz	2.4 dB

p *For a signal to noise ratio of 10 dB (RBW = 1 kHz)*

q *Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12*

Single-axis antenna (H-field) 3551/02

RF Data				
Frequency range			9 kHz to 300 MHz The correction factors determined individually during calibration are stored in an EEPROM and are applied automatically when used in conjunction with the SignalShark basic unit.	
Antenna type			H-field	
Sensor type			Single-axis active magnetic loop	
Dynamic range[r]			0.4 µA/m to 71 A/m (typ.)	
Maximum field strength (destruction limit)			> 2.65 A/m above 1 MHz (nom.)	
Displayed Average Noise Level (DANL) in conjunction with the SignalShark basic unit			0.12 µA/m (typ.) for each frequency > 10 MHz with RBW = 1 kHz	
Measurement range limit (for single CW signal)			100 mA/m (typ.)	
RF connector			N-Connector, 50 Ω, male	

General specifications				
Operating temperature range			-10 °C to +50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K4 (IEC 60721-3) -40 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (antenna connected)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and IEC/EN 61326 -1: 2021	
		Immunity	IEC/EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emission	IEC/EN: 61000-3-2, 61000-3-3, IEC/EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and IEC/EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU, (EU)2015/863 and EN 63000:2018	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			450 g	
Dimensions			460 mm length; 43 mm x 100 mm antenna head diameter	
Calibration			183 reference points: The SignalShark EMF basic unit applies linear interpolation between reference points	
Recommended calibration interval			24 months	
Country of origin			Germany	

Measurement uncertainty		
Expanded measurement uncertainty[s] (in conjunction with SignalShark basic unit and 1.5 m RF cable)	Frequency range	Single-axis measurement
	0.009 to 300 MHz	2.7 dB
	> 0.03 to 300 MHz	2.4 dB

r *For a signal to noise ratio of 10 dB (RBW = 1 kHz); for frequencies > 10 MHz*

s *Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12*

Specifications - LNB antennas

General Specifications				
Operating temperature			-10 °C to 50 °C	
Compliance	Climatic		Storage	1K3 (IEC 60721-3) extended to -10 °C to +50 °C
			Transport	2K3 (IEC 60721-3) extended to -30 °C to +70 °C
			Operating	7K2 (IEC 60721-3) extended to -10 °C to +50 °C
	Mechanical		Storage	1M3 (IEC 60721-3)
			Transport	2M3 (IEC 60721-3)
			Operating	7M3 (IEC 60721-3)
	Ingress protection		IP 52 (USB flap closed)	
	EMC	EU	Complies with EMC Directive 2014/30/EU and EN 61326 -1: 2013	
		Immunity	EN: 61000-4-2, 61000-4-3, 61000-4-4, 61000-4-5, 61000-4-6, 61000-4-8, 61000-4-11	
		Emissions	EN: 61000-3-2, 61000-3-3, EN 55011 (CISPR 11) Class B	
	Safety		Complies with European Low Voltage Directive 2014/35/EU and EN 61010-1: 2010	
	Material		Complies with European RoHS Directive 2011/65/EU	
Air humidity (operating range)			< 29 g/m³ (< 93 % RH at +30 °C), non-condensing	
Weight			615 g	
Dimensions			485 mm length; 78 mm antenna head diameter (19.1'' length; 3.1'' antenna head diameter)	
Power supply			USB C, operation and charge at least 1 A	
Operating time			Appr. 4h operation with internal battery. Can also be operated with an external USB power bank.	
Recommended calibration interval			24 months	
Country of origin			Germany	

