# Plug-and-play long-range unmanned system connectivity solution

Robonode is a long-range, low-latency data radio built on the Qualcomm® QCS405 SoC and QCN9074 radio chip. Deploy powerful features like FEC, fast frequency shifting, and an improved extended-range IEEE 802.11ax implementation that help deliver the range and security you need for critical, high-performance unmanned system connectivity. A durable aluminum housing with an integrated ventilator and heat sinks optimizes weight and makes Robonode plug-and-play capable for easy integration into your mobile project.

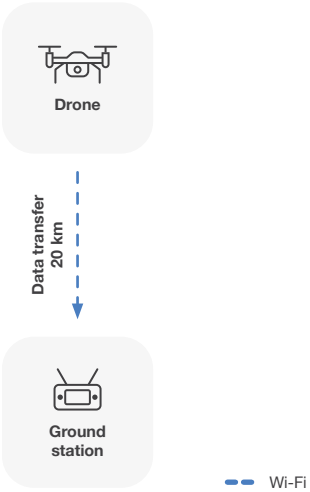
Robonode also features powerful pre-loaded Robosoft firmware that comes standard with advanced features that are usually provided on a premium basis. These features are simple to configure with Robosoft's single-file configuration and can be accessed through a direct interface or the Robosoft GUI.

# What can Robonode do for your unmanned system?

The following use case examples visualize just a few of the ways in which Robonode can help unlock new features and capabilities for your company's high-performance drone project. For even more insights into Robonode's potential, schedule a consultation with our engineers to discuss your specific needs and use cases.

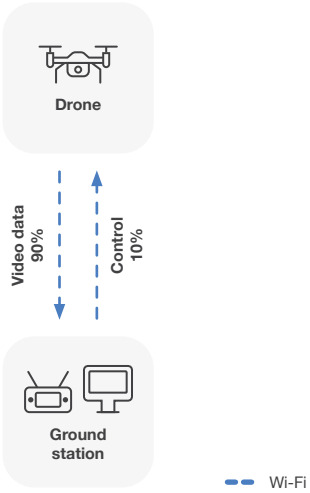
## Wi-Fi broadcast with Robonode

Ack-less Wi-Fi broadcast support enables Robonode to provide reliable, long-range connectivity between drones and ground stations at distances up to 20 km. This feature enhances video stream stability, maintains continuous data transmission over extended ranges, and improves network performance in multi-device wireless environments.Despite broadcasting, Robonode's integrated encryption features ensure encryption throughout the connection process and all transmitted data remains secure.



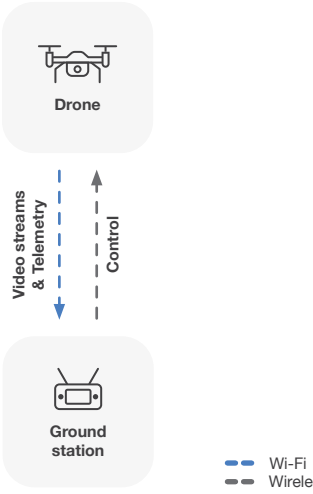

## Bandwidth optimization with Robonode

Robonode achieves efficient bandwidth utilization by managing the natural asymmetry in unmanned system communication patterns. By allocating, in this example, 90% of the available channel to downstream video data and only 10% to control inputs, it delivers optimal-quality video feedback without sacrificing responsiveness, even under constrained wireless conditions.

