Nicla Voice
Reseller Sales Brief

PRO Business Unit

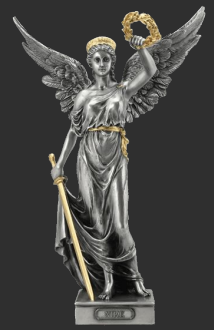
September 12, 2022

Table of Contents

NICLA Family

A range of industrial-grade sensors packed into a tiny footprint.

1. Tiny form factor
2. Easy configuration, instant setup, high-level data
3. Easy to create WSN (wireless sensor network) that collect data
4. State of the art, industrial-grade sensors
5. Low-power AI and machine learning
6. Can host intelligence on the edge
7. Eslov connector for easy, nearby communication
8. Compatible with Portenta and MKR product line
9. Fast deployment within existing infrastructure



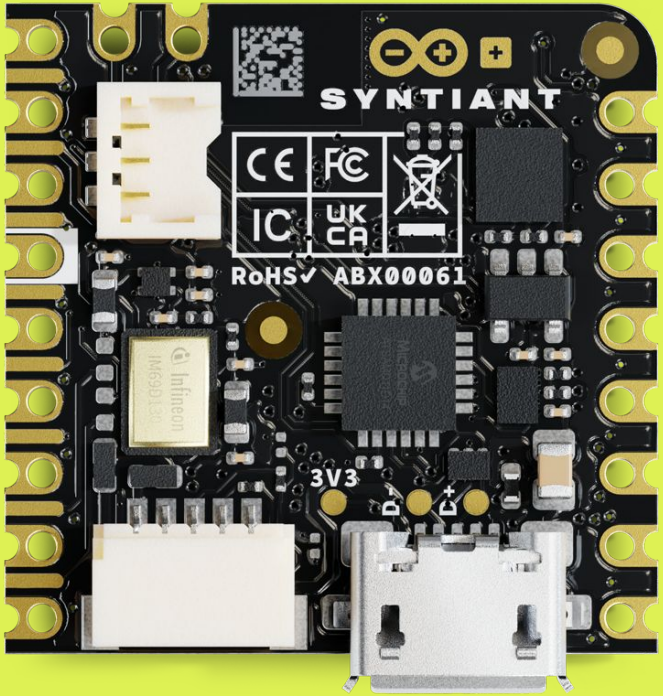
"NICLA" is a Greek word meaning:
Victory of the People.

Product Overview

Implement **always-on speech recognition** on the edge with Nicla Voice. The board integrates a **Neural Decision processor** from Syntiant (NDP120), allowing to run multiple AI algorithms.

In addition to its **microphone**, the tiny Nicla Voice features a **smart 6-axis motion sensor** and a **magnetometer**, making it the ideal solution for ultra-low power **predictive maintenance**, **gesture/voice recognition** and **contactless** applications.

Nicla Voice offers onboard **Bluetooth® Low Energy** connectivity and is compatible with Nicla, Portenta and MKR products.

