



# ARDUINO PRO®

AN UNCONVENTIONALLY  
SIMPLE PATH TO  
IoT SUCCESS

[ARDUINO . CC / PRO](https://www.arduino.cc/pro)



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ARDUINOPRO®



## WHY PRO?

Millions of users and thousands of companies worldwide use Arduino as an innovation platform. Arduino has drawn on this experience in frictionless design to enable enterprises to quickly and securely connect remote sensors to business logic within one **simple IoT application development platform**.



### FAST BUSINESS TRANSFORMATION

We empower enterprises to invent and keep up-to-date their business models and solutions along their complete journey, from concept to market.



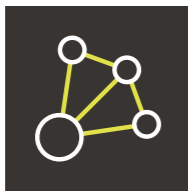
### SECURE AND SCALABLE AS STANDARD

The latest generation of Arduino Pro solutions allows simplicity of integration and a scalable, secure, and reliable service.



### NO VENDOR LOCK-IN

Securely connect remote sensors to business applications with Arduino IoT Cloud or third-party cloud services of your choice.



### CROSS-PLATFORM

Re-use your code with other hardware; it is possible to port existing code among different Arduino Pro products.



### LOW POWER BOARDS READY FOR IoT APPLICATIONS

Arm® Microcontrollers performance combined with battery management, on-board hardware security, and wide range of connectivity options spanning WiFi, BLE, LoRa®, LTE Cat-M and NB-IoT.

## WHY PRO?

### SIMPLIFY AND ACCELERATE YOUR IoT DEPLOYMENT

We are passionate about IoT technologies, about sharing them easily to achieve **higher efficiency, productivity, flexibility and performance**, making the best usage of energy and other limited resources, for a sustainable world and a better quality of life.

We leverage on Arduino competences, reputation and user experience and on our large worldwide community of technology enthusiasts monitoring the latest breakthroughs in digital intelligence together with us, generating new ideas and use cases.

We make all this suitable for PRO business:

- Through our qualified PRO product and service offering
- Empowering enterprises to directly adopt the highly accessible Arduino technology
- Ensuring the best customer journey for key accounts
- Managing a network of PRO integrator partners to support market customers worldwide

No matter how large or small is your company, Arduino Pro people are ready to work with you to transform your business:

**SMEs and startups with physical products** looking to add digital connectivity to their device.

**Enterprises aspiring to transform their businesses** from traditional selling to a subscription-based model with new IoT-based revenue streams.

**Production facilities looking to improve efficiency** through monitoring, control and analysis of fields, factories, or equipment.

**Existing R&D users within larger enterprises** wishing to transfer their Arduino prototypes to larger volume field trials or initial production runs.

## ARDUINO PRO VERTICALS

Developers, engineers, and professionals have successfully embedded Arduino into a wide variety of IoT applications to solve real-life problems:

### MANUFACTURING MACHINES AND PROCESSES

- Connected production devices
- Sensorized condition monitoring
- Compact machine automation
- Logistics / Material handling / AGVs

### AGRICULTURE / CONSTRUCTION / REMOTE MONITORING

- Connected farming equipment
- Connected construction / Tech mobile equipment (e.g. cranes, paving, waste collection, street cleaning)
- Connected city installations (e.g. utilities, road signs, ads/billboards)
- Agriculture data acquisition and automation
- Structural monitoring (e.g. bridge, pipeline, water)

### IOT BUILDING AUTOMATION / PHYSICAL SECURITY

- Intruder and fire detection systems
- Light / Shutter / Climate control
- Energy management
- Augmented house / Voice Control / Remote
- Access control

### LAB PROTOTYPING

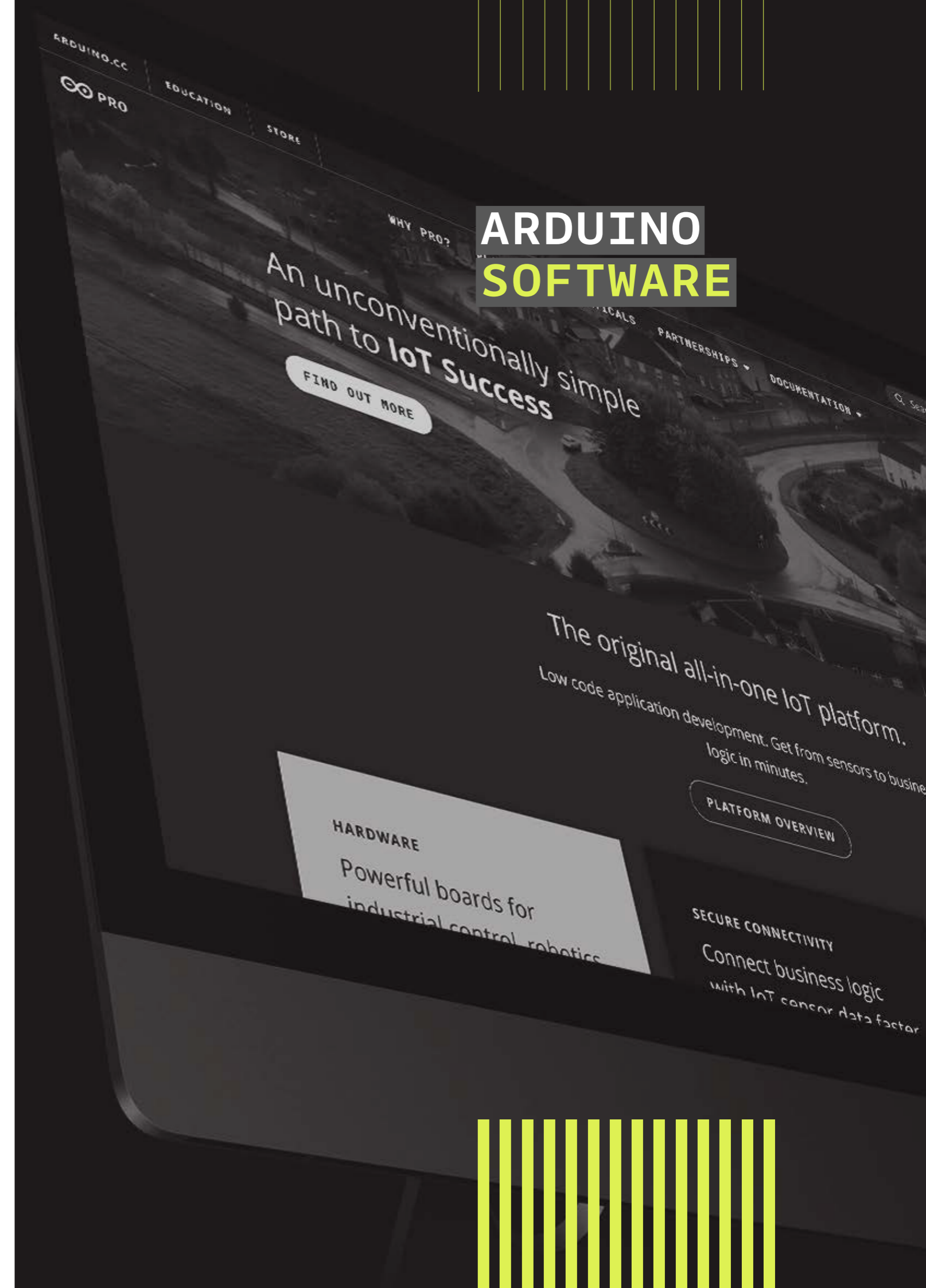
- Quick external sensors validation
- Initial POC evaluation
- Easy access to I/O's

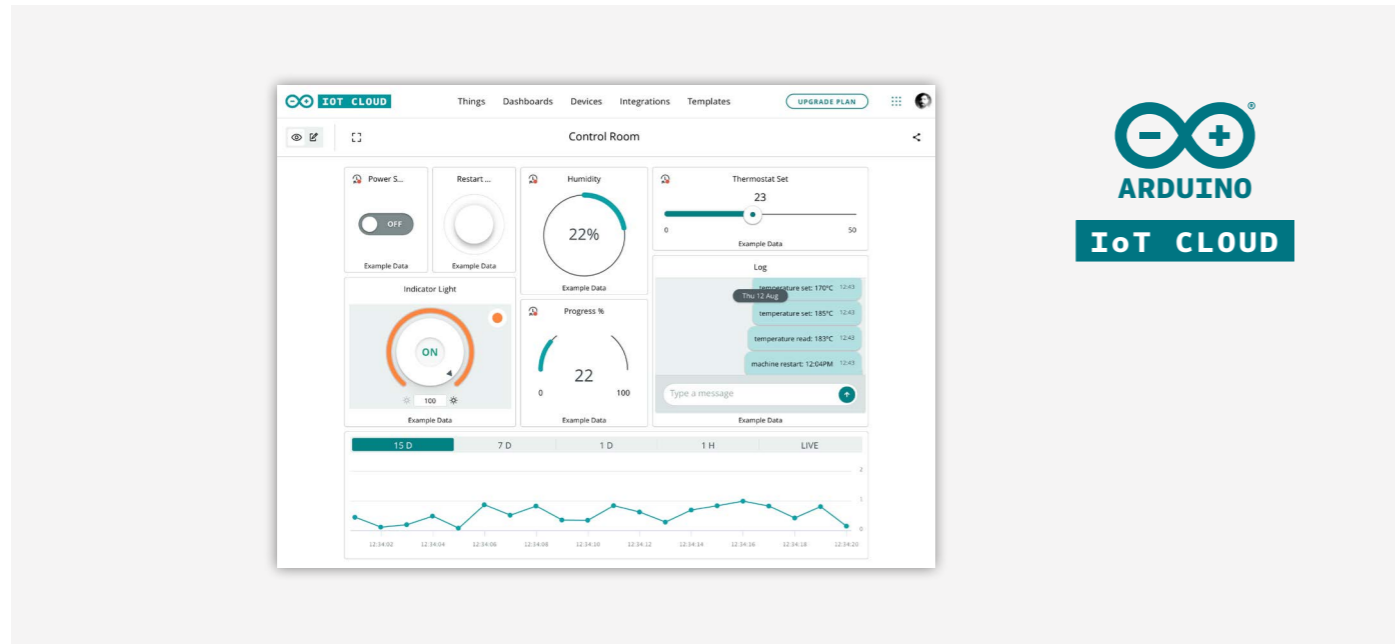
### TRACKING / ACCESS CONTROL SYSTEMS

- Social distancing
- Optimized employee flows
- Geofencing

### WEARABLE / MOBILE DEVICES

- Sport diagnostics (e.g. helmets, jackets)
- Work enhancement (e.g. exoskeleton, helmets)
- Light transportation
- Farming (e.g. animal diagnostics)





## ARDUINO IoT CLOUD

Arduino IoT Cloud is a simple, secure way to connect remote sensors to business applications using environment familiar to millions of users.

