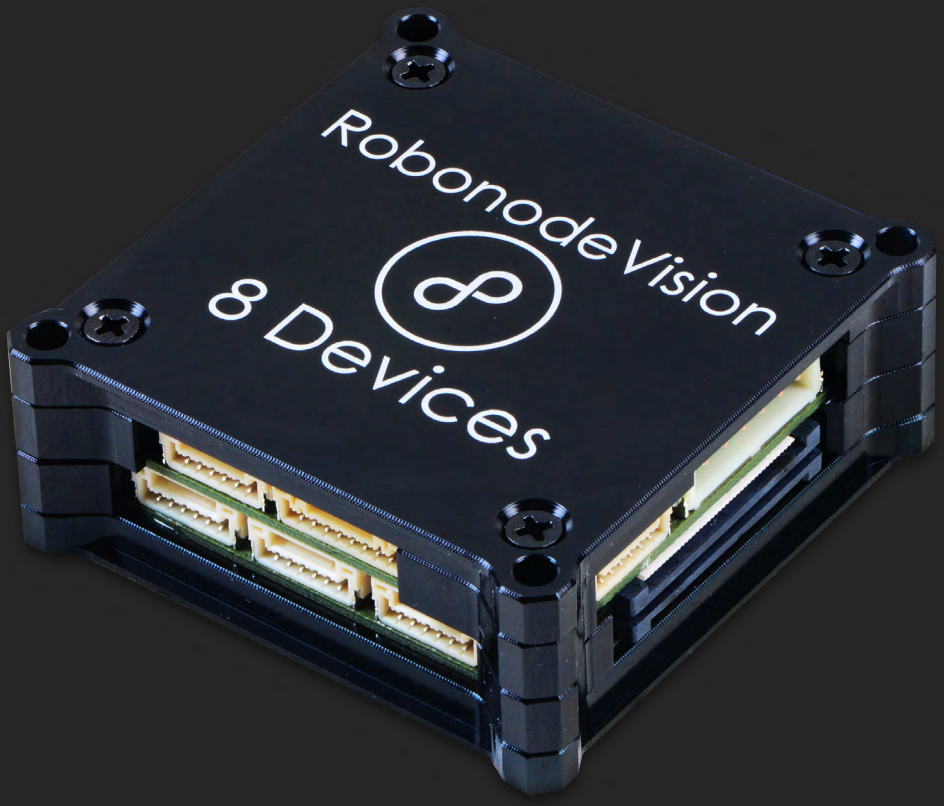


RobonodeVision - Compact, High-performance Vision & Modified 802.11be Connectivity Platform

RobonodeVision is a compact, high-performance vision and connectivity platform built around the Qualcomm QCS6490 SoC that delivers 4K @ 60 fps video, AI inference at the edge, and long-range modified 802.11be communication in a single 4-board stack. The platform supports up to three concurrent MIPI-CSI camera inputs, high-power dual-band RF (up to 27-28 dBm per chain), hardware-accelerated H.264 / H.265 / VP9 encode and decode, and dual 1 Gbps Ethernet - all within a 54.5 × 54.5 × 20.3 mm form factor optimized for drone payloads and demanding industrial applications.

The pre-installed Robosoft embedded Linux platform provides end-to-end functionality out of the box - from secure boot and video streaming to RF configuration, AI processing, and full system management through a web-based GUI.

RobonodeVision Application Scenarios

The following use cases illustrate how RobonodeVision's capabilities combine to address demanding vision and connectivity challenges across multiple industries.

Drone Vision & Ground Station

Multi-camera capture, H.265 encoding, and long-range wireless connectivity on the airborne unit. The same platform acts as a high-performance ground-station video receiver with MIPI-DSI display output and web-based management GUI.

Search & Rescue / Remote Ops

Real-time low-latency video streaming from airborne drones to portable ground stations in mountainous or obstructed environments - leveraging narrow-channel and ACK-timeout RF tuning.

Industrial Robots & AGVs

Embedded vision and AI inference (Qualcomm SNPE / Hexagon DSP) for warehouse navigation and factory inspection, with reliable wireless connectivity and Ethernet connectivity and flexible UART / SPI / I²C expansion.

