

```
#include <Arduino.h>
#include <Wire.h>
#include <RGB_LCD.h>
#include < Grove_Button.h>

// RGB LCD
// Grove_Button (Arduino 2号引脚)

void setup() {
  Serial.begin(9600);
  // INITIALIZE RGB LCD
  RGB.begin(255, 0, 0); // 100% RED
  LCD.begin(16, 2); // 16x2 LCD
  // INITIALIZE BUTTON
  BUTTON.begin(DIGITAL_PULLUP);
}

void loop() {
  // READ BUTTON STATE AND DISPLAY ON LCD
  if (BUTTON.isPressed()) {
    LCD.setCursor(0, 0);
    LCD.print("PRESS THE BUTTON!");
    LCD.setCursor(0, 1);
    LCD.print("10 YEARS WITH SEED!");
    LCD.clear();
    LCD.print("SEED STUDIO 10th!");
    LCD.setCursor(0, 1);
    LCD.print("HAPPY BIRTHDAY!");
    LCD.print("HAPPY BIRTHDAY!");
  }

  // WAIT FOR 100 MILLISECONDS BEFORE LOOPING AGAIN
  delay(100);
}
```

```
#include <Wire.h>
#include <OneWire.h>
#include <DS18B20.h>
#include <RGB_LCD.h>
#include < Grove_Button.h>

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seed studio

The AI Hardware Partner 2024 Product Catalog

www.seedstudio.com

V1.0

seed studio

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About us

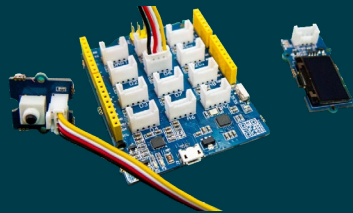
the AI hardware partner

Seeed Studio has been a leading Open Hardware company since 2008, empowering half a million direct users to create real-world digital solutions. Through relentless efforts and earned trust, our ever-growing product lines now form around emerging AI scenarios:

- Sensor networks to fetch extensive real-time data
- Edge computing to push intelligence to new frontiers

We provide industrial-ready modules and devices, and open up the capability of prototype, produce, and promote as Fusion service. Innovators from different vertical domains co-create with us to make their creations widely available for diversified markets.

By embracing open source, community building and integrated software suites like SenseCraft, we are proactively lowering the tech barriers and including users with diverse expertise for globalized matters.



How it started 2008

From possibilities to
productivities



How it's going 2024

From Technology to Industry

Technologies

- Open Source Hardware
- Machine Learning
- Advanced Sensors
- Home Assistant
- Wireless. DePIN
- LLM

Applications

- Asset Tracking
- Smart Building
- Industrial space
- Smart City
- Smart Agriculture
- Smart Energy
- Tech for good
- Open Science



Global Developer
Communities



open source
hardware

Collaborative
Innovation

Emerging Technologies

Chips Algorithms Accessories



Integration



Sensor Network

tinyML Ready
Rich Sensor Portfolio
Diverse Connectivity



Edge Computing

IPCs, HMIs, Edge Controllers
From Basic to High-End Performance
Cutting-Edge AI APP integration



SenseCraft



Services

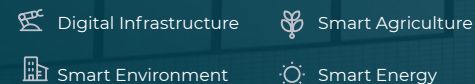
AI Model / dAPP Distribution,
Device Config + Data Management

Design & Manufacturing & Co-Create

Digital Economy



Traditional Industries



Featured Product Lines



Arduino



Beaglebone



Home Assistant



NVIDIA® Jetson



Raspberry Pi



SenseCAP



TinyML

Sensor Network

Nerve Endings of Our Digital World

Transitioning from the physical to the digital world, and from modules to devices, efficiently collecting real-world data significantly boosts traditional industries in their digital transformation. With the proliferation of AI technology, smarter sensors can supply large language models (LLMs) with more authentic data from the physical world. Fortified with AI capabilities, these sensors, along with gateways offering wide network coverage, are compact yet robust, suitable for both indoor and outdoor applications. Seeed's solutions excel in their rapid deployment capabilities within the real-world AIoT sector, including Asset Tracking, Smart Building, Smart City, and Agriculture.



Sensor Network

Seeed provides customers with smart sensing and network coverage capabilities, and the ability to efficiently complete the collection and transmission of physical world data through ready-to-use devices and easy-to-develop open source hardware modules.

Devices

AI Sensors

Smarter sensors, to see, to hear, to understand



AI Vision

LoRaWAN Devices

Low power, long range, low connectivity cost



LoRaWAN Sensors

Gateways

Weather Sensors

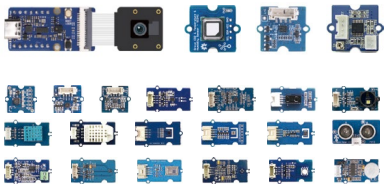
All-in-one with multi parameter, easy to integrate



Modules

Sensor and peripheral modules

Grove Open Source Plug and Play Modules



400+

Vision, environmental sensors, actuators and rich kits with tutorials

XIAO tinyML MCUs



10+

Arduino, ESP32, tinyML, diverse connectivity

Wio LoRa Modules



Low-cost LoRa modules for sensor and gateway

AI Sensors

Seeed Studio's AI Sensor series collaborate IOT, Edge Computing and LLM together. By analysing data from vision, sound, and environment sensors through wireless sensor connectivity, it can be naturally fitted into indoor and outdoor scenarios to help users to improve their management of the space in an revolutionary way.

Application



Smart Home



Situation Awareness



Wireless Sensing



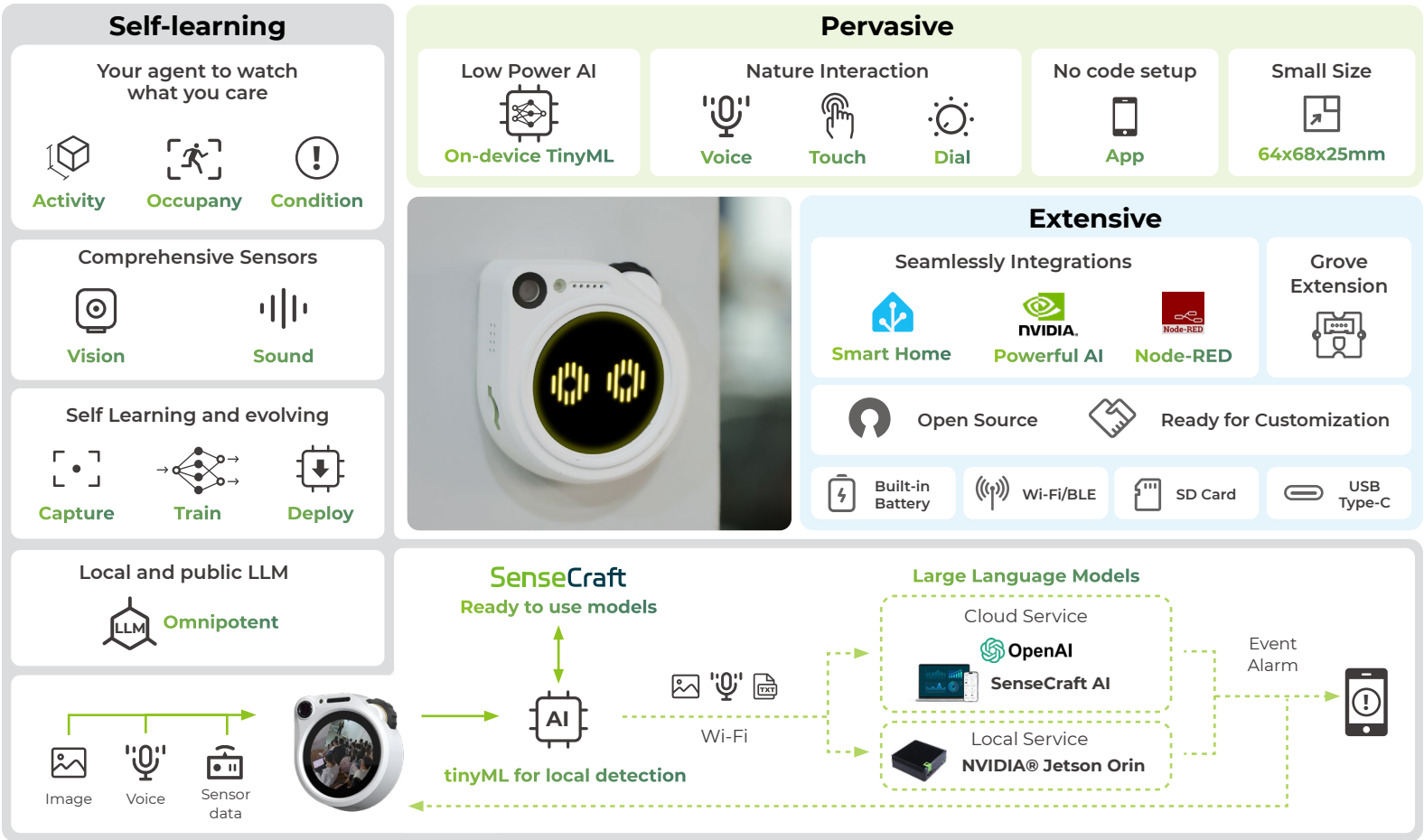
SenseCAP Watcher

NEW

AI-Native

A physical LLM agent for smarter space

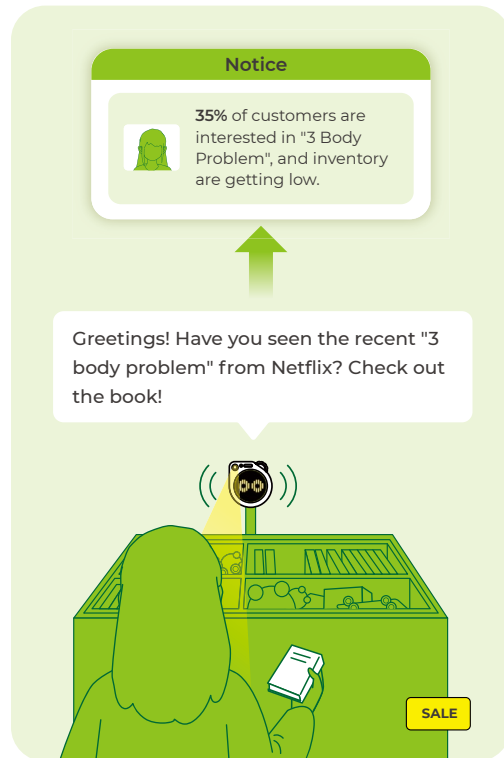
Equipped with a local tinyML module and connected to a native Large Language Models (LLMs) to ensure privacy, SenseCAP Watcher features a camera, voice detection to achieve an effortless oversight of your business operations, it learns from your commands and performs tasks accordingly, operating 24/7. Experience the new transformation towards a more responsive and smarter space.



