ARDUINO

PRO™

A SIMPLE PATH TO
IoT SUCCESS

ARDUINO.CC/PRO

TABLE OF CONTENTS

4 WHY PRO?
6 Verticals

7 SOFTWARE
8 Arduino Cloud
9 Arduino IDE 2
10 Arduino CLI
11 Arduino PLC IDE

12 PORTENTA FAMILY
14 Portenta X8
16 Portenta H7
18 Portenta H7 Lite + H7 Lite Connected
20 Portenta C33
22 Portenta Max Carrier
24 Portenta Hat Carrier
26 Portenta Mid Carrier
28 Portenta Breakout
30 Portenta Vision Shield
32 Portenta Cat. M1/NB IoT GNSS Shield
34 4G Module EMEA + 4G GNSS Module Global
36 Portenta Machine Control

38 NICLA FAMILY
40 Nicla Sense ME
42 Nicla Vision
44 Nicla Voice

46 OPTA FAMILY
48 Opta
50 Opta Digital Expansion
52 Opta Analog Expansion

54 EDGE CONTROL

58 MKR FAMILY
60 MKR Shields and Carriers

63 NANO FAMILY

65 WISGATE EDGE GATEWAY

68 PARTNERSHIP PROGRAMS
69 Works with Arduino™
70 System Integrators Program

71 GET IN CONTACT

WHY PRO?

Millions of users and thousands of companies worldwide use Arduino as an innovation platform. Arduino's **frictionless IoT development platform** enables enterprises to quickly and securely connect remote sensors to business logic.

FAST BUSINESS TRANSFORMATION

We empower enterprises to innovate, and keep their business models and solutions up-to-date, 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 Cloud or third-party cloud services.

CROSS-PLATFORM

Re-use your code with other hardware. Port existing code to different Arduino Pro products easily.

LOW POWER BOARDS READY FOR IoT APPLICATIONS

Arm® microcontroller performance combined with battery management, on-board hardware security, and a wide range of connectivity options spanning Wi-Fi®, Bluetooth® Low Energy, LoRa®, LTE Cat-M and NB-IoT.

SIMPLIFY AND ACCELERATE YOUR IoT DEPLOYMENT

We're passionate about IoT technologies. Delivering **higher efficiency, productivity, flexibility and performance**. Efficient use of energy and other limited resources, for a sustainable world and a better quality of life.

We leverage Arduino competences, reputation and user experience, and our worldwide community of technology enthusiasts. Together we monitor the latest breakthroughs in digital intelligence, generating new ideas and discovering new use cases..

WHY PRO?

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 customers worldwide

No matter how big or small your company is, Arduino Pro is ready to work with you to transform your business.

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

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 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
- Lights / shutters / climate control
- Energy management
- Augmented house / voice control / remote
- Access control

LAB PROTOTYPING

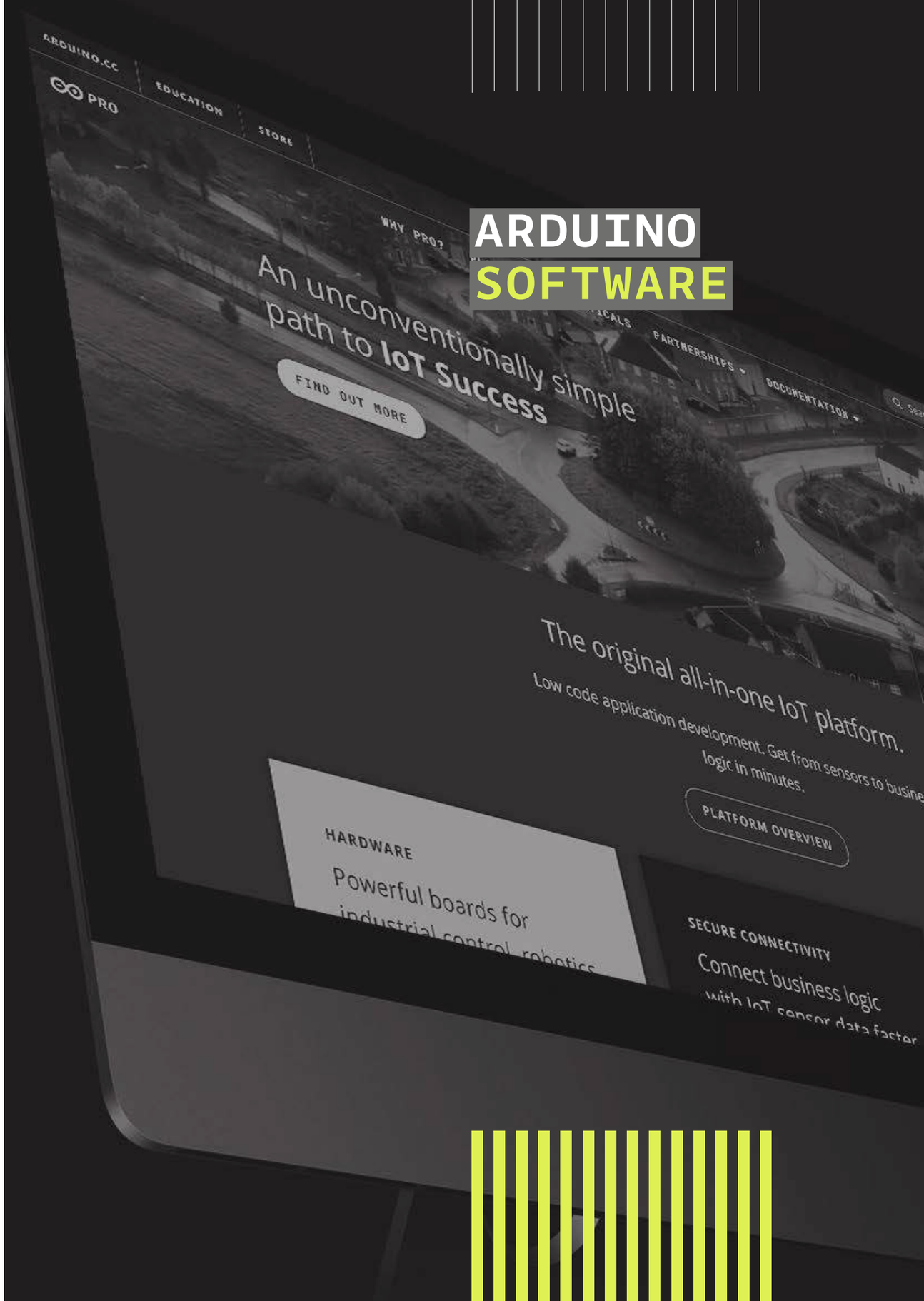
- Quick external sensor validation
- Initial POC evaluation
- Easy access to I/O's

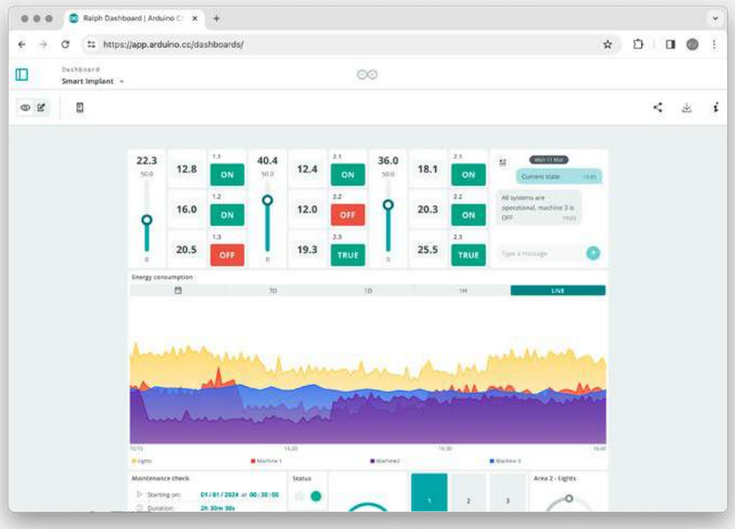
TRACKING / ACCESS CONTROL SYSTEMS

- 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 CLOUD

LEARN MORE

Arduino Cloud is a simple, secure way to connect remote sensors to business applications using an environment that's 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 Cloud provides frictionless development in a secure, scalable service.
Talk to our representatives today to find out how your business can harness Arduino Cloud.

PRICING Arduino Cloud (Wi-Fi®, LoRa®)	Free plan	Entry plan	Maker plan	Maker Plus plan
Cost (excl. tax)	Free	$1.99 / month	$5.99 / month	$19.99 / month
Arduino devices (e.g. MKR, Portenta)	2	10	25	100+
Dashboard sharing			✓	✓

PRICING Arduino Cloud (Cellular SIM included)	
Per device (5 MB cellular data per month included)	$1.50 / month

CONNECT, MANAGE, AND MONITOR

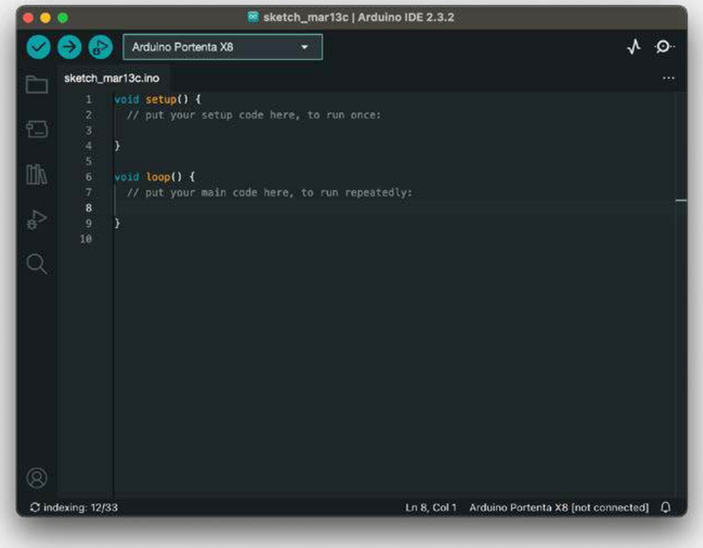
With the Arduino Cloud web app on desktop or mobile you can quickly connect, manage, and monitor your devices from anywhere in the world. Arduino Cloud automatically generates the code for your devices. Customize it however you want with just a few lines of simple code. If you're new to Arduino, don't worry. There are plenty of examples for hundreds of different 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 Sheets, Amazon Alexa, and many other third-party services are available. Developers can also create custom apps using the Arduino Cloud API.

SECURITY

Arduino 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.



ARDUINO IDE 2

LEARN MORE

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 CLOUD 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 Cloud it auto generates code and directs you to Arduino Cloud Editor to compile and program your devices.

ARDUINO IDE 2

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

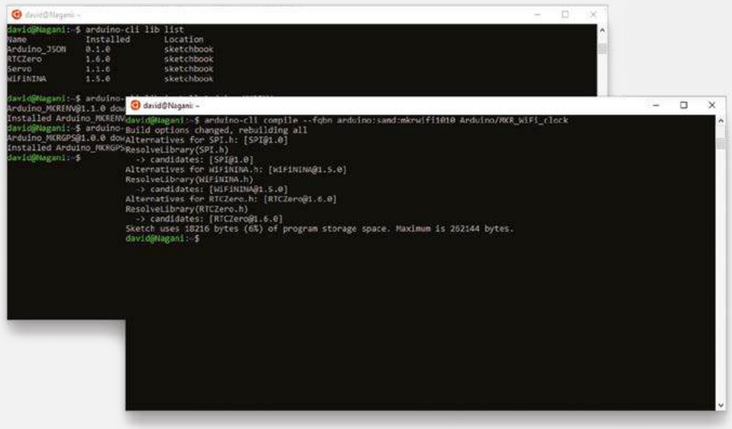
Available in Windows, macOS, and Linux 64 bit versions.

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

Download Arduino IDE 2 at arduino.cc/en/software



ARDUINO CLI

LEARN MORE

Designed for power users. Everything you need, right 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.

Learn more: arduino.cc/pro/software-pro-cli

PROVEN IN USE

Arduino CLI is the backbone of the Arduino Cloud 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 for your boards.

GETTING STARTED

You can find documentation, source code and binary downloads at: 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.

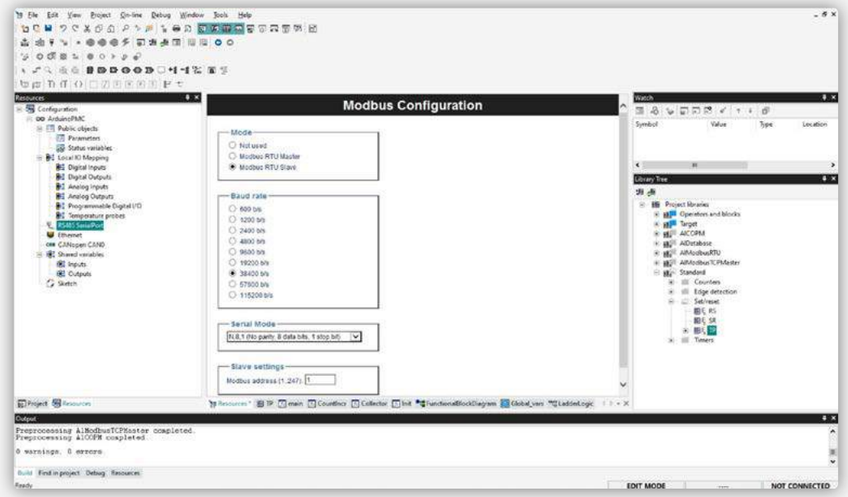
EXAMPLE USE

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 PLC IDE

LEARN MORE

Boost production and building automation with your own Industry 4.0 control system

The Arduino PLC IDE allows you to program Portenta Machine Control and Arduino Opta using the 5 programming languages defined by the IEC 61131-3 standard:

- Ladder Diagram
- Functional Block Diagram
- Structured Text
- Sequential Function Chart
- Instruction List

For more info visit: arduino.cc/pro/software-plc-ide

You can **mix PLC programming with Arduino sketches** within the integrated sketch editor, and seamlessly share variables between the two environments. **Bring deterministic cyclic tasks and multitasking** to your software application: leverage automation to define timings and repetition of all your mission-critical tasks. Manage CANOpen, Modbus RTU and Modbus TCP communication with the **integrated no-code fieldbus configurators.**

A complete set of **monitoring and debugging tools** provides a powerful workbench for professionals: get an instant view of all PLC operations while debugging thanks to the Live Debug Mode, and easily dive into code analysis with the PLC IDE Oscilloscope. You can even implement program changes with zero downtime and no machine reboot.

