CamThink

NeoEyes NE301

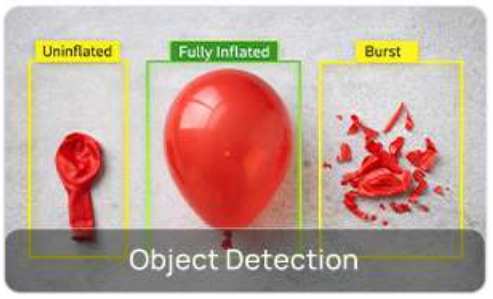
Edge AI Camera

On-device AI vision with flexible connectivity for real-world deployment.

Overview

NeoEyes NE301 is a compact edge AI camera platform designed to bridge rapid prototyping and real-world deployment.
Built on the STM32N6 AI microcontroller with integrated NPU, NE301 enables fully on-device vision inference while offering multiple deployment-ready connectivity options — Wi-Fi, LTE Cat.1, and PoE — to support diverse deployment environments without requiring changes to the AI stack.
One hardware platform. Multiple deployment-ready connectivity options.

AI Capability to Applications



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Highlights

High-Performance Edge AI Processing

- STM32N6 AI microcontroller with integrated Neural-ART Accelerator (up to 0.6 TOPS)
- Real-time, fully on-device AI inference
- Compatible with YOLO-family, MobileNet, and ResNet-class architectures
- Supports Bring Your Own Model (BYOM) via user-defined INT8 TFLite models

High-Quality Video Processing

- Up to 4 MP (2672 × 1520) video capture at 30 fps
- Hardware-accelerated H.264 video encoding
- Real-time video streaming via RTMP and other standard protocols

Ultra-Low-Power Dual-Core Architecture

- Dual-core architecture for long-term, unattended operation
- Cortex-M55 (up to 800 MHz) for AI inference and high-performance tasks
- Cortex-M0+ for always-on monitoring and millisecond-level wake-up
- Standby current as low as 7 µA in low-power mode
- Always-on Video (AOV) support under ultra-low power conditions

Flexible Connectivity, Power & Expansion

Supports Wi-Fi 6 (802.11ax) and BLE 5.3 wireless connectivity
Power over Ethernet (PoE variant) support (up to 7 W)
Wide power input: DC 5 V or battery (3.6 V - 6.4 V)
Onboard interfaces: smart PIR, alarm input, and RS485
Supports TF card local storage (up to 2 TB)
Modular expansion for communication (LTE Cat.1 / LoRa / PoE) and sensing modules

Open & Controllable Software Stack

- Custom-trained model deployment
- MQTT / HTTP and other standard interfaces
- Web UI for configuration, testing, and monitoring
- Full access to inference outputs and system logs

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AI Model Support & Openness

Any AI model architecture officially supported by STM32N6 can be deployed or adapted on NE301 — with no proprietary lock-in.

Supported AI Model Categories

Visual Perception

- Image classification
- Object detection
- Segmentation (instance & semantic)

Audio & Multimodal

- Audio event detection
- Speech enhancemen

Human-Centric AI

- Activity recognition
- Gesture / posture recognition

Advanced Vision

- Re-identification
- Depth estimation
- Neural style transfer

Representative models include MobileNet-, YOLO-, DeepLab-, and CNN-based architectures.

Open Source & Developer Ecosystem

- Full-stack open-source codebase (STM32N6 / U0 firmware to web frontend)
- Community and Commercial dual-licensing
- Docker-based development with one-command build and flashing
- Modular HAL / Service / App architecture
- Built-in MQTT, HTTP, and WebSocket services
- Comprehensive WIKI, API, and model deployment documentation

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NE301 Variants Overview			
	NE301 Wi-Fi	NE301 LTE Cat.1	NE301 PoE
Connectivity	Wi-Fi	4G LTE Cat.1 / Wi-Fi	Ethernet / Wi-Fi
Power	USB-C / Battery	USB-C / Battery	PoE
Deployment Type	Indoor / Flexible	Remote / Distributed	Fixed / Infrastructure
Typical Use	Fast PoC, Testing	Field Deployment	24/7 Installation
AI Capability	Same across all variants	Same	Same

Notes

All variants share the same AI processing capabilities and software stack. Connectivity and power options do not affect AI model compatibility. Lens options are available across all variants.

Technical Specifications

AI Processor & Memory	
Power	Arm Cortex-M55 @ 800 MHz with Arm Helium (M-Profile Vector Extension)
Connectivity	Neural-ART™ Accelerator @ 1 GHz
Power	Up to 0.6 TOPS
Deployment Type	4.2 MB
Typical Use	128 MB
AI Capability	64 MB
Power & Efficiency	
NPU Efficiency	Up to 3 TOPS/W
Standby Current	~7 µA (low-power mode)
Boot Time	Microsecond-level boot
Wake-up Time	Millisecond-level wake-up
Cooling	Passive (fanless)
Power Input	USB Type-C / Battery / PoE (variant dependent)
Power Ctrl Unit	The STM32U073Kx further reduces N6 power consumption through independent, refined power management.

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AI Software Support

Pre-installed Analytics	Human detection & recognition
Model Compatibility	Compatible with lightweight CNN-based vision architectures, including YOLO-family, SSD-based detectors, MobileNet-class and ResNet-class models
Audio & Time-Series	YamNet, MiniResNet, Human Activity Recognition (HAR)
Custom Models	Supports INT8 TFLite models (BYOM)

Model compatibility depends on architecture complexity and optimization.

Imaging System

Image Sensor	1/2.9" Progressive Scan CMOS
Camera Module	4 MP OS04C10
Max Resolution	2688 × 1520 (4 MP)
Video Encoding	H.264 hardware encoder, JPEG codec
Frame Rate	Up to 1080p @ 30 fps

Lens Options

	2.5 mm	3.0 mm	6.0 mm
HFOV	137°	88°	51°
Aperture	F2.4	F2.5	F2.2
Distortion	< -33%	< 1%	< 1.6%

Connectivity & Protocol

Wireless	Wi-Fi 6 (802.11ax), Bluetooth 5.4
Cellular	LTE Cat.1 (variant dependent)
PoE	Supported (variant dependent)
Protocol Stack	Based on LwIP and MbedTLS
Protocol Support	HTTP / HTTPS MQTT / MQTTS

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Interfaces & Expansion (Mainboard)	
Alarm Interface	1 × Alarm In, 1 × Alarm Out (supports 4-pin smart PIR)
Storage	Built-in MicroSD / SDHC / SDXC slot, up to 2 TB
Multi -function Button	Reset / Wake / Capture
Lens Interface	1× 4-pin USB, 1× MIPI CSI-2
I/O Interfaces	1× UART, 1× RS485, 1× I²C, 2× GPIO, 2× GND, 1× 3.3 V / 5 V (controllable)
Debug / Power	1× USB Type-C, 1× 4-pin UART
Audio I/O	1× UART, 1× RS485, 1× I²C, 2× GPIO, 2× GND, 1× 3.3 V / 5 V (controllable)
Communication Expansion	12-pin + 16-pin expansion IOs for communication modules
Power Interface	2-pin connector (Battery / USB Type-C)
Sensor Expansion	Supports PIR, radar, temperature/humidity, and other sensors via motherboard I/O

Environmental & Certification	
Operating Temperature	-20 °C to 50 °C
Operating Humidity	< 95% RH (non-condensing)
Protection Rating	IP67
Dimensions	77 × 77 × 48 mm
Certifications	CE, FCC

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