Interference and Direction Analyzer

Portable signal analyzer for radio monitoring and interference analysis from 9 kHz to 6 GHz. Active directional antennas with embedded electronic compass for emission location

▲ Extremely fast sweep time at 12 GHz/s
▲ Real-time bandwidth of up to 32 MHz for intercepting short term signals
▲ Direction Finding Mode with automatic azimuth determination
▲ Embedded GPS receiver and electronic compass for easy emitter location
▲ smartDF® manages triangulation results and automatically calculates emitter positions
▲ Rugged and highly size-efficient low weight package (less than 3 kg)

OPTIONAL
▲ Mapping capabilities with onboard maps stored on microSD card
▲ High resolution oscilloscopic view for signal classification
▲ I/Q demodulation recorder
DESCRIPTION
IDA-3106 is a highly sensitive signal analyzer combining excellent RF signal selectivity with high speed monitoring capabilities and built-in geolocation tools including dual-compass and mapping software. The system is designed for portable use and outdoor field applications as well as for indoor emitter location and is the ideal solution when high mobility and rapid deployment are essential.

The main tasks for IDA-3106 are detecting, classifying and localizing RF signals. The unique directional antenna set with embedded electronic compass and data communication between antenna and analyzer makes these jobs very easy. Outstanding for a portable device are such features as Horizontal Scan with automatic azimuth determination and smartDF® for auto calculation of emitter positions.

The rugged, ergonomic design withstands mechanical stress, foul weather conditions and very high RF exposure.

APPLICATIONS
Further rapid growth in the use of mobile wireless technologies is certain. The risk of RF interference due to unintended emissions will increase as a result. IDA-3106 has been developed to quickly detect and find any kind of RF emission. Some example applications are:

- Detecting interference caused by industrial facilities
- Securing communication at mega events
- Localization of emergency transmitters
- Jammer location
- Radio monitoring tasks
- Security-critical missions
- Localization of miniature transmitters
- Signal monitoring for border patrols
- Close range reconnaissance
- Detection of improvised explosive devices (IED)
OPERATING MODES

Detecting, classifying and localizing emissions successfully greatly depends on result visualization. IDA-3106 meets this requirement, thanks to its various operating modes and impressive presentation of measurement results. The following operating modes are available:

- SPECTRUM
- DIRECTION FINDING
- MULTI-CHANNEL POWER
- LEVEL METER
- SCOPE and IQ Demodulation (option)

**Spectrum**

Spectrum mode provides extremely fast scans across the entire frequency range, ideal for detecting, monitoring and analyzing all kinds of signals. A full 6 GHz spectrum scan is performed in less than 500 ms, even for high-resolution results (RBW = 500 kHz, 250 kHz marker resolution).

The extremely low noise level down to -30 dBµV/m in conjunction with Narda Directional Antennas allows the detection even of very low-power devices.

Resolution bandwidths range from 10 Hz to 20 MHz to match any modern communications equipment or even of pulsed signals. Maximum (Max), average value (Avg) and minimum (Min) traces allow initial classification of the nature of a signal.

Suspect signals can be isolated using convenient marker functions, can be quickly zoomed in on and directly transferred to the other operating modes for in-depth analysis.

SPECTROGRAM view is ideal for long-term surveillance of the RF spectrum and identification of permanent, transient and frequency-hopping signals. This view also allows identification of emitters with varying power and/or varying bandwidths.

An outstanding feature is the capability of simultaneously recording RMS, +Peak and -Peak traces of the spectrogram.

The large 7-inch color display presents the results as:

- a spectrum,
- a spectrogram,
- a spectrum and spectrogram,
- or as a table of highest peaks
Direction Finding

(requires Narda directional antennas)

- **Manual Bearing**
  Once the signals of interest have been identified, bar graph and numerical representation of the signal level make it easy to determine the direction (maximum level). Alongside the screen information, an audible tone dependent on field strength is available to enable location of hot spots without looking at the monitor. The demodulated signal can be observed at the same time. The current antenna orientation is displayed on the IDA screen, and is updated continuously with the aid of an embedded electronic compass. Supplemented by the position measured by the integrated GPS receiver, this provides ideal support for classical direction finding.