KEY BENEFITS:

- Enables PLC engineers to leverage IEC 61131-3 programming languages within the Arduino environment
- Easy and intuitive programming experience for deterministic cyclic tasks and multitasking
- No-code industrial fieldbus support (Modbus RTU, Modbus TCP, and CanOpen are integrated)
- Function blocks and libraries are available for a low-code approach
- Quickly port existing PLC applications to Arduino hardware
- Wide set of debugging tools: watch windows, breakpoints with step-by-step execution, triggers, Oscilloscope, Live Debug Mode

ARDUINO PORTENTA FAMILY

Arduino’s series of high-performance industry-rated boards. When performance is key, use Portenta.

Outstanding performance and industry-grade security, leveraging the Arduino ecosystem to deploy powerful AI algorithms and machine learning on the edge.

ARDUINO PORTENTA X8

BUY NOW

INDUSTRIAL-GRADE, SECURE SOM WITH OUTSTANDING COMPUTATIONAL DENSITY

KEY BENEFITS:

— Two industrial products in one, combining Arduino and Linux ecosystems
— Outstanding computational density in a compact form factor
— Real-time I/O and Fieldbus/control on a dedicated core
— Deploy powerful AI algorithms on the edge
— Secure OS/applications updates over the air
— Industrial-grade security at the hardware level

TWO INDUSTRIAL-GRADE PRODUCTS IN ONE

Portenta X8 offers the best of two approaches: flexibility of usage of Linux combined with real-time applications through the Arduino environment. Developers can now perform real-time tasks, while simultaneously performing high-performance processing on Linux cores.

Portenta X8 is a powerful SOM (System on Module) with onboard Wi-Fi® and Bluetooth® Low Energy connectivity. It features two microprocessors:

— **NXP® i.MX 8M Mini Arm® Cortex®-A53 quad-core, up to 1.8 GHz per core + 1x Arm® Cortex®-M4 up to 400 MHz**
— **STMicroelectronics STM32H747XI dual-core Arm® Cortex®-M7 up to 480 MHz +M4 32 bit Arm® MCU up to 240 MHz**

PLUG-AND-PLAY

The Portenta X8 **comes with Linux OS** (Yocto) distribution already preloaded onboard.

CONTAINERIZING SYSTEM

With Portenta X8, it is possible to deploy device-independent software thanks to the **modular container architecture**, allowing single packages of software to run within a controlled environment. Linux applications can run on the Portenta X8 and directly interact with the Arduino sketch.

SECURITY OVER TIME

Portenta X8 comes with a continuously maintained Linux kernel distribution, to keep security at first by **OTA device updates** and **fleet management**.

Crypto element ensures a secure connection at the hardware level. **PSA certified** IoT security from Arm®.

For more info visit:
arduino.cc/pro/hardware-product-portenta-x8

PROCESSOR	NXP® I.MX 8M MINI: — 4X Arm® Cortex®-A53 CORE UP TO 1.8 GHz — 1X Arm® Cortex®-M4 CORE UP TO 400 MHz			
MICROCONTROLLER	STMICROELECTRONICS STM32H747AII6 DUAL Arm® Cortex®-M7/M4 IC: — 1X Arm® Cortex®-M7 CORE UP TO 480 MHz — 1X Arm® Cortex®-M4 CORE UP TO 240 MHz			
EXTERNAL MEMORIES	2 GB LOW POWER DDR4 DRAM 16 GB EMMC			
USB-C®	HOST / DEVICE	DISPLAYPORT OUT	HIGH / FULL SPEED	POWER DELIVERY
CONNECTIVITY	Wi-Fi®	ETH PHY	BLUETOOTH® LOW ENERGY	
DIMENSIONS	66.04 X 25.40 mm			
CERTIFICATIONS	PSA FROM Arm®		Arm® SYSTEMREADY IR (MULTIPLE DISTRIBUTIONS)	
INTERFACES	CAN	PCIe	SAI	MIPI	DSI
	SPI	12S	12C	UART	PDM
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)			
SECURITY	NXP® SE050C2 CRYPTO ON A SEPARATE SECURE BUS			

ARDUINO PORTENTA H7

BUY NOW

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)

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			

Portenta H7 simultaneously runs high level code along with real time tasks. H7's main processor is a dual core unit made of a Arm® Cortex®-M7 running at 480 MHz and a Arm® 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 Wi-Fi® and Bluetooth® connectivity. The Wi-Fi® 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 Bluetooth® Low Energy.

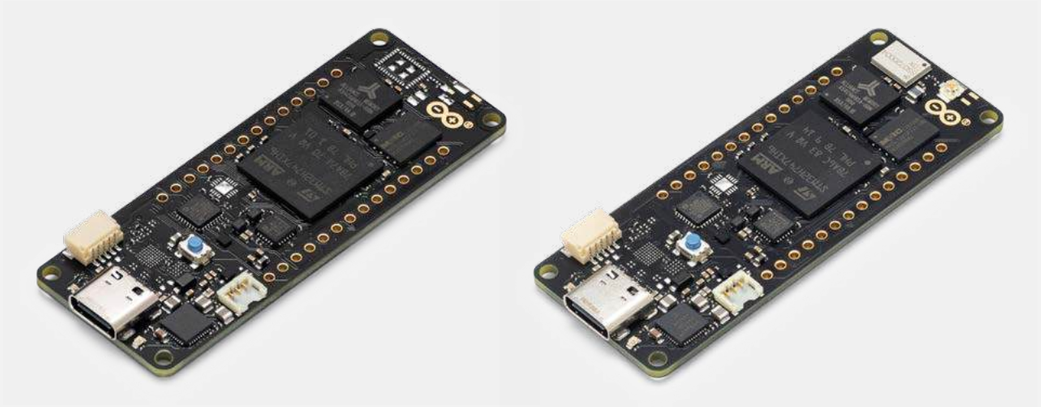
The Portenta H7 follows the Arduino MKR form factor, but enhanced with the Portenta family 80 pin high-density connector.

For more info visit:
arduino.cc/pro/hardware-product-portenta-h7

ARDUINO PORTENTA H7 LITE + H7 LITE CONNECTED

BUY NOW
Portenta H7 Lite

BUY NOW
Portenta 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.

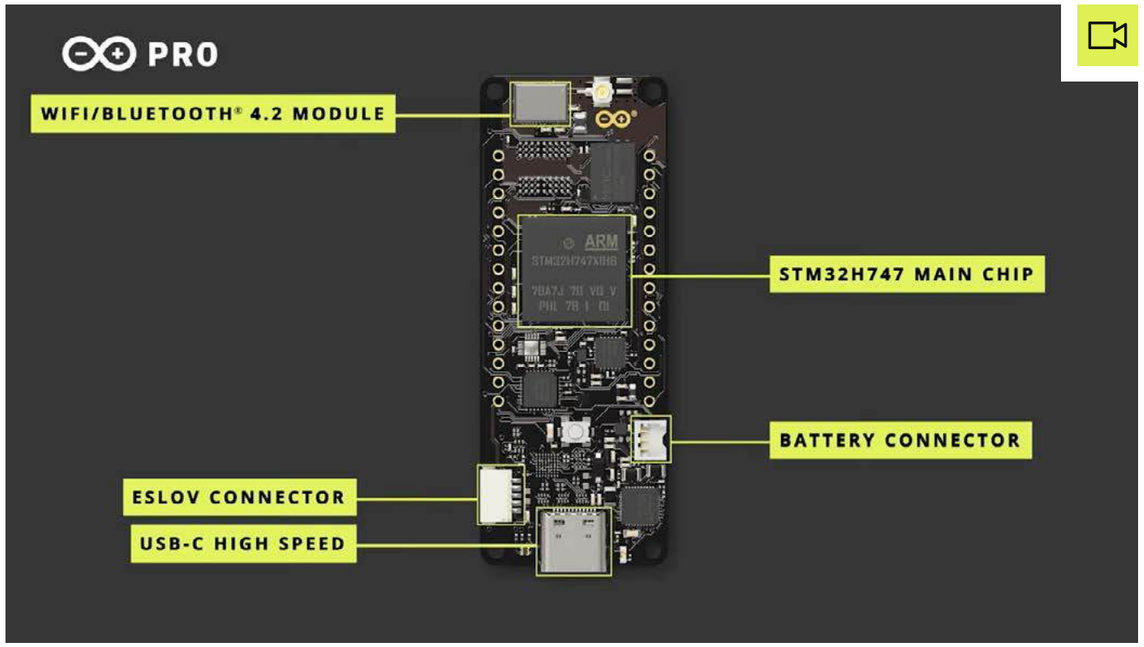
The **Portenta H7 Lite** is a cost-effective solution, ideal for complex environments where radio communications are not suitable or possible.

For more info visit:
arduino.cc/pro/hardware-product-portenta-h7

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.

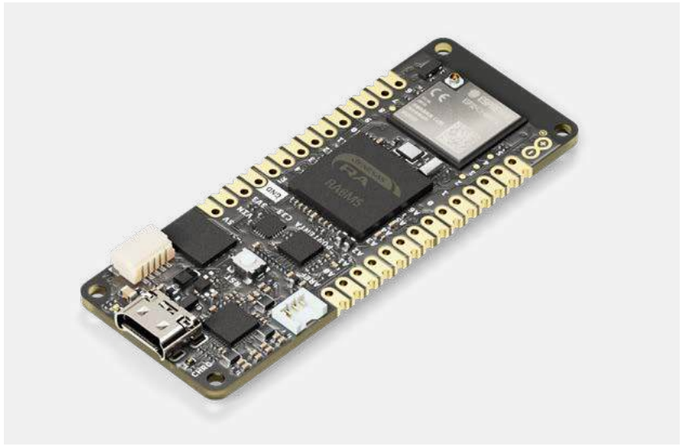
The Portenta H7 follows the Arduino MKR form factor, but enhanced with the Portenta family 80 pin high-density connector.

	H7 FULL	H7 LITE	H7 LITE CONNECTED
SKU	ABX00042	ABX00045	ABX00046
MICROCONTROLLER	STM 747		
CONNECTIVITY	ETH PHY / Wi-Fi® BLUETOOTH® LOW ENERGY	ETH PHY	ETH PHY / Wi-Fi® BLUETOOTH® LOW ENERGY
CRYPTOCHIP	ECC 608 / NXP	ECC608 ONLY	ECC608 ONLY
SDRAM / FLASH	8 MB / 16 MB		
USB-C® / VIDEO OUTPUT	YES	NO	NO



ARDUINO PORTENTA C33

BUY NOW



DEVELOP COST-EFFECTIVE, REAL-TIME APPLICATIONS WITH PORTENTA C33

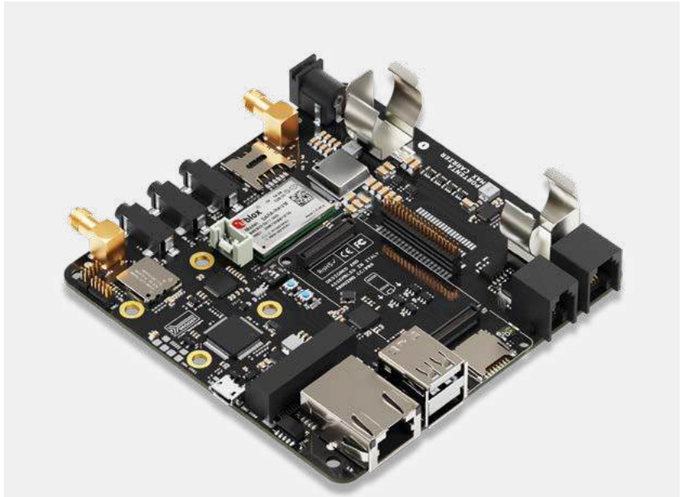
For more info visit:
arduino.cc/pro/hardware-product-portenta-c33

Featuring the **Arm® Cortex®-M33** microcontroller by Renesas, the module supports **MicroPython** and other high-level programming languages. Thanks to its onboard **Wi-Fi® and Bluetooth® Low Energy connectivity**, Portenta C33 is the ideal solution for **IoT gateways**, **remote control systems**, **fleet management** and **process tracking**.
Quickly implement it in your industrial projects, leveraging the vast amount of software libraries available. Securely perform **over-the-air** firmware updates with **Arduino Cloud**.