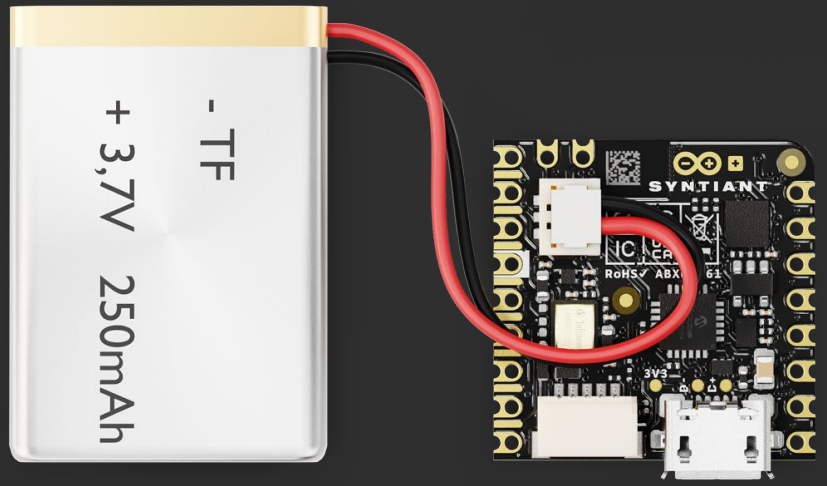


Target Customers

Customer need	Target	Value	Use Cases
Vibrations detection of industrial machineries	• Industrial equipment • Machinery Manufacturers • Industrial Automation • Production plants	• Cost effective solution without the need of external sensor • Improve quality of products • Reduce down-time/return from field • Predict machine health • Short time-to-value • Highly scalable deployment	• Motors, gearboxes, chillers and belts vibrations detection • Fans and compressors monitoring • Wind turbines monitoring • Water pump monitoring • Machine bearings monitoring
Upgrade existing industrial machines with low-power speech recognition	• Industrial equipment • Machinery Manufacturers • Industrial Automation	• Enhance existing products with minimal effort • Highly scalable deployment • Facilitate human-machine interaction • Increase speed of work • Avoid vendor lock-in • Avoid interaction with machines in critical environments	• HMI for local user interaction • Speech-based machine setup and interaction • Chiller machines
Implement contactless operations for building automation applications	• Healthcare • Corporate offices • Shopping malls • Train stations/airports	• Ready-to-use solution • User experience improvement • Enhance hygienic conditions • Add always-on capabilities • Preserve privacy and security with local storage	• Interactive totem/kiosks/smart lockers • Smart vending machine/ATM • HMI for local user interaction • Telemedicine and telehealth monitoring
Improve building security	• Building automation • Smart homes • Smart cities • Corporate offices • Coworking spaces	• Improve user experience • Facilitate human-appliance interaction • Standalone when battery powered • Allow fast decision-making	• Motion sensing • Smart doorbells • Intruder detection • Surveillance & alarm systems
Bring hand-free and gesture recognition functionalities to your wearable devices	• Consumer electronics • Healthcare • H&S • Corporate offices • Coworking spaces	• Tiny form factor • Always-on detection usage • Ultra low-power consumption • Battery powered • Cost effective solution without the need of external sensor • Preserve privacy and security with local storage	• Smartwatches • Fitness trackers • Wristbands • Smart headphones • Helmets

Benefits

- Powerful processor with integrated Deep Neural Networks in a tiny form factor (22.86 x 22.86 mm)
- Integrated microphone, magnetometer and smart 6-axis IMU
- Onboard Bluetooth® Low Energy connectivity to easily interact with existing devices
- Run multiple applications simultaneously to detect events, speakers, multiple wake-up words, keyword spotting
- Enhance audio quality with echo-cancellation and noise suppression
- Ultra-low power for 24/7 always-on-sensor data processing
- Standalone when battery powered
- Compatible with Arduino MKR and Portenta products

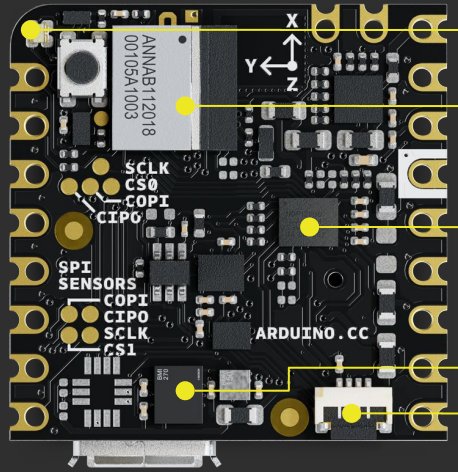


Example of a typical application combining Arduino Nicla Voice with a LiPo battery