- **Horizontal Scan**
  Horizontal Scan provides accurate and automatic determination of the azimuth of the targeted emitter. For each frequency of interest a scan is started and stopped by pushbutton on the antenna handle, with the antenna being smoothly rotated horizontally during the scan. A transmitter table of frequencies can be created to simplify and speed up scanning of multiple signals. The measurement results of a horizontal antenna scan are shown in a polar diagram. Based on this information, IDA calculates the most likely direction of the emitter. Continuous or discrete point scans can be performed. A Max Hold function allows location even of interrupted signals. Audio indication helps to keep the antenna levelled to obtain best scan accuracy. As soon as the scan result has been saved, smartDF handles further processing.

- **smartDF®**
  Localization can be performed by triangulation from at least two direction-finding results. An additional estimation of the distance to the emitter can be made by considering the signal attenuation vs. distance. The smartDF algorithm determines latitude and longitude of the targeted emitter based on the saved Horizontal Scan or Manual Bearing results. Positions and directions are displayed as a graph, underlaid with an optional map. No more need for paper maps, compass and pencil. For indoor use (e.g. in conference rooms) smartDF supplies an editable room plan display.
Multi-Channel Power

MCP mode is perfect for a very fast overview of specified frequency bands or channels. Service tables can be defined containing up to 500 freely selectable channels each with a dedicated channel bandwidth CBW and service name. Simultaneous representation of maximum (Max), average (Avg) and minimum (Min) values allows immediate distinction between permanent and non-permanent signals.

Level Meter

Level Meter mode allows selective measurements at a defined frequency (Fcent) e.g. for monitoring a specific channel (Zero-Span operation). Resolution bandwidth (RBW) can be set according to the channel width in the range of 100 Hz to 32 MHz. The steep filter characteristics provide precise separation from adjacent channels. Peak detector values (for short pulsed) and RMS detector values (for fluctuating signals) are displayed simultaneously. Level Meter mode provides gapless and interruption-free measurements.

Scope and IQ Demodulation (Option)

Most signals can be easily classified in the time domain by analyzing the RF power versus time. IDA provides an oscilloscopic view of signals using zero span operation at a tunable fixed frequency for this purpose. The outstanding time resolution (32 ns) and extensive trigger capabilities make this mode a very powerful tool. Selectable bandwidths from 100 Hz to 32 MHz support the display of fast burst signals as well as for monitoring the power of an RF carrier over a full day. You can thus easily find out how a signal is modulated or determine data signal timing. Selecting I/Q data enables display and storage of the timing diagram of the real part (in-phase, I) and imaginary part (quadrature-phase, Q) of the signal. This allows you to analyze digitally modulated signals as well on a PC using appropriate software tools.
ACTIVE DIRECTIONAL ANTENNA SET

Narda offers a set of three directional antenna modules covering the frequency range from 20 MHz to 6 GHz. This addresses all major applications for interference and direction finding. A high sensitivity loop antenna module for lower frequencies from 9 kHz to 30 MHz is available as an accessory.

The snap-in connector of the Active Antenna Handle picks up one of the directional antenna modules aligned for either horizontally or vertically polarized signals. IDA recognizes the type of antenna, alignment (H or V) and corresponding antenna factors. Correction data based on the frequency response calibration of the handle is automatically transferred to the instrument. Inside the antenna handle a low noise, switchable amplifier (0 dB/20 dB) provides very high sensitivity for weak signals. Position sensors in combination with a 3D high resolution compass accurately determine the current antenna orientation. This information is automatically transferred to the IDA-3106 and assigned to the measured RF signal.

Measurements from different locations are tracked by the IDA embedded GPS receiver. Thus, triangulation can be performed immediately and the results then be graphically displayed on the screen of the IDA-3106. Triangulation becomes even more effective with the Option Mapping, drawing bearing results and suspected emitter positions directly onto a map.

IDA-3106 can also be used with antennas from other manufacturers, e.g. for signal monitoring with omnidirectional antennas.

OTHER FUNCTIONS

Additional functions support practical applications during measurement, analysis and evaluation. They make the IDA-3106 into a masterpiece for interference finding, triangulation and localization:

- Delta spectrum for easy detection of newly appeared emitters
- High capacity time- or event-controlled data logger
- Demodulation (via build in speaker or headphone)
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 (marked as <, >, ≥, ≤, ±, max., min.) apply under the given conditions for the product and are tested during production taking measurement uncertainty into account.

**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 (marked 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 an interval for a given measurand estimated to have a level of confidence of approximately 95 percent. 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 of the Expression of Uncertainty in Measurement" (GUM).