MICROCONTROLLER	RENESAS R7FA6M5BH2CBG Arm® Cortex®-M33: — 1X Arm® Cortex®-M33 CORE UP TO 200 MHz — 512 kB ONBOARD SRAM — 2 MB ONBOARD FLASH — Arm® TrustZone — SECURE CRYPTO ENGINE 9			
EXTERNAL MEMORIES	16 MB QSPI FLASH			
USB-C®	USB-C® HIGH SPEED			
INTERFACES	CAN	SD card	ADC	GPIO
	SPI	12S	12C	JTAG/SWD
SECURITY	NXP® SE050C2 Secure Element			
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)			
CONNECTIVITY	— 100 Mbit ETHERNET INTERFACE (PHY) — Wi-Fi® — BLUETOOTH® LOW ENERGY			
DIMENSIONS	66.04 X 25.40 mm			

ARDUINO
PORTENTA MAX CARRIER

BUY NOW



EASILY PROTOTYPE YOUR PORTENTA APPLICATIONS. DEPLOY IN ZERO TIME

KEY FEATURES:

- Powerful carrier exposing main Portenta peripherals, for instance CAN, RS232/422/485, USB, mPCIe
- Expand existing projects with multiple connectivity options (Ethernet, LoRa®, CAT.M1, NB IoT)
- microSD card for data logging operations
- Featuring integrated audio jacks (line-in, mic-in, line-out)
- Standalone when battery powered
- Onboard JTAG debugger via microUSB (with Portenta H7 only)
- Great tool for prototyping new applications running on Portenta boards

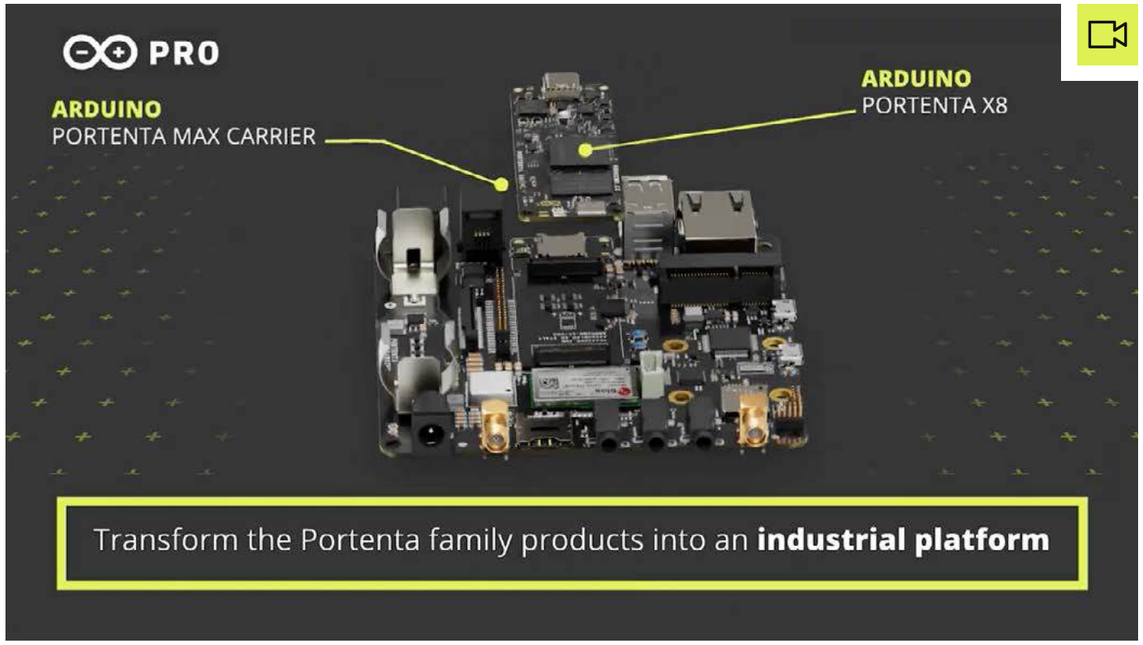
CONNECTORS	HIGH DENSITY PORTENTA CONNECTORS COMPATIBLE WITH PORTENTA PRODUCT		2 USB-A FEMALE CONNECTORS / 1 GIGAbit ETHERNET CONNECTOR (RJ45)
	1 FD-CAN ON RJ11	1 mPCIe	1 SERIAL RS232/422/485 ON RJ12
AUDIO	3X AUDIO JACKS (STEREO LINE-IN/LINE-OUT, MIC-IN), SPEAKER CONNECTOR		
MEMORY	microSD		
WIRELESS MODULES	MURATA CMWX1ZZABZ-078 LoRa®		SARA-R412M-02B (CAT.M1/NB-IoT)
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)		
DIMENSIONS	101.60 X 101.60 mm (4.0 X 4.0 in)		
DEBUGGING	ONBOARD JLINK OB / BLACKMAGIC PROBE		
POWER/BATTERY	POWER JACK FOR EXTERNAL SUPPLY (6-36 V)		ON-BOARD 18650 LI-ION BATTERY CONNECTOR WITH BATTERY CHARGER (3.7 V)

Enable edge AI for high performance **industrial**, **building automation** and **robotics** applications with the Portenta Max Carrier. The Portenta Max Carrier transforms the Portenta family products into a **standardized industrial platform**, ready for use as a single board computer or as a reference design.

The Portenta Max Carrier provides easy access to the X8 peripherals including **audio/video output**, as well as **Ethernet**, **microSD** and **mPCIe** connectors. This carrier further augments the capabilities of the Portenta platforms with **Fieldbus**, **LoRa®**, **Cat.M1** and **NB-IoT** connectivity, providing a platform for Industry 4.0. Thanks to its thermal design, the Portenta Max Carrier provides support for **Li-ion batteries**. Furthermore, the carrier is compatible with Portenta H7.

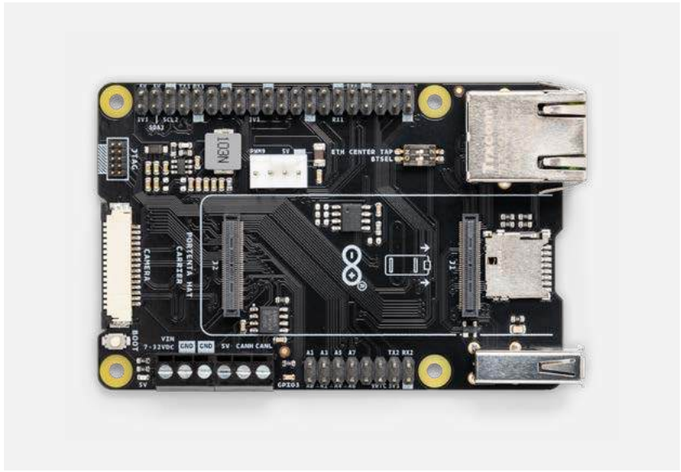
For more info visit:
arduino.cc/pro/hardware-product-portenta-max-carrier

The Portenta Max Carrier needs the Arduino Portenta X8 or Portenta H7 to operate.



ARDUINO
PORTENTA HAT CARRIER

BUY NOW



TRANSFORM YOUR PORTENTA SOM INTO AN INDUSTRIAL SINGLE BOARD COMPUTER COMPATIBLE WITH RASPBERRY PI® HATS.

KEY FEATURES:

- Add Raspberry Pi® Hats to your Portenta projects
- Quickly access CAN, USB, Ethernet peripherals
- Leverage onboard microSD card to log data
- Simple debugging through the onboard JTAG pins
- Easily control actuators via 16x analog I/Os
- Develop industrial machine vision solutions leveraging onboard camera connector
- Great prototyping tool for scalable
- Portenta applications

Transform your Portenta SOM into an industrial single board computer compatible with Raspberry Pi® Hats.

As part of our range of high-performance hardware, **Portenta Hat Carrier** transforms your Portenta X8 into an industrial platform **compatible with Raspberry Pi® Hats**, ready for multiple robotics and building automation applications.

Compatible also with Portenta H7 and Portenta C33, Portenta Hat Carrier provides **easy access to multiple peripherals** – including CAN, Ethernet, microSD and USB – and further simplifies any Portenta application.

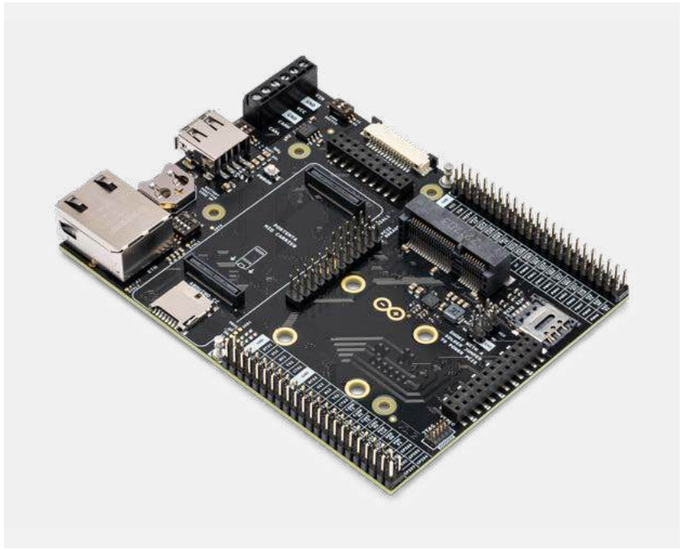
Great for prototyping and ready for scaling up, it features dedicated JTAG pins for quick debugging and a PWM fan connector, and is ideal to control actuators via 16x analog I/Os, or to develop industrial machine vision solutions leveraging the **onboard camera connector**.

For more info visit:
arduino.cc/pro/hardware-product-portenta-hat-carrier

CONNECTORS	— HIGH-DENSITY CONNECTORS COMPATIBLE WITH PORTENTA PRODUCTS — 1X USB-A FEMALE CONNECTOR — 1X GIGAbit ETHERNET CONNECTOR (RJ45) — 1X CAN FD WITH ONBOARD TRANSCEIVER — 1X MIPI CAMERA CONNECTOR — 1X microSD CARD SLOT — 1X PWM FAN CONNECTOR — 40 PIN HEADER CONNECTOR ALLOWING COMPATIBILITY WITH RASPBERRY PI HATS								16 PIN ANALOG HEADER CONNECTOR, INCLUDING: — 8X ANALOG PINS — 1X GPIO — 1X UART WITHOUT — FLOW CONTROL — 2X PWM PINS — 1X LICELL PIN FOR PORTENTA'S RTC POWER
INTERFACES	CAN FD	UART	SAI	ANALOG	GPIO	SPI	I2C	I2S	PWM
DEBUGGING	ONBOARD 10X PIN 1.27 mm JTAG CONNECTOR								
WIRELESS MODULES	16 PIN ANALOG HEADER CONNECTOR, INCLUDING: — MURATA CMWX1ZZABZ-078 LoRa® — SARA-R412M-02B (CAT.M1/NB-IoT)								
POWER	FROM ONBOARD SCREW TERMINAL BLOCK ALLOWING: — 7-32 V POWER SUPPLY POWERING BOTH THE CARRIER AND THE CONNECTED PORTENTA — 5 V POWER SUPPLY FROM USB-C® ON PORTENTA FROM 5 V ON 40 PIN HEADER CONNECTOR								
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)								
DIMENSIONS	85 X 56 mm (3.35 X 2.6 in)								

ARDUINO
PORTENTA MID CARRIER

BUY NOW



PROTOTYPE IN ZERO TIME WITH THE PORTENTA MID CARRIER

KEY FEATURES:

- Great prototyping tool for scalable Portenta applications
- Quickly access all Portenta's high density signals
- Expand existing projects with multiple connectivity options thanks to the Ethernet and mPCIe connectors
- Leverage onboard microSD card slot to boot from an external source
- Easily interact with actuators deploying the onboard CAN lines (with onboard or offboard transceiver)
- Develop industrial machine vision solutions exploiting onboard camera connectors
- Simple reference design to develop proprietary hardware

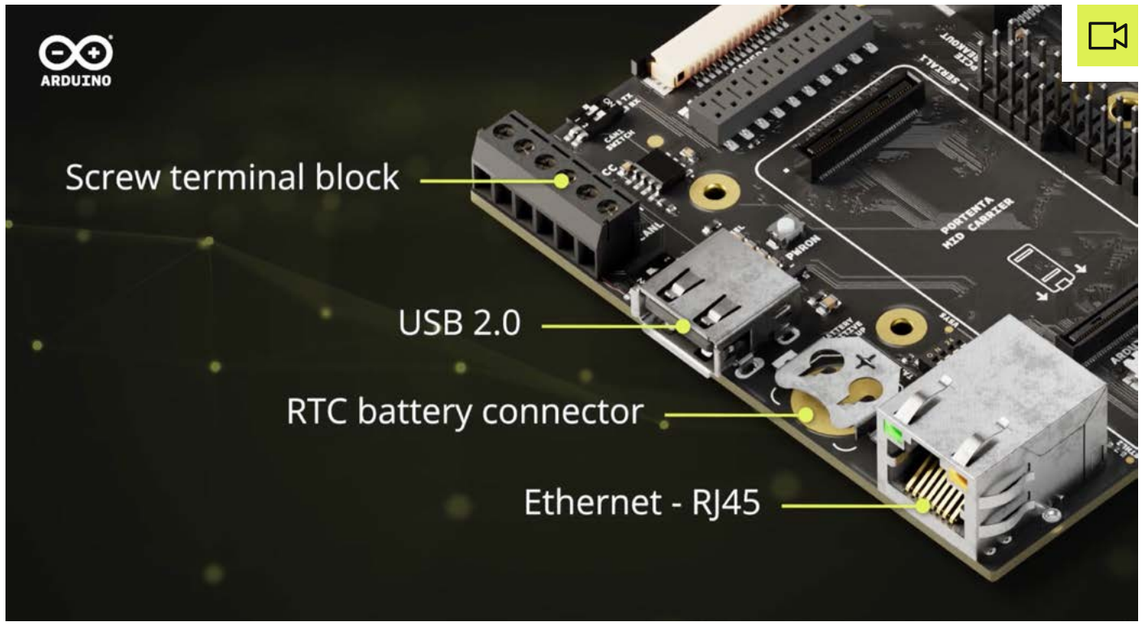
Exploit all the capabilities of Portenta family boards with the Portenta Mid Carrier. It makes all the high density signals easily accessible through dedicated headers, enabling a quick and frictionless **prototyping** experience.

The Portenta Mid Carrier exposes multiple peripherals, including **two CAN lines, Ethernet, microSD, USB as well as camera and GIGA Display Shield interface**. It further simplifies your development experiences through dedicated **debug pins and RTC battery** back-up.

The carrier is compatible with Portenta C33, Portenta H7 and Portenta X8.