Monitor and control your devices using the widget-based dashboard, connect live sensor data to a spreadsheet, automate alerts using webhooks, or even design a custom application using the API. Arduino IoT Cloud brings together the best worlds – frictionless development and a secure, scalable service.

As a Pro customer we encourage you to request a quote with our representatives.

### CONNECT, MANAGE, AND MONITOR

With the Arduino IoT Cloud web app on desktop or mobile you can quickly connect, manage, and monitor your devices from anywhere in the world. Arduino IoT Cloud will also automatically create the code to program your device with – just add a couple of lines to customize it how you want. If you're new to Arduino, don't worry, there's example code for hundreds of sensors and actuators.

### BUSINESS LOGIC

Stream sensor data to a spreadsheet, database, or automate alerts and actions using simple webhooks. Examples for connecting to Google Spreadsheets, Amazon Alexa, and many more third party services are available. Developers can also create custom apps using Arduino IoT Cloud APIs.

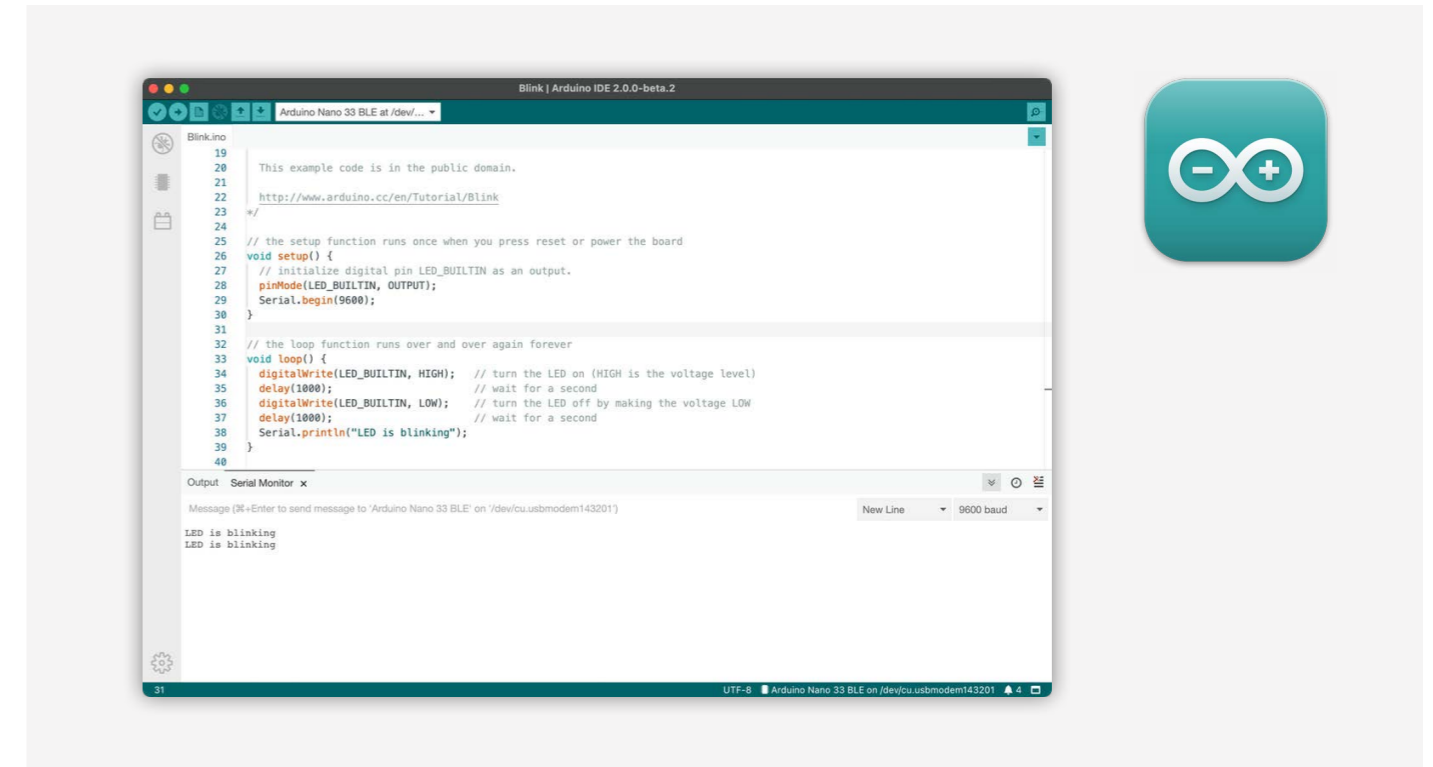
### SECURITY

Arduino IoT Cloud uses best practices without you having to worry about the details. All IoT device communications to the cloud use the industry standard SSL protocol for encryption. Arduino MKR and Arduino Portenta board families have on-board crypto-authentication chips and are further secured using X.509 certificate-based authentication.

PRICING Arduino IoT Cloud (WiFi, LoRa®)	Free plan	Entry plan	Maker plan	Maker Plus plan
Cost (excl. tax)	Free	\$2.99 / month	\$6.99 / month	\$23.99 / month
Arduino devices (e.g. MKR, Portenta)	2	10	25	100+
Dashboard sharing			✓	✓

### PRICING Arduino IoT Cloud (Cellular SIM included)

Per device (5MB cellular data per month included)	\$1.50 / month
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## ARDUINO IDE 2.0

The simplicity of Arduino's IoT device development tools has made them the most popular in the world. From low-code cloud based development tools to a fully-featured professional IDE, Arduino has the right tools for you.

### ARDUINO WEB EDITOR

This web app is the quickest way to get started developing for Arduino devices today – with boards and libraries available without needing to install them. When you add a device in the Arduino IoT Cloud it auto generates code and directs you to Arduino Web Editor to compile and program your devices.

### ARDUINO IDE 2.0

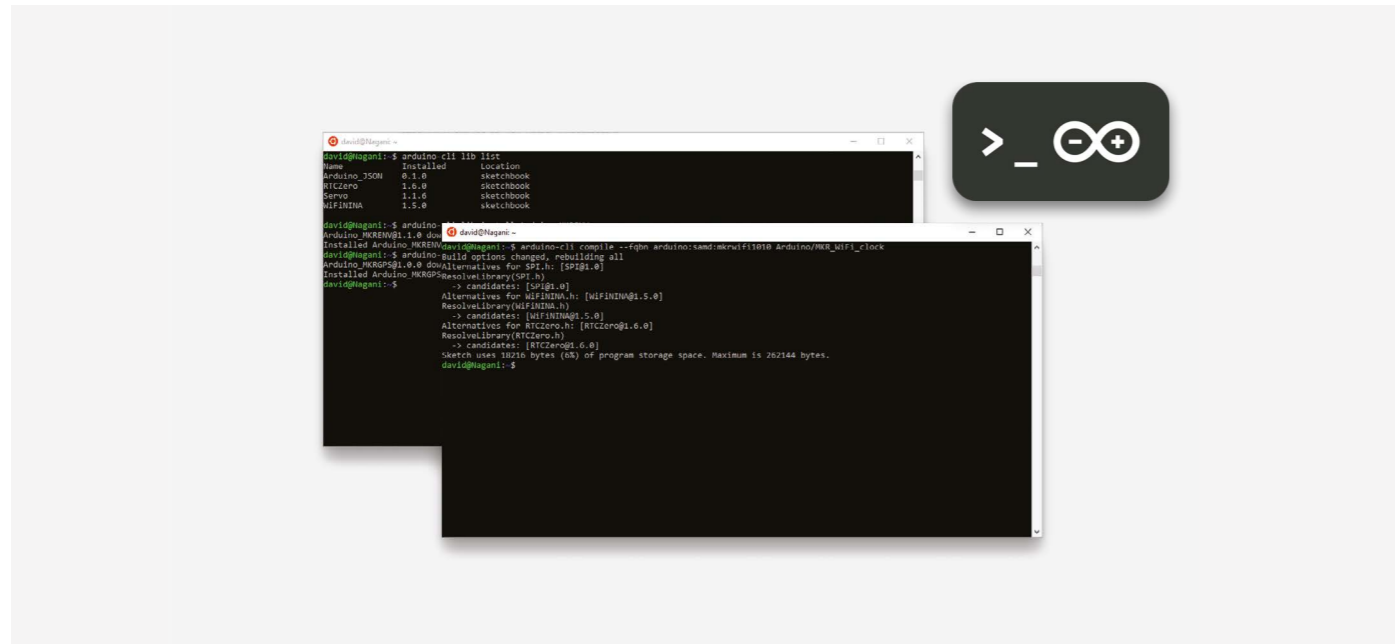
A new enhanced version with features to appeal to the more advanced developers while retaining continuity with the classic Arduino IDE.