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**SPECIFICATIONS**

Basic Unit IDA-3106

### RF DATA *

**Frequency**
- Frequency range: 9 kHz to 6 GHz
- Phase noise (SSB): < -100 dBc/Hz (@ 300 kHz carrier offset) verified at (57.5 / 2140.5 / 4500.5) MHz
- Reference frequency:
  - Initial deviation: < 1 ppm
  - Aging: < 1 ppm/year, < 5 ppm over 15 years
  - Thermal drift: < 1.5 ppm (-10 °C to +50 °C)

**Amplitude**
- Display range: From Displayed Average Noise Level (DANL) to +20 dBm
- Reference level (RL): -30 dBm to +20 dBm in steps of 1 dB
- RF Input attenuation:
  - 0 to 50 dB in steps of 1 dB (coupled with reference level)
- Reference level setting:
  - Set individually from a list or using the "RL Search" function for determining the optimum reference level at a given time
- Level uncertainty:
  - ≤ 1.2 dB (15 °C to 30 °C) valid for Spectrum Analysis and Multi-Channel Power modes
- Displayed Average Noise Level (DANL):
  - Basic unit only:
    - f ≤ 30 MHz: < -160 dBm/Hz (noise figure < 14 dB)
    - f ≤ 2 GHz: < -156 dBm/Hz (noise figure < 18 dB)
    - f ≤ 4 GHz: < -155 dBm/Hz (noise figure < 19 dB)
    - f ≤ 6 GHz: < -150 dBm/Hz (noise figure < 24 dB)
- Displayed Average Noise Level (DANL) with Active Antenna:
  - Handle, preamp on, (typ.):
    - f ≤ 3 GHz: < -167 dBm/Hz (noise figure < 7 dB)
    - f ≤ 4 GHz: < -166 dBm/Hz (noise figure < 8 dB)
    - f ≤ 6 GHz: < -164 dBm/Hz (noise figure < 10 dB)
- 3rd order intermodulation:
  - < -60 dBc for two single tones with a level of 6 dB below RL, spaced by 1 MHz or more
- Spurious responses (input related):
  - < -60 dBc or RL: -60 dB (whichever is worse) and a carrier offset of 1 MHz or more
- Spurious responses (residual):
  - < -90 dBm (RL: -30 dBm, input attenuation = 0 dB) For (294 to 306) MHz and (4534 to 4586) MHz limited to < -85 dBm

**RF input**
- Type: N-Connector, 50 Ω, female
- Maximum RF power level:
  - +27 dBm (destruction limit)
- Maximum DC voltage:
  - ±50 V
- Return loss:
  - > 12 dB (typ.), f ≤ 4.5 GHz
  - > 10 dB (typ.), f > 4.5 GHz
  - RL: -28 dBm (input attenuation ≥ 2 dB)

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*a) RF data apply in the temperature range of 20°C to 26°C and a relative humidity between 25 % and 75 %.*
### OPERATING MODES

<table>
<thead>
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<th>Operating modes</th>
<th>Measurements vs. frequency</th>
<th>Measurements vs. time</th>
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### SPECTRUM

**Measurement principle**

- High resolution spectrum analysis with up to 27000 frequency points per spectrum

**Resolution bandwidth RBW**

- 10 Hz to 20 MHz (1-2-3-5 steps)

**Video bandwidth VBW and RMS detection**

- 0.2 Hz to 2 MHz (1-2-3-5 steps) or off coupled with selected RBW (VBW = RBW/10 ... RBW/1000)

  - RMS detection: The effective integration time for forming the RMS value can be defined as \( T = \frac{0.32}{\text{VBW}} \)

**Filter**

- Type: Gaussian
- Shape factor (-60 dB/-3 dB): 3.8 typical

**Measurement**

- Spectrum: Graphical analysis, peak table, channel power
- Delta Spectrum: Display of selected traces relative to the Reference Trace (Ref)
- Spectrogram: Visual representation of recorded spectra
- Spectrogram & Spectrum: Visual representation of recorded spectra with simultaneous view of the actual trace

**Trace (Spectrum)**

- Act: Clears the previous spectrum and displays the actual measured spectrum
- Max: Maximum hold function
- Avg: RMS averaging over a selectable number of spectra (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

**Detector (Spectrum)**

- Peak: Maximum value of all values within an interval
- RMS: Root Mean Squared average power of all the measurements within an interval
- Min: Minimum hold function
- All three detectors are used simultaneously for spectrogram recording