SenseCAP Watcher Applications

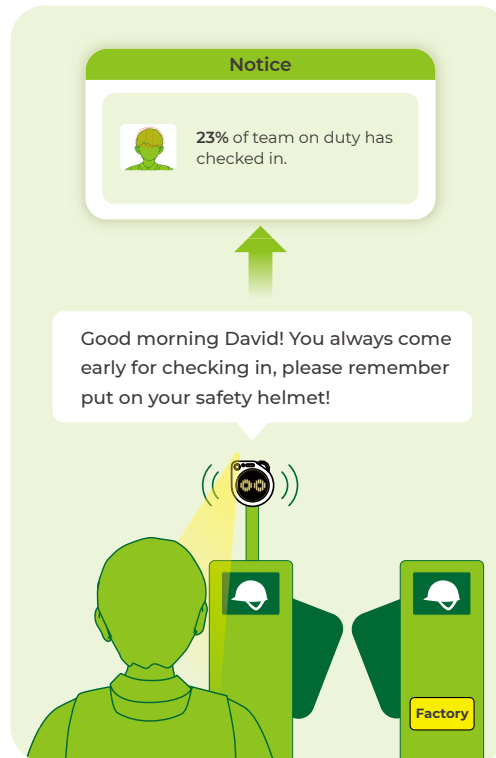
Kiosk Advertiser

SenseCAP Watcher can function as an AI Kiosk Advertiser in unmanned vending areas, enthusiastically greeting customers and suggesting products to them.



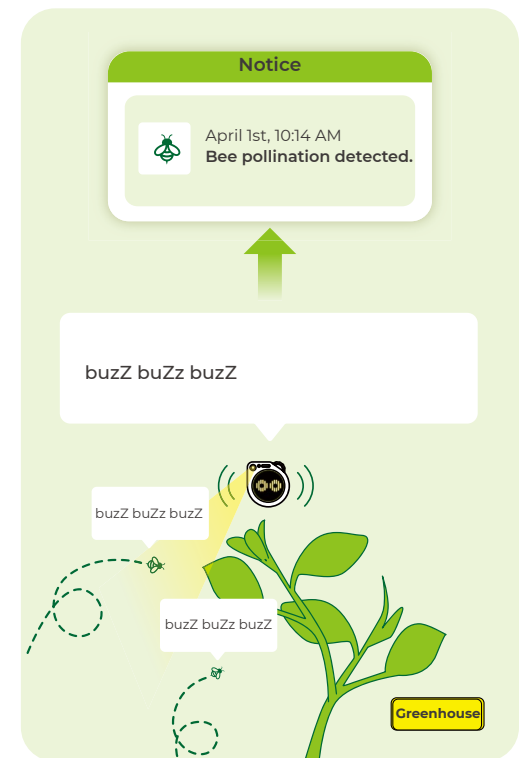
Robo Doorman

SenseCAP Watcher could function as a Robo Doorman for work areas or other entrances. The Watcher can greet people and check whether personnel are wearing their ID badges or safety helmets.



AI Gardener

SenseCAP Watcher could serve as an AI Gardener on farms, capable of detecting bee pollination and reporting the activity logs of bees and other insects.



SenseCAP A1102 - LoRaWAN® Vision AI Sensor

NEW Low-Power AI-Native

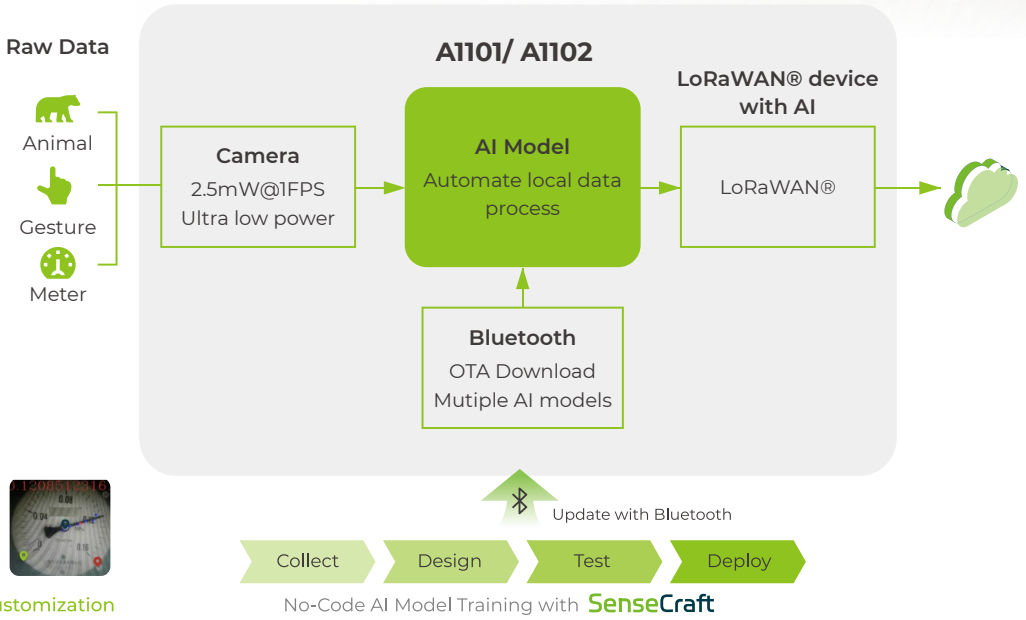
Long-Range, Battery-Driven AI Camera for Efficient Off-Site Surveillance

The SenseCAP A1102 - LoRaWAN® Vision AI Sensor is an Edge AI-enabled smart vision sensor offering diverse AI model functionalities such as image recognition, people counting, target detection, and meter recognition, with TensorFlow Lite support for model training. It facilitates no-code model training and deployment through SenseCraft AI, features extra night vision, LED flashing light, and IR trigger, and uploads inference results data via LoRaWAN® with very low data bandwidth, boasting battery-powered operation lasting over a year.



Features

- Low-power consumption**
Down to 2.3uWh in deep sleep mode, battery life last over a year.
- Long Range**
Leverage the Wio-E5 LoRaWAN module, up to 10km eye-sight communication distance.
- Built-in powerful AI Camera**
Built-in tVOC and CO2 sensors, and an external Grove AHT20 temperature and humidity sensor as add-ons
- Local LoRa® Hub for IoT Connectivity**
Powered by Himax HX6538, Cortex-M55, Ethos-U55, running rich local vision models



Ues Case

- Person Detection
- Specific Object Detection
- Automatic Meter Reading



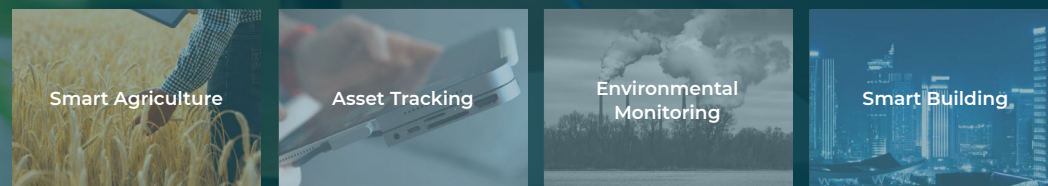
Open for Customization

SenseCAP AIoT Products

Seed offers wireless LoRaWAN sensors, trackers, data loggers, indicator, gateways, and cloud services. Through wireless sensor connectivity, SenseCAP offers the physical world's accurate environmental measurements to the users, along with its robust industrial-grade design, ready-to-use PaaS platform, Apps, and open API services.



