

360° TRACKING ANTENNA ARRAY

# ISOLOG 3D DF

(20 MHz TO 20 GHz)

Ultra-wideband direction finding antenna for real-time spectrum monitoring



## Highlights:

- High tracking accuracy
- Extremely fast tracking speed (up to 1  $\mu$ s)
- Including control software

  
**AARONIA AG**  
WWW.AARONIA.DE



Gewerbegebiet Aaronia AG II, DE-54597 Strickscheid  
Tel.: +49(0)6556-9019-355 Fax: +49(0)6556-93034  
www.aaronia.com E-Mail: mail@aaronia.de



**MADE IN GERMANY**

# Highlights

- ✓ World's first 20 MHz to 20 GHz 3D direction finding antenna array
- ✓ Extremely high tracking accuracy (up to 2° if used with Aaronia spectrum analyzers)
- ✓ Provides 360° coverage without mechanical rotation
- ✓ Superfast tracking speed (up to 1  $\mu$ s)
- ✓ Very high third-order intercept point (IP3) of 40 dBm (with pre-amp in bypass mode)
- ✓ Digital RF switches – high-end, glitch-free, no mechanical parts
- ✓ Ideal for ultra-wideband, real-time spectrum monitoring
- ✓ Can be used as stand-alone or multi-device / grid system
- ✓ Real-time clock and optional GPS
- ✓ Fully customizable and cascable system (16 to 64 independent antennas)
- ✓ Suitable for harsh environments (-30° C to +60° C)
- ✓ Perfect for vehicle mounting
- ✓ Easy to use PC control software (via Ethernet) included
- ✓ Plug and Play: Cable included with all parts
- ✓ Made in Germany



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# Aaronia IsoLOG 3D DF

## Wide-area, multi-direction finding and RF tracking antenna

Aaronia's IsoLOG 3D provides cost-effective high performance real-time signals monitoring, direction finding and geolocation for spectrum-critical areas. The 3D RF Tracking Antenna includes a high density, customizable antenna array. A total of at least 16 and up to 48 tracking-antennas, for horizontal and for vertical polarization, can be integrated. Additionally 8 or 16 specialized low frequency antennas can be added to extend the frequency range down to 20 MHz.



### The Industry Standard in Accuracy and Speed

Both the antenna and its electronics are protected by a radome (included), available in any RAL color and with optional prints (standard shipping color is black). The radome is waterproof, shock- and heat-proof – in other words, it is extremely durable and reliable even in the most adverse conditions.

The IsoLOG 3D DF is thus the perfect solution for countersurveillance measurements as well as the detection of drones or UAVs (unmanned aerial vehicles). The wide frequency range makes multiple antenna setups obsolete, therefore saving space and system costs at the same time. Having just one antenna also makes the IsoLOG 3D DF ideal for vehicle mounting (e.g. automotive prototypes etc.) and for hidden operations. In addition, as the antenna resembles a satellite dish for camping vans, it is hardly recognizable as special equipment, let alone a tracking device.

The IsoLOG 3D DF is sensitive to the majority of incoming signal polarizations, including all linear polarizations. This allows for highly reliable signal detection – even those invisible to most DF systems that consist of vertically polarized antennas only.

### Software

A powerful control software for operation on Windows systems is included for free. The software offers various tracking and selection setups, e.g. sweep all antennas horizontal and/or vertical, switch all in one sector, and a powerful high-speed „chopper mode“. All of this makes it the perfect tool for instantaneous signal tracking.

### Modular and Flexible Deployment

Each IsoLOG 3D DF ships complete with a robust radome designed for the most hostile conditions. Close coupling of the IsoLOG and antenna modules reduces both cable run and cable loss, and significantly improves performance at higher frequencies. Various directional antenna options are available from 20 MHz to 20 GHz.

Over large distances, arrays can form a network as part of a wider monitoring network with other IsoLOG antennas. It can be set up anywhere, be it on paved roads or dirt tracks.