**Spectrogram recording**

- Frequency resolution: \( \geq \frac{\text{Fspan}}{860} \)
- Up to 400 traces (spectrogram lines)
- Observation period: approx. 4 s up to 40 hours
- Time resolution: as fast as possible, 10 ms to 5 min (1-2-5 steps) or 6 min

**Magnifier**

- Simultaneous display of the selected spectrum and a magnified section of interest (magnification level of 10x or 50x)

### LEVEL METER

**Measurement principle**

- Selective level measurement (zero span mode at a tunable fixed frequency)

**Detector**

- Peak (hold time = 480 ms)
- RMS (average time selectable from 480 ms up to 30 min)
- Peak & RMS simultaneously

**Resolution bandwidth RBW**

- 100 Hz to 32 MHz (in steps of 100, 125, 160, 200, 250, 320, 400, 500, 640, 800, 1000, …, 10 MHz, 13.333 MHz, 16 MHz, 20 MHz, 26.666 MHz, 32 MHz)

**Filter**

- Type: Steep cut-off channel filter (app. raised cosine)
- Roll-off factor: 0.16

**Video bandwidth (VBW)**

- 0.01 Hz to 32 MHz or off coupled with selected RBW (VBW = RBW/1 ... RBW/10000)

**Max Hold**

- Available for Peak and RMS detectors

**Noise threshold**

- Selectable at 0, 3, 6, 10, 15, or 20 dB relative to device noise floor. Measurement values below threshold are shown as “< absolute threshold value.”
DIRECTION FINDING - requires Narda Active Antenna Handle

Measurement principle
Selective level measurement (zero span mode at a tunable fixed frequency)
Possible parameters and settings as specified under LEVEL METER

Antenna direction indication
Numerical display of Azimuth, Elevation and Polarization determined by the embedded electronic compass of the antenna handle.

Position indication
Outdoor
Instrument position displayed as latitude and longitude (GPS WGS84) determined by the embedded GPS receiver of the basic unit. Optional: Graphical indication of the current position drawn on a map.

Indoor
Instrument position set manually on an editable rectangular room layout.

Detector
Peak or RMS detection
RMS averaging time: selectable, 0.48 s to 30 min

Display modes
Manual Bearing
Bar graph and numerical display of the signal level and indication of the direction

Horizontal Scan
Polar diagram of the signal level vs. antenna orientation, normalized to the maximum signal. Automatic direction finding and indication

smartDF Localization
Graphical indication of the triangulation results for all measurement positions. Accepts measurements being performed by Manual Bearing or Horizontal Scan. Display of the estimated emitter coordinates, optional drawn on a map (Option Mapping).

Horizontal Scan
Continuous
Every 120 ms the polar diagram is updated with the current signal level and compass data. Start and Stop is initiated by key press on the antenna handle. The duration of a scan is limited to a maximum of 4 min. The target azimuth is calculated automatically.

Discrete
For every key press on the antenna handle the polar diagram is updated with the current signal level and compass data. At least 3 samples are required for calculating the target azimuth (up to 2000 samples are possible). Useful for longer averaging times.

Discrete with Max Hold
The polar diagram is updated with the Max Hold signal level and compass data by pressing a key on the antenna handle. Allows determination of the direction even of intermittent signals.

smartDF Localization
Shows the vector of target azimuth related to the measurement position. Triangulation results based on several vectors will be calculated and the geo coordinates of the potential transmitter position will be displayed. Coordinates are referenced to the WGS84 geodetic datum. Signal fading vs. distance can be taken into account for target position calculation. Remotely determined vector data can be added by manual entry.

Transmitter Table
Used to simplify frequency settings and speed up finding multiple sources transmitting at different frequencies. Tables can be created on-site and include Fcent and RBW.

Maps (option)
Display of high-resolution street maps in various zoom levels. OpenStreetMap bitmap tiles can be downloaded from internet free of charge using the Narda Map Download Tool. Map data are stored on microSD card and then plugged into the IDA card slot for portable use.