Application



SenseCAP T1000 Low-Power

A Card-Size Tracker for LoRaWAN®, Helium, and Amazon Sidewalk

SKU [114993073](#), [114993106](#)

SenseCAP T1000 is a compact GPS tracker that utilizes GNSS/Wi-Fi/Bluetooth for precise indoor & outdoor location tracking, compatible with LoRaWAN®, Amazon Sidewalk, and Helium Networks. It boasts self-geo-adaptive capabilities, local data storage, and an impressive battery life of months. Additionally, it is equipped with temperature, light, and motion sensors, making it ideal for a variety of location-based applications, asset tracking, logistics tracking, and search and rescue.


GNSS


Bluetooth

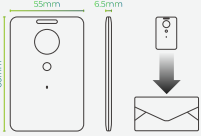

Wi-Fi

3 positioning technology for both indoor & outdoor

Temperature accuracy
±0.5°C

IP65

Credit - card size with just 6.5 mm thickness



915MHz
868MHz

Auto-switch Frequency

SOS button & buzzer

Months of battery life with a single charge



Natively compatible with
LoRaWAN® Helium Amazon Sidewalk

available in
160+ countries

Operating temperature
-20°C to 60°C

Live on KICK STARTER soon

Get location in 4 easy steps



Status sensors
Temp Light Motion

Store data offline when out of connection

1000+ Records

Can be customized for
Personnel safety Wearable size Industrial use

SenseCAP T1000 Tracker





Model	Compatible Networks	Temperature	Light	Accelerometer
T1000-A	LoRaWAN® Helium			
T1000-B	LoRaWAN® Helium	/	/	/
T1000-C	Amazon Sidewalk			

Applications



SenseCAP Indicator

5+ Years Supply

An ESP32 LoRaWAN® Terminal with Touchscreen and Sensors

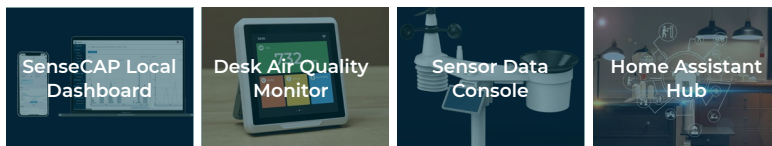
SKU [114993070](#), [114993071](#), [114993068](#), [114993069](#)

SenseCAP Indicator is a 4-inch touch screen driven by ESP32-S3 and RP2040 dual-MCU and supports Wi-Fi/BLE/LoRa® communication. It comes with 2 Type-C USB ports and Grove interfaces, supports ADC and IIC transmission protocols, and can easily connect to other peripherals with rich GPIOs.

Features

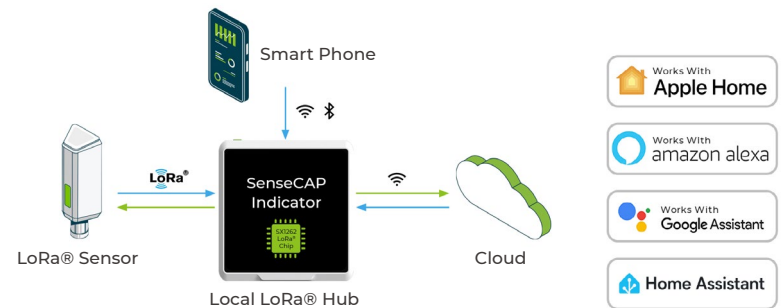
- **Dual MCUs and Rich GPIOs**
Equipped with powerful ESP32-S3 and RP2040 dual MCUs and Grove-compatible GPIOs for flexible expansion
- **4-Inch Touch Screen**
A capacitive RGB touch screen with 480x480 pixels for data visualization and HMI
- **Real-time Air Quality Monitoring**
Built-in tVOC and CO2 sensors, and an external Grove AHT20 temperature and humidity sensor as add-ons
- **Local LoRa® Hub for IoT Connectivity**
Integrated Semtech SX1262 LoRa® chip (optional) for connecting LoRa® P2P and LoRaWAN®
- **Fully Open Source Platform**
Leverage the extensive ESP32 and Raspberry Pi open-source ecosystem for infinite application possibilities

Applications



Scenarios under Spot Light

Use SenseCAP indicator as a LoRa® hub device to connect your LoRa® sensors to your smart home ecosystem



Model	D1	D1S	D1L	D1Pro
tVOC sensor	/	●	/	●
CO2 sensor	/	●	/	●
Grove TH sensor	/	●	/	●
LoRa(SX1262)	/	/	●	●
Wi-Fi	●	●	●	●
Bluetooth	●	●	●	●

SenseCAP S210x LoRaWAN® Sensors

Industrial-Grade

Rugged

Low-Power

SenseCAP S210x series' sensors offer long-distance data acquisition via LoRaWAN®. With IP66 enclosure rating, the sensors can operate in extremely low and high temperature zones (-40°C to +85°C). Their built-in, 19AH high capacity battery, S210x series can operate in harsh, outdoor environments up to 10 years with a range of up to 10km. To add, the built-in Bluetooth made them easy to be configured and deployed, that together reduces field deployment costs. Moreover, users can get data in just a few steps, and with open Cloud API, they are easy to be integrated.

Features



• High accuracy sensor

Fast response and superior stability



• Quick configuration

User-friendly set-up with built-in Bluetooth



• Ultra-low power consumption

Battery life of up to 10 years with built-in 19Ah battery



• Easy deployment

Easy to mount via brackets



• Industrial design

-40 ~ 85°C operating temperature and IP66 rating



• Efficient integration

SenseCAP cloud services with Open API support further development



• Weather resistant

Suitable for indoor, outdoor and harsh environments such as high UV exposure, heavy rain, dusty conditions etc.



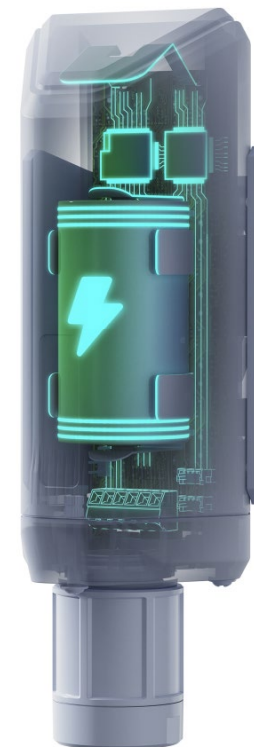
• Multi-platform

Compatible with multiple NS (Helium, TTN) and IoT platforms

Designed for Mass Deployment

1. Onboard it with only 3 steps.

2. Update settings across fleets in 1 click.



Product Model						
	S2101/S2103	S2102	S2104/S2105	S2106	S2107	S2108
Product Name	Air Temperature & Humidity Sensor (and CO2)	Light Intensity Sensor	Soil Temperature and Moisture Sensor (and EC Sensor)	pH Sensor	PT100 Temperature Sensor	Soil Moisture, Temperature and Pore EC Sensor
SKU	114992867/ 114992869	114992868	114992870/ 114992871	101070001	114993078	101070021

SenseCAP S2100 LoRaWAN® DTU

Industrial-Grade

Low-Power

Rugged

A battery-powered IP66 wireless data logger/ DTU supports RS485/Analog/GPIO sensors

SKU [114992872](#)

SenseCAP S2100 LoRaWAN® DTU can connect to Modbus-RTU RS485/Analog Input/GPIO sensors and transmit data from sensors to the LoRaWAN® network. It is specifically optimized for OTA with built-in Bluetooth, which enables quick setup and update. It can be battery-powered or connected to a 12V external power supply. With the help of S2110 sensor builder, S2100 Data Logger is able to connect to Seeed Studio's wide range of Grove Sensors, which will make it the ideal solution for developing, fast prototyping, and small deployment for DIY Industrial level LoRaWAN® Sensors.

Physical World



Agriculture



Industrial Control

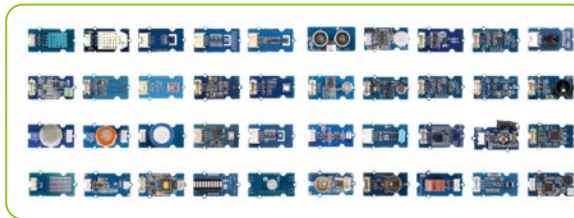


Energy

Expanding to 400+ Grove Sensors



S2110 Sensor Builder



Increased to 100+ Industrial Sensor Probes



Water



Air



More...