3591/01 LNB Antenna, 24.25 GHz to 29.5 GHz, directional

General specification				
Antenna type		E-Field		
Sensor type		Downconverter with directional antenna design		
RF connector		N-connector, 50 Ω, male		
Frequency				
Frequency range		Band A: 24.25 GHz to 27.5 GHz Band B: 26.5 GHz to 29.5 GHz The frequency band can be selected in the user interface of the basic unit.		
SSB phase noise		f_c	df = 10 kHz	df = 100 kHz	df = 10 MHz
		26 GHz	< -83 dBc (1/Hz)	< -90 dBc (1/Hz)	< -112 dBc (1/Hz)
Internal reference frequency		Deviation:		< 1 ppm	
		Aging:		< 1 ppm/year, < 5 ppm over 15 years	
		Thermal drift:		< 1.5 ppm (-10 °C to +50 °C)	
Amplitude					
Dynamic Range	Noise Figure @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz		< 33 dB	
		24.25 GHz ≤ f ≤ 29.5 GHz		26 dB (typ.)	
	2nd order intercept point (IP2, 2 tones) @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz			
	3rd order intercept point (IP3, 2 tones) @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz		10 dBm (typ.)	
Level uncertainty Residual spurs @ attenuator = 0 dB		24.25 GHz ≤ f ≤ 29.5 GHz		< 1.8 dB	without cable
		24.25 GHz ≤ f ≤ 29.5 GHz		< -80 dBm	exceptions < -60 dBm
IF rejection		> 60 dB			
Image rejection		70 dB typ.			
Attenuator		10 dB The attenuator of the antenna can be switched on/off in the user interface of the basic unit.			
RF input					
Type		Directional antenna			
RF destruction limit		225 V/m			
Max. nominal RF level		100 V/m			
Spurs Emmisions		> -70 dBm			
Measurement uncertainty					
Expanded measurement uncertainty[t] (in conjunction with SignalShark basic unit and 1.5 m RF cable)		Frequency range	Directional measurement		
		24.25 to 29.5 GHz	2.7 dB		

t *Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12*

3591/02 LNB Antenna, 24.25 GHz to 29.5 GHz, omnidirectional

General specification					
Antenna type		E-Field			
Sensor type		Downconverter with omnidirectional antenna design			
RF connector		N-connector, 50 Ω, male			
Frequency					
Frequency range		Band A: 24.25 GHz to 27.5 GHz Band B: 26.5 GHz to 29.5 GHz The frequency band can be selected in the user interface of the basic unit.			
SSB phase noise		f_c	df = 10 kHz	df = 100 kHz	df = 10 MHz
		26 GHz	< -83 dBc (1/Hz)	< -90 dBc (1/Hz)	< -112 dBc (1/Hz)
Internal reference frequency		Deviation:		< 1 ppm	
		Aging:		< 1 ppm/year, < 5 ppm over 15 years	
		Thermal drift:		< 1.5 ppm (-10 °C to +50 °C)	
Amplitude					
Dynamic Range	Noise Figure @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz		< 33 dB	
		24.25 GHz ≤ f ≤ 29.5 GHz		26 dB (typ.)	
	2nd order intercept point (IP2, 2 tones) @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz			
	3rd order intercept point (IP3, 2 tones) @ attenuator = 0 dB	24.25 GHz ≤ f ≤ 29.5 GHz		10 dBm (typ.)	
Level uncertainty Residual spurs @ attenuator = 0 dB		24.25 GHz ≤ f ≤ 29.5 GHz		< 1.8 dB	without cable
		24.25 GHz ≤ f ≤ 29.5 GHz		< -80 dBm	exceptions < -60 dBm
IF rejection		> 60 dB			
Image rejection		70 dB typ.			
Attenuator		10 dB The attenuator of the antenna can be switched on/off in the user interface of the basic unit.			
RF input					
Type		Omnidirectional antenna			
RF destruction limit		435 V/m			
Max. nominal RF level		200 V/m			
Spurs Emmisions		> -70 dBm			
Measurement uncertainty					
Expanded measurement uncertainty[u] (in conjunction with SignalShark basic unit and 1.5 m RF cable)		Frequency range	Single-axis measurement		
		24.25 to 29.5 GHz	3.0 dB		

u Valid for the temperature range -10 °C to +50 °C, according to the "Definitions and Conditions" on page 12

IEC 62232 conformity for Frequency-selective measurement system

All mentioned values are in compliance with IEC 62232:2022 as well as HJ 1151-2020.
The specified uncertainties in the tables below are evaluated under the following conditions:

› SignalShark basic unit, antenna and RF cable (P/N 3604/01 or 3604/02) included
› Temperature range: -10 to +50 °C

SignalShark 3310 with Three-Axis Antenna, 27 MHz to 3 GHz (3501/03)