SCOPE (OPTION)

Measurement principle
Selective level measurement (zero span mode at a tunable fixed frequency)

Resolution bandwidth RBW, (-6 dB nominal)
100 Hz to 32 MHz (in steps of 100, 125, 160, 200, 250, 320, 400, 500, 640, 800, 1000,…, 10 MHz, 13.333 MHz, 16 MHz, 20 MHz, 26.666 MHz, 32 MHz)

Filter
Type
Steep cut-off channel filter (app. raised cosine)
Roll-off factor
0.16

Video bandwidth (VBW)
0.01 Hz to 32 MHz or off coupled with selected RBW (VBW = RBW/1 … RBW/10000)

Measurement
High Resolution Scope
Measures the actual magnitude
Time resolution coupled to 1/RBW (31.25 ns to 10 ms)

Long-Time Scope
Uses selectable detectors to measure the magnitude
Sweep time 4 µs to 24 h (resolution ≥ 250 ns)

I/Q Data
Measures the real and imaginary part of the signal I, Q or both (max. 250000 samples each)
Time resolution coupled to 1/RBW (31.25 ns to 10 ms)

Detector
+Peak, RMS, -Peak can be selected individually for Long-Time Scope

Magnifier
Simultaneous display of the selected spectrum and a magnified section of interest (magnification level of 25x or 500x)

Duty cycle
Measurement function for the ratio of average power to maximum power (not for I/Q data)

Triggering
Free run, single, multiple, manual start, time controlled
Programmable trigger level, trigger slope and trigger delay
MULTI-CHANNEL POWER

Measurement principle  | Spectrum analysis, followed by Channel Power evaluation
Number of channels    | 1 to 500, to be defined on instrument or by IDA-Tools PC software
Channel band width CBW, (-3 dB nominal) | Individually selectable for each channel, from 40 Hz to 6 GHz
Roll-off factor       | < 4 * RBW / CBW
Applied RBW           | Automatic: CBW / 4 (RBW ≤ 20 MHz)  
Manual: 10 Hz to 20 MHz (1-2-3-5 steps). (RBW ≤ CBW / 4)  
Individual: separately defined for each channel using IDA-Tools
Channel lists         | Automatic creation on the unit or by PC configuration software. Channel name is assigned automatically. Use definable channel names (15 characters max.) can be assigned by PC.  
“Others” summarizes results of all frequency gaps within the list of channels.
Detection              | Root mean square value (RMS), integration time T = 1 / RBW
Trace, RBW            | See spectrum analysis mode

Display/Views          
Table                  | Channel name, corresponding frequency band, measurement result, RBW if set individually for each channel. Sort function according to columns.
Bar Graph              | Selectable Evaluation function: Distribution of each channel in relation to total amount

Noise threshold        | Selectable at 0, 3, 6, 10, 15, or 20 dB relative to device noise floor. Measurement values below threshold are shown as “< absolute threshold value”.

GENERAL SPECIFICATIONS - BASIC UNIT

Instrument display   | Type: TFT color display with backlight  
                      | Size, resolution: 7 inch (152 mm x 91 mm), 800 x 480 pixels
Interface            | USB mini B (USB 2.0)
                      | Optical RS 232 (Baud rate 115 200)
                      | Headphone 3.5 mm TRS, switches off the integrated speaker when connected
                      | microSD-card interface for maps and export of measurement data, screenshots and WAV
Cables and external devices | Narda RF cables are automatically detected (type, frequency response and more)  
Antenna detection     | Other cables and external devices (e.g. filters) can be defined and selected manually.
Result units          | With antenna: V/m, A/m, W/m², mW/cm², dBV/m, dBmV/m, dBA/m, dBpV/m,
                      | dBm, dBV, dBmV, dBuV
                      | Without antenna: dBm, dBV, dBmV, dBuV
Display functions     | Y-scale reference: -130 dBm to 40 dBm
                      | Y-scale range: 20 dB, 40 dB, 60 dB, 80 dB, 100 dB, 120 dB
                      | Y-scale auto: automatic scaling
Marker functions      | For graphical analysis of Spectrum, Spectrogram, Scope, MCP Bar Graph
                      | - Single marker or Delta marker
                      | - Peak Marker: Highest, lower, higher, left, right. Adjustable peak threshold and excursion.
Demodulation          | Modulation Types: AM, FM, LSB, USB (Level Meter and DF mode)
                      | Representation: Instrument speaker or external earphone
                      | Audio Recording: Format 16 kHz / 16 bit wave file recording (WAV)
Fast Frequency Setting | Frequency setting by selection lists (multi-channel table or transmitter table) or by Fstep
Fast Mode Switch      | “Go to: mode” transfers center frequency or marker frequency and other relevant parameters to the selected operating mode
Setsups               | IDA can store up to 200 device configurations. Up-/download by configuration software.
Results Storage       | Screenshots: File format PNG
                      | Demodulation records: File format WAV
                      | Conditional Storing (not for DF and Scope): Conditional storing of results exceeding a user definable threshold value with individual storage rates and reset function
                      | Time Controlled Storing (not for DF and Scope): Long term monitoring up to 99 hours.  
                      | Settings for: start date, start time, duration and time interval (6 s to 60 min)
                      | Memory capacity: 128 MB internal memory to store up to 8000 spectra, 4000 screenshots
Compass/ GPS          | Inside the basic unit is a GPS receiver for position detection and an electronic compass as an aid to orient the map northwards