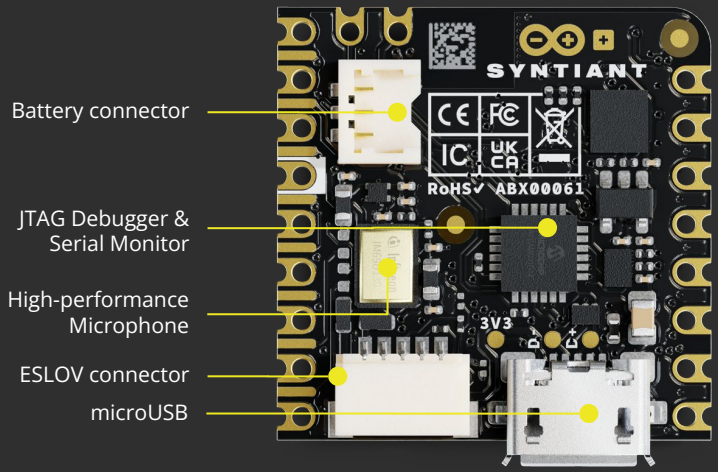
Technical Specs

Microprocessor	Syntiant® NDP120 Neural Decision Processor™ (NDP): • 1x Syntiant Core 2™ ultra-low-power deep neural network inference engine • 1x HiFi 3 Audio DSP • 1x Arm® Cortex® M0 core up to 48 MHz	**Memory**	• 512KB Flash / 64KB SRAM • 16MB SPI Flash for storage • 48KB SRAM dedicated for NDP120
Microcontroller	Nordic Semiconductor nRF52832: • 64 MHz Arm® Cortex M4	**Dimensions and weight**	• 22,86 x 22,86 mm • 2 g
Sensors	• High performance microphone (IM69D130) • 6-Axis IMU (BMI270) • 3-axis magnetometer (BMM150)	**Operating temperature**	0° C to +85° C (32° F to 185°F)
I/O	Castellated pins with the following features: • 1x I2C bus (with ESLOV connector) • 1x serial port • 1x SPI • 2x ADC • Programmable I/O voltage from 1.8-3.3V	**Power**	• High speed USB (500mbps) • Pin Header • 3.7V Li-po battery with Integrated battery charger and fuel gauge (BQ25120AYFPR)
Interface	• External microphone connector (ZIF) • USB interface with debug functionality	**Connectivity**	• Bluetooth® Low Energy (ANNA-B112)