Available in Windows, Mac OS X, and Linux64 versions. This early release is for beta testers and not yet recommended for production use.

[github.com/arduino/arduino-ide/releases/](https://github.com/arduino/arduino-ide/releases/)

### KEY FEATURES:

- Modern fully featured development environment
- Debugger: set breakpoints, view trace, step through execution, and more
- Open to third party plug-ins and boards
- Support for Arduino, and Python code
- New Board Manager, Library Manager, and Serial Monitor



## ARDUINO CLI

Designed for power users; everything you need from the command line. Arduino CLI is a single binary providing a builder, Boards and Library management, device programming, and much more.

Arduino CLI allows you to include Arduino in your Makefile or integrate with Atom, Eclipse, Emacs, Vim, VSCode, or whatever development workflow / IDE you are familiar with.

### PROVEN IN USE

Arduino CLI is the backbone of the Arduino Create Web Editor serving over a million users.

### SUPPORTED PLATFORMS

You can run Arduino CLI on both ARM® and Intel® (x86, x86\_64) architectures. This means you can install Arduino CLI on a Linux system or on your servers, and use it to compile Sketches targeting the boards of your choice.

### GETTING STARTED

You can find documentation, source code and binaries downloads at: [github.com/arduino/arduino-cli](https://github.com/arduino/arduino-cli)

Arduino CLI is open source but companies wishing to incorporate it in end products can also contact us for a commercial license.

### EXAMPLE USE

With **Arduino CLI** you can install project dependencies with just one command:

```
arduino-cli lib install "WiFi101" "WiFi101OTA"
```

Arduino CLI can also output JSON for easy parsing by other programs:

```

arduino-cli --format json lib search wifinina | jq
{
  "libraries": [
    {
      "Name": "WiFiNINA",
      "Author": "Arduino",
      "Maintainer": "Arduino <info@arduino.cc>",
      "Sentence": "Enables network connection (local and Internet) with the Arduino MKR WiFi 1010, Arduino MKR VIDOR 4000 and Arduino UNO WiFi Rev. 2.",
      "Paragraph": "With this library you can instantiate Servers, Clients and send/receive UDP packets through WiFi. The board can connect either to open or encrypted networks (WEP, WPA). The IP address can be assigned statically or through a DHCP. The library can also manage DNS.",
      "Website": "http://www.arduino.cc/en/Reference/WiFiNINA",
      "Category": "Communication",
      ...
    }
  ]
}
  
```

## ARDUINO CONNECTIVITY



To make cellular connectivity even simpler, Arduino introduced SIM plans for easy, global mobile M2M and IoT (2G-3G-4G) connectivity for your Arduino IoT Cloud projects.

To complement this, the Arduino MKR family offers a range of microcontroller boards with integrated connectivity options including the Arduino MKR 1500 – which features 5G ready LTE Cat-M, and NB-IoT support.

Arduino SIM offers the simplest path to mobile IoT device development. The cellular service has a global roaming profile; meaning a single Arduino SIM can be used with over 600+ networks in more than 100 countries worldwide with just one simple data plan.

The Arduino SIM platform is built on Arm® Pelion™ Connectivity Management giving a solid foundation for users needing to scale from a single to large numbers of devices in the future.

Arduino SIM comes with 10 MB of data free for the first 90 days, after that it's one simple subscription at \$1.50 USD per device monthly with 5 MB data included each month. **The Arduino SIM is designed for IoT data and connects via the Arduino IoT Cloud only.**

Additional plans are available for the mass deployment of cellular IoT nodes, with further features like data pooling, SMS capabilities, and proxy configuration for the connection to other Cloud platforms.

For more information on the additional plans available, please contact: [pro@arduino.cc](mailto:pro@arduino.cc)

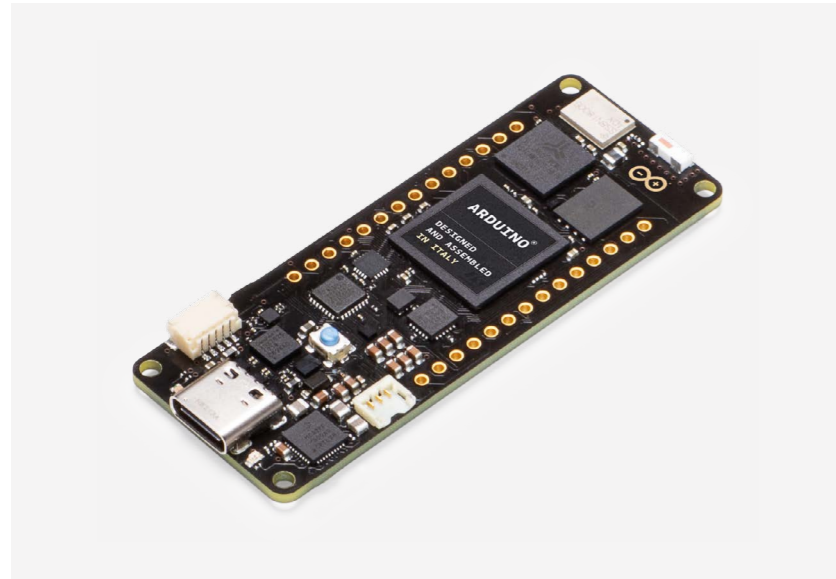
# ARDUINO PORTENTA FAMILY

Arduino's series of high-performance industry-rated boards: use Portenta when performance is key.

With two asymmetric cores to simultaneously run high-level code such as protocol stacks, machine learning or even interpreted languages like MicroPython along with low-level real time tasks



## ARDUINO PORTENTA H7



PROGRAM IT WITH HIGH-LEVEL LANGUAGES AND AI WHILE PERFORMING LOW-LATENCY OPERATIONS ON ITS CUSTOMIZABLE HARDWARE.

### KEY APPLICATIONS:

- High-end industrial machinery
- Laboratory equipment
- Computer vision
- PLCs
- Industry-ready user interfaces
- Robotics controller
- Dedicated stationary computer
- High-speed booting computation (ms)

For more info visit:  
[arduino.cc/pro/hardware/product/portenta-h7](https://arduino.cc/pro/hardware/product/portenta-h7)

**Portenta H7** simultaneously runs high level code along with real time tasks. H7's main processor is a dual core unit made of a Cortex® M7 running at 480 MHz and a Cortex® M4 running at 240 MHz. The two cores communicate via a Remote Procedure Call mechanism that allows calling functions on the other processor seamlessly.

Both processors share all the in-chip peripherals and can run:

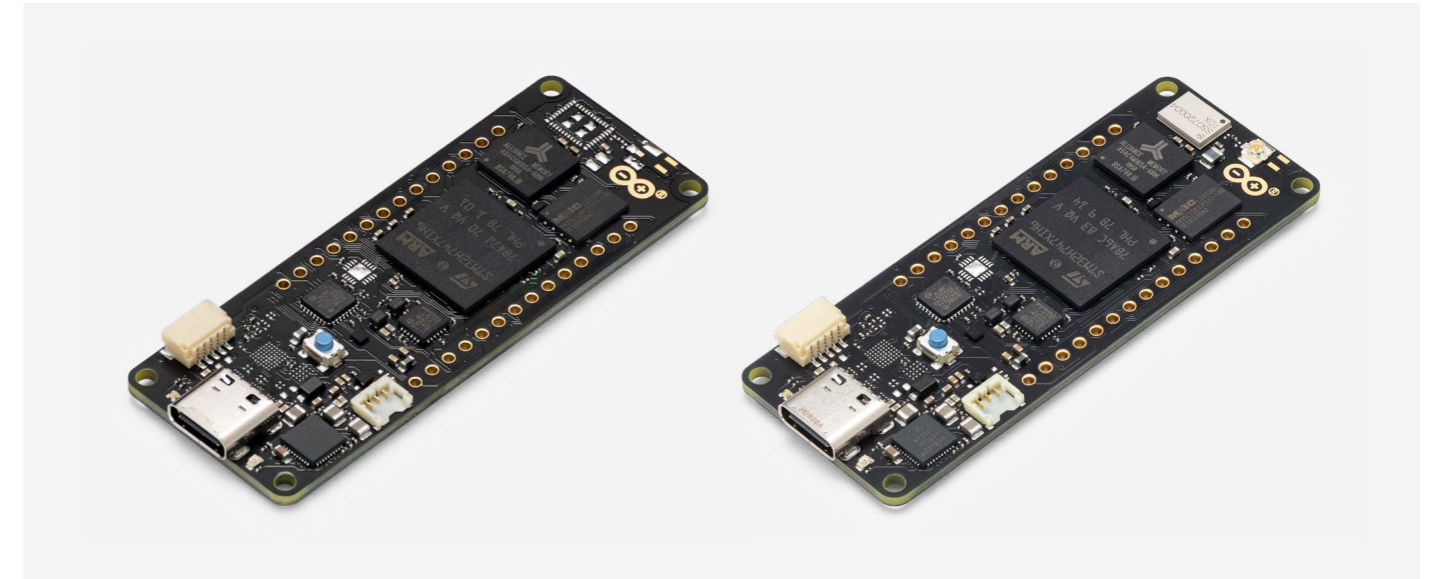
- Arduino sketches on top of the mbedOS
- Native mbed applications
- Micropython via an interpreter
- TensorFlow Lite

The onboard wireless module allows to simultaneously manage WiFi and Bluetooth connectivity. The WiFi interface can be operated as an Access Point, as a Station or as a dual mode simultaneous AP/STA and can handle up to 65 Mbps transfer rate. Bluetooth interface supports Bluetooth Classic and BLE.