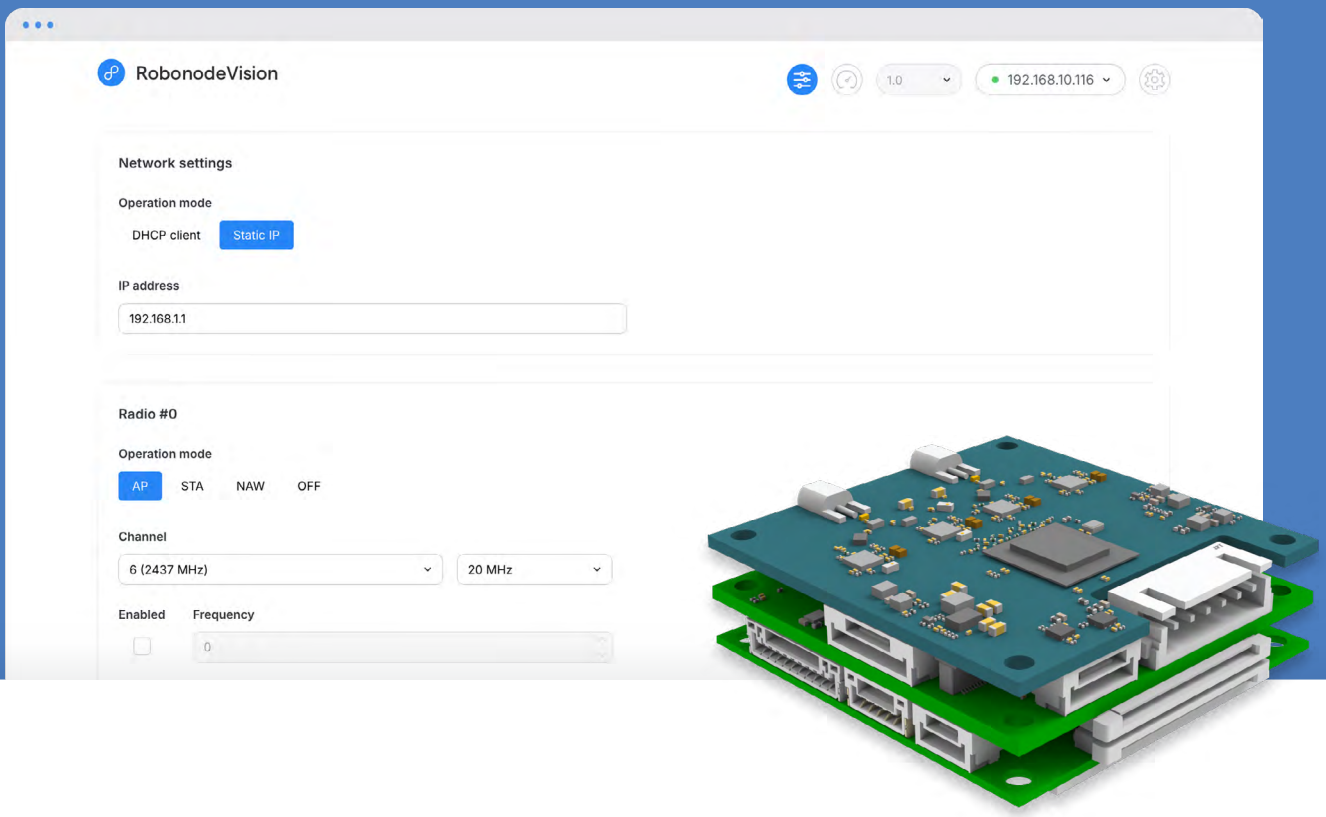
Mining & Harsh Environments

Long-range wireless connectivity in obstructed environments, ruggedized multi-camera support, real-time video compression, and SPI / I²C expansion for gas, temperature, and vibration sensors.

Infrastructure Inspection

4K video transmission from inspection drones to control stations. Automatic wide-to-narrow FOV camera switching on digital zoom for seamless operator experience.

Feature Highlights



High-Power Modified 802.11be RF

QCN9274 with high-power FEMs delivering up to 27-28 dBm per chain across 2.4/5/6 GHz. Supports long-range DCM/DCM-DUP modes, narrow-channel operation, and active spectrum analyzer.

Edge AI Engine

Qualcomm 6th Gen AI Engine with Hexagon DSP, HVX, and Tensor Accelerator. SNPE SDK 2.x enables real-time AI, computer vision, and sensor fusion fully on-device - no cloud dependency.

Multi-Camera Vision

Three independent 4-lane MIPI-CSI interfaces (D-PHY 1.2 / C-PHY 1.2) with Qualcomm Spectra 570L ISP. Up to 3× concurrent cameras with specialized adapters, 720p @ 480 fps slow-motion.

Robosoft Platform

Pre-loaded Robosoft embedded Linux (Kernel ≥ 6.12, ath12k) with AP/STA/NAW (802.11s) modes, frequency shifting, dual-boot, SWUpdate OTA, and full web-based GUI - no desktop client required.

4K Video Pipeline

GStreamer-based real-time pipeline with hardware-accelerated H.264 / H.265 / VP9 decode at 4K @ 60 fps and encode at 4K @ 30 fps. HDR10 and HDR10+ playback support.

Firmware Options

Standard Firmware

Basic functionality. Includes core video streaming and RF connectivity. Suited for cost-sensitive clients and simple video + RF use cases. No premium features enabled.

Premium Robosoft Firmware

Full Robonode Premium feature set: advanced RF tools, active spectrum analyzer, extended camera support, automation features, and the complete WebUI management suite. For high-end drone manufacturers, researchers, and industrial robotics.