Frequency response	Minimum detection level	Dynamic range	Linearity	Probe isotropy[v, w]	
27 MHz to 3 GHz: ± 1.5 dB	< 0.01 mW/m² (i.e. 0.06 V/m) Signal-to-noise ratio of at least 10 dB in the measurement bandwidth	> 60 dB	≤ 1.2 dB	< 700 MHz: 700 MHz to 3 GHz:	< 2 dB < 3 dB

SignalShark 3310 with Three-Axis Antenna, 200 MHz to 8 GHz (3502/03)

Frequency response	Minimum detection level	Dynamic range	Linearity	Probe isotropy[v, w]	
200 MHz to 8 GHz: ± 1.5 dB	< 0.01 mW/m² (i.e. 0.06 V/m) Signal-to-noise ratio of at least 10 dB in the measurement bandwidth	> 60 dB	≤ 1.2 dB	200 MHz to 2 GHz: 2 GHz to 4 GHz: 4 GHz to 6 GHz: > 6 GHz:	< 2 dB < 3 dB < 4 dB < 5 dB

Measurement uncertainty of SignalShark 3310 with Three-Axis or Omnidirectional Antennas

	Expanded uncertainty (k = 2)			
Frequency range	**Antenna 3581/02**	**Antenna 3501/03**	**Antenna 3502/03**	**Antenna 3591/02**
< 60 MHz	3.07 dB	4.27 dB		
60 MHz to 250 MHz	3.77 dB	4.27 dB		
200 MHz to 300 MHz		3.67 dB	3.75 dB	
300 MHz to 800 MHz		3.55 dB	3.37 dB	
800 MHz to 3 GHz		4.13 dB	2.90 dB	
3 GHz to 4.5 GHz			2.81 dB	
4.5 GHz to 7.5 GHz			3.93 dB	
7.5 GHz to 8 GHz			5.01 dB	
24.25 GHz to 29.5 GHz				2.95 dB

The specified uncertainties in the table “Measurement uncertainty of SignalShark 3310 Three-Axis or Omnidirectional Antennas“ above are evaluated under the following additional condition:

› Frequency Response and Linearity included

v The antenna is rotated about its ortho-axis for each frequency. The isotropic response is calculated from the maximum and minimum indication after a full revolution of 360° has been made.

w Probes and measurement antennas with isotropic response are recommended. Single-axis (e.g. dipole) and directional measurement antennas are permitted provided that the measurements are post processed to obtain the total field strength (equivalent to a measurement with an isotropic probe / measurement antenna).

Isotropic Response of SignalShark 3310 with Three-Axis Antennas

	Isotropic response[x]	
Frequency range	**Antenna 3501/03**	**Antenna 3502/03**
< 300 MHz	0.5 dB	2.0 dB
300 MHz to 800 MHz	0.5 dB	0.75 dB
800 MHz to 2 GHz	2.2 dB	0.75 dB
2 GHz to 3 GHz	2.2 dB	1.0 dB
3 GHz to 5 GHz		1.5 dB
> 5 GHz to 7.5 GHz		2.5 dB

x The antenna is rotated about its ortho-axis for each frequency. The isotropic response is calculated from the maximum and minimum indication after a full revolution of 360° has been made.

Ordering Information

The ‘Application Packages EMF’ are especially made to make it easy to adapt SignalShark to your requirements for performing various types of EMF tasks. Each package typically consists of application-dependent hardware accessories and/or firmware options, and costs less than purchasing the items individually. The SignalShark Basic Unit is included in all ‘Application Packages EMF’.
‘Application Packages Radio Monitoring, Direction Finding (DF) and Interference Finding’ as well as Software Options and Accessories that provide additional signal analysis capabilities are also available and can be purchased as and when required.
Your local Narda sales representative will be happy to assist you in the selection of the right packages for your applications.