The Portenta H7 follows the Arduino MKR form factor, but enhanced with the Portenta family 80 pin high-density connector.

MAIN PROCESSOR	STM32H747			
DISPLAY CONNECTOR	MIPI DSI HOST & MIPI D-PHY TO INTERFACE WITH LOW-PIN COUNT LARGE DISPLAYS			
OPERATIONAL TEMPERATURE	-40 °C TO +85 °C (EXCL. WIRELESS MODULE)		-10 °C TO +55 °C (INCL. WIRELESS MODULE)	
USB-C	HOST / DEVICE	DISPLAYPORT OUT	HIGH / FULL SPEED	POWER DELIVERY
CAMERA INTERFACE	8-BIT		UP TO 80 MHZ	
HIGH DENSITY CONNECTORS	TWO 80 PIN CONNECTORS WILL EXPOSE ALL OF THE BOARD'S PERIPHERALS TO OTHER DEVICES			
MKR HEADERS	USE ANY OF THE EXISTING INDUSTRIAL MKR SHIELDS ON IT			

## ARDUINO PORTENTA H7 LITE + H7 LITE CONNECTED



**Designed for developers who want to leverage the computational power of the Portenta H7, without the need for video output and advanced security features.**

The **Portenta H7 Lite** is a cost-effective solution, ideal for complex environments where radio communications are not suitable or possible.

The **Portenta H7 Lite Connected** fills the gap between the full and Lite versions by integrating wireless connectivity, adding yet another option for Arduino PRO clients to build the perfect solution with the right combination of performance and simplicity.

The Portenta H7 follows the Arduino MKR form factor, but enhanced with the Portenta family 80 pin high-density connector.

For more info visit:  
[arduino.cc/pro/hardware/product-family/portenta-family](https://arduino.cc/pro/hardware/product-family/portenta-family)

	H7 FULL	H7 LITE	H7 LITE CONNECTED
SKU	ABX00042	ABX00045	ABX00046
MICROCONTROLLER	STM 747		
CONNECTIVITY	ETH PHY / WiFi BLE	ETH FHY	ETH PHY / WiFi BLE
CRYPTOCHIP	ECC 608 / NXP	ECC608 ONLY	ECC608 ONLY
SDRAM / FLASH	8Mb / 16Mb		
USB-C / VIDEO OUTPUT	YES	NO	NO

## ARDUINO PORTENTA VISION SHIELD



A RAPID SOLUTION FOR EMBEDDED MACHINE LEARNING COMBINING VISION, AUDIO AND CONNECTIVITY

PROFESSIONAL COMPUTER VISION, DIRECTIONAL AUDIO DETECTION, ETHERNET, AND JTAG FOR ARDUINO PORTENTA

For more info visit:  
[arduino.cc/pro/hardware/product/portenta-vision-shield](https://arduino.cc/pro/hardware/product/portenta-vision-shield)

Designed to expand the power of the Portenta H7 with audio and vision detection, the **Portenta Vision Shield** has an ultra low-power camera, two microphones, and connectivity - Ethernet or LoRa®. This shield represents an efficient and certified solution to bring industry-rated features to your Machine Learning applications.

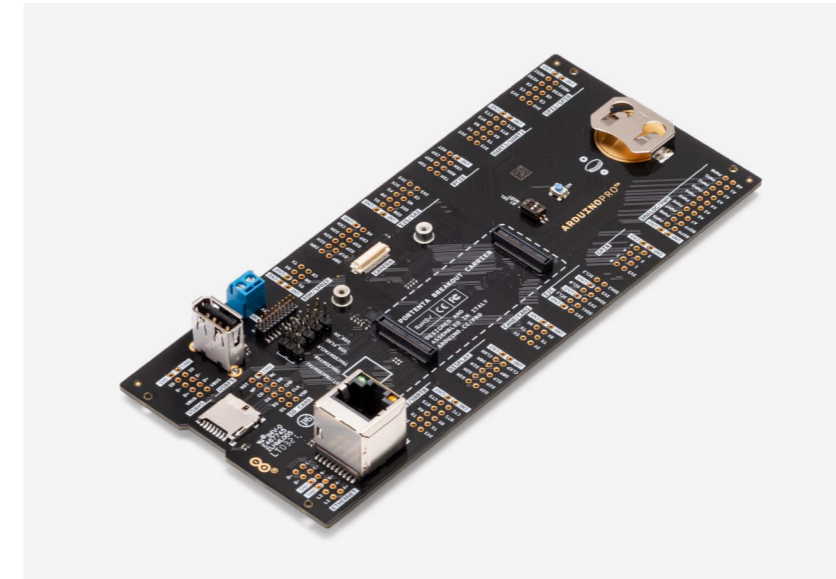
The Portenta Vision Shield comes with a 324x324 pixels camera module which contains an Ultra Low Power Image Sensor that can capture gestures, ambient light, proximity sensing, and object identification. The two omnidirectional built in digital-microphones can capture sounds to the videos that can be stored on a MicroSD Card.

The Portenta Vision Shield comes in two versions, with Ethernet or LoRa® modules. Using OpenMV, any professionals, researchers and developers can develop low cost Python powered camera vision and audio applications.

The LoRa® module option is specifically designed for edge ML applications, enabling low-power, long distance communication over LoRa® wireless protocol and LoRaWAN™ networks. The Ethernet version is perfect for all those wired applications that need high bandwidth data transfer speed.

CAMERA	HIMAX HM-01B0 CAMERA MODULE
RESOLUTION	320 X 320 ACTIVE PIXEL RESOLUTION WITH SUPPORT FOR QVGA
IMAGE SENSOR	HIGH SENSITIVITY 3.6µ BRIGHTSENSETM PIXEL TECHNOLOGY
MICROPHONES	TWO MP34DT06JTR MICROPHONES
CONNECTIVITY	ETHERNET OR LoRa®
INTERFACES	JTAG
DIMENSIONS	66 X 25MM

## ARDUINO PORTENTA BREAKOUT



A GREAT TOOL FOR PROTOTYPING PROJECTS WITH PORTENTA BOARDS

### KEY FEATURES :

- Flexible usage
- Ideal for software developers, service engineers and R&D engineers
- Provides flexibility for measuring and controlling signals
- Great starting point for engineering students
- Great tool for testing devices connections and capacity
- Compatible with high density connector

For more info visit:  
[arduino.cc/pro/hardware/product/portenta-breakout](https://arduino.cc/pro/hardware/product/portenta-breakout)

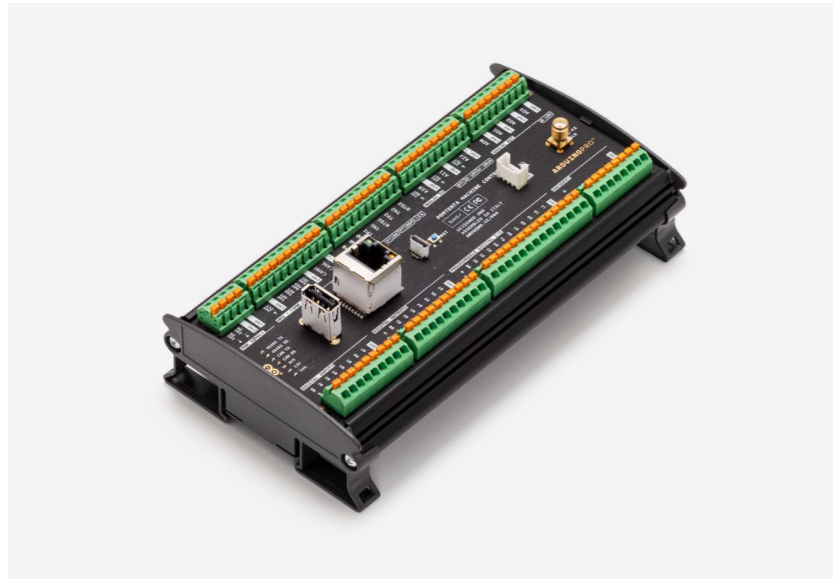
The Portenta Breakout **reduces development time** for industrial grade solution automation based on the Portenta line.

The Portenta Breakout enables **easy debugging** through the JTAG connector and allows for inspection of the bus lines through the breakout pins. It makes all high density connectors' signals individually accessible, making it quick and easy to **connect and test external hardware components and devices** as normally needed during development.

Thanks to the OpenMV Global Shutter Camera connector, the Portenta Breakout allows **rapid development of machine vision** applications alongside the Portenta family.

WEIGHT	69 g
DIMENSIONS	72.12 mm X 163.94 mm (2,83 in X 6,45 in)
BATTERY / POWER	CR2032 RTC LITHIUM BATTERY BACKUP; EXTERNAL POWER TERMINAL BLOCK
NETWORK / CONNECTIVITY	USB, RJ45 GBIT ETHERNET, MICRO SD CARD, OPENMV SHUTTER MODULE, MIPI 20T JTAG WITH TRACE CAPABILITY
MEMORY	MICRO SD CARD SLOT
OPERATING TEMPERATURES	-40°C TO +85°C (-40°F TO 185 °F)

## ARDUINO PORTENTA MACHINE CONTROL



The Portenta Machine Control adds Industrial IoT capabilities to standalone industrial machinery. It enables the collection of real-time data from the factory floor and supports the remote control of equipment, even from the cloud, when desired.

Thanks to its computing power, the Portenta Machine Control enables a wide range of predictive maintenance and AI use cases. It can be programmed using the Arduino framework or other embedded development platforms.