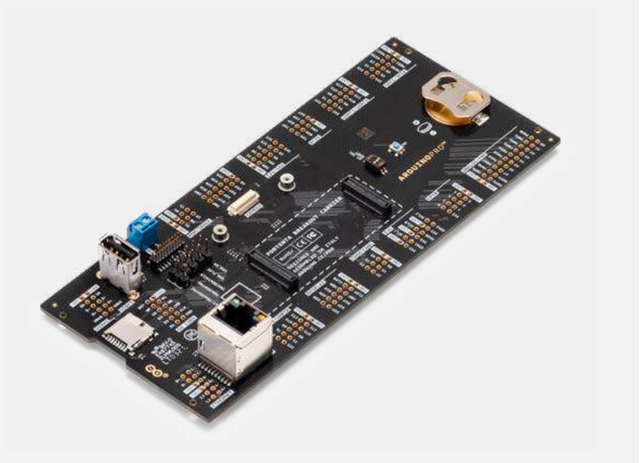
For more info visit:
arduino.cc/pro/hardware-product-portenta-mid-carrier

CONNECTORS	— HIGH-DENSITY CONNECTORS COMPATIBLE WITH PORTENTA PRODUCTS — 1X USB-A FEMALE CONNECTOR — 1X GIGAbit ETHERNET CONNECTOR (RJ45) — 1X CAN WITH ONBOARD TRANSCEIVER							— 1X CAN WITHOUT TRANSCEIVER — 1X mPCIe CONNECTOR — 1X MIPI CAMERA CONNECTOR — 1X ARDUCAM® CAMERA CONNECTOR — 1X microSD CARD SLOT — 1X RTC LiPo BATTERY SLOT — 1X GIGA DISPLAY SHIELD CONNECTOR	
HEADERS INTERFACES	CAN	SAI	I2S	PDM	GPIO	SPI	I2C	PWM	ANALOG I/Os
DEBUGGING	ONBOARD JTAG PINS								
POWER	FROM ONBOARD SCREW TERMINAL BLOCK ALLOWING: — 7-32 V POWER SUPPLY, POWERING BOTH THE CARRIER AND THE CONNECTED PORTENTA — 5 V POWER SUPPLY FROM USB-C® ON PORTENTA FROM 5 V ON HEADERS								
OPERATIONAL TEMPERATURE	40 °C TO +85 °C (-40 °F TO 185 °F)								
DIMENSIONS	114 X 86.5 mm (4.49 X 3.41 in)								



ARDUINO PORTENTA BREAKOUT

BUY NOW



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.

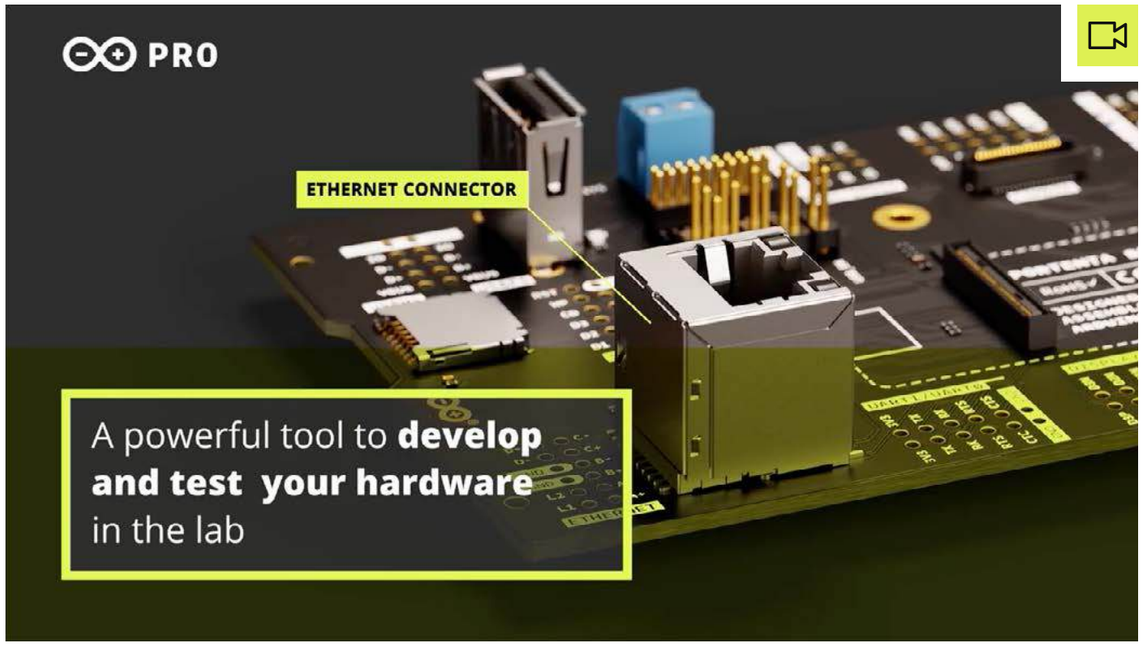
For more info visit:
arduino.cc/pro/hardware-product-portenta-breakout

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

WEIGHT	69 g
DIMENSIONS	72.12 X 163.94 mm (2.83 X 6.45 in)
BATTERY / POWER	CR2032 RTC LITHIUM BATTERY BACKUP; EXTERNAL POWER TERMINAL BLOCK
NETWORK / CONNECTIVITY	USB, RJ45 GIGAbit ETHERNET, microSD CARD, MIPI 20T JTAG WITH TRACE CAPABILITY
MEMORY	microSD CARD SLOT
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)



ARDUINO
PORTENTA VISION SHIELD

BUY NOW
Vision Shield LoRa®

BUY NOW
Vision Shield Ethernet

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

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

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.

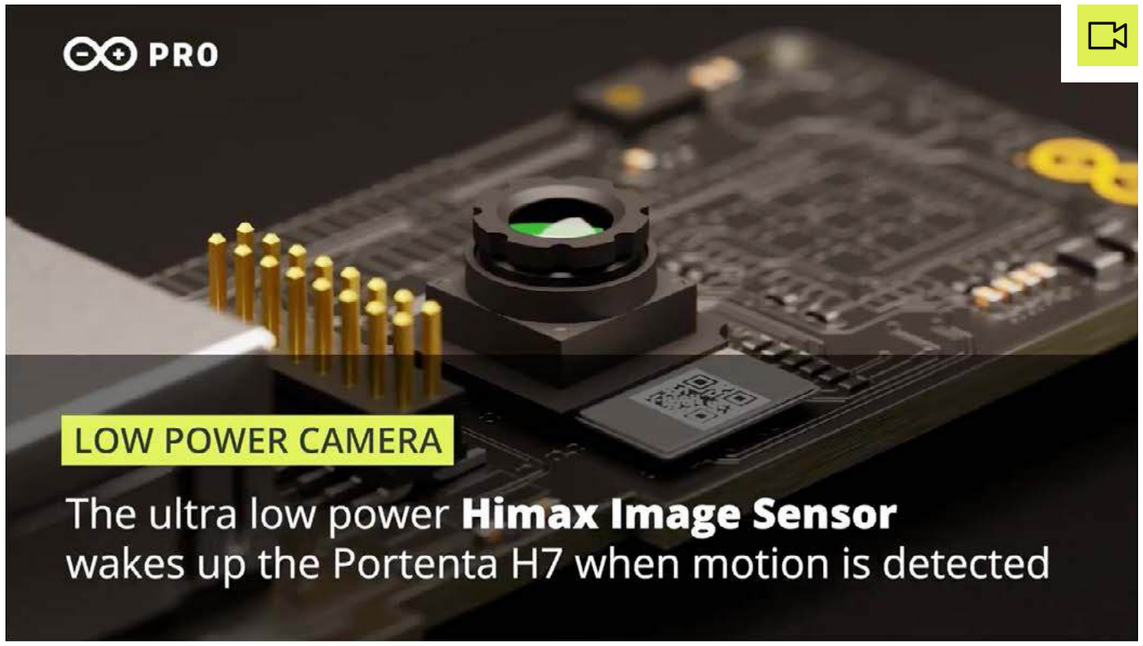
The Portenta Vision Shield comes with a 324x324 pixels camera module which contains an Ultra Low Power Image Sensor that can capture gestures, ambient light, proximity sensing, and object identification. The two omnidirectional built in digital-microphones can capture sounds to the videos that can be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

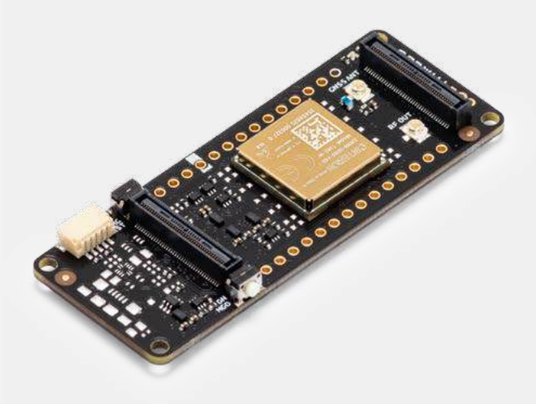
For more info visit:
arduino.cc/pro/hardware-product-portenta-vision-shield

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



ARDUINO
PORTENTA CAT. M1/NB IoT GNSS SHIELD

BUY NOW



BRING CELLULAR COMMUNICATION AND POSITIONING TO YOUR PORTENTA BOARDS

KEY FEATURES:

- Add NB-IoT, CAT.M1 and positioning to Portenta
- Change the connectivity capabilities without changing the board
- Reduce communication bandwidth requirements in IoT applications
- Low Power module
- Implement a small multiprotocol gateway (H7 Wi-Fi® - Bluetooth® + NB-IoT/CAT.M1)
- Compatible with Portenta and MKR boards

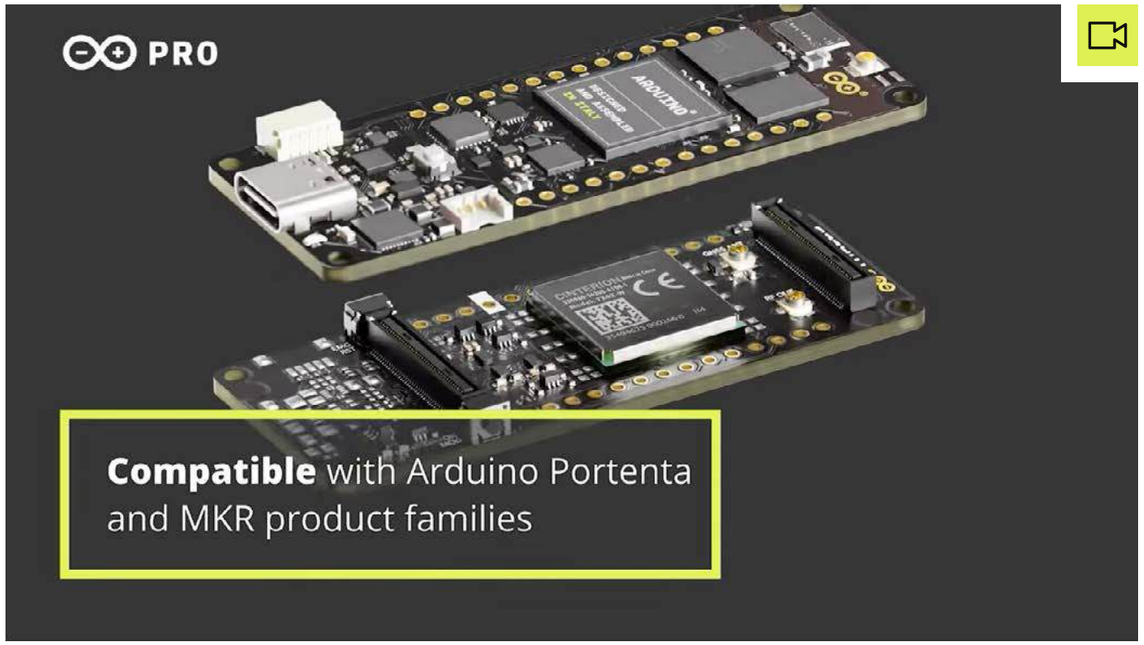
The **Portenta Cat. M1/NB IoT GNSS Shield** brings cellular communication and positioning on the Portenta H7 boards. The shield leverages a Cinterion TX62 wireless module designed for **highly efficient, low-power IoT applications** to deliver optimized bandwidth and performance.

The **Portenta Cat. M1/NB IoT GNSS Shield** allows the development of **asset tracking and remote monitoring** applications (agriculture, smart cities, utilities) in combination with the strong edge computing power of Portenta H7.

This is a **Works with Arduino™** Product, designed by Arduino and Thales.

For more info visit:
arduino.cc/pro/hardware-product-portenta-catm1

CONNECTIVITY	— CINTERION TX62 WIRELESS MODULE — NB-IoT - LTE CAT.M1 — 3GPP REL.14 COMPLIANT PROTOCOL LTE CAT. M1/NB1/NB2 — UMTS BANDS: 1 / 2 / 3 / 4 / 5 / 8 / 12 (17) / 13 / 18 / 19 / 20 / 25 / 26 / 27 / 28 / 66 / 71 / 85 — LTE CAT.M1 DL: MAX. 300 kBps, UL: MAX. 1.1 MBps — LTE CAT.NB1 DL: MAX. 27 kBps, UL: MAX. 63 kBps — LTE CAT.NB2 DL: MAX. 124 kBps, UL: MAX. 158 kBps
SHORT MESSAGING SERVICE (SMS)	— POINT-TO-POINT MOBILE TERMINATED (MT) AND MOBILE ORIGINATED (MO) TEXT MODE — PROTOCOL DATA UNIT (PDU) MODE
LOCALIZATION SUPPORT	GNSS CAPABILITY (GPS/BEIDOU/GALILEO/GLONASS)
OTHER	— EMBEDDED IPv4 AND IPv6 TCP/IP STACK ACCESS — INTERNET SERVICES: TCP SERVER/CLIENT, UDP CLIENT, DNS, PING, HTTP CLIENT, FTP CLIENT, MQTT CLIENT SECURE CONNECTION WITH TLS/DTLS SECURE BOOT
DIMENSIONS	66 X 25.4 mm
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F UP TO 185 °F)



ARDUINO 4G MODULE EMEA + 4G GNSS MODULE GLOBAL

BUY NOW
4G Module EMEA

BUY NOW
4G GNSS Module Global

Start benefit of the **fast data throughput and high bandwidths** of the Arduino Pro 4G Module.