# Antenna Versions

## IsoLOG 3D DF 80



### 8 sectors with 16 antennas

Frequency range: 400 MHz to **8 GHz**  
Tracking accuracy (line of sight): **4 to 6°**

## IsoLOG 3D DF 160



### 16 sectors with 32 antennas

Frequency range: 400 MHz to **8 GHz**  
Tracking accuracy (line of sight): **1 to 3°**

#### Frequency Range

Standard	400 MHz to 8 GHz
VLF Extender to 20 MHz	optional
SHF Extender to 20 GHz	optional

#### Additional Options

Internal GPS Receiver	Yes
Internal Low-Noise Pre-Amplifiers	Yes (included)
Customized Color (RAL Table)	Yes (standard - white)

#### Measurements & Operating Specifications

Operating Temperature	-30° to +60° C (-22° to 140° F)
Storage Temperature	-40° to 70° C (-40° to 158° F)
Dimensions [W x H x D]	960 x 960 x 380 mm
Weight	approx. 22 kg
RF Output	N (50 Ohm)

#### Frequency Range

Standard	400 MHz to 8 GHz
VLF Extender to 20 MHz	optional
SHF Extender to 20 GHz	optional

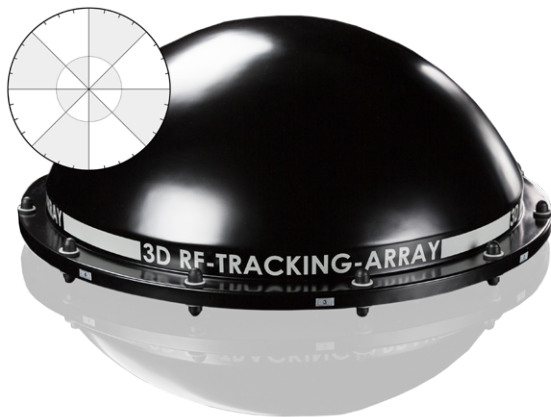
#### Additional Options

Internal GPS Receiver	Yes
Internal Low-Noise Pre-Amplifiers	Yes (included)
Customized Color (RAL Table)	Yes (standard - white)

#### Measurements & Operating Specifications

Operating Temperature	-30° to +60° C (-22° to 140° F)
Storage Temperature	-40° to 70° C (-40° to 158° F)
Dimensions [W x H x D]	960 x 960 x 380 mm
Weight	approx. 25 kg
RF Output	N (50 Ohm)

## IsoLOG 3D DF 80-UWB



### 8 sectors with 24 antennas

Frequency range: 20 MHz to **8 GHz**  
Tracking accuracy (line of sight): **4 to 6°**

## IsoLOG 3D DF 160-UWB



### 16 sectors with 48 antennas

Frequency range: 20 MHz to **8 GHz**  
Tracking accuracy (line of sight): **1 to 3°**

#### Frequency Range

Standard	20 MHz to 8 GHz
VLF Extender to 20 MHz	included
SHF Extender to 20 GHz	optional

#### Additional Options

Internal GPS Receiver	Yes
Internal Low-Noise Pre-Amplifiers	Yes (included)
Customized Color (RAL Table)	Yes (standard - white)

#### Measurements & Operating Specifications

Operating Temperature	-30° to +60° C (-22° to 140° F)
Storage Temperature	-40° to 70° C (-40° to 158° F)
Dimensions [W x H x D]	960 x 960 x 380 mm
Weight	approx. 22 kg
RF Output	N (50 Ohm)

#### Frequency Range

Standard	20 MHz to 8 GHz
VLF Extender to 20 MHz	included
SHF Extender to 20 GHz	optional

#### Additional Options

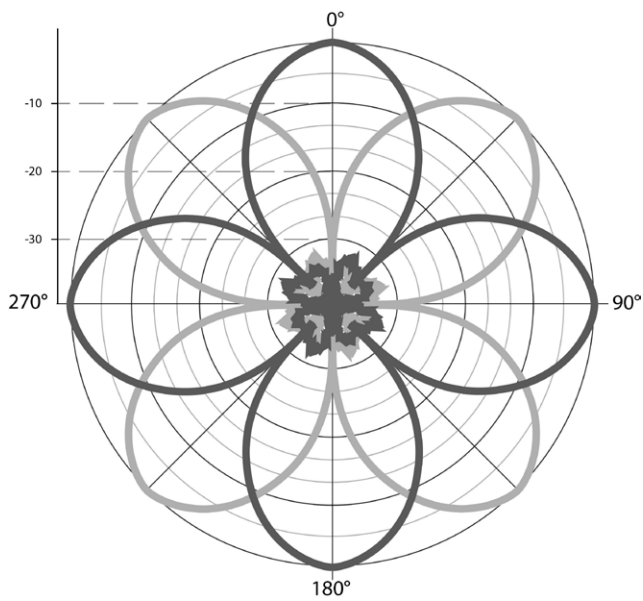
Internal GPS Receiver	Yes
Internal Low-Noise Pre-Amplifiers	Yes (included)
Customized Color (RAL Table)	Yes (standard - white)