***Note:** The functionality of 5G software features and 5G FR2 LNB antennas is compatible with SignalShark Basic Unit (3310/01) firmware version 2.0.0 and later.*

Application Packages EMF

SignalShark 3310, EMF App. Package 1	Part number
Basic Unit, no backpack, no antennas. **Includes:** › SignalShark Basic Unit (40 MHz RTBW) (3310/01) › RF-Cable, DC to 8 GHz, N 50 Ohm, 1.5m (3604/01) › 2x Battery Pack, Rechargeable › Power Supply 12VDC, 5.5A, 100V-240VAC, plug (2259/92.09) - choose Power Cord 2260/90.65 - 69 › Ferrit clamp filter (2260/90.75) › Holding Strap SignalShark (3310/90.07) › Touch Pen for Resistive Touch Screen (3300/90.07) › Clip-On Lanyard (2280/90.03) › Mounting instructions for Holding strap - to be downloaded at narda-sts.com › USB Stick: Software and Manuals, ordered Options (3310/93.01) › EMF Software Configuration - Color Scheme, EMF Setup Filter, SignalShark 5G Analyzer SW[y], NSL: Converter Scripts, Report Script › Option, SCPI Remote Control (3310/95.012) › Electronic manual (English) › Safety Instructions (3300/98.10) › SignalShark 3310 - Quick Start Guide (3310/98.12) › Calibration certificates: Basic unit, RF cable	**3310/94.21**

SignalShark 3310 EMF, App. Package 2	Part number
Basic Unit plus backpack, no antennas. **Includes:** › SignalShark Basic Unit (40 MHz RTBW) (3310/01) › RF-Cable, DC to 8 GHz, N 50 Ohm, 1.5m (3604/01) › 2x Battery Pack, Rechargeable › Power Supply 12VDC, 5.5A, 100V-240VAC, plug (2259/92.09) - choose Power Cord 2260/90.65 - 69 › Ferrit clamp filter (2260/90.75) › Holding Strap SignalShark (3310/90.07) › Touch Pen for Resistive Touch Screen (3300/90.07) › Clip-On Lanyard (2280/90.03) › Mounting instructions for Holding strap - to be downloaded at narda-sts.com › USB Stick: Software and Manuals, ordered Options (3310/93.01) › EMF Software Configuration - Color Scheme, EMF Setup Filter, SignalShark 5G Analyzer SW[y], NSL: Converter Scripts, Report Script › Option, SCPI Remote Control (3310/95.012) › Electronic manual (English) › Safety Instructions (3300/98.10) › SignalShark 3310 - Quick Start Guide (3310/98.12) › Calibration certificates: Basic unit, RF cable › Backpack for SignalShark with Tripod Function (3310/90.02)	**3310/94.22**

y To use the software for measurements an isotropic antenna, a 5G-capable device and the options 3310/95.002 ‘Spectrogram’, 3310/95.012 ‘SCPI Remote Control’ (included) and 3310/95.020 ‘SignalShark 5G Analyzer Measurement’ are required. For more information, see ““SignalShark 5G Analyzer” (Sk5G) Software” on page 2

SignalShark 3310 EMF, App. Package 3	Part number
Basic Unit plus backpack and one isotropic antenna (200 MHz to 8 GHz). **Includes:** › SignalShark Basic Unit (40 MHz RTBW) (3310/01) › Antenna, 3-Axes, E-Field, 200 MHz to 8 GHz (3502/03) › RF-Cable, DC to 8 GHz, N 50 Ohm, 1.5m (3604/01) › 2x Battery Pack, Rechargeable › Power Supply 12VDC, 5.5A, 100V-240VAC, plug (2259/92.09) - choose Power Cord 2260/90.65 - 69 › Ferrit clamp filter (2260/90.75) › Holding Strap SignalShark (3310/90.07) › Touch Pen for Resistive Touch Screen (3300/90.07) › Clip-On Lanyard (2280/90.03) › Mounting instructions for Holding strap - to be downloaded at narda-sts.com › USB Stick: Software and Manuals, ordered Options (3310/93.01) › EMF Software Configuration - Color Scheme, EMF Setup Filter, SignalShark 5G Analyzer SW[z], NSL: Converter Scripts, Report Script › Option, SCPI Remote Control (3310/95.012) › Electronic manual (English) › Safety Instructions (3300/98.10) › SignalShark 3310 - Quick Start Guide (3310/98.12) › Calibration certificates: Basic unit, RF cable, isotropic antenna › Backpack for SignalShark with Tripod Function (3310/90.02)	**3310/94.23**