Developed in the widely adopted **mini PCIe form-factor**, it leverages a powerful **Cat.4 modem from Quectel™** able to guarantee a reliable **4G connectivity** as well as backward compatibility with existing **2G** and **3G** networks.

Available in **two variants**, EMEA and Global (including the US), it can be combined with multiple **Portenta boards** to develop endless smart cities/buildings, remote maintenance and fleet management applications.

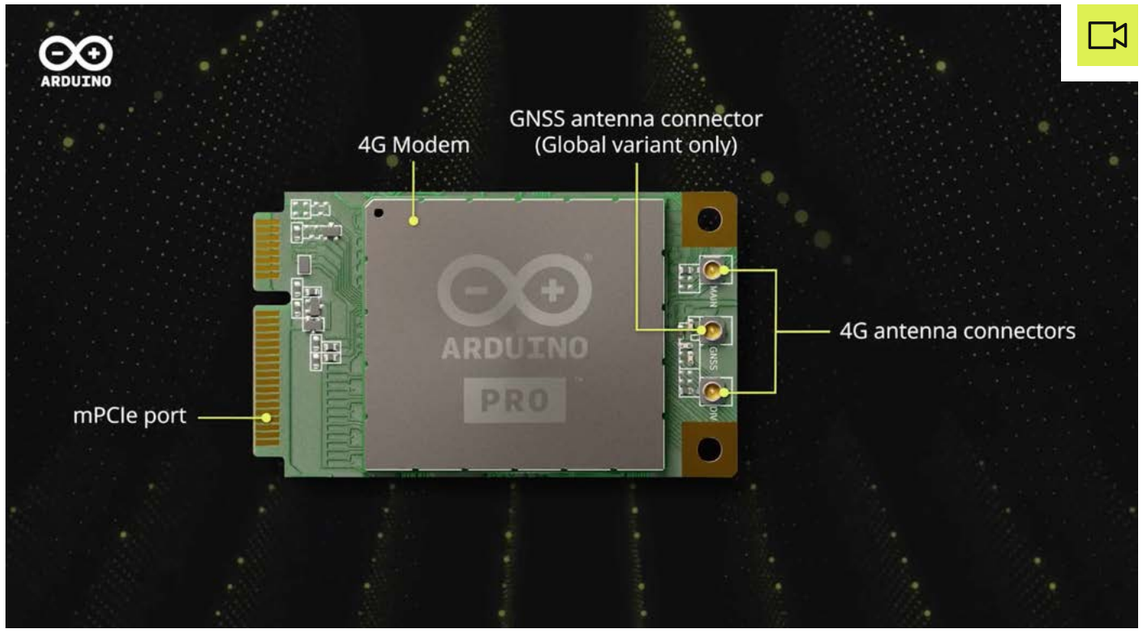
For more info visit:
arduino.cc/pro/hardware-product-4G-module

REVOLUTIONIZE YOUR CONNECTIVITY EXPERIENCE WITH THE ARDUINO PRO 4G MODULE

KEY FEATURES:

- Add 4G connectivity and positioning to the Portenta family
- Guarantee reliable and quick data download and upload even in remote locations
- Enable long range coverage, both indoor and outdoor
- Change connectivity capabilities without changing the board
- Reduce infrastructure investments with respect to other traditional solutions
- Install your products in multiple countries leveraging the global network coverage
- Send SMS and setup real-time notifications in case of alarms
- Take advantage of the widely adopted mini PCIe form factor

	4G MODULE EMEA	4G GNSS MODULE GLOBAL
REGION	EMEA / SOUTHEAST ASIA	GLOBAL
MODEM	QUECTEL™ EC200A-EU	QUECTEL™ EG25-G
CHIPSET	ASR1803 (MARVELL)	MDM9X07 (QUALCOMM)
LTE	LTE CAT4 4G WITH 2G/3G FALLBACK	
GNSS	N/A	GPS, GLONASS, BeiDou (COMPASS), GALILEO AND QZSS
INTERFACES	— USB — UART — PCM / I2C	
CARRIER CERTIFICATIONS	DEUTSCHE TELEKOM / VODAFONE	DEUTSCHE TELEKOM / VERIZON / AT&T / T-MOBILE / SPRINT / U.S. CELLULAR / TELUS / ROGERS
REGULATORY CERTIFICATIONS	CE / UKCA	FCC / CE / IC / UKCA



ARDUINO
PORTENTA MACHINE CONTROL

BUY NOW

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)

PROCESSOR	STM32H747XI DUAL Arm® Cortex®-M7+M4 32 bit LOW POWER Arm® MCU (PORTENTA H7)
INPUT	— 8 DIGITAL 24 VDC — 2 CHANNELS ENCODER READINGS — 3 ANALOG FOR PT100/J/K TEMPERATURE PROBES (3-WIRE CABLE WITH COMPENSATION) — 3 ANALOG INPUT (4-20 mA / 0-10 V / NTC 10 K)
OUTPUT	— 8 DIGITAL 24 VDC UP TO 0,5 A (SHORT CIRCUIT PROTECTION) — 4 ANALOG 0-10 V (UP TO 20 mA OUTPUT PER CHANNEL)
OTHER I/O	12 PROGRAMMABLE DIGITAL I/O (24 V LOGIC)
COMMUNICATION PROTOCOLS	— CAN BUS — PROGRAMMABLE SERIAL PORT 232/422/485
CONNECTIVITY	— ETHERNET — USB PROGRAMMING PORT — Wi-Fi® — BLUETOOTH® LOW ENERGY
MEMORY	— 16 MB ONBOARD FLASH MEMORY — 8 MB SDRAM
DIMENSIONS	170 X 90 X 50 mm
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)
POWER	24 VDC +/- 20%
CONNECTOR TYPE	PUSH-IN TERMINALS FOR FAST CONNECTION

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 **Bluetooth® Low Energy 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.

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.

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.

The Portenta Machine Control is compatible with PLC IDE, find more:
store.arduino.cc/products/plc-key-portenta-machine-control

For more info visit:
arduino.cc/pro/portenta-machine-control

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

BUY NOW

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
- Bluetooth® Low Energy connectivity
- Compatible with Arduino MKR and Portenta products

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**.

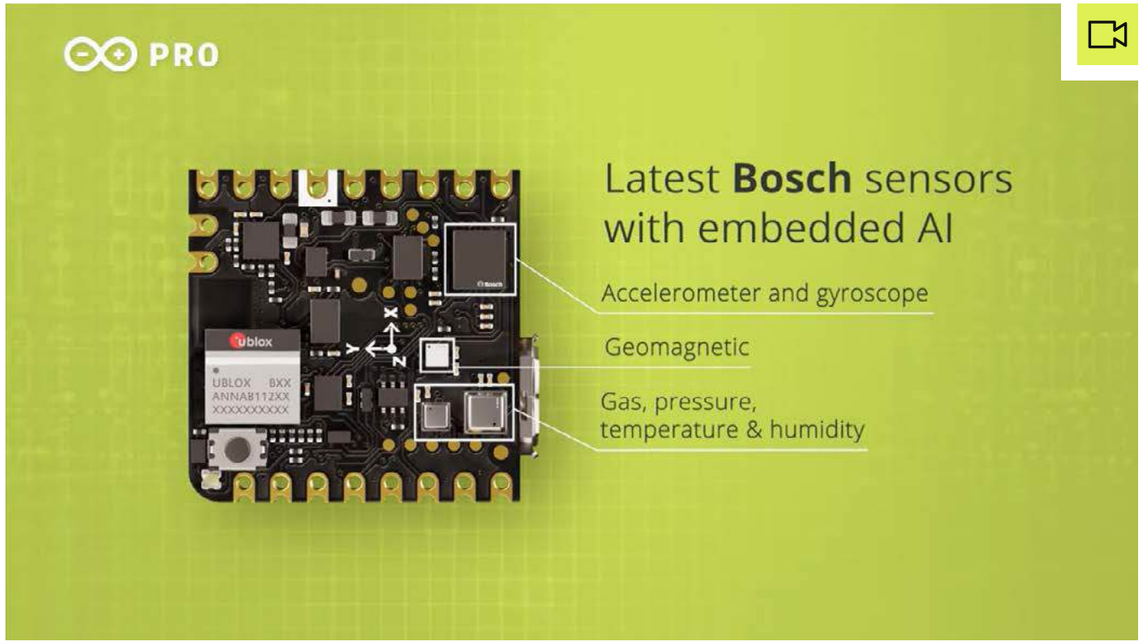
The Nicla Sense ME – where "ME" stands for "Motion" and "Environment" – comes with Bosch® Sensortec's BHI260AP **AI sensor system with integrated motion sensor**, BMM150 **magnetometer**, BPM390 **pressure sensor**, and the unique BME688 4-in-1 **gas sensor with AI** and integrated high-linearity, and high-accuracy **pressure, humidity and temperature sensors**.

For more info visit:
arduino.cc/pro/hardware-nicla-sense-me

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 22.86 X 22.86 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	— BHI260AP: SELF-LEARNING AI SMART SENSOR WITH INTEGRATED ACCELEROMETER AND GYROSCOPE — BMP390: DIGITAL PRESSURE SENSOR	— BMM150: GEOMAGNETIC SENSOR — BME688: DIGITAL LOW POWER GAS, PRESSURE, TEMPERATURE & HUMIDITY SENSOR WITH AI
I/O: CASTELLATED PINS WITH THE FOLLOWING FEATURES	— 1X I2C BUS (WITH EXT. ESLOV CONNECTOR) — 1X SERIAL PORT — 1X SPI	— 2X ADC — PROGRAMMABLE I/O VOLTAGE FROM 1.8-3.3 V
POWER	— MICRO USB (USB-B) — PIN HEADER	— 3.7 V LiPo BATTERY WITH INTEGRATED BATTERY CHARGER
CONNECTIVITY	BLUETOOTH® 5	
MEMORY	— 512 kB FLASH / 64 kB RAM — 2 MB SPI FLASH FOR STORAGE	— 2 MB QSPI DEDICATED FOR BHI260AP
INTERFACE	USB INTERFACE WITH DEBUG FUNCTIONALITY	



ARDUINO
NICLA VISION

BUY NOW

SPEED UP DEPLOYMENT OF
MACHINE VISION AT THE EDGE

KEY FEATURES:

- Powerful microcontroller equipped with 2 MP color camera
- Tiny form factor of 22.86 X 22.86 mm
- Integrated microphone, distance sensor and smart 6-axis motion sensor
- Onboard Wi-Fi® and Bluetooth® Low Energy connectivity
- Supports MicroPython
- Standalone when battery-powered
- Expand existing projects with sensing capabilities
- Enable fast Machine Vision prototyping
- Compatible with Nicla, Portenta and MKR products

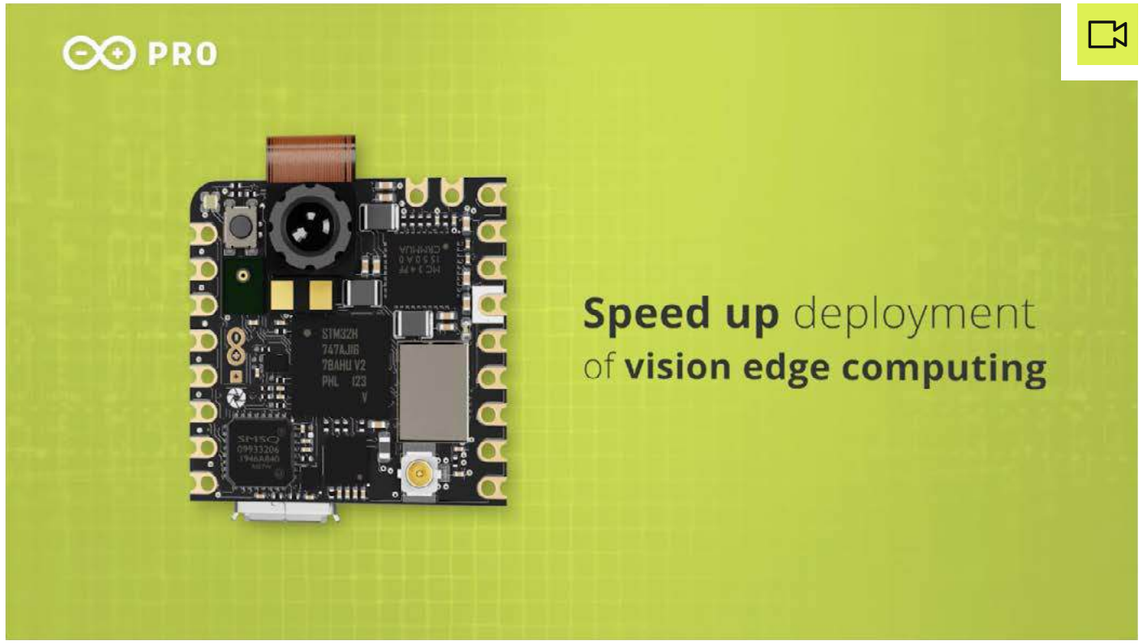
Nicla Vision is a ready-to-use, standalone camera for analyzing and processing images on the edge.

Thanks to its **2 MP color camera**, smart **6-axis motion sensor**, integrated **microphone** and **distance sensor**, it is suitable for asset tracking, object recognition and predictive maintenance. Quickly implement sensor nodes to send collected data to the **Arduino Cloud** (or third-party vendor services) via integrated **Wi-Fi®/Bluetooth® Low Energy connectivity**.

The Nicla Vision features the **STM32H747AII6 Dual Arm® Cortex®**-M7 core up to 480 MHz + M4 core up to 240 MHz - and is compatible with Nicla, Portenta and MKR products. **Small in size** (22.86 X 22.86 mm) but big on compatibility, Nicla Vision **supports MicroPython**.

