HUGHES
An EchoStar Company

# Hughes WS-1000 Nano
# UAV BVLOS Architecture Implementation

Reliable, secure, and adaptive communications are both advantageous and mission critical in today's dynamic operational landscape. Hughes is proud to introduce the WS-1000, enabling high bandwidth 4G/5G Beyond Visual Line of Sight (BVLOS) Command Control and Communications (C3) for Unmanned Aerial Vehicles (UAVs).This next-generation, compact, multi-network communications architecture is engineered for demanding operational environments. The WS-1000 is one of many modem options powering the Hughes All Domain Communications Service or as a vendor integrated communications channel.

## KEY FEATURES AND TACTICAL ADVANTAGES

**Innovative and Adaptable BVLOS Communications**

Designed for integration into UAV platforms, controllers, heads-up displays, the WS-1000 ensures global persistent connectivity across vast operational theaters.

**Low Low Size, Weight, and Power (SWaP)**

Optimized for tactical deployment, our platform delivers high performance in a compact footprint which is ideal for Group 1–3 UAVs and other SWaP-constrained platforms.

**Hughes Warpspeed Smallest Form Factor**

- Embedded solution for Small Unmanned Aircraft System (sUAS), handheld controllers, headsets, and more
- Lowest cost entry – service enabler for GUARDIAN

**Global 5G/4G Cellular Modem**

- 5G Redcap at 200 Mbps downlink and 100 Mbps uplink
- 4G/LTE CAT4 Fallback

**Secure Network Gateway**

- Executes Hughes Router OS and SNE-Lite Functionality. Switches between Cellular and Line of Sight (LOS) connectivity.
- GUARDIAN Secure Tunnel Backbone
- FIPS 140-3 Level 2 Trusted Platform Module

**eSIM and Network Management**

- Dual SIM On-board: eSIM + 4FF Physical SIM
- Automatic Network Failover: SIM and Wide Area Network (WAN) failover
- Primary, Alternate, Contingency, and Emergency (PACE) and network route planning. Pre-provision SIM and network rules prior to mission

**Quick Deployment**

Zero touch provisioning and remote endpoint management*

**Easy to Integrate**

- M.2 B-Key standard connector for power and data (USB 2.0/UART)
- No custom kernel drivers needed. Support Windows / Linux out of the box
- Built-in MAVLink router for framing and routing MAVLink between Unmanned Aerial System (UAS) and network endpoints*

**Future Roadmap Features*

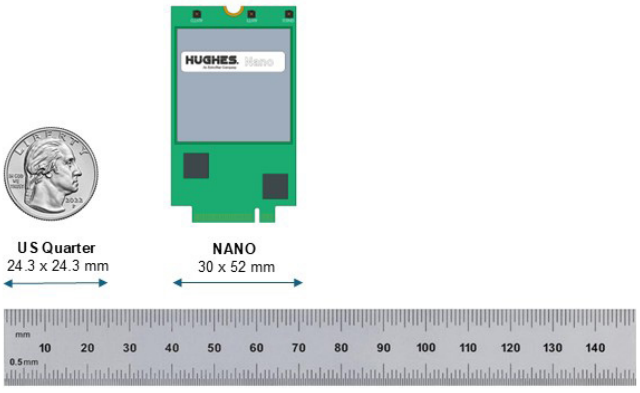
# Hughes WS-1000 Nano

## Technical Specifications

| | |
|---|---|
| Processor Subsystem | 1x ARM A7 @ 1.7 GHz 1 GB DDR/1 GB NAND |
| # SIM | Dual SIM: Nano-4FF, eSIM |
| Antenna/MIMO | Rx Diversity and MIMO DL 2×2 (2 MHF.4) |
| GNSS | L1/L5 (MHF.4) |
| M.2 Key | Industry Standard M.2 B-Key<br>• 3.3V Supply and Gnd<br>• USB 2.0<br>• PCI Express x1<br>• SIM 1 and 2 (option)<br>• UART<br>• GPIOs |
| Operational Temperature | -40 °C to +70 °C |
| Weight | Less than 12 g |
| Dimensions (W x L x D) | 30 x 52 x 4.5 mm |

## Cellular Capabilities with WS-Nano Installed

| | |
|---|---|
| Cellular Radio Access | 3GPP Rel 17, 5G Redcap<br>4G/LTE CAT4 Fallback |
| Cellular Bands | **5G FR1:**<br>n1/n2/n3/n5/n7/n8/n12/n13/n14/n18/ n20/n25/n26/n28/n29/n30/n38/n40/ n41/n48/n66/n70/n71/n77/n78/n79<br>**4G LTE:**<br>B1/B2/B3/B4/B26/B7/B8/B12/B13/ B14/B17/B18/B19/B20/B25/B28/ / B30/B34/B38/B39/B40/B41/B42/B43/ B48(CBRS)/B66/B70/B71/B106 |
| Cellular Throughput | 5G Sub.6 FDD and TDD operation in 5G NR stand-alone<br>• DL: 223 Mbps<br>• UL: 123 Mbps<br>LTE Cat 4<br>• DL: 200 Mbps<br>• UL: 105 Mbps |
| LTE/5G Transmit Power | 23 dBm (Power Class 3) |




Warpspeed G2 Resilient Comms

For more information, visit
**www.hughes.com**