NSTS 0912 – E0280D

10 / 14  Subject to change without notice
GENERAL SPECIFICATIONS - BASIC UNIT (continued)

Environmental
- Operating temperature: -10 °C to +50 °C with battery
- Humidity: < 29 g/m³ (< 93 % RH at +30 °C), non-condensing

Climatic
- Storage: 1K3 (IEC 60721-3) extended to -10 °C to +50 °C
- Transport: 2K4 (IEC 60721-3) restricted -30°C to + 70°C due to display
- 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 (with antenna attached and interface protector closed)
- IP 67 (stored in the hardcase)

Compliance
- Immunity: IEC/EN: 61000 -4-2, 61000 -4-3, 61000 -4-4, 61000 -4-5, 61000 -4-6, 61000 -4-11
- Emissions: IEC/EN: 61000 -3-2, 61000 -3-3, IEC/EN 55011 (CISPR 11) Class B

Safety

Weight
- 2.8 kg / 6.2 lbs (basic unit including battery)

Dimensions (H x W x D)
- size without cable: 213 mm x 297 mm x 77 mm (8.4" x 11.7" x 3.0")

Power supply
- Battery: Lithium-Ion rechargeable battery pack, hot-swappable during operation
- operating time: 2.5 hours (nominal)
- charging time: 4.5 hours (nominal)
- External power supply: Input: 9 to 15 Vdc, 2.5 A

Recommended calibration interval
- 24 months

Country of origin
- Germany

SPECIFICATIONS OF ANTENNAS

GENERAL SPECIFICATIONS - ANTENNA HANDLE AND ANTENNAS

Environmental
- Operating temperature: -10 °C to +50 °C
- Humidity: < 29 g/m³ (< 93 % RH at +30 °C), non-condensing

Climatic
- Storage: 1K3 (IEC 60721-3) extended to -10 °C to +50 °C
- Transport: 2K4 (IEC 60721-3)
- 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)

Compliance
- Immunity: IEC/EN: 61000 -4-2, 61000 -4-3, 61000 -4-4, 61000 -4-5, 61000 -4-6, 61000 -4-11
- Emissions: IEC/EN: 61000 -3-2, 61000 -3-3, IEC/EN 55011 (CISPR 11) Class B

Safety

Dimensions (L x W x H), Weight
- size without cable: 165 mm x 165 mm x 43 mm (6.5" x 6.5" x 1.7")
- 470 g / 1.04 lbs
- Dir. Antenna 1: 325 mm x 255 mm x 80 mm (12.8" x 10.0" x 3.1")
- 450 g / 1.0 lbs
- Dir. Antenna 2: 285 mm x 410 mm x 43 mm (11.2" x 16.1" x 1.7")
- 350 g / 0.77 lbs
- Dir. Antenna 3: 460 mm x 320 mm x 48 mm (18.1" x 12.6" x 1.9")
- 400 g / 0.88 lbs
- 3100/14: 430 mm x 370 mm x 42 mm (16.9" x 14.6" x 1.7")
- 380 g / 0.84 lbs

Country of origin
- Germany
### ACTIVE ANTENNA HANDLE (3100/10) - WITH ELECTRONIC COMPASS AND PREAMPLIFIER

<table>
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<tr>
<th>Parameter</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>9 kHz to 6 GHz</td>
</tr>
<tr>
<td>Preamplifier</td>
<td>Built in, can be switched off, Amplification 20 dB, noise figure &lt; 6 dB</td>
</tr>
<tr>
<td>Compass</td>
<td>Embedded electronic compass</td>
</tr>
<tr>
<td>Compass uncertainty (typ.)</td>
<td>Azimuth uncertainty &lt; 1.5° RMS for tilt &lt; 15°, Pitch- and roll uncertainty &lt; 3° RMS in the range of +/- 30° (RMS means the standard deviation of the specified error)</td>
</tr>
<tr>
<td>Connection cable to IDA basic unit</td>
<td>RF cable and control cable combined in a flexible tube, length of 1 meter</td>
</tr>
<tr>
<td>RF connector to basic unit</td>
<td>N-connector, male, 50 Ω</td>
</tr>
<tr>
<td>RF connector to Narda directional antennas</td>
<td>BMA 50 Ω, (female on handle side)</td>
</tr>
<tr>
<td>Antenna connectivity</td>
<td>Narda antennas can be plugged in with horizontal and vertical polarization. Type of antenna and polarization detected automatically and transferred to basic unit</td>
</tr>
<tr>
<td>Power supply</td>
<td>From basic unit</td>
</tr>
<tr>
<td>Mounting</td>
<td>Connecting thread on the underside of the handle for tripod mounting</td>
</tr>
</tbody>
</table>