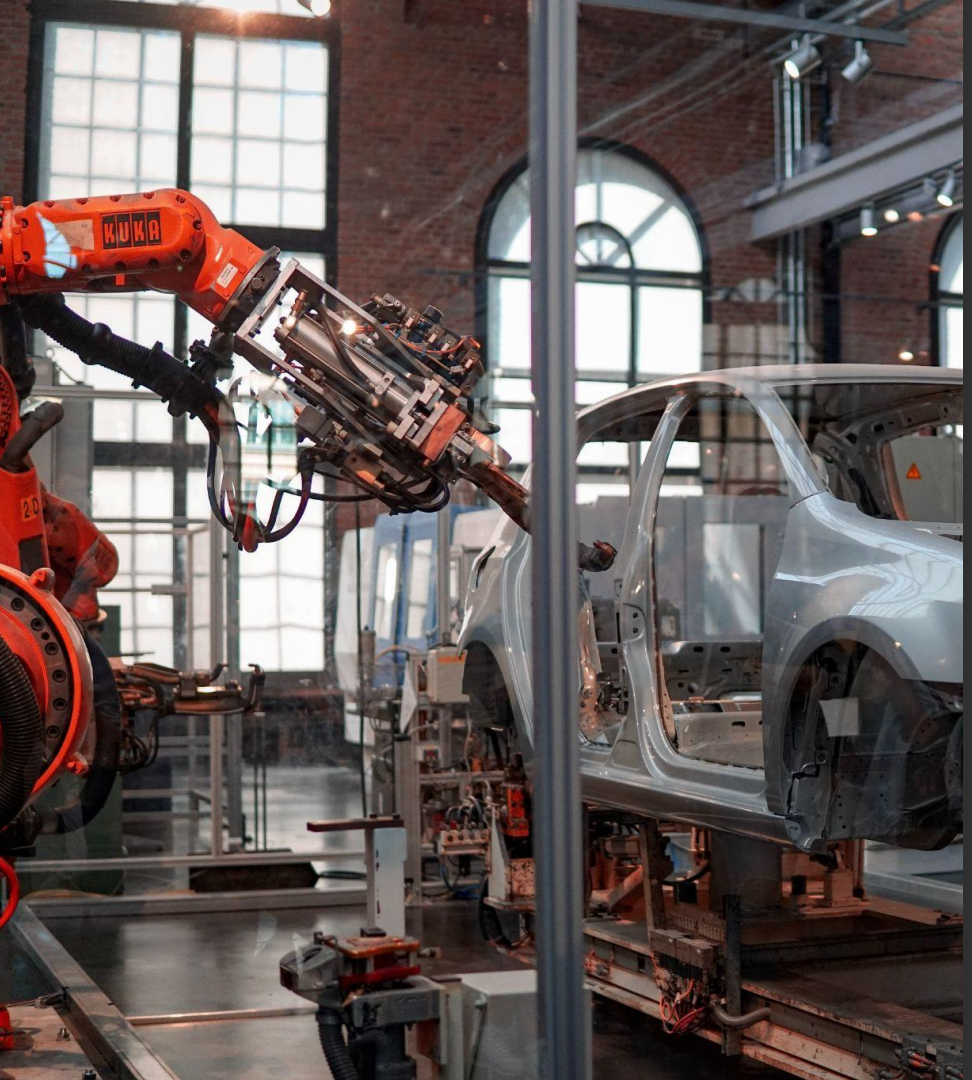
Technical Specs



Top View



Back View



Applications Examples

INDUSTRIAL AUTOMATION

- **Vibrations detection in robotic arms**
  By incorporating an IMU and a microphone, the tiny Nicla Voice can be easily incorporated into any robotic joint and activated only when needed. It can prevent loss of accuracy by detecting unexpected vibrations during operation.

- **Voice-enabled commands for industrial refrigerators**
  Nicla Voice can be implemented to allow contactless operations with chiller machines. Its neural processor is able to recognize voice commands like "*Set -2°C*" and operate the machine accordingly.