### UPGRADE EQUIPMENT OR DEVELOP NEW DISTINCTIVE PRODUCTS

The Portenta Machine Control **enhances existing products** with minimal effort, allowing companies to implement a **standard platform across different equipment models**. It is now easy to create an infrastructure of interconnected machines, which can be controlled onsite or via the cloud when needed; moreover, human-machine interaction can be further enhanced via mobile apps thanks to **BLE connectivity**. Arduino is a popular technology that has been adopted by many customers worldwide to reduce time to market; there is a huge number of ready-to-use software libraries that make it easier to interact with sensors and actuators.

### THE SIMPLEST WAY TO ADD A POWERFUL BRAIN TO YOUR MACHINES

#### KEY BENEFITS:

- Shorter Time-To-Market
- Single entry point for enabling complex scenarios, supporting multiple different machines
- Industry 4.0 enabler
- Enhance existing products with minimal effort
- Make equipment smarter to be ready for the AI revolution
- Add connectivity for monitoring and control
- Interact with your equipment with advanced HMI displays
- Tailor it to your needs, with programmable I/O pins
- Secure and robust by design
- Modular design for adaptation & upgrades
- Open new business model opportunities (e.g. business-as-a-service)

### IMPROVE CUSTOMER EXPERIENCE

Monitoring customer usage of equipment can provide valuable **production data**, useful to **minimize downtime**, perform **predictive maintenance**, and carry out calibration activities. Customers can be supported remotely, in order to **optimize field engineer workload** as well as **spare parts availability**. In addition, the constant monitoring of the equipment parameters often makes achieving **industry certifications** easier.

### DATA FIRST, BUSINESS INTELLIGENCE A-LA-CARTE

Start collecting a wide range of different parameters and seamlessly send them to BI systems or store to relational or time series databases to provide real valuable data, and make informed decisions.

For more info visit:  
[arduino.cc/pro/hardware/  
product/portenta-machine-control](https://arduino.cc/pro/hardware/product/portenta-machine-control)

### TAILOR IT TO YOUR NEEDS

The modular design is **ideal for upgrades** and adaptations. Since each I/O pin can be configured, the Portenta Machine Control can be **highly customizable** while allowing companies to **avoid vendor lock-in**. Our hardware is robust and secure by design. Many corporations have chosen Arduino Pro solutions to improve manufacturing processes and enhance their products and services.

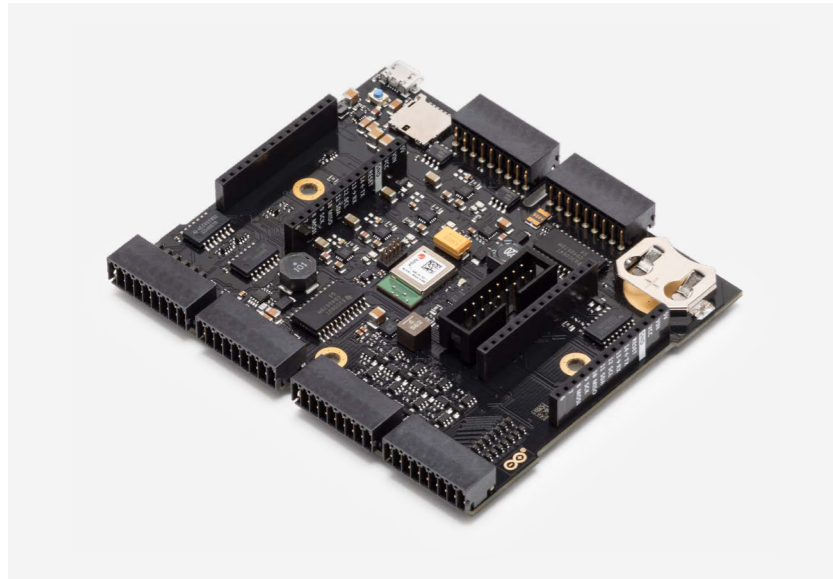
PROCESSOR	STM32H747XI DUAL CORTEX®-M7+M4 32 BIT LOW POWER ARM® MCU (PORTENTA H7)
INPUT	<ul style="list-style-type: none"> <li>— 8 DIGITAL 24VDC</li> <li>— 2 CHANNELS ENCODER READINGS</li> <li>— 3 ANALOG FOR PT100/PT1000/J/K TEMPERATURE PROBES (3-WIRE CABLE WITH COMPENSATION )</li> <li>— 3 ANALOG INPUT (4-20MA/ 0-10V/NTC 10K)</li> </ul>
OUTPUT	<ul style="list-style-type: none"> <li>— 8 DIGITAL 24VDC UP TO 0,5A (SHORT CIRCUIT PROTECTION)</li> <li>— 4 ANALOG 0-10V (UP TO 20MA OUTPUT PER CHANNEL)</li> </ul>
OTHER I/O	12 PROGRAMMABLE DIGITAL I/O (24V LOGIC)
COMMUNICATION PROTOCOLS	<ul style="list-style-type: none"> <li>— CAN BUS</li> <li>— PROGRAMMABLE SERIAL PORT 232/422/485</li> </ul>
CONNECTIVITY	<ul style="list-style-type: none"> <li>— ETHERNET</li> <li>— USB PROGRAMMING PORT</li> <li>— WI-FI</li> <li>— BLE</li> </ul>
MEMORY	<ul style="list-style-type: none"> <li>— 16 MB ONBOARD FLASH MEMORY</li> <li>— 8MB SDRAM</li> </ul>
DIMENSIONS	170 X 90 X 50 mm
OPERATING TEMPERATURES	-40°C TO +85°C (-40°F TO 185°F)
POWER	24V DC +/- 20%
CONNECTOR TYPE	PUSH-IN TERMINALS FOR FAST CONNECTION



ARDUINO  
EDGE  
CONTROL



## ARDUINO EDGE CONTROL



A REMOTE MONITORING AND CONTROL SOLUTION, OPTIMIZED FOR OUTDOOR ENVIRONMENTS.

### KEY BENEFITS:

- Precision farming & process automation
- Improved yield & lower production risks
- Real-time & historical data
- Monitors environmental conditions
- Powered by solar panels
- Easy installation
- Connect easily with sensors/devices
- Operates in high & low temperatures
- Choice of connectivity types
- Supports TensorFlow Lite micro for tiny machine learning applications

The Arduino Edge Control can be positioned anywhere and is suitable for precision farming, smart agriculture, and other applications requiring intelligent control in remote locations. Power can be either supplied via solar panel or DC input.

Remotely control your application through the Arduino Cloud (or third-party services) using a choice of connectivity options suitable to the location. The Arduino Edge Control features built-in Bluetooth and its connectivity can be expanded with 2G/3G/CatM1/NB-IoT modems, LoRa®, Sigfox, and WiFi by adding any one of the MKR boards.

The Arduino Edge Control is capable of connecting sensors and drive actuators like latching valves (common in agriculture). Moreover, it has the capability to provide real-time monitoring over the entire process, thereby reducing production-related risks.

For more info visit:  
[arduino.cc/pro/hardware/product/edge-control](https://arduino.cc/pro/hardware/product/edge-control)

Particularly suited to smart agriculture, the sensors can collect real-time data such as weather conditions, soil quality, crop growth, amongst others. Once sent to the Arduino Cloud, the data value chain becomes valuable analytics that supports business processes at various levels (e.g. crop yield, equipment efficiency, staff performance, etc.). The Arduino Edge Control has the capability to improve crop quality and reduce human effort/error by automating processes like irrigation, fertilization, or pest control.

Read more about Edge Control's features, application examples, schematics, connectors and other technical aspects in its datasheet. To learn more about how you can use the Edge Control, check out how to get started.

### AUTOMATED GREENHOUSES

Automatically manage the humidity and temperature to ensure the best environment for crop growth, minimising carbon emissions and increasing economic yield. The inclusion of an Arduino MKR GPS Shield allows for optimum crop rotation planning and acquisition of geospatial data.

### HYDROPONICS / AQUAPONICS

Since hydroponics involves the growth of plants without soil, delicate care must be taken to maintain the conditions required for optimum growth. The Arduino Edge Control can be set-up to control these conditions with minimal manual labour. The Arduino Edge Control can help match the even higher requirements of Aquaponics, by providing automated control over the internal process and reducing production risks.