### DIRECTIONAL ANTENNA 1 (3100/11)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>20 MHz to 250 MHz</td>
</tr>
<tr>
<td>Antenna type</td>
<td>Loop antenna</td>
</tr>
<tr>
<td>Antenna factor</td>
<td>21 dB(1/m) typical @ 200 MHz (passive mode)</td>
</tr>
</tbody>
</table>

### DIRECTIONAL ANTENNA 2 (3100/12)

<table>
<thead>
<tr>
<th>Parameter</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>200 MHz to 500 MHz</td>
</tr>
<tr>
<td>Antenna type</td>
<td>Dipole antenna</td>
</tr>
<tr>
<td>Antenna factor</td>
<td>21 dB(1/m) typical @ 350 MHz (passive mode)</td>
</tr>
</tbody>
</table>

### DIRECTIONAL ANTENNA 3 (3100/13)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>400 MHz to 6 GHz</td>
</tr>
<tr>
<td>Antenna type</td>
<td>Log-periodic antenna</td>
</tr>
<tr>
<td>Antenna factor</td>
<td>18.5 dB(1/m) typical @ 500 MHz (passive mode)</td>
</tr>
</tbody>
</table>

### LOOP ANTENNA, H-FIELD (3100/14)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency range</td>
<td>9 kHz to 30 MHz</td>
</tr>
<tr>
<td>Antenna type</td>
<td>Shielded loop antenna</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Antenna factor/ Radiation pattern</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passive mode (preamp. off):</td>
<td>66.0 dB(1/m) typical @ 100 kHz</td>
</tr>
<tr>
<td></td>
<td>47.5 dB(1/m) typical @ 1 MHz</td>
</tr>
<tr>
<td></td>
<td>42.0 dB(1/m) typical @ f &gt; 10 MHz</td>
</tr>
</tbody>
</table>

*a) Preamplifier lower frequency is limited to 20 MHz for antenna handles produces before year 2013.*
DIRECTIONAL ANTENNAS - CHARACTERISTICS

Antenna Factors (typical)

Radiation Pattern (typical)

Directional Antenna 1 (Loop)

Directional Antenna 2 (Dipole)

Directional Antenna 3 (Log Per)

Patterns above are valid for a horizontal scan and vertical polarization (V) or horizontal polarization (H)

f < 1.2 GHz

1.2 GHz < f < 2.5 GHz
## ORDERING INFORMATION

### IDA

<table>
<thead>
<tr>
<th>IDA Set with Antennas</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IDA-3106 Interference Analyzer</strong>, Set with 20 MHz - 6 GHz Antennas includes:</td>
<td>3106/102</td>
</tr>
<tr>
<td>- IDA-3106 Basic Unit</td>
<td></td>
</tr>
<tr>
<td>- Active Antenna Handle</td>
<td></td>
</tr>
<tr>
<td>- Directional Antenna 1, 20 MHz - 250 MHz</td>
<td></td>
</tr>
<tr>
<td>- Directional Antenna 2, 200 MHz - 500 MHz</td>
<td></td>
</tr>
<tr>
<td>- Directional Antenna 3, 400 MHz - 6 GHz</td>
<td></td>
</tr>
<tr>
<td>- Arm Support</td>
<td></td>
</tr>
<tr>
<td>- Headphone, 3.5 mm Plug</td>
<td></td>
</tr>
<tr>
<td>- Carrying Strap for IDA</td>
<td></td>
</tr>
<tr>
<td>- Power Supply 12 VDC, 100 V-240 VAC</td>
<td></td>
</tr>
<tr>
<td>- Cable, USB 2.0, A/B mini, 1.8 m</td>
<td></td>
</tr>
<tr>
<td>- Configuration Software</td>
<td></td>
</tr>
<tr>
<td>- Mem-Card Reader, microSD / USB</td>
<td></td>
</tr>
<tr>
<td>- Operating Manual IDA-3106, English</td>
<td></td>
</tr>
<tr>
<td>- Calibration Reports (Basic Unit and Handle)</td>
<td></td>
</tr>
</tbody>
</table>

