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TECHNOLOGIES

NORD

NOFFZ OBSERVATION & RADIO DETECTION

RF-BASED DRONE DETECTION AND REAL-TIME PROTOCOL
DECODING SYSTEM



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NORD - NOFFZ OBSERVATION & RADIO DETECTION

NORD (NOFFZ Observation and Radio Detection) is an RF-based drone detection and real-time protocol decoding system built on NI USRP hardware and leveraging an FPGA-based architecture.

The system determines the direction of arrival (DoA), operating frequency, signal power, and other key transmission parameters associated with drone communication links. In addition to detection, NORD performs real-time decoding of commercial drone communication protocols up to 5 km range.

The core concept of NORD is not a fixed, one-size-fits-all solution, but full customization depending on customer requirements. In addition to the main signal processing software, the system incorporates a configurable antenna subsystem and RF front-end architecture, allowing optimization of detection range, directional accuracy, frequency selectivity, and overall system performance.

- › Wide band frequency range 70 MHz - 6 GHz
- › Sector antennas with fast RF switching, scanning the entire space in less than 2 s (360° azimuth, 90° elevation)
- › Channelizer (sector, operating frequency, bandwidth, signal power)
- › Real-time DJI protocol decoding (Drone ID, Drone GPS, Pilot GPS, Home GPS)
- › Integration with other systems - jammers, optical surveillance systems, central control units



DRONE DETECTION SYSTEM

In this configuration, the focus is on a system equipped with a single rotating directional antenna and an RF front-end optimized for up to 2 km range. The system is configured for commercial ISM bands at 2.4 GHz and 5.8 GHz, with up to 160 MHz bandwidth per receive channel.

Such a configuration is well suited for protection of sensitive locations against commercial drone incursions and can be integrated into larger counter-UAS systems, including jamming subsystems and complementary sensors (e.g., optical systems).

It highlights the deployment of NI USRPs for high-performance RF surveillance systems, combining spectrum sensing, highspeed protocol analysis and directional localization in a compact, field-deployable setup.



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