Industrial Sensor Probes Rugged

Compatible with SenseCAP S2100 LoRaWAN® DTU and SenseCAP 4G Sensor Hub

Soil Temperature , Moisture and EC Sensor

SKU [101990667](#)



Soil Temperature and Moisture Sensor

SKU [101990668](#)



Solar Radiation Shield for Outdoor Sensor Protection

SKU [114992222](#)



pH Sensor

SKU [101990666](#)



EC and TDS Sensor

SKU [314990634](#)



Optical Rain Gauge RG-15 Rain Sensor

SKU [114992321](#)



Light Intensity Sensor

SKU [314990739](#)



PAR Sensor

SKU [314990733](#)



Ultrasonic Level Sensor

SKU [101991041](#)



NH3/H2S/CO2 Sensor

SKU [101990862](#)



Air Temperature and Humidity Sensor

SKU [101990881](#)



Water Leak Detector

SKU [314990618](#)



Ultrasonic Level Sensor

SKU [101991042](#)



Liquid Level Sensor

SKU [314990619](#)



Industrial Total Solar / UV Radiation Sensor

SKU [101991047](#), [101991048](#)



Leaf Temperature and Humidity Sensor

SKU [314990737](#)



And More...

SenseCAP Outdoor Combo

NEW

Low-Power

Rugged

A highly integrated autonomous environment sensor

SenseCAP Outdoor Combo is an compact, easy-to-use environment sensor. The device supports multiple measurement elements such as temperature, humidity, dew point, light, carbon dioxide, and supports the extension of up to 10 Modbus-RTU RS485 sensors, allowing it to connect with most types of sensors available on the market. The device uploads the collected data to a designated server via 4G using the MQTT protocol. Equipped with a solar panel and a large-capacity rechargeable lithium battery, it ensures the device can work for up to two weeks in rainy weather or during power outages, while also supporting continuous power supply. The device supports hanging or pole mounting, and allows none-tech users to quickly install and deploy. The device is designed to be waterproof, meets UV aging resistance standards, and supports use in harsh environments such as greenhouses.

Features



• Compact Body

Compact integrated body, containing various sensors and 4G communication



• Accurate

Sensors accurately measure environmental elements



• Easy to deploy

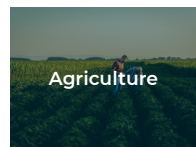
Ready to use out-of-box, with multiple installation methods



• Long Battery Life

Solar power, battery, and direct current supply options enable long-time operation even in rainy weather

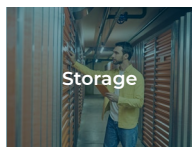
Applications



Agriculture



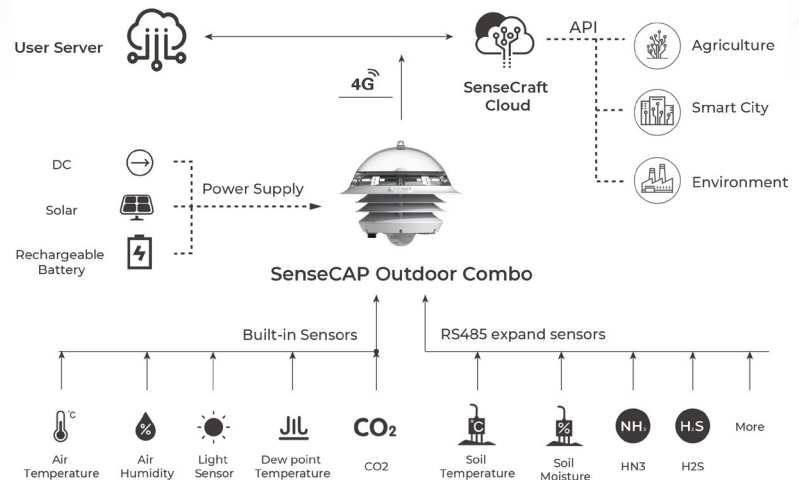
Raise Livestock



Storage



Education



SenseCAP Outdoor LoRaWAN® Gateway

Industrial-Grade



SKU [102991155](#)

SenseCAP Outdoor Gateway is a robust data collection device designed for large-scale networks. It utilizes a telecom-operator-level LoRa chip and a powerful processor to ensure stable and efficient performance. It can seamlessly collect and transmit data to various platforms like SenseCAP, TTN, and Chirpstack via 4G or Ethernet connection. Encased in an IP66-rated protective enclosure, it is suitable for industrial settings and harsh outdoor environments.

Features



- Cortex A8 processor & Linux system: Stable and reliable



- LTE and Ethernet backhaul, suitable for multiple scenes



- Supports Packet Forwarder mode, built-in Chirpstack Server, and SenseCAP Portal



- Easy to deploy with mounting accessories



- Industrial-grade protection: IP66 enclosure, -40 to 70°C operating temperature



- Certified by CE, FCC and RoHS

SenseCAP M2 Multi-Platform LoRaWAN® Indoor Gateway

EU868 / US915 / AU915 / AS923 / IN865 / KR920 / RU864



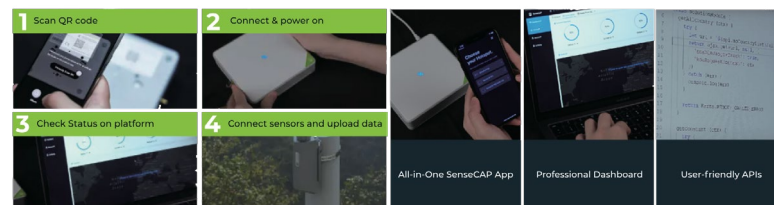
SKU [114992982](#)

SenseCAP M2 Multi-Platform LoRaWAN® Gateway is a standard LoRaWAN® protocol gateway that supports connecting to different network servers. It is compatible with multiple LNS like AWS, TTN, ChirpStack and others via using the Packet Forwarder / Basics™ Station mode.

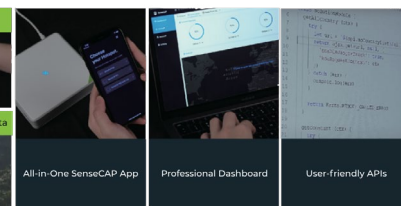
Features

- Power-over-Ethernet (PoE), Wi-Fi and 4G as back haul
- CE, FCC, Verizon, RoHS, TELEC, KC, REACH certified
- Designed for scalability and easy management

Easy to Deploy



Easy to Manage



SenseCAP 4G Sensor Hub

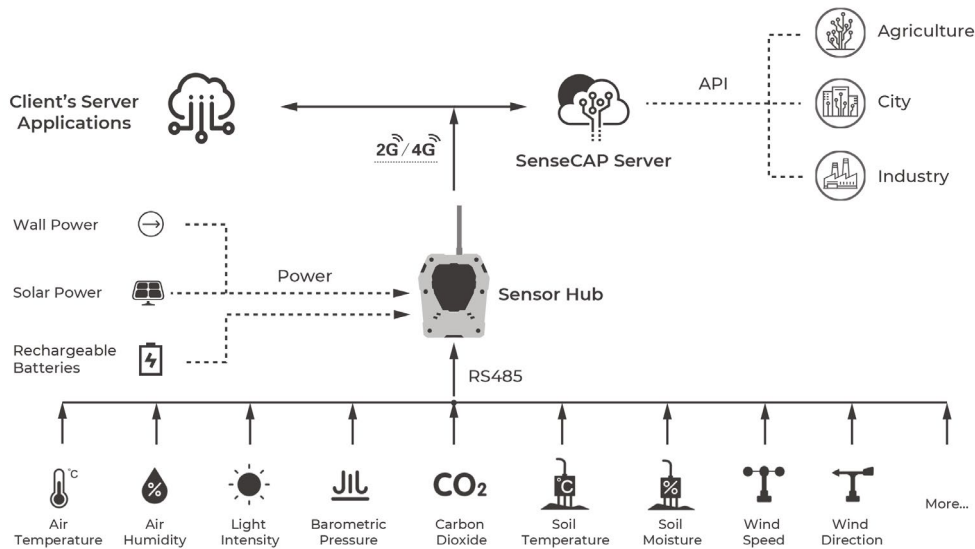
Rugged

SKU [114992170](#), [114992171](#)

SenseCAP Sensor Hub is a powerful 4G data logger that can be connected to 32 RS-485 sensors. It is designed with industry standards, which makes it robust and stable. Being IP66 rated, waterproof and dustproof, it is highly suitable for long-term, remote environmental monitoring for outdoor application scenarios.

Features

- Simultaneously collects various environmental data via a RS-485 sensor probe
- Local data storage
- Uploads the collected data to SenseCAP or customer's server via MQTT
- Supports 4G/3G/2G communication, supporting and global LTE frequency band
- Built-in GPS, remote upgrades and maintenance



SenseCAP ONE Weather Sensors

Compact all-in-one weather sensors measure multiple parameters



SenseCAP ONE Weather Sensors

Industrial-Grade

5+ Years Supply

SenseCAP ONE is a series of industrial weather sensors, that can measure localized weather patterns. The SenseCAP ONE is equipped with precise and accurate sensors to measure air temperature, relative humidity, barometric pressure, light intensity, rainfall, PM2.5, PM10, wind speed, wind direction, CO2, radiation, etc. With an IP66 enclosure and a wide operating temperature range, it features strong robustness to withstand even the toughest outdoor environment. In order to measure wind speed and wind direction, the sensors use ultrasonic technology, instead of traditional mechanical 3-cup anemometers or vane anemometers, that reduces maintenance costs, and increases the operating life cycle.