#### Measurements & Operating Specifications

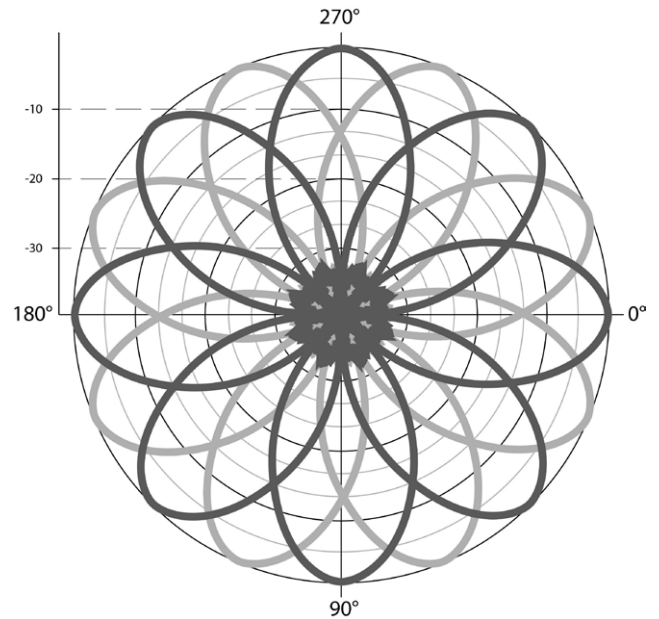
Operating Temperature	-30° to +60° C (-22° to 140° F)
Storage Temperature	-40° to 70° C (-40° to 158° F)
Dimensions [W x H x D]	960 x 960 x 380 mm
Weight	approx. 25 kg
RF Output	N (50 Ohm)

# Typical Antenna Pattern

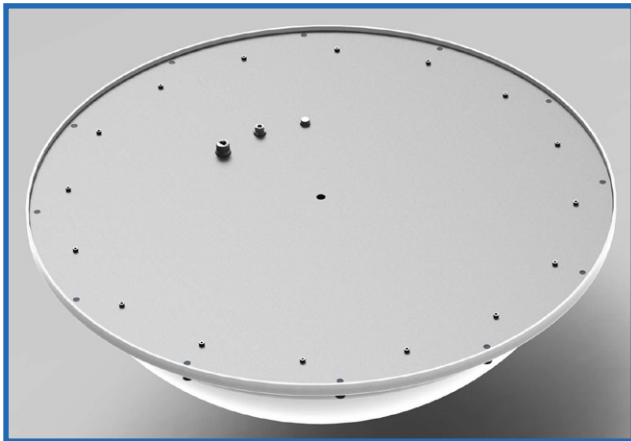
### IsoLOG 3DDF 80 & 80-UWB



### IsoLOG 3D DF 160 & 160-UWB

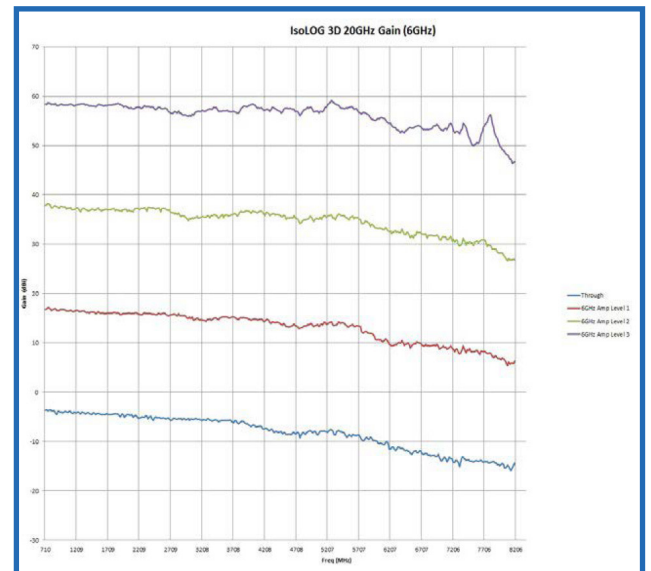


# Connectors and Gain



## Mounting Plate & Connectors

The picture above shows the standard positions of the RF output, the Ethernet connector and mounting holes. The design of the antenna's mounting plate can be changed according to customers' needs. Please contact us at [mail@aaronia.de](mailto:mail@aaronia.de) for further details.