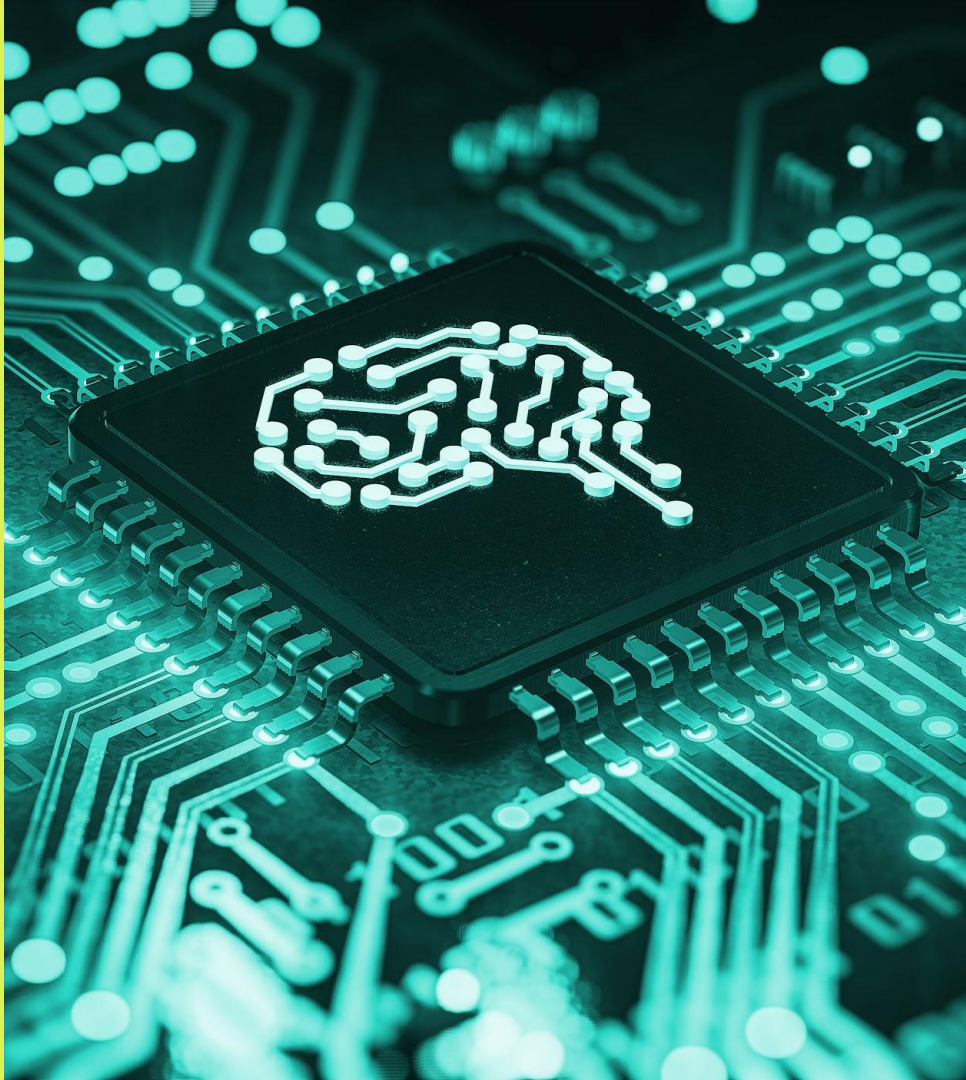
Applications Examples

BUILDING AUTOMATION

- **Automated intruder detection system**
  Nicla Voice's edge capabilities enables faster identification of critical and time-sensitive events, including glass-breaking or motion sensing. Multiple voice, sound and sensor applications can run simultaneously with low power consumption, all in a tiny battery-powered size, allowing long period of usage without intervention.

HEALTH & SAFETY

- **Smart Personal Protective Equipment (PPE) headphones**
  When integrated into a pair of smart headphones, Nicla Voice enables noise suppression and acoustic echo cancellation, allowing the user to work in noisy environments without risks. However, the integrated deep learning algorithms are able to classify and avoid filtering machine or line alarm signals, preserving overall safety.

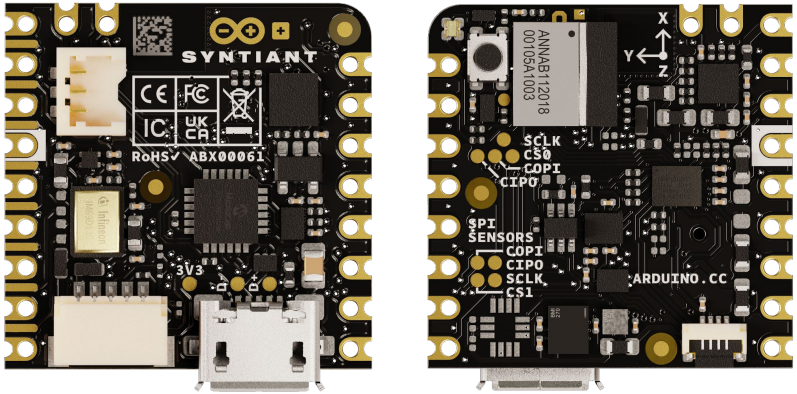


Applications Examples

PROTOTYPING

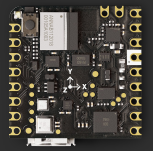
- **Ready-to-use speech recognition prototyping solution**
  The Nicla Voice can become handy for Portenta and MKR developers with their prototypes by integrating ready-to-use sensors such as microphone and IMU. Moreover, Nicla Voice features a powerful processor with Deep Neural Networks, allowing rapid prototyping of always-on speech recognition applications.

Pricing

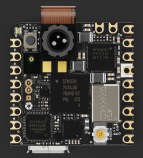


Product Name	Nicla Voice
SKU	ABX00061
BARCODE	7630049203204
MSRP	€69 or $82
Availability	October 2022 (TBC)

Related Products



Nicla Sense ME



Nicla Vision

Portenta X8

Portenta H7

MKR Family boards

Support

DOCUMENTATION

Getting started, Datasheets libraries and user manuals
docs.arduino.cc

COMMUNITY

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TUTORIALS AND EXAMPLES

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That’s a wrap, Thank you!

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