Specifications

Compute Platform	
SoC	Qualcomm QCS6490 (Citron SoM)
CPU	Kryo 670 octa-core (Arm v8)
GPU	Adreno - OpenGL ES 3.2, Vulkan 1.x, OpenCL 2.0, DirectX FL 12; HDR10+ and Wide Color Gamut
RAM	32 Gb LPDDR5 SDRAM @ 6400 Mbps
Storage	32 GB eMMC 5.1
AI/DSP	
AI Engine	Qualcomm Hexagon Processor - 6th Gen Qualcomm AI Engine
Acceleration	Scalar, vector, and tensor acceleration (HVX + Tensor Accelerator)
Framework	Qualcomm SNPE (Hexagon DSP / NPU inference)
Wireless	
Wireles Standard	Modified IEEE 802.11be, backward compatible 802.11 b/g/n/ax
RF IC	Qualcomm QCN9274
FEMs	2.4 GHz: SKY85358-11, 5 GHz: SKY85798-11, 6 GHz: SKY85798-11
Radio Mode	Dual-band simultaneous - 2×2 MU-MIMO @ 2.4 GHz + 2×2 MU-MIMO @ 5/6 GHz
Modulation	4096-QAM
2.4 GHz	20/40 MHz, up to 27 dBm per chain @ MCS0
5 GHz	20/40/80/160 MHz, up to 27 dBm per chain @ MCS0
6 GHz	20/40/80/160/320 MHz, up to 26 dBm per chain @ MCS0
Long-range MCS modes	DCM / DCM-DUP (MCS14 / MCS15)
Network modes	AP, STA, NAWDS (802.11s mesh)
Spectrum analyzer	Active, real-time
Antenna connectors	2× MMCX
Variants	2.4 GHz + 5 GHz SKU, 2.4 GHz + 6 GHz SKU (separate SKUs)

Camera	
ISP	Qualcomm Spectra 570L
MIPI-CSI interfaces	3× 4-lane (D-PHY 1.2 - 2.5 Gbps/lane; C-PHY 1.2 - 10.26 Gbps/T)
Concurrent cameras	Up to 3 simultaneous inputs
Max resolution	36 MP + 22 MP @ 30 fps, or 3× 22 MP ZSL
Slow-motion	720p @ 480 fps, 1080p @ 240 fps
Default camera sensors	IMX577 D-PHY 12 MP, OV9282 D-PHY 1 MP (22-pin)
Adapter support	Raspberry Pi 5, Jetson Orin (22-pin), GMSL-to-CSI (TBD)
Display	
MIPI-DSI	1× 4-lane (D-PHY / C-PHY)
Video	
Decode	4K @ 60 fps - H.264 / H.265 / VP9
Encode	4K @ 30 fps - H.264 / H.265
HDR	HDR10 and HDR10+ playback
Video middleware	GStreamer 1.20+
Latency target	< 100 ms end-to-end
Interfaces	
Ethernet	2× 1 Gbps
USB	1× USB 3.1, 1× USB 2.0
UART / I²C / SPI / GPIO	5× configurable 6-pin JST QUP connectors
Debug UART	1× JST 4-pin
MIPI-CSI connectors	3× 40-pin FPC
MIPI-DSI connectors	1× 40-pin FPC
Ethernet connectors	2× JST 8-pin
RF connectors	2× MMCX
Power	
Input voltage	5.0 - 34.0 V
Power connector	JST 6-pin
Physical	
Form factor	54.5 × 54.5 × 20.3 mm
Architecture	4-board stack: Radio + I/O & Power + I/O & Carrier + Citron SoM
Operating temperature	Industrial

Software	
OS / Kernel	Linux Kernel ≥ 6.12 with ath12k support
AI framework	Qualcomm SNPE
Video middleware	GStreamer 1.20+
OTA / dual-boot	SWUpdate framework
Management	Web-based GUI - AP/STA/NAW modes, RF config, live video, telemetry, diagnostics
Security	Secure boot, Robosoft-integrated user access management
Features	
AP / Station / NAW mesh	✓
Active spectrum analyzer	✓
Narrow-channel operation	✓
Frequency shifting	✓
ACK-timeout control	✓
Dual-boot / SWUpdate OTA	✓
Web-based GUI	✓
GNSS module compatibility	✓
Auto camera FOV switching on zoom	✓

Ordering Info

Order No.	Description
RobonodeVision25-B	RobonodeVision - 2.4 GHz + 5 GHz, industrial temperature range, basic firmware
RobonodeVision26-B	RobonodeVision - 2.4 GHz + 6 GHz, industrial temperature range, basic firmware
RobonodeVision25-A*	RobonodeVision - 2.4 GHz + 5 GHz, industrial temperature range, advanced Robosoft firmware
RobonodeVision26-A*	RobonodeVision - 2.4 GHz + 6 GHz, industrial temperature range, advanced Robosoft firmware

Note: For ordering RobonodeVision please contact us separately