Features

- **High Wind Speed and Standard Gas Calibrated**
Calibrated in wind tunnel up to 80m/s CO2 accuracy:1% of MV
- **Industrial Grade Design**
IP66, working on -40°C ~85°C, RS485/SD-12 Integrated heaters; Embedded with electronic compass/magnetometer
- **Accurate, Real-time Weather Information**
Powerful sensor chip and algorithm embedded to improve accuracy and reliability
- **Maintenance-free, Easy Installation**
Compact, no moving parts, Long-term availability
- **Customization Service**
Support sensor customization White labeling

Applications

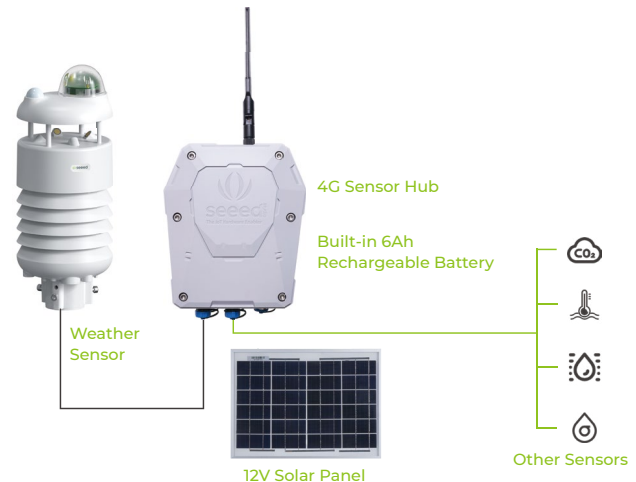


Get the Weather Data via SenseCAP Data Logger

- Data transmit via LoRa Network



- Data transmit via Cellular(4G/3G/2G) Network



SenseCAP ONE Families

	SKU	Air Temperature	Humidity	Air Pressure	Light Intensity	Wind Speed	Wind Direction	Rainfall	PM2.5	PM10	CO ₂	Noise	Radiation
S1000	101991024	●	●	●	●	●	●	●	●	●	●	/	/
S800	101991023	●	●	●	/	●	●	/	●	●	/	●	/
S700/ S700-A	101991022	●	●	●	●	●	●	●	/	/	/	/	/
S700-B	101991102	●	●	●	/	●	●	●	/	/	/	/	●
S500	101991021	●	●	●	/	●	●	/	/	/	/	/	/
S200	101991044	/	/	/	/	●	●	/	/	/	/	/	/

Specifications

	Range	Accuracy	Resolution
Air Temperature	-40~85°C	±0.1°C	0.01°C
Air Humidity	0~100%RH	±1.5%RH	0.01%RH
Barometric Pressure	300~1250hPa	±50Pa	10 Pa
Light Intensity	0~200,000Lux	±5% of reading	5Lux
Wind Speed	0~60m/s standard range; 0~75m/s extended range up to 80m/s withstand range	±0.3m/s(≤10m/s); ±3% (10m/s ~ 50m/s) ±5% (>50m/s)	0.1m/s
Wind Direction	0~360°	±3.0°	0.1°
Rain(Optional)	0~200mm/h	±10%	0.2mm/0.02mm
Rain(60G Radar,Only for S700-A)	0~300mm/h	±10%	0.01mm
PM2.5	0~1000µg/m ³	±10%@100~1000µg/m ³ ±10µg/m ³ @0~100µg/m ³	1µg/m ³
PM10	0~1000µg/m ³	±15% (100~1000µg/m ³) ±15µg/m ³ (0~100µg/m ³)	1µg/m ³
CO ₂	400~10000 ppm	±(30+3% of reading)(400~5000ppm) ±10% of reading (5000~10000ppm)	1 ppm
Noise	35~100dB	±1.5dB	0.1dB
Radiation	0~2000W/m ²	±5%	1W/m ²
Power Supply	12V~24V (1W)		
Heating Power Supply	24V(3W)		
Supported Protocols	Modbus-RTU(RS485), SDI-12 protocol		
IP Rating	IP66		
Operating Temperature	-40~85°C		
Operating Humidity	0~100%RH(non-condensing)		

SenseCAP S2120 LoRaWAN® 8-in-1 Weather Station

Low-Power

SKU [101990961](#)

SenseCAP S2120 LoRaWAN® Weather Station provides you with hyperlocal weather data at your fingertips. It supports multi-scenario applications like backyards, gardens, agriculture, meteorology, urban environmental monitoring, and so on. It enables low maintenance costs, thanks to its ultra-low power consumption, reliable performance, built-in Bluetooth for OTA configuration, and remote device management.

Features

• 8-in-1 Weather Station

Collects air temperature, humidity, wind speed/direction, rainfall, light intensity, UV index, and barometric pressure data

• Bluetooth Configuration and Remote Management

Simple configurations to check out the latest and historical data

• Ultra-Low Power Consumption, Easily Replaceable Battery & Expandable Capacity

Powered by a 0.5W solar panel and 3 standard 1.5V AA -sized dry batteries that can last up to 2 years of service life, while an external battery compartment can accommodate 6 batteries at maximum to double the service life

• Reliable Performance

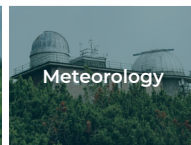
Suitable for outdoor harsh environments outdoors such as a high level of UV exposure, heavy rain, dusty conditions, etc

• One-Stop Deployment & Flexible Layout

Accessories include poles, mounting stand, among other things, for quick installation to be set up at almost any locations



Applications



Advanced Wind Tunnel Laboratory

The wind tunnel is an essential facility for testing, calibrating, and verifying the quality and performance of wind sensors. To ensure that SenseCAP weather sensors meet industry standards, we have built an in-house wind tunnel laboratory equipped with advanced auto-calibration instruments that allow wind direction control with 360°, a minimum speed of 0.1 m/s, and a maximum speed of 80 m/s.

By subjecting the weather sensors to Sseed Studio's wind tunnel, which generates high-speed airflow and simulates different levels of natural wind speeds, we calibrate and validate each weather sensor's performance to ensure high levels of accuracy, reliability, and durability. Every single Sseed Studio weather sensor must pass a series of rigorous speed tests before being delivered to our customers.

Sensor Calibration



Wind Tunnel Control System



Sensor Network Module

Facilitating Rapid Prototyping and Product Design



Grove Sensor Modules

Grove is an open source, modular, easy-to-use toolset designed for simplicity and rapid prototyping. Sensor connection is made much easier and faster with our plug and play Grove modules. This, in turn, makes breadboarding a thing of the past!



Sensor



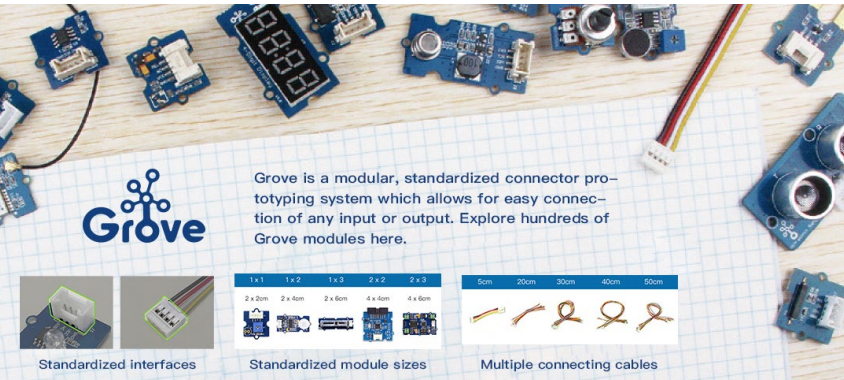
Actuators



Network



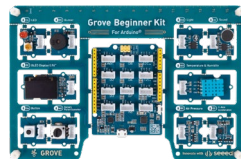
Accessories



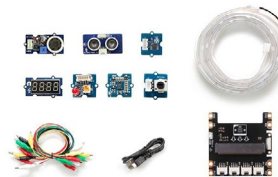
Grove Kits Compatible with



XIAO Starter Kit
SKU [110010044](#)



Grove Beginner Kit for Arduino
SKU [110061162](#)



Grove Inventor Kit for micro:bit
SKU [110060762](#)



Grove Starter Kit for Seeed Studio BeagleBone Green
SKU [110060131](#)



Grove Starter Kit for Raspberry Pi Pico With Free Courses
SKU [110061283](#)



Open Source Courses for STEAM Education

Seeed Studio's curriculums integrate interdisciplinary pedagogy, the latest industry trends, and international curriculum standards for its fully-ready courses.

Grove - Vision AI Module V2

NEW

AI-Native

Low-Power

World First MCU-Based Vision AI Module Powered by Arm Cortex-M55 & U55

SKU [101021112](#)

Features



• Powerful AI Processing Capabilities

WE2 HX6538 processor with dual-core Arm Cortex-M55 + Arm Ethos-U55 neural network unit.