PROCESSOR	64 MHZ ARM® CORTEX-M4F (WITH FPU)
I/O	<ul style="list-style-type: none"> <li>— 6X EDGE SENSITIVE WAKE UP PINS</li> <li>— 16X HYDROSTATIC WATERMARK SENSOR INPUT</li> <li>— 8X 0-5V ANALOG INPUTS</li> <li>— 4X 4-20MA INPUTS</li> <li>— 8X LATCHING RELAY COMMAND OUTPUTS WITH DRIVERS</li> <li>— 8X LATCHING RELAY COMMAND OUTPUTS WITHOUT DRIVERS</li> <li>— 4X 60V/2.5A GALVANICALLY ISOLATED SOLID STATE RELAYS</li> <li>— 6X 18 PIN PLUG IN TERMINAL BLOCK CONNECTORS</li> </ul>
MEMORY	<ul style="list-style-type: none"> <li>— 1 MB ONBOARD FLASH MEMORY</li> <li>— 2 MB ONBOARD QSPI FLASH MEMORY</li> <li>— SD CARD SLOT</li> </ul>
OPERATING TEMPERATURES	-40°C TO +85°C (-40°F TO 185°F)
WEIGHT	67g
DIMENSIONS	86 X 104 mm
BATTERY	<ul style="list-style-type: none"> <li>— LITHIUM BATTERY BACKUP</li> <li>— SOLAR PANEL BATTERY CHARGER</li> </ul>
CONNECTIVITY *Requires Arduino MKR board	<ul style="list-style-type: none"> <li>— BLUETOOTH</li> <li>— WiFi*</li> <li>— 3G*</li> <li>— NB-IoT*</li> <li>— LORAWAN™*</li> </ul>
POWER	<ul style="list-style-type: none"> <li>— LOW POWER (UP TO 34 MONTHS ON A 12V/5AH BATTERY)</li> <li>— 12V ACID/LEAD SLA BATTERY SUPPLY (RECHARGED VIA SOLAR PANELS)</li> </ul>

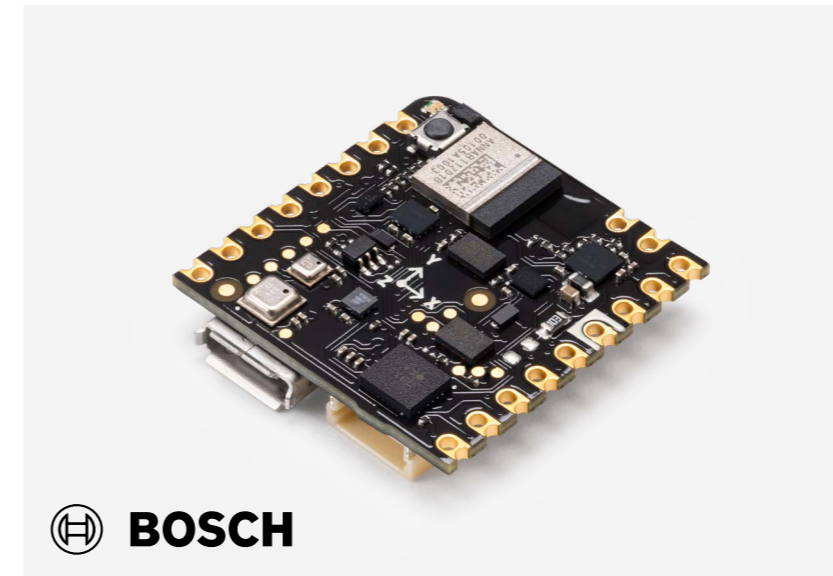
# ARDUINO NICLA FAMILY

Arduino's tiniest industrial-oriented board

Easily deploy low-power AI and machine learning within existing infrastructures. Fully equipped with industrial-grade sensors, the Nicla boards are designed to work as an autonomous, battery-operated system.

## ARDUINO NICLA SENSE ME

Developed in partnership with Bosch



A NEW STANDARD FOR SMART SENSING SOLUTIONS

### KEY BENEFITS:

- Tiny size (22.86 x 22.86 mm), packed with features
- Low power consumption
- Standalone board when battery powered
- Powerful processor, capable of hosting intelligence on the Edge
- BLE connectivity
- Compatible with Arduino MKR and Portenta product

For more info visit:  
[arduino.cc/pro/hardware/product/nicla-sense-me](https://arduino.cc/pro/hardware/product/nicla-sense-me)

Featuring a 9DoF smart motion sensor and a multi parametric environmental sensor with AI capabilities, the board developed with Bosch Sensortec allows for a wide range of **IoT applications**. Having Arduino's signature simplicity of integration and scalability, it is also perfect for **research projects, rapid prototyping and development**.

The Nicla Sense ME – where “ME” stands for “Motion” and “Environment” – comes with Bosch Sensortec's BHI260AP **AI sensor system with integrated motion sensor**, BMM150 **magnetometer**, BMP390 **pressure sensor**, and the unique BME688 4-in-1 **gas sensor with AI** and integrated high-linearity, and high-accuracy **pressure, humidity and temperature sensors**.

The ability to sense and process so many different types of data on the edge increases autonomy and **reduces latency and power consumption**, offers more privacy and requires less bandwidth: it's a **tiny board**, packed with a great mix of sensors combined with **high computational power**, opening up a whole new range of applications leveraging on sensor fusion.

The powerful and versatile Nicla Sense ME is a mere 22.86x22.86 mm. This compact board is the first product to launch in the new **Arduino Nicla family**: a modular range of easy-to-use and cost-effective tools, created by Arduino Pro, literally meaning “victory of the people” in Greek.

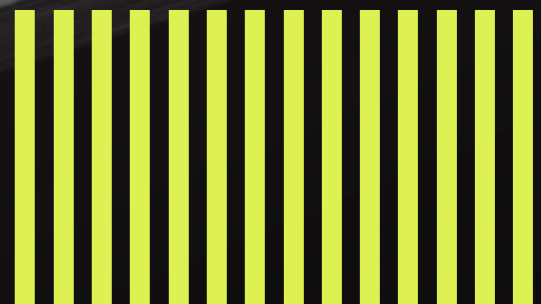
MICROCONTROLLER	64 MHZ ARM® CORTEX M4 (NRF52832)	
SENSORS	<ul style="list-style-type: none"> <li>— BHI260AP: SELF-LEARNING AI SMART SENSOR WITH INTEGRATED ACCELEROMETER AND GYROSCOPE</li> <li>— BMP390: DIGITAL PRESSURE SENSOR</li> </ul>	<ul style="list-style-type: none"> <li>— BMM150: GEOMAGNETIC SENSOR</li> <li>— BME688: DIGITAL LOW POWER GAS, PRESSURE, TEMPERATURE &amp; HUMIDITY SENSOR WITH AI</li> </ul>
I/O: CASTELLATED PINS WITH THE FOLLOWING FEATURES >	<ul style="list-style-type: none"> <li>— 1X I2C BUS (WITH EXT. ESLOV CONNECTOR)</li> <li>— 1X SERIAL PORT</li> <li>— 1X SPI</li> </ul>	<ul style="list-style-type: none"> <li>— 2X ADC</li> <li>— PROGRAMMABLE I/O VOLTAGE FROM 1.8-3.3V</li> </ul>
POWER	<ul style="list-style-type: none"> <li>— MICRO USB (USB-B)</li> <li>— PIN HEADER</li> </ul>	<ul style="list-style-type: none"> <li>— 3.7V LI-PO BATTERY WITH INTEGRATED BATTERY CHARGER</li> </ul>
CONNECTIVITY	BLUETOOTH® 5	
MEMORY	<ul style="list-style-type: none"> <li>— 512KB FLASH / 64KB RAM</li> <li>— 2MB SPI FLASH FOR STORAGE</li> </ul>	<ul style="list-style-type: none"> <li>— 2MB QSPI DEDICATED FOR BHI260AP</li> </ul>
INTERFACE	USB INTERFACE WITH DEBUG FUNCTIONALITY	

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## ARDUINO MKR FAMILY

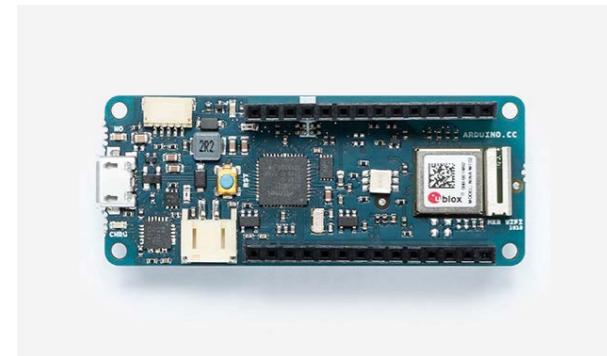
	MKR WiFi 1010	MKR FOX 1200	MKR WAN 1310
START LEVEL	Beginner	Intermediate	Intermediate
CONNECTIVITY	WiFi (ESP32), BLE	Sigfox	LoRa®
PROGRAMMING METHODS	Arduino, Arduino PRO IDE, CLI	Arduino, Arduino PRO IDE, CLI	Arduino, Arduino PRO IDE, CLI
IDEAL FOR	IoT, getting Started with IoT, smart home, home automation, healthcare	IoT, agriculture, smart cities, environmental monitoring	IoT, agriculture, smart cities, environmental monitoring, industry 4.0
AT A GLANCE	Entry point to IoT. Coverage on short range distances, perfect indoor with WiFi connection	Free access to Spot'it geolocation service, coverage on long range distance, perfect for remote and rural areas covered by Sigfox. Low power consumption	Coverage on long range distances, dense urban indoor areas, rural regions. Low power consumption
ENCRYPTION, CRYPTO AUTHENTICATION	Yes	Yes	Yes
BASED ON	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), WiFi - u-blox NINA-W102 (ESP32)	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), Sigfox - ATA8520	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), LoRa® - Murata CMWX1ZZABZ"
CERTIFICATIONS	CE, FCC, RoHS Compliant	CE, FCC, RoHS Compliant	CE, FCC, RoHS Compliant

	MKR GSM 1400	MKR NB 1500	MKR VIDOR 4000
START LEVEL	Intermediate	Intermediate	Advanced
CONNECTIVITY	GSM	Narrowband IoT	WiFi (ESP32), BLE
PROGRAMMING METHODS	Arduino, Arduino PRO IDE, CLI	Arduino, Arduino PRO IDE, CLI	Arduino IDE, Create, visual programming editor (TBD), most common HDLs, Arduino PRO IDE, CLI
IDEAL FOR	IoT, cellular networks, automotive, home automation, smart home, wearable	IoT, agriculture, fleet management, smart home	Industry 4.0, home automation, video, aerospace, communications
AT A GLANCE	3G/4G, HSPA, it is ideal for automotive and transport applications, among other fields such as: wearables, smart cities and smart home and buildings.	Coverage on long range distances, perfect for remote and rural areas. Low power consumption	Ease-to-use of Arduino applied to FPGA, flexibility, high performance, ideal also for audio and video processing
ENCRYPTION, CRYPTO AUTHENTICATION	Yes	Yes	Yes
BASED ON	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), GSM - u-blox SARA-U201	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), NB-IoT - u-blox SARA-R410M	MCU - Microchip® ATSAM21 (Arm® Cortex®-M0+ processor), FPGA - Intel Cyclone 10CLO16, WiFi - u-blox NINA-W102 (ESP32)
CERTIFICATIONS	CE, FCC, RoHS Compliant	CE, FCC, RoHS Compliant	CE, FCC, RoHS Compliant



## ARDUINO MKR FAMILY

A family of boards and shields for engineers and developers to easily add wireless connectivity along with other functionalities to their applications in a secure, powerful and a cost efficient manner



### ARDUINO MKR WiFi 1010

The basics to build secure WiFi and Bluetooth applications.