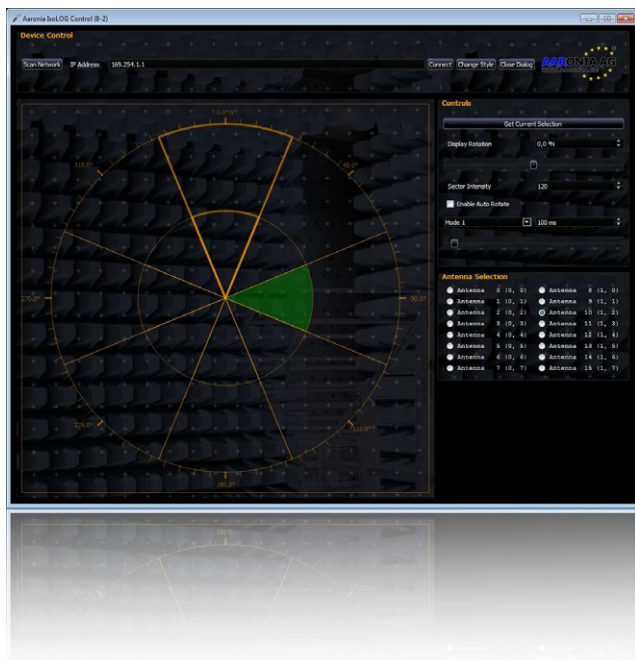


## Typical Gain

The above diagram shows the typical gain of the IsoLOG 3D DF 80, with and without activated internal pre-amplifiers.



# Control Software



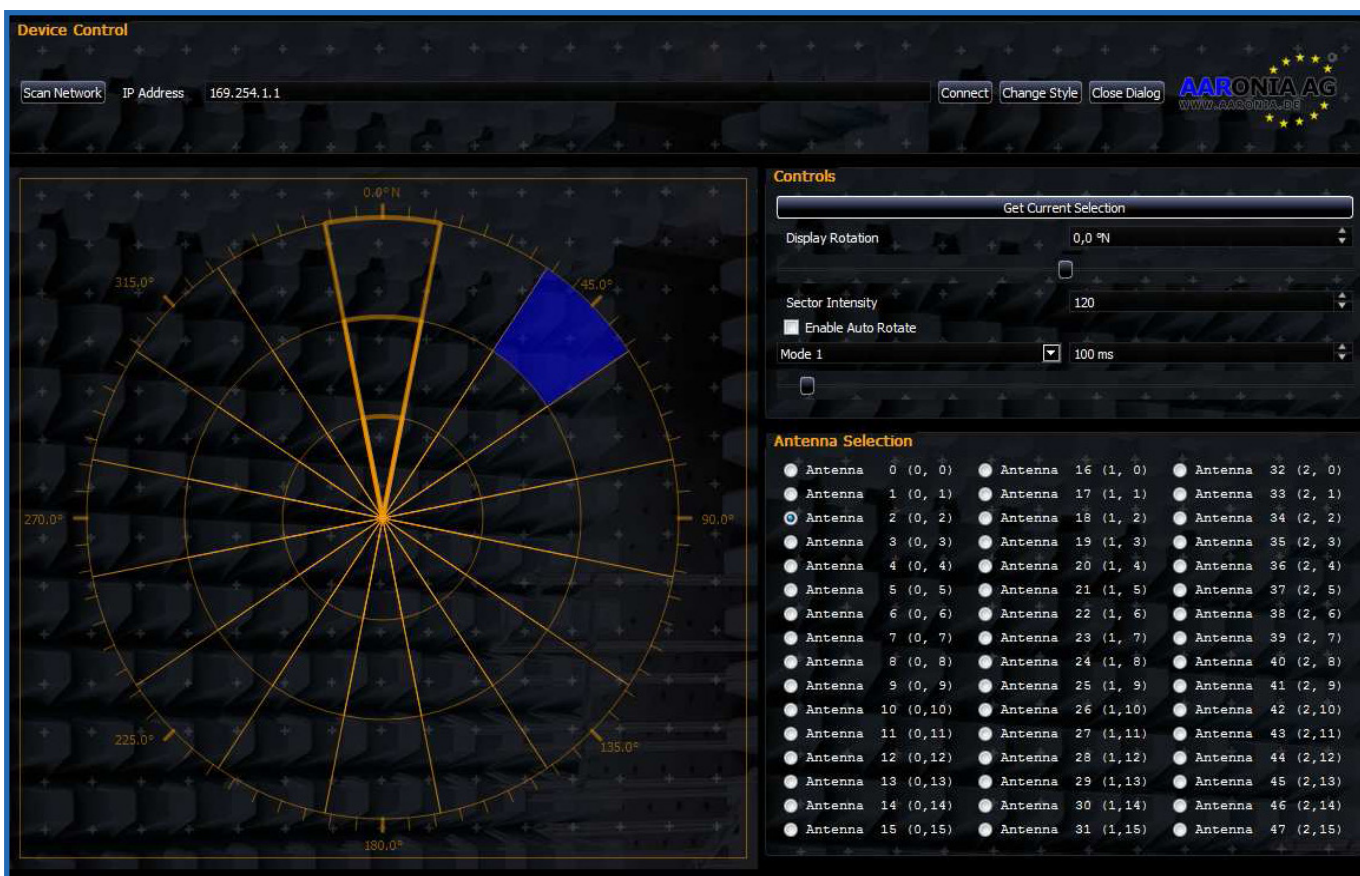
The Remote Control Software included in the shipment is easy to use, and lets you control the tracking array via any Windows PC with Ethernet connector.