• Versatile AI Model Support

Easily deploy off-the-shelf or your custom AI models from SenseCraft AI, including Mobilenet V1, V2, Efficientnet-lite, Yolo v5 & v8. TensorFlow and PyTorch frameworks are supported.



• Rich Peripheral Devices

Includes PDM microphone, SD card slot, Type-C, Grove interface, and other peripherals.



• High Compatibility

Compatible with XIAO series, Arduino, Raspberry Pi, easy for further development

4 Step No-Code Model Deployment with Senscraft AI



Connect Device

Select Model

Click Deploy

Check inference results

Ready to Deploy Models



Pet Detection

The model is a Swift-YOLO model trained on the animal detection dataset for cat and dog.

Detection Grove - Vision AI V2



Person Detection--YOLOV8

The model is a YOLOV8 model trained on the person detection dataset.

Detection Grove - Vision AI V2



Pose estimation

Pose estimation is a task that involves identifying the location of specific points in an image, usually...

Pose reComputer Jetson

Open Source

World First MCU-Based Vision AI Module Powered by Himax WiseEye™ WE2 HX6538, based on Arm Cortex-M55 & Ethos-U55

Cortex -M55 Processor (Big)

Cortex -M55 Processor (Little)

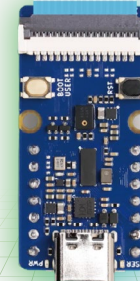
Ethos-U55 microNPU

Security

No-code Model Deployment with

SenseCraft AI

Grove Vision AI v2



arm
Himax
seeed studio

Significant boost in on-device ML performance

Award-winning low power consumption

Significant boost in on-device ML performance

Versatile AI Model Supported

TensorFlow
PyTorch

Work as a Smart Expansion

XIAO / Arduino /
Raspberry Pi / BeagleBoard ,
ESP32 and other
mainstream controllers

IIC, UART, SPI

SD Card Slot

Support Multimodel Input

Compatible with
all Pi cameras

On-board PDM
Microphone

Tailored for
battery-powered
endpoint AI
applications

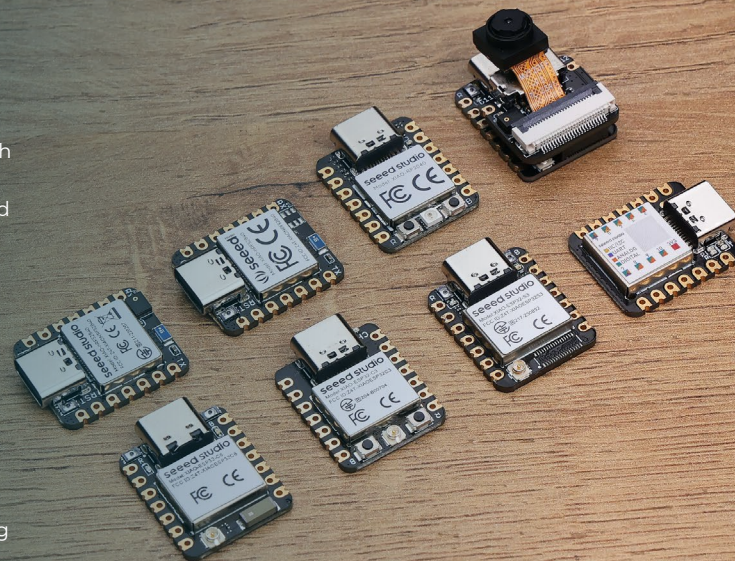
XIAO - tinyML MCUs

Add AI to Almost Everything

The Seeed Studio XIAO Series is a collection of thumb-sized, powerful microcontroller units (MCUs) tailor-made for space-conscious projects requiring high performance and wireless connectivity. Embodying the essence of popular hardware platforms such as ESP32, RP2040, nRF52840, and SAMD21, the Arduino compatible XIAO series is the perfect toolset for you to embrace tiny machine learning (tinyML) on the Edge. Trusted by 500,000 developers globally!

Features

-  **Module and Development Board Hybrid**
Enabling Rapidly Prototype While Easily Integrate;
Significantly Streamline Product Development Process
-  **Invest for Your Future**
Unified Form Factor Enables You to Seamlessly Upgrade or Downgrade Your
Product at the Lowest Cost
-  **Single-Sided Surface Mount Design**
Effortlessly Incorporate XIAO into Other Boards for Large-Scale Manufacturing
-  **Strong Ecosystem Support**
Extensive Software Compatibility, Abundant Community Resources, and
Dedicated Technical Assistance



XIAO ESP32C6

NEW

5+ Years Supply

 SKU [113991254](#)

A RISC-V low-power micro development board with multi-protocol wireless connectivity.

Features

- Multi-Protocol Wireless Connectivity**
2.4 GHz Wi-Fi 6/BLE/ Zigbee/Thread wireless communication.
- Outstanding RF performance**
Has an on-board antenna with up to 80m BLE/Wi-Fi range, while reserving an external antenna interface for UFL antenna
- Matter Native**
Supports building Matter-compliant smart home projects thanks to its enhanced connectivity, achieving interoperability



Seed Studio XIAO Comparison Table

	Seed Studio XIAO SAMD21	Seed Studio XIAO RP2040	Seed Studio XIAO nRF52840	Seed Studio XIAO nRF52840 Sense	Seed Studio XIAO ESP32C3	Seed Studio XIAO ESP32S3	Seed Studio XIAO ESP32S3 Sense	Seed Studio XIAO ESP32C6
								
SKU	102010328	102010428	102010448	102010469	113991054	113991114	113991115	113991254
Chip	Microchip SAMD21	Raspberry Pi RP2040	Nordic nRF52840	Nordic nRF52840	Expressif ESP32-C3	Expressif ESP32-S3	Expressif ESP32-S3	Expressif ESP32-C6
Architecture	Cortex-M0+ running up to 48MHz	Dual-core Cortex-M0+ running up to 133MHz	Cortex-M4 running up to 64MHz	Cortex-M4 running up to 64MHz	RISC-V running up to 160 MHz	Dual-core Xtensa Lx7 running up to 240 MHz	Dual-core Xtensa Lx7 running up to 240 MHz	RISC-V running up to 160 MHz
RAM	32 KB SRAM	264 KB SRAM	256 KB RAM	256 KB RAM	400 KB SRAM	512 KB SRAM + 8MB PSRAM	512 KB SRAM + 8MB PSRAM	512 KB SRAM
Flash(Chip)	256KB	x	1MB	1MB	4MB	384KB	384KB	4MB
Flash(On-Board)	x	2MB	2MB	2MB	x	8MB	8MB	x
Built-in Sensors	x	x	x	IMU, Microphone	x	x	OV2640 camera Microphone	x
Wireless	x	x	BLE	BLE	BLE/Wi-Fi	BLE/Wi-Fi	BLE/Wi-Fi	Wi-Fi 6/BLE/ Zigbee/Thread
Battery Charge circuit	x	x	✓	✓	✓	✓	✓	✓
Low Power Mode	x	x	<5μA	<5μA	<44μA	14 μA	26.5 mA	15μA
Arduino	✓	✓	✓	✓	✓	✓	✓	✓
CircuitPython	✓	✓	✓	✓	✓	x	x	x
MicroPython	x	✓	✓	✓	✓	✓	✓	x

Wio Communication Modules & Dev Kits

Powered by STMicroelectronics and Semtech, Wio Series is a collection of low-cost, compact LoRa® Modules and Dev Kits for developers to design LoRaWAN® sensor nodes and gateway.