### IDA Basic Unit

<table>
<thead>
<tr>
<th>IDA-3106 Interference Analyzer, Basic Unit Set includes:</th>
<th>3106/101</th>
</tr>
</thead>
<tbody>
<tr>
<td>- IDA-3106 Basic Unit</td>
<td></td>
</tr>
<tr>
<td>- Power Supply 12 VDC, 100 V-240 VAC</td>
<td></td>
</tr>
<tr>
<td>- Cable, USB 2.0, A/B mini, 1.8 m</td>
<td></td>
</tr>
<tr>
<td>- Configuration Software</td>
<td></td>
</tr>
<tr>
<td>- Mem-Card Reader, microSD / USB</td>
<td></td>
</tr>
<tr>
<td>- Operating Manual IDA-3106, English</td>
<td></td>
</tr>
<tr>
<td>- Calibration Report</td>
<td></td>
</tr>
</tbody>
</table>

### OPTIONS

<table>
<thead>
<tr>
<th>Option</th>
<th>Part number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option, Mapping</td>
<td>3100/95.01</td>
</tr>
<tr>
<td>Option, Scope and I/Q Recorder</td>
<td>3100/95.02</td>
</tr>
</tbody>
</table>

### ANTENNAS

<table>
<thead>
<tr>
<th>Active Antenna Handle (required for Dir. Antennas 1-3 and Loop Antenna, Calibration Report included)</th>
<th>3100/10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directional Antenna 1, 20 MHz - 250 MHz</td>
<td>3100/11</td>
</tr>
<tr>
<td>Directional Antenna 2, 200 MHz - 500 MHz</td>
<td>3100/12</td>
</tr>
<tr>
<td>Directional Antenna 3, 400 MHz - 6 GHz</td>
<td>3100/13</td>
</tr>
<tr>
<td>Loop Antenna, H-Field, 9 kHz - 30 MHz (available 2013)</td>
<td>3100/14</td>
</tr>
<tr>
<td>Arm Support (for Active Antenna Handle)</td>
<td>3100/90.10</td>
</tr>
</tbody>
</table>

### ACCESSORIES

<table>
<thead>
<tr>
<th>Battery Pack, Rechargeable, 7V4 / 5100 mAh (one is included with each IDA Basic Unit)</th>
<th>3001/90.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charger Set for Battery Pack, External</td>
<td>3001/90.07</td>
</tr>
<tr>
<td>Power Supply DC Vehicle Adapter</td>
<td>2260/90.56</td>
</tr>
<tr>
<td>Protective Soft Carrying Bag for IDA-3106 Basic Unit</td>
<td>3001/90.13</td>
</tr>
<tr>
<td>Hardcase for IDA Sets (included in Set 3106/102, space for Dir. Antennas 1-3 additional space for the Loop Antenna will be available 2013)</td>
<td>3100/90.01</td>
</tr>
<tr>
<td>Headphone, 3.5mm Plug (included in Set 3106/102)</td>
<td>3100/90.11</td>
</tr>
<tr>
<td>Carrying Strap for IDA Set (included in Set 3106/102)</td>
<td>3100/90.12</td>
</tr>
<tr>
<td>Memory Card, microSD 8GB (one is included with each IDA Basic Unit)</td>
<td>3100/90.13</td>
</tr>
<tr>
<td>O/E Converter USB, RP-02/USB</td>
<td>2260/90.07</td>
</tr>
<tr>
<td>Cable, FO Duplex (1000µm), RP-02, 20m</td>
<td>2260/91.03</td>
</tr>
<tr>
<td>RF-Cable, 9 kHz – 6 GHz, N 50 ohm, 1.5m</td>
<td>3602/01</td>
</tr>
<tr>
<td>RF-Cable, 9 kHz – 6 GHz, N 50 ohm, 9m</td>
<td>3602/02</td>
</tr>
<tr>
<td>Tripod, Non-Conductive, 1.65 m, with Carrying Bag</td>
<td>2244/90.31</td>
</tr>
<tr>
<td>Operating Manual IDA-3106, German</td>
<td>3106/98.01</td>
</tr>
</tbody>
</table>

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