## Free Software Included

The powerful software allows you to manually switch between each antenna and / or sector (i.e. manual RF tracking). The software also includes a programmable sector / antenna auto-rotate, and an ultra-fast „chopper mode“ for real-time and simultaneous isotropic measurements across all antennas / sectors. Thanks to the freely adjustable switching speed, even slower receivers can be used with the IsoLOG 3D DF.

Nevertheless, because of the high switching speed possible, we recommend the use of a real-time spectrum analyzer such as Aaronia's SPECTRAN® series.

- Auto-rotate with adjustable speed and ultra-fast “chopper mode” (i.e. “omnidirectional” measuring)
- Fast and easy antenna / sector selection for manual RF tracking
- Virtually real-time switching between all sectors (vertical, horizontal, all)
- Pre-saved and adjustable profiles for specific measurement modes



# REFERENCES



## Selected Aaronia Clients

### Government, Military, Aeronautic, Astronautic

- **NATO**, Belgium
- **Department of Defense (DoD)**, USA
- **Department of Defence**, Australia
- **Airbus**, Germany
- **Boeing**, USA
- **German Armed Forces**, Germany
- **NASA**, USA
- **Lockheed Martin**, USA
- **Lufthansa**, Germany
- **German Aerospace Center (DLR)**, Germany
- **Eurocontrol**, Belgium
- **EADS**, Germany
- **Drug Enforcement Administration (DEA)**, USA
- **Federal Bureau of Investigation (FBI)**, USA
- **Federal Criminal Police Office (BKA)**, Germany
- **Federal Police**, Germany
- **Ministry of Defence**, Netherlands

### Research/Development, Science and Universities

- **MIT - Physics Department**, USA
- **California State University**, USA
- **Indonesian Institute of Science (LIPI)**, Indonesia
- **Los Alamos National Laboratory (LANL)**, USA
- **University of Bahrain**, Bahrain
- **University of Florida**, USA
- **University of Victoria**, Canada
- **University of Newcastle**, United Kingdom
- **University of Durham**, United Kingdom
- **University Strasbourg**, France
- **University of Sydney**, Australia
- **University of Athen**, Greece
- **University of Munich**, Germany
- **Technical University of Hamburg**, Germany
- **Max-Planck Inst. for Radio Astronomy**, Germany
- **Max-Planck Inst. for Nuclear Physics**, Germany
- **Research Centre Karlsruhe**, Germany

### Industry

- **IBM**, Switzerland
- **Intel**, Germany
- **Shell Oil Company**, USA
- **ATI**, USA
- **Microsoft**, USA
- **Motorola**, Brazil
- **Audi**, Germany
- **BMW**, Germany
- **Daimler**, Germany
- **Volkswagen**, Germany
- **BASF**, Germany
- **Siemens AG**, Germany
- **Rohde & Schwarz**, Germany
- **Infineon**, Austria
- **Philips**, Germany
- **ThyssenKrupp**, Germany
- **EnBW (Energie Baden-Württemberg)**, Germany
- **CNN**, USA
- **Duracell**, USA
- **German Telekom**, Germany
- **Bank of Canada**, Canada
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- **Hyundai Europe**, Germany
- **VIAVI**, Korea
- **Wilkinson Sword**, Germany
- **IBM Deutschland**, Germany
- **Nokia-Siemens Networks**, Germany



Aaronia AG, Gewerbegebiet Aaronia AG, DE-54597 Strickscheid, Germany  
Phone: +49(0)6556-9019-355 | Fax: +49(0)6556-93034  
Email: mail@aaronia.de | URL: www.aaronia.com