LoRa® Sensor Modules



Wio-E5 | Wio-E5-LE

SKU [317990829](#), [114993120](#)

Powered by STM32WLE5JC, the World's First Combination of LoRa® RF and MCU on One Chip

- 12x12 mm, 28 pins SMS with rich interfaces for expansion
- Ultra-low power consumption of 2.1uA in sleep mode
- Easy to use with LoRaWAN AT commands

Grove Wio-E5 Wireless Module

SKU [113020091](#)



Wio-E5/Wio-E5-LE Mini Dev Board

SKU [113990939](#), [113991156](#)



Wio-E5/Wio-E5-LE Dev Kit

SKU [113990934](#), [113991157](#)



LoRa® Sensor Modules



Wio-WM1110 LoRa® Tracker Module

SKU [114992865](#)

Low-cost indoor and outdoor tracker module

- 20x20 mm, 80 pins LGA
- Semtech LR1110 and Nordic nRF52840
- GNSS, Wi-Fi, Bluetooth for outdoor and indoor positioning
- Low-power consumption: 6uA in sleep mode

Wio Tracker Dev Board

SKU [114993186](#)



Wio-WM1110 Dev Kit

SKU [114993082](#)



LoRa® Gateway Modules



Wio-WM1302 / Wio-WM1303

SKU [114992969](#), [114993268](#), [114992628](#), [114992991](#)

LoRaWAN® Gateway Module in Mini-PCIe Form Factor Based on Semtech SX1302

- 50x30 mm, Mini PCIe form factor with 52 pin Golden Finger
- Ultra-low operating temperature, no additional heat dissipation needed
- Low-power consumption: down to 7.5 mA in standby mode

Wio-WM1110 Raspberry Pi Hat

SKU [113100022](#)

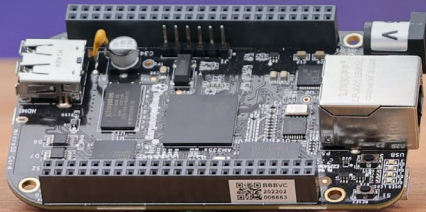


Edge Computing

The evolution of Edge Computing is increasingly a big trend in the field of distributed systems, along with a growing demand for processing power closer to data source. The new generation of Edge Computing solutions is characterized by openness, integration, and cloud-native approaches, and it's being fueled by the latest advancements in computing, communication, storage, and interaction technologies. Seeed Studio offers a wide range of Edge Computing options, from development boards to industrial-grade devices. Its open, integrated, and cloud-native Edge Computing solutions are poised to play

Single Board Computer (SBC)

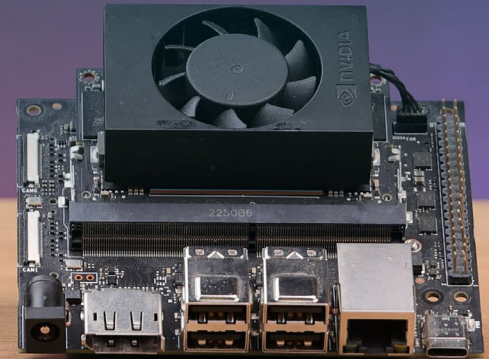
Partner with the most popular communities and leading chip manufacturers, we bring powerful Single Board Computers (SBCs) to developers. Also, we provide hundreds of related supporting products to help developers realize various creative projects, ranging from the Internet of Things to robotics, faster and more conveniently.



The Beagleboard is a fully open source, industrial single-board computer based on low-power Texas Instruments processors featuring the ARM Cortex-A core with all of the expandability of today's machines.



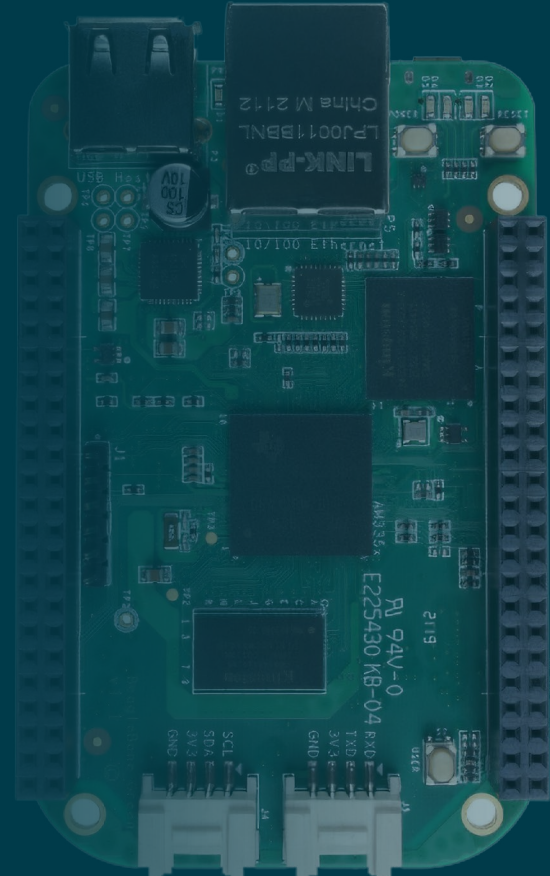
The Raspberry Pi is a low-cost, credit card sized single-board computer with high performance and rich sets of I/O. Its rich software ecosystem won over a diverse user base ranging from students to engineers.



NVIDIA Jetson is the leading platform for autonomous machines and embedded AI applications. NVIDIA Jetson provides scalable software, a modern AI stack, and application-specific workflows, accelerating the time-to-market for AI products.

Strategic Design Partner of BeagleBoard®

BeagleBoard® is a series of open source, low-cost, high-expansion, community-supported single board computers launched by BeagleBoard.org. As the strategic design partner of BeagleBoard®, Seeed Studio actively participates in the product hardware development and community building to bring this fantastic development platform to developers



Seeed Studio BeagleBone® Green Series

Jointly developed by Seeed Studio and BeagleBoard.org

Processor

AM335x 1GHz ARM® Cortex-A8.



Seeed Studio BeagleBone® Green

SKU [102010027](#)

BBG is based on the open-source hardware design of BeagleBone Black and is developed into the differentiated version. It is a cost-effective BeagleBone® compatible board with on-board Grove connectors to extend possibilities.

Software Compatibility

Debian, Android, Ubuntu, Cloud9 IDE on Node.js w/ BoneScript library.



Seeed Studio BeagleBone® Green Wireless

SKU [102010048](#)

BBGW is the first Wi-Fi + Bluetooth Low Energy board from the BeagleBone community, and it is also based on the open-source hardware design of BeagleBone Black. It offers a built-in 2.4 GHz TI WLinkTM8 module with two antennas. It also supports AP+STA mode of communication, comes with an MRAA library.

Official BeagleBone® Series

Seeed Studio has been closely collaborating with BeagleBoard.org to help manufacture official BeagleBone® development boards to serve prosperous AIoT/IIoT needs.



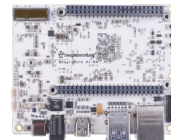
BeaglePlay®

Easy. Affordable. Connected. Open. BeaglePlay is an open-source single board computer based on the Texas Instruments AM6254 quad-core Cortex-A53 Arm SoC designed to simplify the process of adding sensors, actuators, indicators, human interfaces, and connectivity to a reliable embedded system.



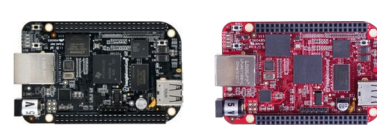
BeagleConnect® Freedom

BeagleConnect™ Freedom is built around the TI CC1352P7 microcontroller, which supports both 2.4-GHz and long-range, low-power Sub-1 GHz. Rapidly prototyping of IoT applications is accelerated by over 1,000 mikroBUS add-on sensors, acutators, indicators and additional connectivity and storage options.



BeagleBone® AI 64

BeagleBone AI-64 like its predecessors (BeagleBone AI), is designed to address the open-source community, early adopters, and anyone interested in a low cost 64-bit Dual Arm® Cortex®-A72 processor based Single Board Computer. Rich on-board interfaces allow the use of add-on boards called capes, to add different combinations of features.



BeagleBone® Black, Black Industrial

BeagleBone® Black is a low-cost, community-supported development platform. Boot Linux in under 10 seconds and get started on development in less than 5 minutes with just a single USB cable. BeagleBone® Black Industrial answers the need for an industrial rated single board computer with extended temperature range.

seeed studio



Raspberry Pi
Approved Reseller



Raspberry Pi
Design Partner

Raspberry Pi® Approved Design Partner and Reseller

Seeed Studio is a leading provider of Raspberry Pi® products, offering a wide range of official boards, kits and devices for various domains tailored to your needs.