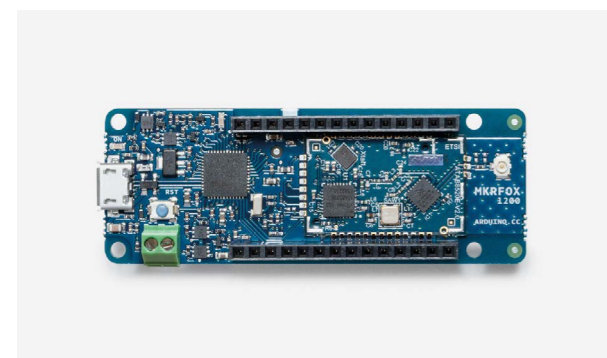
For more info visit:  
[store.arduino.cc/mkr-wifi-1010](https://store.arduino.cc/mkr-wifi-1010)



### ARDUINO MKR GSM 1400

GSM/3G board to get your products online worldwide in seconds.

For more info visit:  
[store.arduino.cc/mkr-gsm-1400](https://store.arduino.cc/mkr-gsm-1400)



### ARDUINO MKR FOX 1200

Add Sigfox connectivity to IoT solutions with low power consumption.

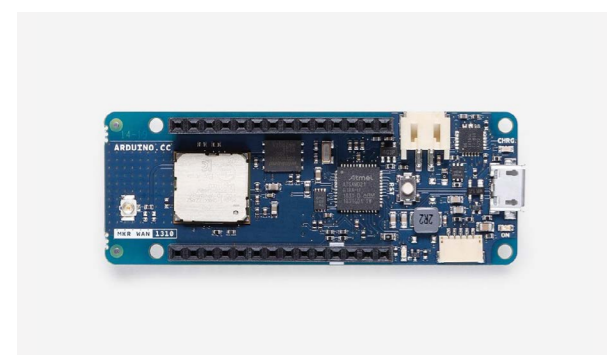
For more info visit:  
[store.arduino.cc/mkr-fox-1200](https://store.arduino.cc/mkr-fox-1200)



### ARDUINO MKR NB 1500

Implement inexpensive, large-coverage solutions over Narrowband IoT.

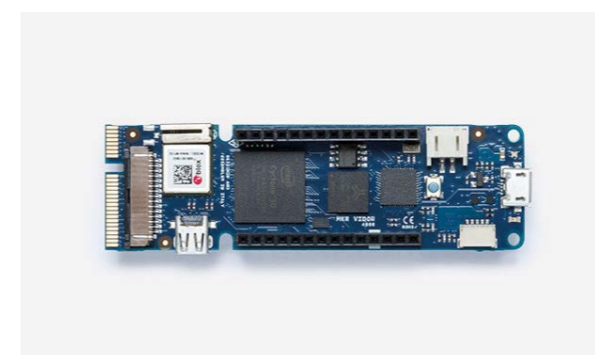
For more info visit:  
[store.arduino.cc/mkr-nb-1500](https://store.arduino.cc/mkr-nb-1500)



### ARDUINO MKR WAN 1310

Send data securely over LoRaWAN™ with minimal power consumption.

For more info visit:  
[store.arduino.cc/mkr-wan-1310](https://store.arduino.cc/mkr-wan-1310)



### ARDUINO MKR VIDOR 4000

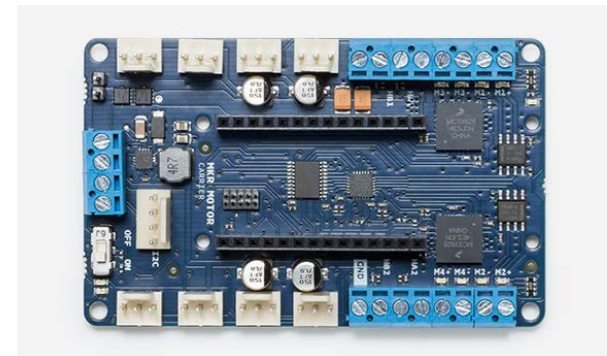
Build FPGA-powered solutions connected via WiFi or BLE.

For more info visit:  
[store.arduino.cc/mkr-vidor-4000](https://store.arduino.cc/mkr-vidor-4000)

## ARDUINO MKR SHIELDS AND CARRIERS

According to Arduino's naming standards, a carrier board is one that, when connected to a microcontroller board, happens to be larger than the microcontroller board itself. In contraposition, a shield is a board that, when connected to the microcontroller board, it is smaller than that one.

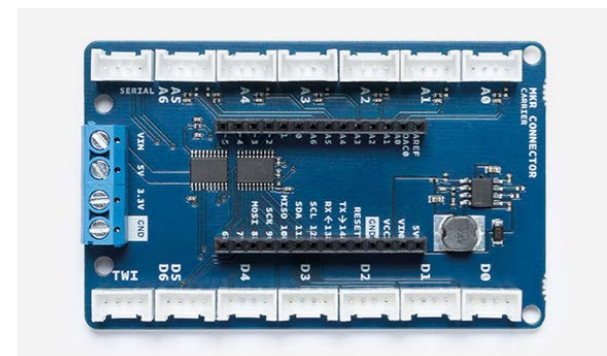
Similarly to the Shields, the Carrier boards are circuit boards plugged at the bottom of the MKR boards to extend their features, to add special connectors or functionalities to the board.



### ARDUINO MKR MOTOR CARRIER

Connect several motors and sensors for your mechatronics applications.

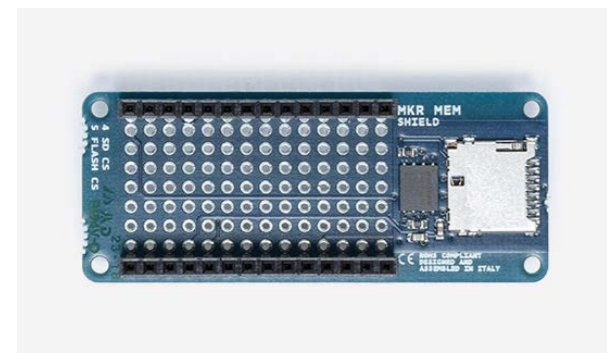
For more info visit:  
[store.arduino.cc/mkr-motor-carrier](https://store.arduino.cc/mkr-motor-carrier)



### ARDUINO MKR CONNECTOR CARRIER

Select among a long list of possible add-ons and easily plug them to any MKR board.

For more info visit:  
[store.arduino.cc/mkr-connector-carrier](https://store.arduino.cc/mkr-connector-carrier)



### ARDUINO MKR MEM SHIELD

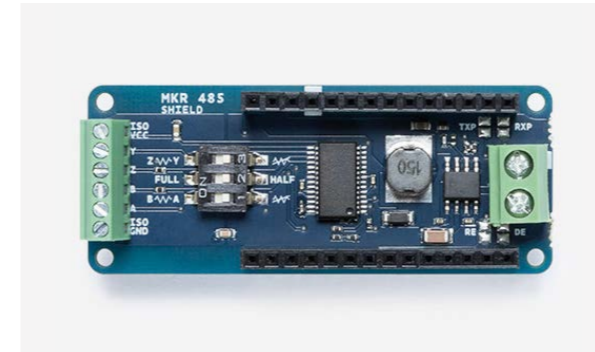
Add Flash memory and microSD storage, implement OTA functionalities.

For more info visit:  
[store.arduino.cc/mkr-mem-shield](https://store.arduino.cc/mkr-mem-shield)

### ARDUINO MKR 485 SHIELD

Turn almost any legacy industrial system into an IoT device.

For more info visit:  
[store.arduino.cc/mkr-485-shield](https://store.arduino.cc/mkr-485-shield)



### ARDUINO MKR CAN SHIELD

Communicate over a CAN bus and build Arduino-powered automotive solutions.

For more info visit:  
[store.arduino.cc/mkr-can-shield](https://store.arduino.cc/mkr-can-shield)



### ARDUINO MKR ETH SHIELD

Connect your board to an Ethernet network and build servers and clients.

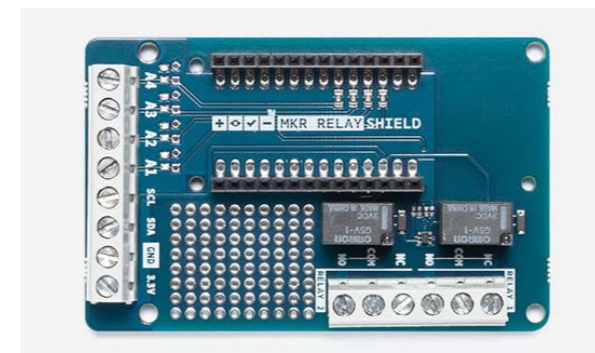
For more info visit:  
[store.arduino.cc/mkr-eth-shield](https://store.arduino.cc/mkr-eth-shield)



### ARDUINO MKR RELAY PROTO SHIELD

Safe screw terminals for your sensors and relays to control high-voltage devices.