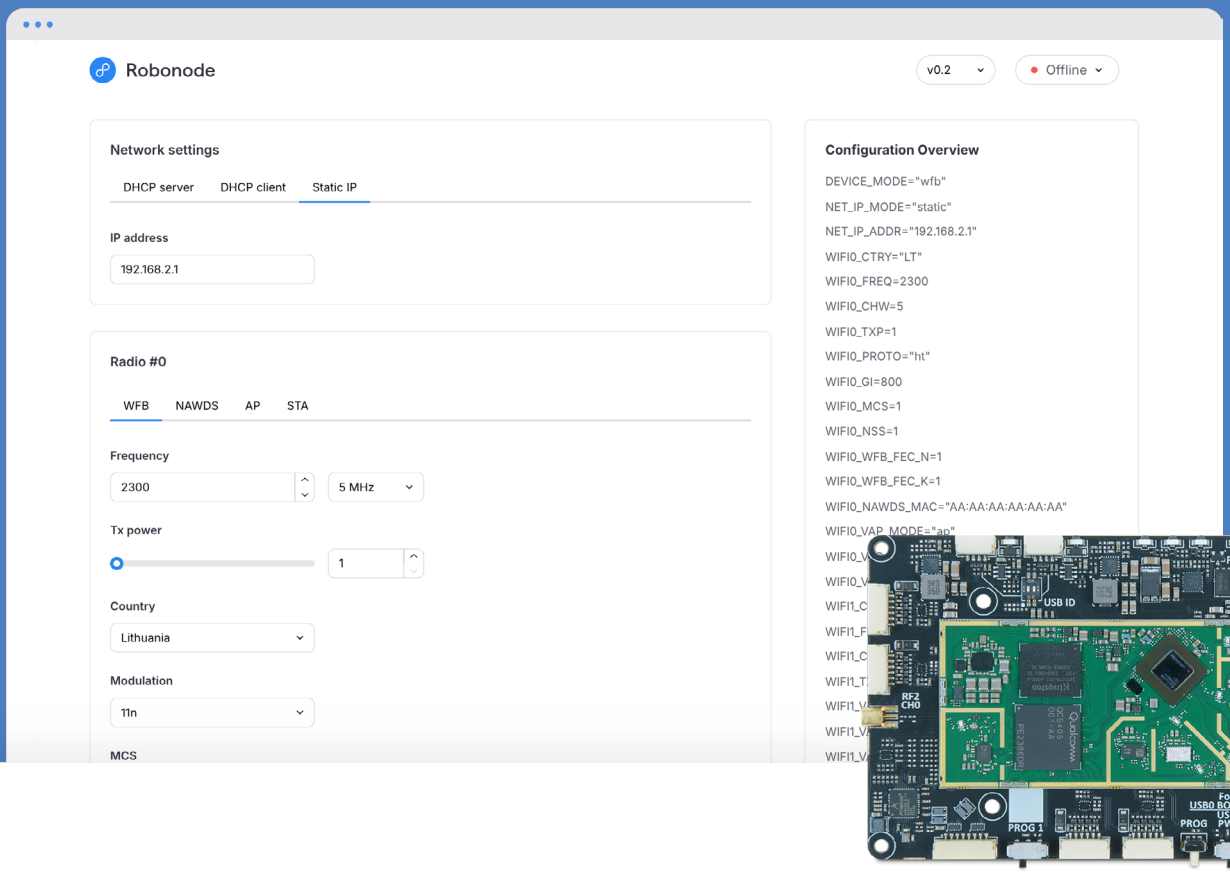



## Flexible connectivity with Robonode

Enhances resilience, range, and mission assurance by using a hybrid communication model with Robonode. Video and telemetry data can flow over Wi-Fi while control commands are routed via a separate wireless link. This can be used to ensure uninterrupted operation even in RF-challenged or dynamic environments.



# Feature Highlights







## Wi-Fi Broadcast

Ack-less Wi-Fi broadcast makes Robonode's wireless connectivity and video feedback more resilient to adverse connection conditions and more capable of functioning near the edge of its maximum connection range. This feature also makes it easier for Robonode to operate in unison with repeaters and other components in multi-device networks.

## Frequency shifting

Robonode supports frequency shifting, which is a key function for improving Robonode's interference and jamming avoidance capabilities. Robonode's pre-loaded firmware can help detect and respond to adverse conditions and make adjustments with hertz precision to maintain critical connectivity for your unmanned project.

## USB Gadget Mode

Robonode supports USB gadget mode, making it extremely easy for developers and end users alike to build, configure and upgrade Robonode by connecting to its flash drive using a PC. This also lets Robonode act as a USB to ETH adapter to deliver internet access.

## Single configuration file

Running your Robonode from a single configuration file drastically simplifies development, configuration and maintenance. Configure network interfaces, network topology, system files, and services with formatted service-specific configurations.

## Narrow Channels

Narrow channel support is essential for interference avoidance, connection range optimization, jitter reduction, and other Robonode features optimized for resilient extended range unmanned system operation. This capability is unlocked by default by Robonode's pre-loaded firmware.

## Robonode UI

Use Robonode's cloud-connected UI to configure its parameters remotely. Just configure this pre-loaded feature with your Robonode's IP address and it's ready to go, adding a layer of value to your Robonode-empowered unmanned system project.

