

## WG-8800 VHF/UHF/SHF TDOA Geolocation System

- Proven TDOA (time-difference of arrival) method for accurate position estimation
- Multilateration (hyperbolic) positioning technique
- Wide frequency range 100 MHz to 8000 MHz
- 34 MHz instantaneous bandwidth for capturing signals
- Scalable architecture supporting 3 or more sensors
- Modulation independent position estimation, suitable for various signal types
- Transportable or stationary deployment options
- Client-server architecture with multi-user networking
- LAN interface for sensor connectivity
- GPS-based timing reference for receiver coherency
- GPS-based automatic sensor positioning
- Hardware option available for additional antennas
- Mapping feature for visualizing estimated positions
- Built-in self-test functionality for system integrity verification
- Ruggedized and weather-proof construction for reliability
- Rapid and easy system deployment, minimizing setup time and effort



The WinRADIo WG-8800 VHF/UHF/SHF geolocation system utilizes the proven TDOA method (time-difference of arrival) with statistical signal processing.

This integrated hardware/software system accurately estimates the position of transmitters by calculating the signal propagation delay time between multiple sensors. Even when dealing with complex digitally modulated signals, this technique remains highly robust.

The system's design is cost-effective and versatile, making it suitable for a wide range of applications, including government, military, law enforcement, and industrial sectors. Deploying the system is effortless, thanks to its user-friendly setup and robust design. It can be easily used in stationary or transportable deployments, offering exceptional adaptability with minimal constraints.

The system's software-defined radio (SDR) architecture provides unparalleled flexibility, allowing seamless adaptation to various scenarios. Its precision and sensitivity are remarkable, making it not only an excellent position finding system but also a highly capable HF/VHF/UHF COMINT intercept receiver.

### Hardware

The hardware components of the solution are primarily deployed at outdoor sensor sites strategically positioned around the monitored area of interest. A minimum of three sensor sites is required for the system's operation. Each site consists of several key elements, including a multiband omnidirectional high sensitivity antenna, a GPS antenna, a ruggedized waterproof aluminium alloy housing for the sensor receiver and processing systems, and tripods for antenna support.



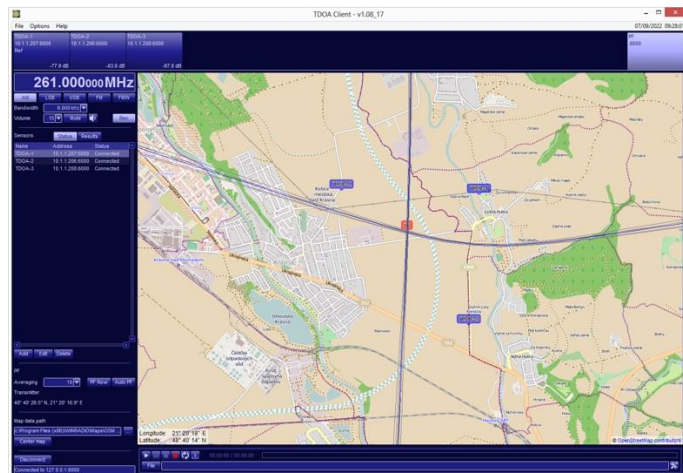
The system functions seamlessly on the user-provided IP network, which can be either wired or wireless, including cellular connections. The network architecture facilitates efficient communication, with the sensor sites located on one side and the system server and clients on the other side.

In TDOA systems, precise timing is crucial for achieving accurate results. Each sensor site relies on nanosecond-level time precision for optimum performance in position estimation. To achieve this level of precision, our system incorporates a GPS-disciplined OCXO-based time base within the sensor enclosure at each site. This highly accurate time base, combined with the external GPS antenna positioned in close proximity to the main receiving antenna, supplies the essential timing information needed. Additionally, the GPS module allows each sensor to acquire its position, simplifying the installation process and enhancing overall convenience.

An integral component of the system is the receiving antenna, which has been specifically designed to meet its unique requirements. The active discone antenna covers an impressive frequency range, spanning from below 100 MHz up to 8 GHz. Enclosed within a compact and weather-resistant radome, this antenna combines multiple antenna systems. External conical radial elements ensure exceptional reception sensitivity, even at its lowest frequency limit. The antenna's strictly omnidirectional radiation pattern in the horizontal plane provides comprehensive coverage, while integrated band-specific low noise amplifiers further enhance performance.

## Software

The software component of the system includes sensor software running within the sensor receiver and processing systems, along with server software and client software typically installed on operator sites. For smaller installations, the server and client software can be conveniently operated on a single workstation, streamlining the setup process.



The software offers a wide range of features designed to enhance the user experience. The results of the position estimation process are displayed on an interactive map, providing users with a visual representation of the estimated positions and information about the estimation quality.

Additionally, the software enables the display of sensor locations, offering a comprehensive overview of the network. Detailed maps with various levels of zoom and customization options are readily accessible, allowing users to explore specific areas of interest.

To accommodate different operational preferences, the position estimation process can be performed in either manual or automatic mode, providing flexibility and meeting diverse user requirements.

Our software also includes comprehensive network management functionality, empowering users to oversee and manage the entire sensor network. This functionality allows for continuous monitoring of the status and health of individual sensors, ensuring optimum performance and resolution of any potential issues. With our software suite, users benefit from a robust and user-friendly interface that streamlines the operation, monitoring, and management of the sensor network. It provides a powerful toolset for efficient and effective utilization of the system's capabilities.

## Technical specifications

### Receiver

Frequency range	8 kHz to 8 GHz
Tuning resolution	1 Hz
Mode	AM, AMS, LSB, USB, DSB, ISB, CW, FMN, FMW, FSK, UDM (user-defined mode), digital modes (optional)
Image Rejection	60 dB typ.
SFDR	90 dB (Preamp OFF) 85 dB (Preamp ON)
Noise figure	15 dB typ. (Preamp OFF) 6 dB typ. (Preamp ON)
LO Phase noise	-106 dBc/Hz @ 10 kHz typ.
Internal spurious	below -100 dBm
Processing bandwidth	20 kHz - 32 MHz
Demodulation bandwidth	1 Hz - 320 kHz
Tuning stability	0.001 ppm, GPS disciplined
Antenna inputs	2 x 50 ohm (N connectors)

### Frequency and timing reference

Type	GNSS disciplined OCXO
Compatible GNSS	GPS, GLONASS, GALILEO, BEIDOU
GPS Antenna	Active (5V compatible) or Passive

### Interfaces

RF inputs	2x N connector, 50 ohm
LAN	10/100/1000 Mbit Ethernet, RJ-45 (female)
DC voltage input	5-pin circular connector (DC IN)
GPS antenna	N connector, 50 ohm

### General

Power requirements	50 W typical, 90 W peak
Power supply	12 V, 7.5 A
Self-diagnostics	BIT (Built-In test), SMA connector
Operating temperature	-20 °C to 50 °C (without direct sunlight)
Storage temperature	-20 °C to 70 °C
Dimensions	300 x 220 x 150 mm without pole / wall bracket
Degree of protection	IP68
Weight	7.5 kg

*Specifications are subject to change without prior notice due to continuous product development.*

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