For more info visit:  
[store.arduino.cc/mkr-relay-proto-shield](https://store.arduino.cc/mkr-relay-proto-shield)



## ARDUINO MKR SHIELDS AND CARRIERS



### ARDUINO MKR ENV SHIELD

Collect environmental data, such as temperature, humidity, atmospheric pressure and UV radiation.

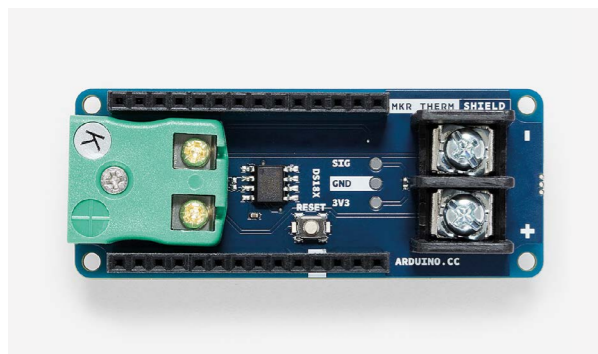
For more info visit:  
[store.arduino.cc/mkr-env-shield](https://store.arduino.cc/mkr-env-shield)



### ARDUINO MKR RGB SHIELD

Visualize information through this RGB display.

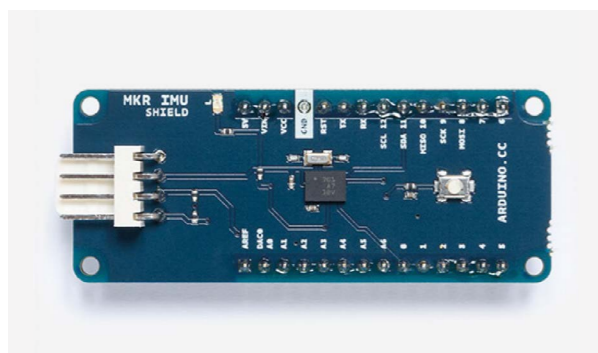
For more info visit:  
[store.arduino.cc/mkr-rgb-shield](https://store.arduino.cc/mkr-rgb-shield)



### ARDUINO MKR THERM SHIELD

Capture temperature information from type K and DS18Bxx thermocouples.

For more info visit:  
[store.arduino.cc/mkr-therm-shield](https://store.arduino.cc/mkr-therm-shield)



### ARDUINO MKR IMU SHIELD

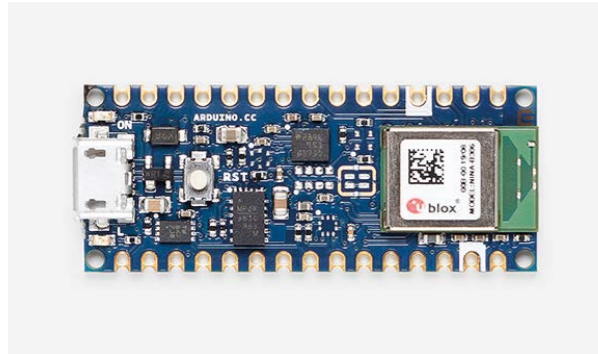
Industry-rated 9 axis IMU sensor with extra I2C connector.

For more info visit:  
[store.arduino.cc/arduino-mkr-imu-shield](https://store.arduino.cc/arduino-mkr-imu-shield)

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## ARDUINO NANO FAMILY

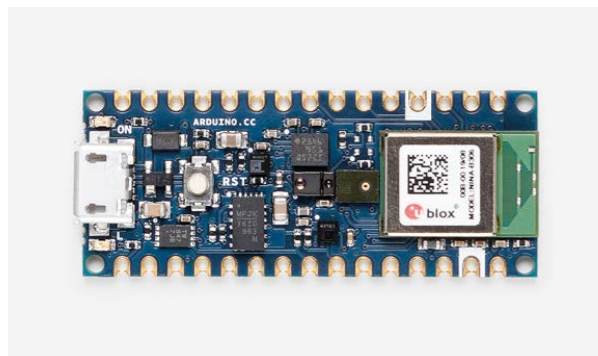
Tiny and powerful boards offering the possibility of running embedded machine learning (AI). Including series of embedded sensors and Bluetooth; ideal for wearables, drones, or any design made to last.



### ARDUINO NANO 33 BLE

Tiny and powerful board that incorporates 9 axis inertial sensor.

For more info visit:  
[store.arduino.cc/nano-33-ble](https://store.arduino.cc/nano-33-ble)



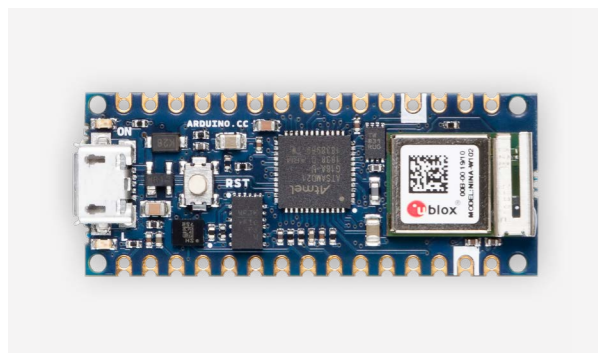
### ARDUINO NANO 33 BLE SENSE

Sense the environment, detect movement, or capture sound without any extra components.

The Arduino Nano BLE Sense comes with a series of embedded sensors:

- 9 axis inertial sensor: what makes this board ideal for wearable devices
- humidity, and temperature sensor: to get highly accurate measurements of the environmental conditions
- barometric sensor: you could make a simple weather station
- microphone: to capture and analyse sound in real time
- gesture, proximity, light color and light intensity sensor: estimate the room's luminosity, but also whether someone is moving close to the board

For more info visit:  
[store.arduino.cc/nano-33-ble-sense](https://store.arduino.cc/nano-33-ble-sense)



### ARDUINO NANO 33 IoT

The easiest and cheapest point of entry to enhance existing devices (and creating new ones) to be part of the IoT and designing pico-network applications.

For more info visit:  
[store.arduino.cc/nano-33-iot](https://store.arduino.cc/nano-33-iot)

# ARDUINO PARTNERSHIP



## PARTNERSHIP PROGRAM: WORKS WITH ARDUINO™

Arduino changed the world by catalysing innovation – in return the Arduino community built entirely new industries including wearables, drones and 3D printers.

**Amazon, Arm®, Bosch, Google, Intel®, Microsoft, and Samsung** are just a few of the companies who have partnered with Arduino.

To expand the Arduino ecosystem and provide partners with the opportunity to market their products to over 30 million active users, Arduino has launched the **Works with Arduino™** program.

### WORKS WITH ARDUINO™

**Validate your design** – the Arduino team will check it works with Arduino.

**Differentiate your products** – display the **Works with Arduino™** program mark on your products and website.

**Raise awareness** – joint marketing to millions of followers on Arduino's Social Media.

**Product feedback to dream of** – Thanks to our open source philosophy, Arduino community users collaborate and contribute to the development of our ecosystem and therefore to the development of your products.

### MARKET YOUR PRODUCT TO OVER 30 MILLION ACTIVE USERS

Partner with Arduino to develop and bring your products to market. Through the **Works with Arduino™** program we will validate your products are compliant with Arduino technologies, and provide access to the millions of Arduino users worldwide working in the Arduino ecosystem.

If you are a start-up or an established company, a maker or a professional developer, the **Works with Arduino™** program is there for you. As long as your product concept is compatible with Arduino and is not a copy or clone of an existing Arduino product, then we are open to assess your idea (under mutual NDA) for inclusion in the program.

### FLEXIBLE APPROACH TO PARTNERSHIP

Choice of revenue models based upon the level of involvement by Arduino.

Varying degrees of service available, from reviewing product design and documentation for compatibility with Arduino, through to organization of manufacturing, packaging, distribution, and sales.

If you are interested in joining the Works with Arduino™ program please contact: [pro@arduino.cc](mailto:pro@arduino.cc)

### KEY BENEFITS:

- Listing for the product's related library and code examples on the Arduino IDE and Create Web Editor
- Works with Arduino™ program logo to use on the product, packaging, and marketing materials
- Listing on the Arduino Store and inclusion in the linecard for Arduino's global distribution network
- Visibility on Arduino's social channels (Facebook, Instagram, Twitter, and LinkedIn)
- The Intellectual Property of the product belongs to you, the program partner

## ARDUINO SYSTEM INTEGRATORS PROGRAM

We set the bar high and look for like-minded businesses to partner with. Explore opportunities based on the Arduino ecosystem to unlock your potential with us.

### WHY JOIN THE PROGRAM?

**Visibility:** unrivaled access to business opportunity

**Reputation:** boost your reach and reputation in the IoT world

**Growth:** combine your expertise with our cutting edge technology

**Leadership:** help shape IoT innovation as it happens

**Efficiency:** reduce product development costs and time-to-market

**Benefits:** take advantage of special prices for Arduino hardware and cloud services

**Support:** enjoy exclusive access to our skilled engineers' assistance

**Take the first step towards success**

### APPLY AND UNDERGO THE ASSESSMENT PROCESS

We will contact you to ensure we have complementary capabilities and a shared goal.

### COLLABORATE WITH US TO SHAPE THE FUTURE OF TECH

We will start collaborating to generate leads and profits!

### START YOUR EXCLUSIVE PARTNERSHIP

You will access a plethora of advantages and foster opportunities.

To learn more and apply for the program visit: [arduino.cc/pro/integrator-program](http://arduino.cc/pro/integrator-program)





# GET IN CONTACT

CONTACT US

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