For more info visit:
arduino.cc/pro/hardware-product-nicla-vision

MICROCONTROLLER	STM32H747AII6 DUAL Arm® Cortex®-M7/M4 IC: — 1X Arm® Cortex®-M7 CORE UP TO 480 MHz — 1X Arm® Cortex®-M4 CORE UP TO 240 MHz	
SENSORS	— 2 MP COLOR CAMERA — 6-AXIS IMU (LSM6DSOX) — DISTANCE / TIME OF FLIGHT SENSOR (VL53L1CBV0FY/1) — MICROPHONE (MP34DT05)	
I/O	CASTELLATED PINS WITH THE FOLLOWING FEATURES: — 1X I2C BUS (WITH ESLOV CONNECTOR), JTAG, POWER AND GPIO PIN HEADERS — 1X SERIAL PORT — 1X SPI — 2X ADC — PROGRAMMABLE I/O VOLTAGE FROM 1.8-3.3 V	
POWER	— HIGH SPEED USB (500 MBps) — PIN HEADER — 3.7 V LiPo BATTERY WITH INTEGRATED BATTERY CHARGER AND FUEL GAUGE (MAX17262REWL)	
DIMENSIONS	22.86 X 22.86 mm	
MEMORY	2 MB FLASH / 1 MB RAM	16 MB QSPI FLASH FOR STORAGE
SECURITY	NXP SE050C2 CRYPTO CHIP	
CONNECTIVITY	Wi-Fi® / BLUETOOTH® LOW ENERGY 4.2 (MURATA 1DX - LBEE5KL1DX-883)	
INTERFACE	USB INTERFACE WITH DEBUG FUNCTIONALITY	
OPERATING TEMPERATURE	-20 °C TO +70 °C (-4 °F TO 158 °F)	



ARDUINO NICLA VOICE
Powered by SYNTIANT

BUY NOW

Implement **always-on speech recognition on the edge** with Nicla Voice. The board integrates a **Neural Decision Processor™** from Syntiant, 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.

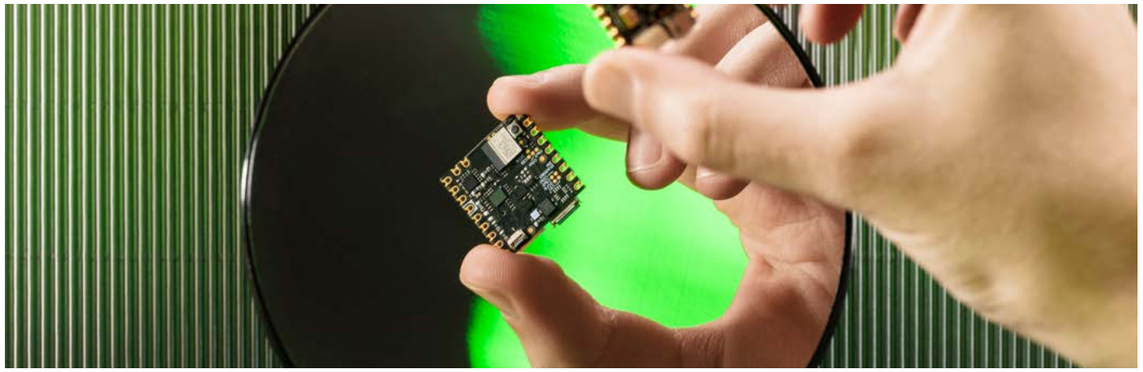
Nicla Voice offers onboard **Bluetooth® Low Energy** connectivity and is compatible with Nicla, Portenta and MKR products.

IMPLEMENT ALWAYS-ON SPEECH RECOGNITION ON THE EDGE

KEY 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, 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

For more info visit:
arduino.cc/pro/hardware-nicla-voice



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	
MICROCONTROLLER	NORDIC SEMICONDUCTOR NRF52832: — 64 MHz Arm® Cortex®-M4	
SENSORS	— HIGH PERFORMANCE MICROPHONE (IM69D130) — 6-AXIS IMU (BMI270) — 3-AXIS MAGNETOMETER (BMM150)	
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 1.8-3.3 V	
INTERFACE	— EXTERNAL MICROPHONE CONNECTOR (ZIF) — USB INTERFACE WITH DEBUG FUNCTIONALITY	
MEMORY	— 512 kB FLASH / 64 kB SRAM — 16 MB SPI FLASH FOR STORAGE	— 48 kB SRAM DEDICATED FOR NDP120
DIMENSIONS AND WEIGHT	22.86 X 22.86 mm	2 g
OPERATING TEMPERATURE	0 °C TO +70 °C (32 °F TO 158 °F)	
POWER	— HIGH SPEED USB (500 MBps) — PIN HEADER — 3.7 V LiPo BATTERY WITH INTEGRATED BATTERY CHARGER AND FUEL GAUGE (BQ25120AYFPR)	
CONNECTIVITY	BLUETOOTH® LOW ENERGY (ANNA-B112)	

ARDUINO OPTA FAMILY

ARDUINO OPTA

Powered by finder

BUY NOW Opta WiFi | BUY NOW Opta RS485 | BUY NOW Opta Lite

Arduino Opta is a secure, easy-to-use **micro PLC with Industrial IoT capabilities**. Designed in partnership with Finder, leading industrial and building automation device manufacturer, it allows professionals to scale up automation projects while taking advantage of the open and widely known Arduino ecosystem. Thanks to its computing power, Arduino Opta enables a wide range of **real-time control**, **monitoring** and **predictive maintenance** applications.

Quickly put it to work, leveraging the many **available software libraries**. The onboard **secure element** ensures **over-the-air firmware updates** and **remote control** via the Arduino Cloud or third-party services.

For more info visit:
arduino.cc/pro/hardware-arduino-opta

MICROPLC WITH INDUSTRIAL IOT CAPABILITIES

KEY BENEFITS:

- Easy and fast software development, starting from ready-to-use Arduino sketches, tutorials and libraries
- Optional support for standard IEC 61131-3 PLC languages
- Fieldbus integration via Modbus TCP (Ethernet) and Modbus RTU (serial RS485)
- Seamless IIoT connectivity (Ethernet/Wi-Fi®/ Bluetooth® Low Energy)
- Real-time remote monitoring via intuitive Arduino Cloud dashboards or third-party services
- Security at the hardware level thanks to onboard secure element and compliance with X.509 Standard
- Secure OTA firmware updates and cloud device management
- High power relay switching (4X 2.3 kW)
- Reliable by design, thanks to industrial certifications and Finder's expertise in switching technology
- Easy DIN rail installation

ARDUINO OPTA IS AVAILABLE IN THREE VARIANTS:

- **Opta Lite:** onboard Ethernet and USB-C® ports
- **Opta RS485:** onboard Ethernet and USB-C® ports, plus RS485 connectivity
- **Opta WiFi:** onboard Ethernet and USB-C® ports, plus RS485 and Wi-Fi®/Bluetooth® Low Energy

INPUT	8X CONFIGURABLE DIGITAL / ANALOG (0-10 V) INPUT	
PROCESSOR	STM32H747XI DUAL Arm® Cortex®: — Arm® Cortex®-M7 CORE UP TO 480 MHz — Arm® Cortex®-M4 CORE UP TO 240 MHz	
CONNECTIVITY	— SUPPORT 10/100 ETHERNET (TCP/IP OR MODBUS TCP) — USB-C® — Wi-Fi® + BLUETOOTH® LOW ENERGY (OPTA WiFi ONLY) — RS485 HALF DUPLEX (OPTA RS485 AND OPTA WiFi ONLY)	
MEMORY	1 MB RAM (PROGRAMMING)	2 MB INTERNAL + 16 MB FLASH QSPI
RTC	TYPICAL 10 DAYS POWER RETENTION AT 25 °C NTP SYNC AVAILABLE THROUGH ETHERNET	
IP PROTECTION	IP20	
OUTPUT	4X RELAYS (250 VAC - 10 A)	
SECURITY	ATECC608B SECURE ELEMENT	
PROGRAMMING LANGUAGES	ARDUINO PROGRAMMING LANGUAGE VIA IDE IEC-61131-3: — LADDER DIAGRAM (LD) — FUNCTION BLOCK DIAGRAM (FBD) — SEQUENTIAL FUNCTION CHART (SFC) — STRUCTURED TEXT (ST) — INSTRUCTION LIST (IL)	
SUPPLY VOLTAGE	12…24 VDC	
OPERATING TEMPERATURE	-20 °C TO +50 °C (-4 °F TO 122 °F)	
CERTIFICATIONS	cULus LISTED / ENEC / CE / UKCA / FCC / IC	

ARDUINO OPTA DIGITAL EXPANSION

Powered by finder

LEARN MORE

Snap on your Opta Digital Expansion and multiply your system capabilities with the addition of **16 programmable inputs** for connecting your digital sensors and **8 more relays to operate your machines**.

Quickly put them to work, managing the new **I/Os from the Opta base unit seamlessly**, taking advantage of the open and widely known Arduino ecosystem or **PLC IDE IEC 61131-3 programming environment**.

For more info visit:
arduino.cc/pro/hardware-arduino-opta-expansions

OPTA EXPANSION MODULES: READY TO BROADEN YOUR OPTIONS

KEY BENEFITS:

- Expand Inputs Flexibly: Add 16 new inputs per expansion, programmable as digital 0-24 VDC or analog 0-10 V
- Robust Outputs: Choose between 8 EMR (250 VAC, 6 A) or 8 SSR (24 VDC, 2 A)
- Snap-On Modules: Easily expand and mix I/Os, integrating seamlessly with the Opta Base module
- Arduino IDE Compatibility: Use Arduino IDE with pre-made sketches, tutorials, and libraries
- PLC Integration: Employ IEC 61131-3 PLC languages for simple I/O integration
- Real-Time Monitoring: Enhance remote monitoring and OTA updates through Arduino Cloud dashboards
- Industrial Reliability: Certified and built on Finder's expertise in switching technology
- Easy DIN Rail Installation

OPTA DIGITAL EXPANSIONS ARE AVAILABLE IN TWO VARIANTS:

- **Arduino Pro Opta Ext D1608E:**
  16 programmable voltage inputs,
  8 electromechanical relays 250 VAC 6 A
- **Arduino Pro Opta Ext D1608S:**
  16 programmable voltage inputs,
  8 solid state relays 24 VDC 2 A

INPUTS	16X PROGRAMMABLE (0-24 V as DIGITAL / 0-10 V as ANALOG)	
ANALOG INPUTS RESOLUTION	14 bit	
PROGRAMMING LANGUAGES FROM THE BASE MODULE	FROM THE MAIN OPTA CONTROLLER USING: — ARDUINO PROGRAMMING LANGUAGE VIA IDE — IEC-61131-3 VIA PLC IDE: — LADDER DIAGRAM (LD) — FUNCTION BLOCK DIAGRAM (FBD) — SEQUENTIAL FUNCTION CHART (SFC) — STRUCTURED TEXT (ST) — INSTRUCTION LIST (IL)	
SUPPLY VOLTAGE	12…24 VDC THROUGH DEDICATED PINS	
IP PROTECTION	IP20	
OUTPUTS	**OPTA EXT D1608E (AFX00005):** 8X ELECTROMECHANICAL RELAYS (250 VAC - 6 A)	**OPTA EXT D1608S (AFX00006):** 8X SOLID STATE RELAYS (24 VDC - 2 A)
EXPANDABILITY	THROUGH AUX PORT ON THE LEFT AND ON THE RIGHT. AVAILABLE TO CONNECT TO THE OPTA BASE MODULE OR TO EXPANSIONS ALREADY CONNECTED. ENABLING THE CONNECTION OF ADDITIONAL EXPANSIONS IN DAISY CHAIN.	
OPERATING TEMPERATURE	-20 °C TO +50 °C (-4 °F TO 122 °F)	
CERTIFICATIONS	cULus LISTED / ENEC / CE / UKCA / FCC / IC	

ARDUINO OPTA ANALOG EXPANSION

Powered by finder

LEARN MORE

Enhance your Arduino Opta's **real-time control, monitoring and predictive maintenance** applications thanks to **Arduino Pro Opta Ext A0602**.

Snap on your Opta Analog Expansion and **extend your system capabilities** with the addition of 6 programmable inputs for connecting your analog sensors, reading Voltages (0 to 10 V), Current (0/4 to 20 mA) or temperature through RTD PT100 sensors.

Get advantage of the flexibility of 2 analog outputs, programmable in Voltage (0 to 10 V) or Current (0/4 to 20 mA) plus 4 PWM digital outputs.

Quickly put them to work, managing the new **I/Os from the Opta base unit seamlessly**, taking advantage of the open and widely known Arduino ecosystem or **PLC IDE IEC 61131-3 programming environment**.