SignalShark 3310 EMF, App. Package 4	Part number
Basic Unit plus backpack and two isotropic antennas (9 kHz to 8 GHz). **Includes:** › SignalShark Basic Unit (40 MHz RTBW) (3310/01) › Antenna, 3-Axes, H-Field, 9 kHz to 250 MHz (3581/02) › Antenna, 3-Axes, E-Field, 200 MHz to 8 GHz (3502/03) › RF-Cable, DC to 8 GHz, N 50 Ohm, 1.5m (3604/01) › 2x Battery Pack, Rechargeable › Power Supply 12VDC, 5.5A, 100V-240VAC, plug (2259/92.09) - choose Power Cord 2260/90.65 - 69 › Ferrit clamp filter (2260/90.75) › Holding Strap SignalShark (3310/90.07) › Touch Pen for Resistive Touch Screen (3300/90.07) › Clip-On Lanyard (2280/90.03) › Mounting instructions for Holding strap - to be downloaded at narda-sts.com › USB Stick: Software and Manuals, ordered Options (3310/93.01) › EMF Software Configuration - Color Scheme, EMF Setup Filter, SignalShark 5G Analyzer SW[z], NSL: Converter Scripts, Report Script › Option, SCPI Remote Control (3310/95.012) › Electronic manual (English) › Safety Instructions (3300/98.10) › SignalShark 3310 - Quick Start Guide (3310/98.12) › Calibration certificates: Basic unit, RF cable, isotropic antennas › Backpack for SignalShark with Tripod Function (3310/90.02)	**3310/94.24**

z To use the software for measurements an isotropic antenna, a 5G-capable device and the options 3310/95.002 'Spectrogram', 3310/95.012 'SCPI Remote Control' (included) and 3310/95.020 'SignalShark 5G Analyzer Measurement' are required. For more information, see ""SignalShark 5G Analyzer" (Sk5G) Software" on page 2

Application Packages Radio Monitoring, Direction Finding (DF) and Interference Finding

The 'Application Packages Radio Monitoring, Direction Finding (DF) and Interference Finding' are especially made to make it easy to adapt SignalShark to your requirements for performing various types of monitoring, direction finding or interference tasks. Each package typically consists of application-dependent hardware accessories and/or firmware options, and costs less than purchasing the items individually. Additional packages can be purchased as and when required.
Your local Narda sales representative will be happy to assist you in the selection of the right packages for your applications.

App. Package, Off-Site Extension	Part number
This Application Package provides suitable accessories for applications that involve operation in vehicles or outdoors. A hard shell case with wheels and a retractable handle provides secure (IP 67) the transport of the SignalShark and all accessories. The DC adapter enables powering the device from a vehicle. An easily and quickly worn carry strap provides hands-free support for viewing the SignalShark allowing even long-term measurements to be made comfortably. **Includes:** › Power Supply DC Vehicle Adapter, screw plug (2259/92.12) › Double Charger Set, External for 2259/92.16 (2259/92.17) - choose Power Cord 2260/90.70 - 74 Consists of: 2x single bay charger - Charger Set, External (2259/92.14) › Vehicle power adapter for charger set 2259/92.17 (2259/92.15) Consists of: Car/Truck Power Adapter (2259/92.18) Power Splitter Cable (2259/92.19) › Carrying Strap for Basic Unit (3300/90.08) › Headphone, 3.5mm Plug (3300/90.14) › 10.4'' Screen Protector Film (3310/90.04) › Hardcase for SignalShark 3310 (3310/90.05) - fits the Basic Unit and the Directional Antennas only	**3310/94.07**

App. Package, Remote Control	Part number
Option VITA 49 requires option SCPI Remote Control for device setup and streaming control. This application package makes it easy to obtain the greatest benefits of SignalShark's remote control functionality. **Includes:** › Option, SCPI Remote Control (3310/95.012) › Option, VITA 49 (3310/95.14)	**3310/94.10**