# Specifications

| Platform | | |
|---|---|---|
| SoC | Qualcomm® QCS405 | |
| CPU | Arm Cortex A53 quad-core; 1.4GHz; 64-bit | |
| GPU | Qualcomm® AdrenoTM 306 graphics processing unit (GPU) with 64-bit addressing; 600MHz | |
| Flash | 8GB eMMC | |
| RAM | 1024MB LPDDR3 | |
| **Wireless** | | |
| Radio | Long range connectivity radio<br>(based on QCN9074 from Qualcomm) \| 2x4 MU - MIMO | Short range connectivity data radio<br>(based on WCN9380 from Qualcomm): 1x1 |
| Wireless Standard | Improved IEEE 802.11 a/b/g/n/ac/ax | Improved IEEE 802.11 a/b/g/n/ac/ax |
| Frequency | 2412-2484 MHz<br>5150-5925 MHz | 2412-2484 MHz<br>5180-5825 MHz |
| Extended Frequencies | 2300 ~ 3200 MHz (2.4 GHz)<br>4100 ~ 6700 MHz (5GHz) | N/A |
| Channel sizes | 5/10/20/40/80/160 MHz | 20/40/80 MHz |
| Modulation | OFDMA | OFDMA |
| Data Rate | 2402 Mbps (5 GHz \| 160 MHZ @mcs11) | 433.3 Mbps (5 GHz \| 80 MHz @mcs9) |
| Bluetooth | - | Bluetooth 5.0 and FM RDS/RBDS |
| Max Output Power (per chain) | 26 dBm @mcs0 | 15 dBm @mcs0 |
| **Features** | | |
| AP / Station | ✓ | ✓ |
| Wi-Fi Broadcast | ✓ | ✓ |
| Single config file | ✓ | ✓ |
| Configuration over USB storage | ✓ | ✓ |
| ADB over USB connection | ✓ | ✓ |
| USB to ETH adapter mode | ✓ | ✓ |
| System management (GUI/CLI) | ✓ | ✓ |

| Security | |
|---|---|
| Data Encryption algorithm | crypto_aead_chacha20poly1305_encrypt |
| **Interfaces** | |
| Ethernet | 1 x 1000 Base-T |
| USB | 2xUSB 2.0 |
| Serial interfaces | DMIC;UART;SPI;I2C |
| Push buttons | 1x Reset button<br>1x Boot button<br>1x GPIO |
| Fan | Programmable fan (GND controlled via MOSFET with GPIO_39) |
| Slide-switch | x1 Cut USB0 Power for USB recovery mode, x1 GPIO |
| **Power** | |
| DC Power (connector type) | 8.6 - 33.8 V (JST) |
| **Physical** | |
| Dimensions | 108.5 x 73.5 x 20 mm |
| Product Weight | 178 g |
| Temperature range | -45°C to 75°C*<br><br>We recommend connecting a software-controlled ventilator (not included) to ensure optimal performance under maximum temperature conditions, especially in static environments or areas with limited airflow. |
| Box content (DVK) | 1 x Robonode<br>1 x Power cable, 100 mm<br>2 x USB cable, 100 mm<br>1 x ETH cable, 100 mm<br>1 x UART cable, 100 mm<br>4 x GPIO cable, 100 mm<br>1 x ETH adapter board<br>2 x USB adapter board<br>5 x RF MMCX-SMA cable, 100 mm<br>5 x 2.4/5/6GHz omni antenna<br>1 x 12 V power supply |
| Warranty | 1 year |
| Certification | CE mark (pending)<br>IC / FCC (pending) |

# Ordering Info

**Note**: In addition to a standard Robonode unit, the Robonode DVK option also includes cables and peripherals essential for interfacing with and testing your Robonode. We highly recommend investing in a handful of DVKs to accelerate your development process.

| Order No. | Description |
|---|---|
| **Robonode25** | Robonode25 device, Radio 1: 2.4GHz and 5GHz, industrial temperature range -40°C to 75°C |
| **Robonode25-DVK** | Robonode25 Development Kit |
| **Robonode25-NE** | Robonode25 device without enclosure, only the board |
| **Robonode26** | Robonode26 device, radio 1: 2.4 GHz + 6GHz, industrial temperature range  -40°C to 75°C |
| **Robonode26-DVK** | Robonode26 Development Kit |
| **Robonode26-NE** | Robonode26 device without enclosure, only the board |

# Robonode Development Kit Content


| # | Description | Qty |
|---|---|---|
| 1 | Robonode | 1 |
| 2 | Power Cable, 100mm | 1 |
| 3 | USB Cable, 100mm | 2 |
| 4 | ETH Cable, 100mm | 1 |
| 5 | UART Cable, 100mm | 1 |
| 6 | GPIO Cable, 100mm | 4 |
| 7 | ETH adapter board | 1 |
| 8 | USB Adapter board | 2 |
| 9 | RF MMCX-SMA cable, 100mm | 5 |
| 10 | 2.4/5/6GHz omni antenna | 5 |
| 11 | 12V power supply | 1 |