For more info visit:
arduino.cc/pro/hardware-arduino-opta-expansions

OPTA EXPANSION MODULES: READY TO BROADEN YOUR OPTIONS

KEY BENEFITS:

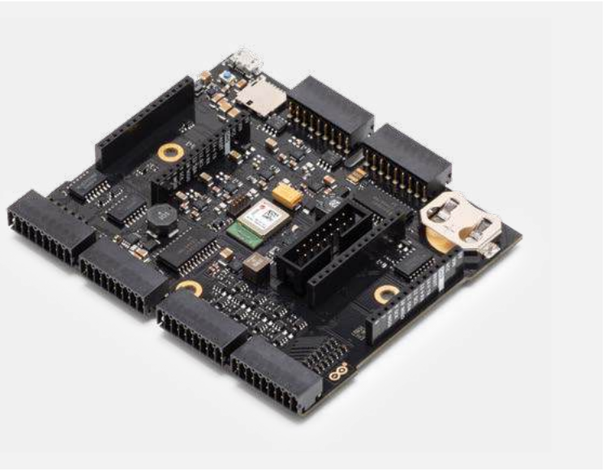
- Flexible Inputs: 4 analog inputs, user-programmable for 0-10 V, 0/4-20 mA, 2 analog inputs, user-programmable for 0-10 V, 0/4-20 mA, or temperature measurement (-25 °C to +400 °C via 3-wire RTD PT100 sensors)
- Configurable Outputs: 2 analog outputs (0-10 V or 0/4-20 mA) and 4 digital PWM outputs
- Snap-On Modules: Expand I/Os with up to 5 modules, integrating seamlessly with the Opta Base module
- Arduino IDE Compatibility: Extend hardware capabilities using Arduino IDE with ready-made resources
- PLC Integration: Seamlessly integrate I/Os with IEC 61131-3 PLC languages
- Real-Time Monitoring: Enhance remote monitoring and firmware updates through Arduino Cloud dashboards
- Industrial Reliability: Certified for industrial use, backed by Finder's expertise in industrial electronics
- Easy DIN Rail Installation

INPUTS	6X ANALOG PROGRAMMABLE: — 4X 0-10 V OR 0/4-20 mA — 2X 0-10 V OR 0/4-20 mA OR PT100
ANALOG INPUTS RESOLUTION	16 bit
ANALOG OUTPUTS RESOLUTION	13 bit
PROGRAMMING LANGUAGES FROM THE BASE MODULE	FROM THE MAIN OPTA CONTROLLER USING: — ARDUINO PROGRAMMING LANGUAGE VIA IDE — IEC-61131-3 VIA PLC IDE: — LADDER DIAGRAM (LD) — FUNCTION BLOCK DIAGRAM (FBD) — SEQUENTIAL FUNCTION CHART (SFC) — STRUCTURED TEXT (ST) — INSTRUCTION LIST (IL)
SUPPLY VOLTAGE	12…24 VDC THROUGH DEDICATED PINS
IP PROTECTION	IP20
OUTPUTS	— 2X ANALOG PROGRAMMABLE: 0-10 V OR 0/4-20 mA — 4X PWM OUTPUTS
EXPANDABILITY	THROUGH AUX PORT ON THE LEFT AND ON THE RIGHT. AVAILABLE TO CONNECT TO THE OPTA BASE MODULE OR TO EXPANSIONS ALREADY CONNECTED. ENABLING THE CONNECTION OF ADDITIONAL EXPANSIONS IN DAISY CHAIN.
OPERATING TEMPERATURE	-20 °C TO +50 °C (-4 °F TO 122 °F)
CERTIFICATIONS	cULus LISTED / ENEC / CE / UKCA / FCC / IC

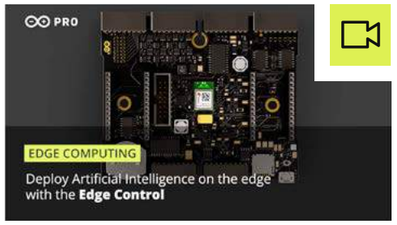
ARDUINO EDGE CONTROL

ARDUINO
EDGE CONTROL

BUY NOW



A REMOTE MONITORING AND CONTROL SOLUTION, OPTIMIZED FOR OUTDOOR ENVIRONMENTS



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 Edge Control features built-in Bluetooth® and its connectivity can be expanded with 2G/3G/CatM1/NB-IoT modems, LoRa®, Sigfox®, and Wi-Fi® by adding any one of the MKR boards.

The 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. 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 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.

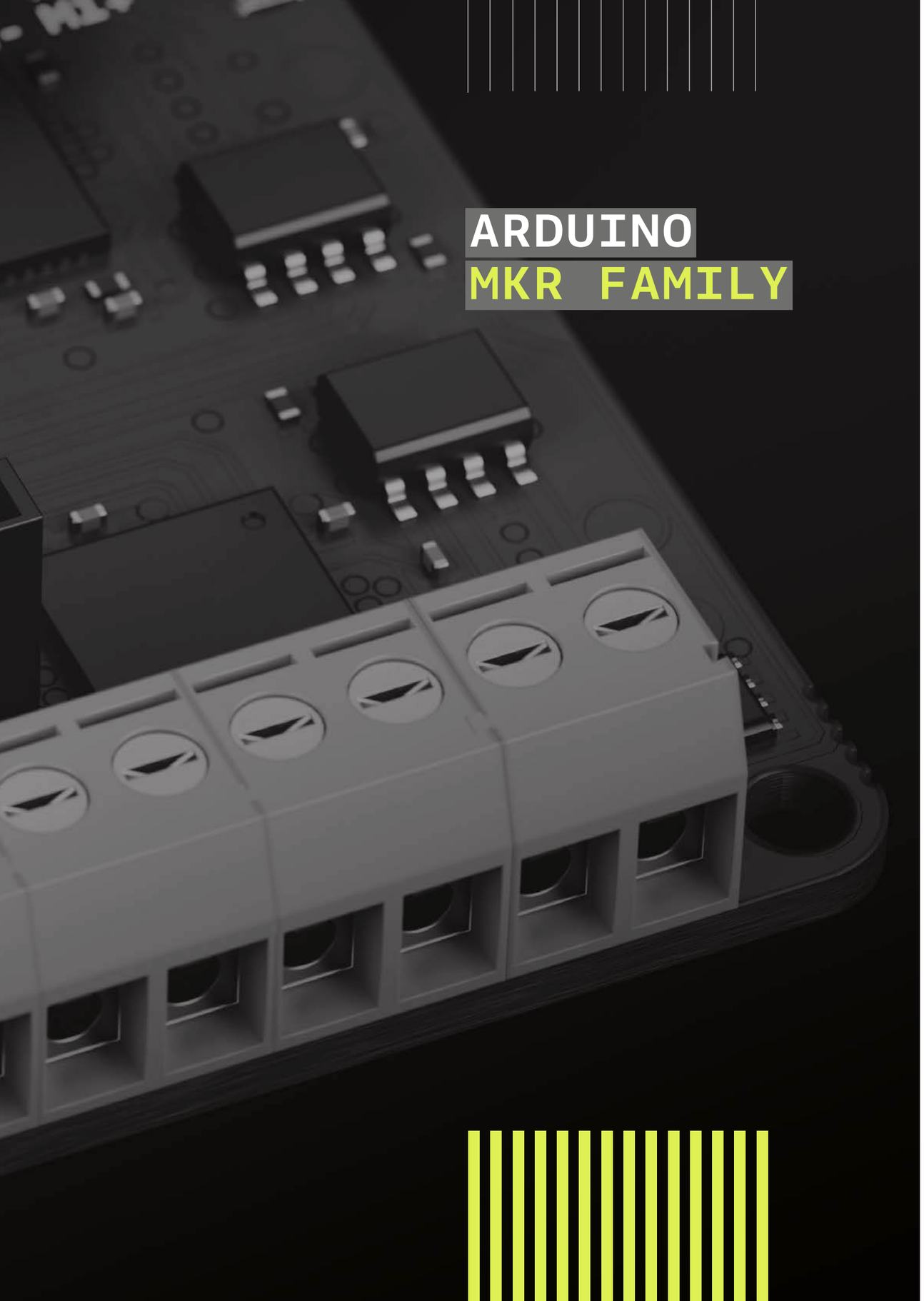
HYDROPONICS / AQUAPONICS

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

For more info visit:
arduino.cc/pro/hardware-product-edge-control

PROCESSOR	64 MHz Arm® Cortex®-M4F (WITH FPU)
I/O	— 6X EDGE SENSITIVE WAKE UP PINS — 16X HYDROSTATIC WATERMARK SENSOR INPUT — 8X 0-5 V ANALOG INPUTS — 4X 4-20 mA INPUTS — 8X LATCHING RELAY COMMAND OUTPUTS WITH DRIVERS — 8X LATCHING RELAY COMMAND OUTPUTS WITHOUT DRIVERS — 4X 60 V / 2.5 A GALVANICALLY ISOLATED SOLID STATE RELAYS — 6X 18 PIN PLUG IN TERMINAL BLOCK CONNECTORS
MEMORY	— 1 MB ONBOARD FLASH MEMORY — 2 MB ONBOARD QSPI FLASH MEMORY — SD card SLOT
OPERATING TEMPERATURES	-40 °C TO +85 °C (-40 °F TO 185 °F)
WEIGHT	67 g
DIMENSIONS	86 X 104 mm
BATTERY	— LITHIUM BATTERY BACKUP — SOLAR PANEL BATTERY CHARGER
CONNECTIVITY *Requires Arduino MKR board	— BLUETOOTH® — Wi-Fi® — 3G — NB-IoT — LoRaWAN®
POWER	— LOW POWER (UP TO 34 MONTHS ON A 12 V / 5 Ah BATTERY) — 12 V ACID/LEAD SLA BATTERY SUPPLY (RECHARGED VIA SOLAR PANELS)

The **Arduino Edge Control Enclosure Kit** is the perfect companion for the Edge Control board. It is IP40-certified and DIN Rail compatible, meaning it can easily fit in a suitable cabinet. Featuring a **2-row display** and **user button** the enclosure kit can be highly customized to visualize sensor **data in real-time**, such as weather conditions and soil parameters.



ARDUINO MKR FAMILY

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 Wi-Fi® and Bluetooth® applications.

BUY NOW

ARDUINO MKR WAN 1310

Send data securely over LoRaWAN® with minimal power consumption.

BUY NOW

ARDUINO MKR NB 1500

Implement inexpensive, large-coverage solutions over Narrowband IoT.

BUY NOW

ARDUINO MKR VIDOR 4000

Build FPGA-powered solutions connected via Wi-Fi® or Bluetooth® Low Energy.

BUY NOW

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 485 SHIELD

Turn almost any legacy industrial system into an IoT device.

BUY NOW

ARDUINO MKR MOTOR CARRIER

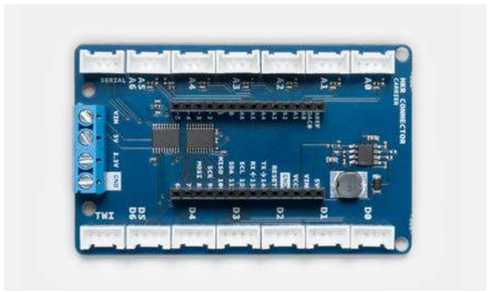
Connect several motors and sensors for your mechatronics applications.

BUY NOW

ARDUINO MKR CAN SHIELD

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

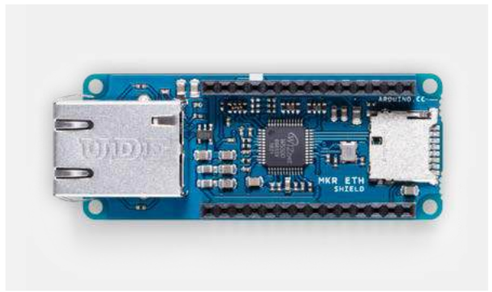
BUY NOW



ARDUINO MKR CONNECTOR CARRIER

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

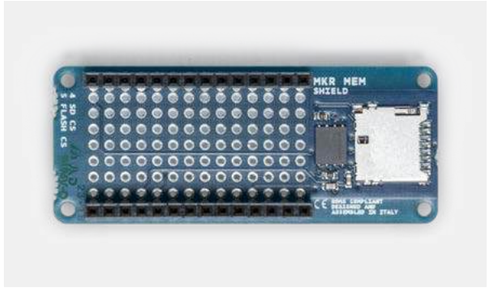
BUY NOW



ARDUINO MKR ETH SHIELD

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

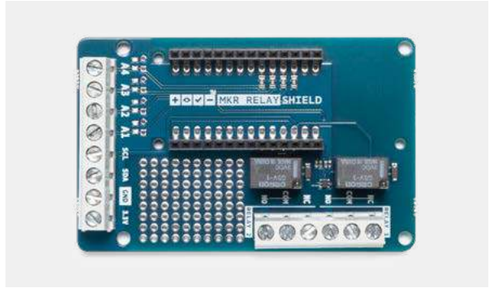
BUY NOW



ARDUINO MKR MEM SHIELD

Add Flash memory and microSD storage, implement OTA functionalities.

BUY NOW



ARDUINO MKR RELAY SHIELD

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

BUY NOW

ARDUINO MKR SHIELDS AND CARRIERS

ARDUINO MKR ENV SHIELD

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

BUY NOW

ARDUINO MKR RGB SHIELD

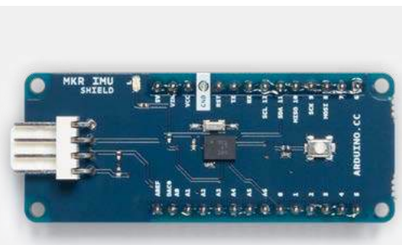
Visualize information through this RGB display.

BUY NOW

ARDUINO MKR THERM SHIELD

Capture temperature information from type K and DS18Bxx thermocouples.

BUY NOW



ARDUINO MKR IMU SHIELD

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

BUY NOW

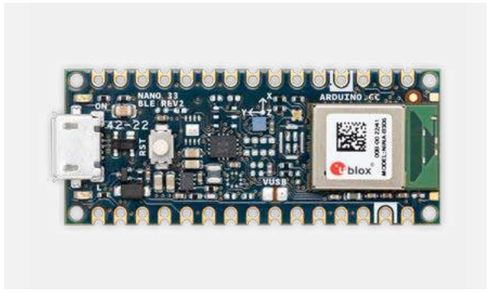
ARDUINO NANO FAMILY

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.

BUY NOW



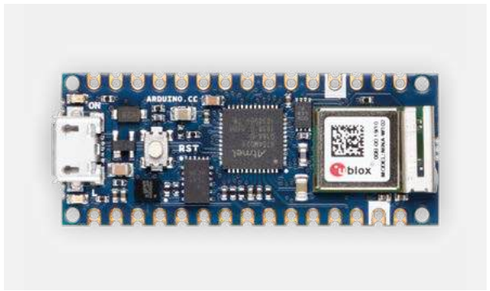
ARDUINO NANO 33 BLE SENSE Rev2

Sense the environment, detect movement, or capture sound without any extra components. The Arduino Nano BLE Sense Rev2 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

Arduino Nano 33 BLE Sense Rev2 is ideal for running low-power Edge Computing applications using TinyML.