App. Package, Receiver	Part number
The Receiver Application Package guarantees situational awareness by providing gapless analysis of entire signal bands. It also enables demodulation of AM, FM, LSB, USB, and CW signals. **Includes:** › Option, Spectrogram (3310/95.002) › Option, Level Meter incl. Compass values (3310/95.003) › Option, Analog Demodulation (3310/95.007)	**3310/94.01**

App. Package, Direction Finding Basic	Part number
This Application Package provides comprehensive functions to support hunting of interference signals and hidden transmitters. The device based GPS and the antenna handle with built-in electronic compass makes it possible to conveniently take bearings on a transmitter from various locations. **Includes:** › Active Antenna Handle for SignalShark, 8 kHz to 8 GHz (3300/10) › Arm Support for Active Antenna Handle (3100/90.10) › Option, Mapping and Localization (3310/95.006) › Option, Horizontal Scan (3310/95.011)	**3310/94.02**

App. Package, Antenna Basic Kit (Mobile Operators)[aa]	Part number
This Application Package provides you with a lightweight yet robust directional antenna for the frequency range from 400 MHz to 8 GHz and covers cellular communication as well as other service bands. The Package also includes an antenna adapter that allows you to use your own antennas together with the Antenna Handle. This enables you to benefit from the integrated compass, low noise amplifier, and automatic polarization detector in the handle when using your own **Includes:** › Directional Antenna 3, 400 MHz to 8 GHz (3100/13) › Antenna Adapter, N Male (3100/15)	**3106/92.03**

App. Package, Antenna Extension Kit	Part number
This Application Package complements and completes the Antenna Basic Kit Application Package so that you can make the best use of the entire frequency range from 8 kHz to 8 GHz. **Includes:** › Directional Antenna 1, 20 MHz to 250 MHz (3100/11) › Directional Antenna 2, 200 MHz to 500 MHz (3100/12) › Loop Antenna, H-Field, 8 kHz to 30 MHz (3100/14)	**3106/92.04**

App. Package, Automatic DF 2, 10 MHz to 8 GHz[ab]	Part number
This Application Package provides basic equipment and options for vehicle based, automatic direction finding (bearing). **Includes:** › Automatic DF-Antenna 2 (3361/01) › USB Stick: Software and Manuals, ordered Options (3310/93.01) › RF-Cable, DC to 8 GHz, N to SMA, 50 Ohm, 5 m (3603/02) › Option, Automatic DF Antenna Control, Bearing View (3310/95.005) › Tool, Allen Wrench 3 mm (3300/90.19) › ADFA Vehicle Mounting Kit for autom. DF Antenna (3300/90.04) incl. the “Automatic DF-Antenna Handling and Safety Instructions” multilingual (3360/98.12) › Shipping Carton with Inlet for autom. DF-Antenna	**3310/94.06**

App. Package, Automatic DF 2, 10 MHz to 8 GHz, Hardcase[ab]	Part number
This Application Package provides basic equipment and options for vehicle based, automatic direction finding (bearing). **Includes:** › Automatic DF-Antenna 2 (3361/01) › USB Stick: Software and Manuals, ordered Options (3310/93.01) › RF-Cable, DC to 8 GHz, N to SMA, 50 Ohm, 5 m (3603/02) › Option, Automatic DF Antenna Control, Bearing View (3310/95.005) › Tool, Allen Wrench 3 mm (3300/90.19) › ADFA Vehicle Mounting Kit for autom. DF Antenna (3300/90.04) incl. the “Automatic DF-Antenna Handling and Safety Instructions” multilingual (3360/98.12) › Hardcase for Automatic DF Antenna (3360/90.01)	**3310/94.12**

aa Additional option 3310/95.006 ‘Mapping and Localization’ is recommended for Open Street Map based visualization and heatmap localization as well as the 3300/10 ‘Active Antenna Handle for SignalShark, 8 kHz to 8 GHz’.

ab Additional option 3310/95.006 ‘Mapping and Localization’ is recommended for Open Street Map based visualization and heatmap localization.

Software Options

Software options allow the adaption of the device feature set to your needs.

Description	Part number
40 MHz real-time Spectrum, Marker and Peak Table (included in all SignalShark App. Packages)	**3310/95.001**
Option, Spectrogram (RT Spectrum and Scan Spectrum)	**3310/95.002**
Option, Level Meter incl. Compass values (RT Spectrum)	**3310/95.003**
Option, Persistence (of real-time Spectrum)	**3310/95.004**
Option, Automatic DF Antenna Control, Bearing View (AutoDF)	**3310/95.005**
Option, Mapping and Localization (RT Spectrum, Scan Spectrum, AutoDF)	**3310/95.006**
Option, Analog Demodulation (RT Spectrum)	**3310/95.007**
Option, Horizontal Scan (RT Spectrum)	**3310/95.011**
Option, SCPI Remote Control (included in all SignalShark 3310 EMF App. Packages)	**3310/95.012**
Option, VITA 49[ac]	**3310/95.014**
Option, IQ Analyzer, Recorder, Trigger, Magn. View	**3310/95.018**
Option, SignalShark 5G Analyzer Measurement[ad]	**3310/95.020**
Option, 4G EMF Decoder	**3310/95.021**
Option, 5G EMF Decoder	**3310/95.022**
SignalShark 5G Analyzer Software[ae] (included in all SignalShark 3310 EMF App. Packages)	**3300/93.12**
SignalShark 3310 EMF Tools, Configuration Software (available for free at www.narda-sts.com under Downloads)	**3300/93.01**

ac Requires Option 3310/95.012 'SCPI Remote Control'

ad Requires Options 3310/95.002 'Spectrogram' and 3310/95.012 'SCPI Remote Control'

ae To use the software for measurements an isotropic antenna, a 5G-capable device and the options 3310/95.002 'Spectrogram', 3310/95.012 'SCPI Remote Control' (included) and 3310/95.020 'SignalShark 5G Analyzer Measurement' are required. For more information see ""SignalShark 5G Analyzer" (Sk5G) Software" on page 2

Accessories

Accessory Description	Part number
RF-Cable, DC to 8 GHz, N 50 Ohm, 1.5m	**3604/01**
RF-Cable, DC to 8 GHz, N 50 Ohm, 5m	**3604/02**
RF Adapter, N Male to SMA Female, 50 Ohm	**3300/90.13**
N-Connector Saver	**3001/90.14**
RF and Control-Cable for Automatic DF-antennas, DC to 8 GHz, N to SMA, 50 Ohm, 5 m	**3603/02**
RF and Control-Cable for Automatic DF-antennas, DC to 8 GHz, N to SMA, 50 Ohm, 15 m	**3603/03**
RF and Control-Cable for Automatic DF-antennas, DC to 8 GHz, N to SMA, 50 Ohm, 10 m	**3603/07**
Power Supply 12VDC, 5.5A, 100V-240VAC, Non-Locking Power Plug S1017, choose Power Cord 2260/90.65 -.69	**2259/92.09**
Power Supply DC Vehicle Adapter, screw plug	**2259/92.12**
Battery Pack Set, rechargeable, Li-Ion, 2 x RRC2057, Li-Ion, 7V5 , 6.4Ah	**2259/92.16**
Double Charger Set, external, for 2259/92.16, choose Power Cord 2260/90.70 -.74 Consists of: 2x single bay charger - Charger Set, External (2259/92.14)	**2259/92.17**
Vehicle power adapter for charger set 2259/92.17 Consists of: Car/Truck Power Adapter (2259/92.18) Power Splitter Cable (2259/92.19)	**2259/92.15**
Power Supply USB-C PD, AU/EU/UK/US Plugs (for 3591/0x antennas)	**2259/92.29**
Cable, 2x USB-C(M), 3A, 2m (for 2259/92.29)	**2260/90.76**
Ferrite clamp filter for USB cable	**2260/90.90**
Car Charger Adapter, USB-C PD	**2259/92.28**
External GNSS Antenna, active	**3300/90.05**
Antenna Holder for Uniaxial/Triaxial Antenna	**3501/90.01**
Antenna Holder for Triaxial Antenna	**3501/90.02**
Tripod, Non-Conductive, 1.65 m, 1/4”, with Carrying Bag	**2244/90.31**
Tripod Extension, 0.50m, Non-Conductive	**2244/90.45**
Tripod, Non-Conductive, 1.65m, reinforced, 3/8”-16 UNC (for ADFA 2 only)	**3300/90.16**
Tripod Quick-Release Coupling, 3/8”-16 UNC (for 3300/90.16)	**3300/90.17**
ADFA Non-Conductive Antenna Mast Mounting Kit	**3300/90.23**
Holding Strap SignalShark incl. Touch Pen, Lanyard Consists of: Holding Strap SignalShark (3310/90.07) Touch pen for resistive touch screen (3300/90.07) Clip-On Lanyard (2280/90.03) Mounting instructions for Holding strap (to be downloaded at narda-sts.com)	**3310/90.06**
Carrying Strap for Basic Unit	**3300/90.08**
Backpack for SignalShark with Tripod Function	**3310/90.02**
Headphone, 3.5mm Plug for SignalShark	**3300/90.14**
Recovery media for SignalShark Quad Core	**3310/90.25**
10.4’’ Screen Protector Film	**3310/90.04**
LNB Antenna - Quick Start and Safety Instructions	**3591/98.12**
Safety Instructions	**3300/98.10**
SignalShark 3310 - Quick Start Guide	**3310/98.12**