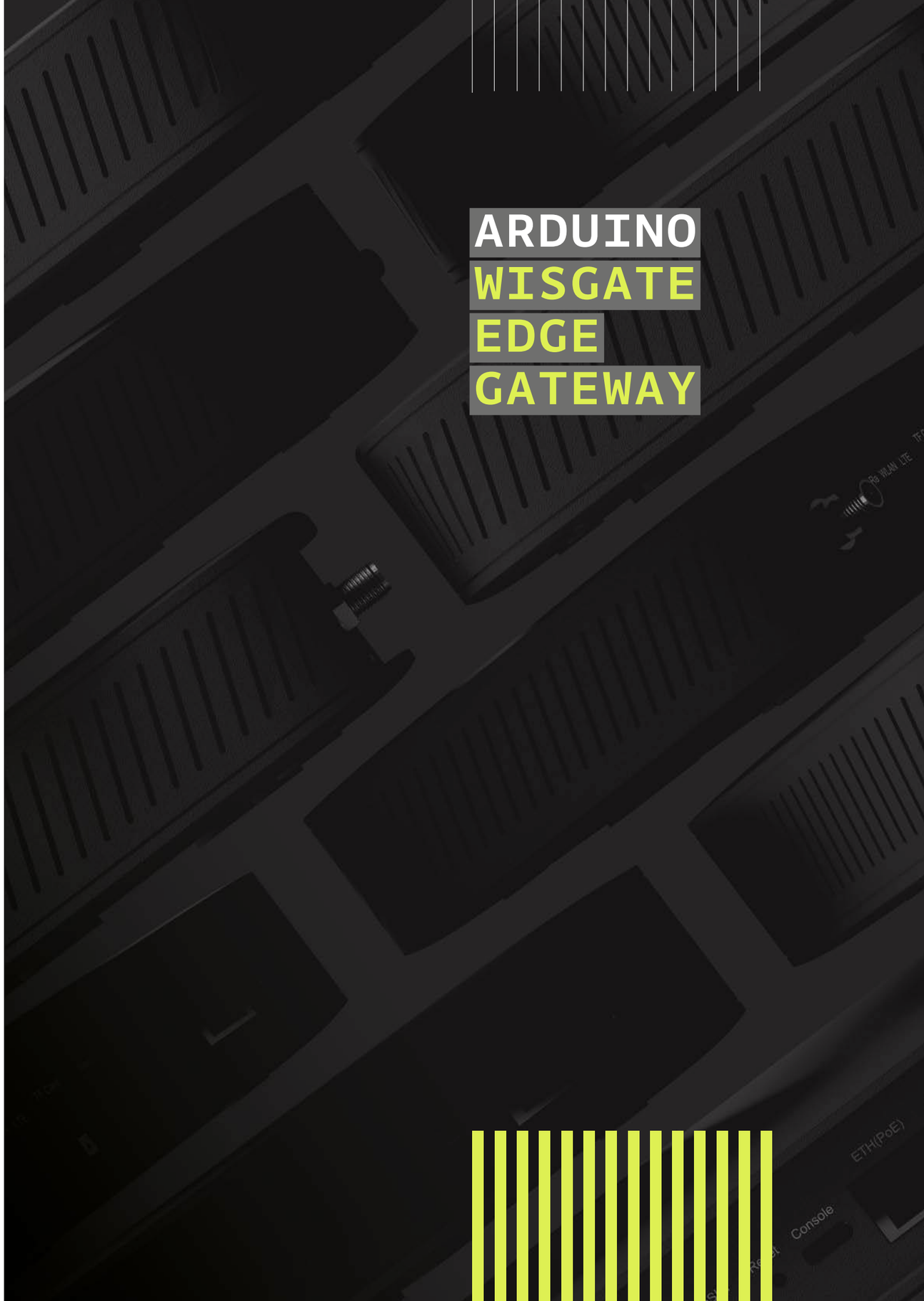
BUY NOW



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.

BUY NOW



ARDUINO
WISGATE EDGE GATEWAY
For LoRaWAN® connectivity

BUY NOW
WisGate Edge Lite 2

BUY NOW
WisGate Edge Pro

CONNECT YOUR LoRa® DEVICES
BETTER THAN EVER

To complete its LoRaWAN® offerings, Arduino Pro integrated two ready-to-use industrial-grade solutions within its product line, targeting **indoor** and **outdoor** applications.

Arduino gateways for LoRaWAN® connectivity ensure **secure and reliable connectivity** for a wide range of professional applications and are suitable for medium-sized to wide area coverage. Designed for industrial usage thanks to **IP30 enclosures**, Arduino gateways for LoRaWAN® connectivity can be mounted on TS15 and TS25 DIN rails.

Leverage the intuitive out-of-the-box user experience for **easy setup and diagnostics**, as well as exhaustive tutorials and technical documentation.

For more info visit:
arduino.cc/pro/lora-gateways

WISGATE EDGE LITE 2

LoRaWAN® indoor gateway

The WisGate Edge Lite 2 gateway is a device with high reliability that allows to set up home and medium-sized **industrial indoor LoRaWAN® applications** with a high execution efficiency.

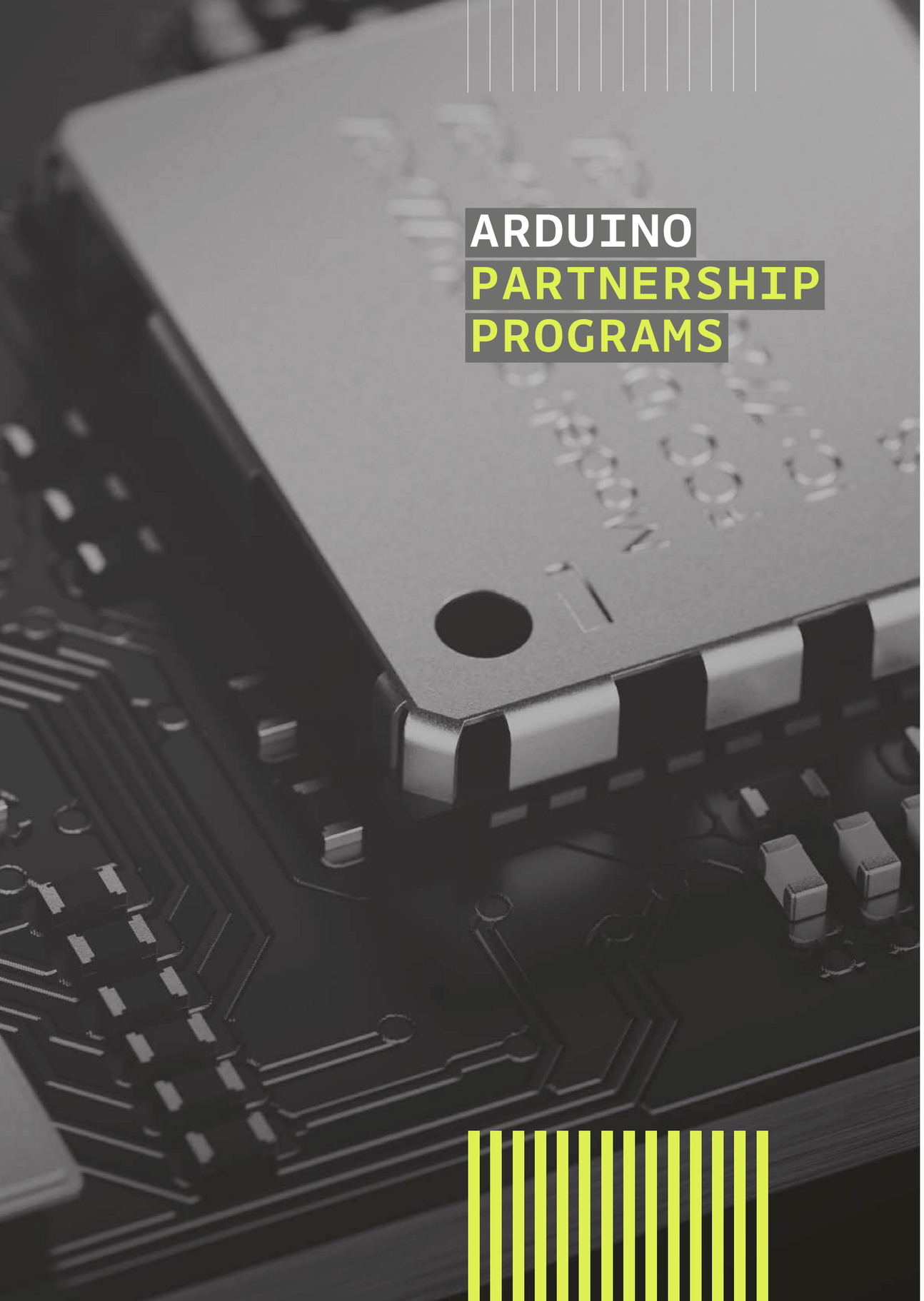
It supports up to 8 **LoRa® channels**, multi backhaul with Ethernet, Wi-Fi®, and Cellular connectivity.
The gateway is powered by OpenWRT which allows to develop custom applications.

WISGATE EDGE PRO

LoRaWAN® outdoor gateway

The WisGate Edge Pro gateway is an industrial-grade device with high reliability and suits every requirement for an IoT commercial deployment.

It **supports 16 LoRaWAN® channels** thanks to a Dual LoRaWAN® Concentrator, and multi backhaul connectivity via Ethernet, Wi-Fi®, and Cellular LTE. The design of its enclosure allows internal antennas for LTE, Wi-Fi®, and GPS. It is powered by **OpenWRT** which allows to develop custom applications.



ARDUINO PARTNERSHIP PROGRAMS

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

KEY BENEFITS:

- Listing for the product's related library and code examples on the Arduino IDE and Cloud 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, X and LinkedIn)
- The Intellectual Property of the product belongs to you, the program partner

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.

3 LEVELS

Platinum

ARDUINO® OFFICIAL INTEGRATOR

Gold

ARDUINO® OFFICIAL INTEGRATOR

Silver

ARDUINO® OFFICIAL INTEGRATOR

To learn more and apply for the program visit:
arduino.cc/pro/partnerships-integrator-program

GET IN CONTACT

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ARDUINO.CC/PRO

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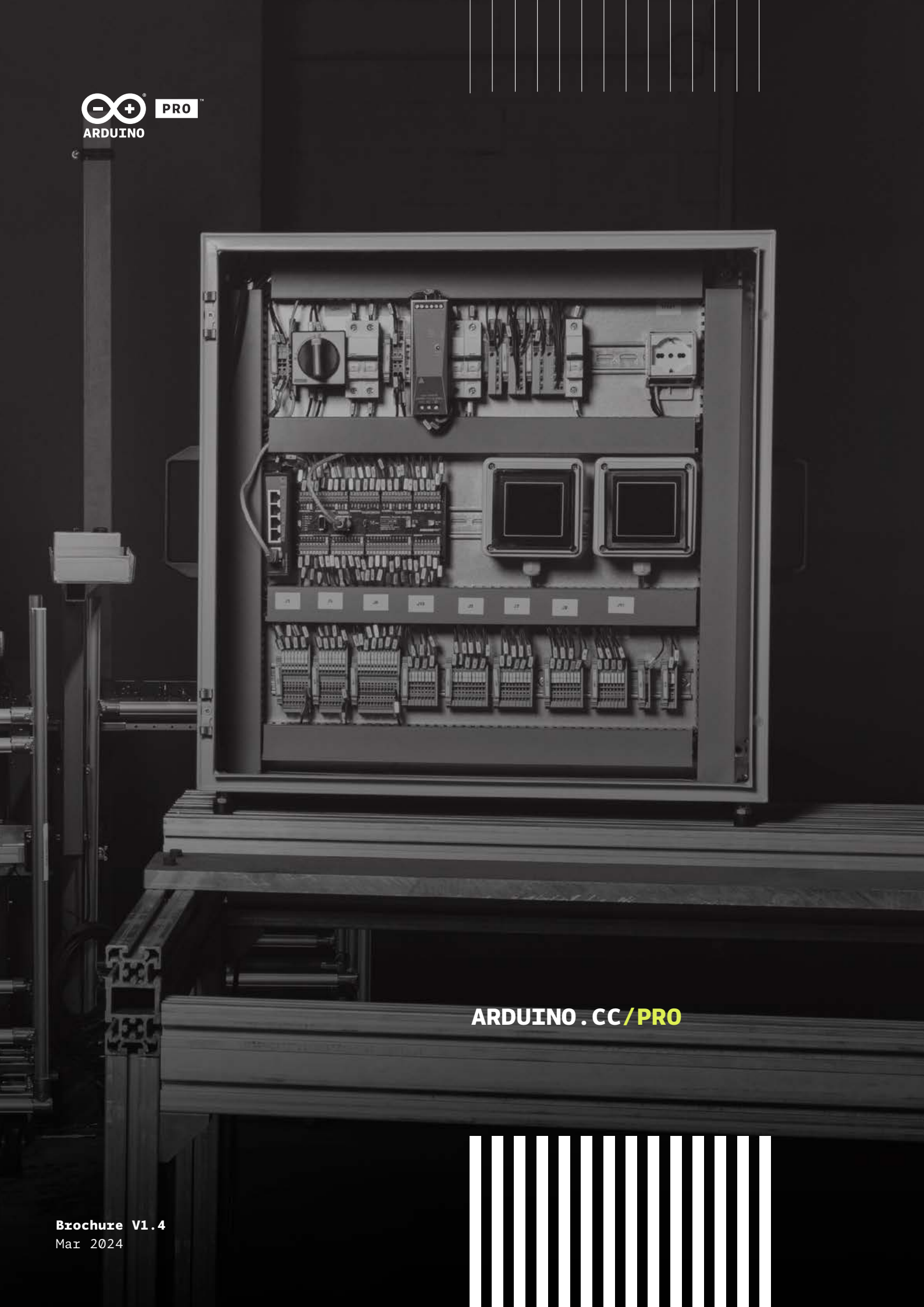
pro@arduino.cc



ARDUINO PRO

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Brochure V1.4
Mar 2024