Antennas*	Part number
Antenna, Three-Axis, E-Field, 27 MHz to 3 GHz	**3501/03**
Antenna, Three-Axis, E-Field, 200 MHz to 8 GHz	**3502/03**
Antenna, Three-Axis, H-Field, 9 kHz to 250 MHz	**3581/02**
Antenna, Single-Axis, E-Field, 27 MHz to 3 GHz	**3531/01**
Antenna, Single-Axis, E-Field, 9 kHz to 300 MHz	**3531/04**
Antenna, Single-Axis, H-Field, 9 kHz to 300 MHz	**3551/02**
Antenna, Set 5G FR2 Antenna, directional, 24.25 to 29.5 GHz.	**3591/101**
Antenna, Set 5G FR2 Antenna, omnidir., 24.25 to 29.5 GHz.	**3591/102**
Antenna, Set 5G FR2 Antenna, dir. + omni., 24.25 to 29.5 GHz.	**3591/103**
Directional Antenna 1, 20 MHz to 250 MHz	**3100/11**
Directional Antenna 2, 200 MHz to 500 MHz	**3100/12**
Directional Antenna 3, 400 MHz to 8 GHz	**3100/13**
Loop Antenna, H-Field, 8 kHz to 30 MHz	**3100/14**
Antenna Adapter, N Male for Handle 3100/10 and 3300/10	**3100/15**
Arm Support for Active Antenna Handle	**3100/90.10**
Active Antenna Handle for SignalShark, 8 kHz to 8 GHz	**3300/10**
Automatic DF-Antenna 2 Basic Set, 10 MHz to 8 GHz[af] Consists of: Automatic DF-Antenna 2 (3361/01) Tool, Allen Wrench 3 mm (3300/90.19) Autom. DF-Antenna Handling and Safety Instructions (3360/98.12) Shipping Carton with Inlet for autom. DF-Antenna	**3361/101**

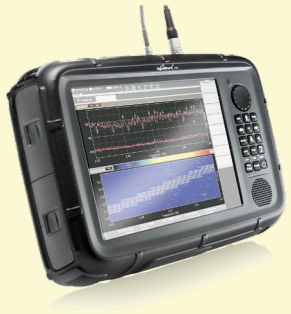
*There are separate datasheets for “DF Antennas” as well as a “5G FR2 LNB Antenna”, which provide detailed information about the direction-finding antennas and the 5G FR2 LNB antennas available from Narda.

af Requires Option 3310/95.005 ‘Automatic DF Antenna Control, Bearing View’

SignalShark Family

There are several different instrument types in the SignalShark family:
SignalShark Handheld, SignalShark Remote Unit, SignalShark Outdoor Unit Modem R[n] Basic Set, SignalShark DF Receiver Module and SignalShark EMF Monitoring System, R[n].
For more information, please visit our website www.narda-sts.com

SignalShark Handheld



SignalShark Remote Unit

SignalShark Outdoor Unit

SignalShark DF Receiver Module

SignalShark EMF Monitoring System

SignalShark and Narda Antennas documentation

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