SBCs and MCUs



Raspberry Pi® 5
8GB SKU [102110919](#)
4GB SKU [102110918](#)



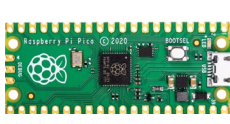
Raspberry Pi® 4
8GB SKU [102110421](#)
4GB SKU [102110301](#)
2GB SKU [102991317](#)
1GB SKU [102110299](#)



Raspberry Pi® 3 Model A+
W SKU [102110358](#)
WH SKU [102110359](#)
2W SKU [102110617](#)



Raspberry Pi® Zero
SKU [102110359](#)



Raspberry Pi® Pico
SKU [102110537](#)

Cameras



Raspberry Pi® Camera Module 3
SKU [114993028](#)



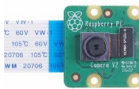
Raspberry Pi® Camera Module 3 NoIR
SKU [114993029](#)



Raspberry Pi® Camera Module 3 Wide
SKU [114993030](#)



Raspberry Pi® Camera Module 3 Wide NoIR
SKU [114993031](#)



Raspberry Pi® Camera Module V2
SKU [113990214](#)

Computing Modules



Raspberry Pi® Compute Module 4

Part Number	SKU	Part Number	SKU	Part Number	SKU
CM4001000	102991380	CM4102008	102991377	CM4101008	102991419
CM4001008	102991415	CM4102032	102991378	CM4102000	102991376
CM4008000	102991434	CM4104000	102991431	CM4104032	102991379
CM4002016	102991424	CM4104016	102991433	CM4108032	102991441
CM4108000	102991438				

Expansion Boards



Grove Beginner Kit - Raspberry Pi® 4B - 4GB
SKU [110061127](#)



Grove Starter Kit for Raspberry Pi® Pico with Free Course
SKU [110061283](#)



reSpeaker 2-Mics Pi HAT for Raspberry Pi®
SKU [107100001](#)



Water Cooling Kit for Raspberry Pi® 5
SKU [110070128](#)

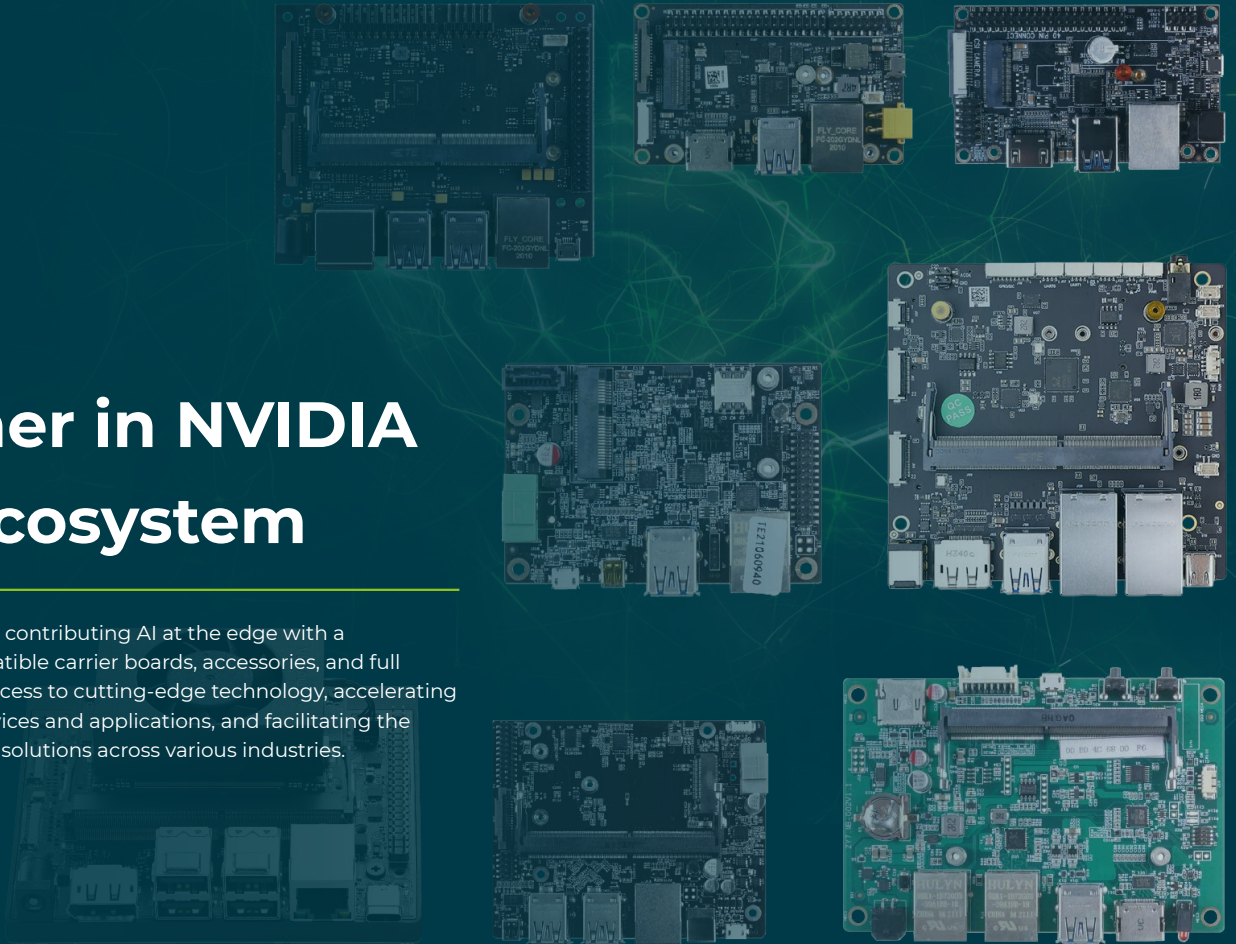


Raspberry Pi® Official Active Cooler
SKU [114993229](#)

Add-ons & Expansion Boards

Elite Partner in NVIDIA Jetson® Ecosystem

Seeed Studio plays a pivotal role in contributing AI at the edge with a comprehensive selection of compatible carrier boards, accessories, and full systems. We commit to simplify access to cutting-edge technology, accelerating the development of intelligent devices and applications, and facilitating the creation of smarter, more efficient solutions across various industries.



Pioneering Embedded AI Partner

Support every stage of edge AI hardware development



Jetson Developer Kits



NVIDIA® Jetson Orin™
Nano Developer Kit

SKU [102110839](#)



NVIDIA® Jetson AGX
Orin™ Developer Kit

SKU [110991725](#)

Carrier Boards



J101
Jetson Nano

SKU [102991694](#)



J202
Jetson Nano/
Xavier NX

SKU [102991695](#)



A203
Jetson Nano/
Xavier NX

SKU [103110043](#)



A205
Jetson Nano/
Xavier NX

SKU [114110048](#)



J401
Jetson Orin™
NX/Nano

SKU [102110770](#)



A603
Jetson Orin™
NX/Nano

SKU [102110840](#)



A607
Jetson Orin™
NX/Nano

SKU [102110841](#)



A608
Jetson Orin™
NX/Nano

SKU [105110001](#)

Lidar



RPLIDAR A1M8

SKU [114992561](#)



RPLIDAR S3

SKU [101090041](#)



RPLIDAR C1

SKU [101090061](#)

Camera Module



IMX219-77
8MP Camera

SKU [114992260](#)



IMX219-200
8MP Camera

SKU [114992265](#)



IMX219-160IR
8MP Camera

SKU [114992264](#)



Raspberry Pi
HQ Camera

SKU [114993032](#)



Raspberry
Pi Camera
Module V2

SKU [113990214](#)



IMX390 2.12MP
118°(H) FOV
4-lane MIPI CSI
Camera

SKU [114993127](#)

Accessories



Aluminum Heatsink for
Jetson Nano Module

SKU [114992686](#)



Jetson Nano Module
Active Heat Sink

SKU [101110061](#)



Aluminum Heatsink with
Fan for Jetson Xavier NX
Module

SKU [114992687](#)



Aluminum Heatsink with
Bigger Fan for Jetson
Xavier NX Module with
Long Cable

SKU [114992746](#)



Aluminum Heatsink with
Fan for Jetson TX2 NX
Module

SKU [114992731](#)



Aluminum Heatsink with
Fan for Jetson Orin NX/
Orin Nano/Xavier NX
Module

SKU [110991904](#)

reComputer, reServer

Compact and powerful edge AI computing solutions for efficient data processing and insights.



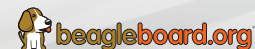
reComputer B Series **NEW**

reComputer B6712

Industrial-Grade

5+ Years Supply

AI-Native



Open-source industrial vision AI computer powered by BeagleY-AI SBC from BeagleBoard.org, ideal for cost-sensitive high performance compute applications in Factory Automation, Building Automation, and other markets

Features



• Powerful Performance

Based on the TI AM67x SoC which includes quad 64-bit Arm® Cortex®-A53 along with deep learning accelerator, supporting up to 4 TOPS AI performance



• TI Model Zoo

100+ pre-trained AI models provided by Texas Instruments



• Industrial-grade stability

10+ years lifetime; 2-year warranty; RoHS, CE, FCC supported



• Open

Fully open source; Fueled by BeagleBoard.org Community



Applications



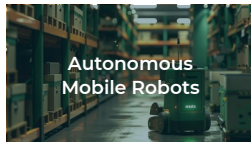
Industrial Automation



Machine Vision Camera



Smart Home



Autonomous Mobile Robots



Human Machine Interfaces (HMI)

reComputer R Series

NEW

5+ Years Supply



Raspberry Pi
Approved Reseller



Raspberry Pi
Design Partner

reComputer R1000 Series

Open-source, cost-effective, high-performance edge controller with extensive connectivity and powerful IoT capabilities, ideal for smart buildings and energy management.

Price from:

\$150

Features



• Powerful Performance

Raspberry Pi CM4, quad-core A72, up to 8GB RAM and 32GB eMMC



• Multiple Industrial Interfaces

3*RS485, 2*Ethernet Ports, 1*HDMI, 1*SIM Card Slot



• Versatile Wireless Options

Support Wi-Fi, BLE, LoRaWAN, Zigbee, and 4G LTE



• Perfect Fit for Building Automation System

Support BACnet & Modbus Protocols to ensure interoperability



• Safety and Reliability

Hardware Watch Dog, UPS, EMC protection and 6 year lifetime



Applications



Smart Building



Energy
Management



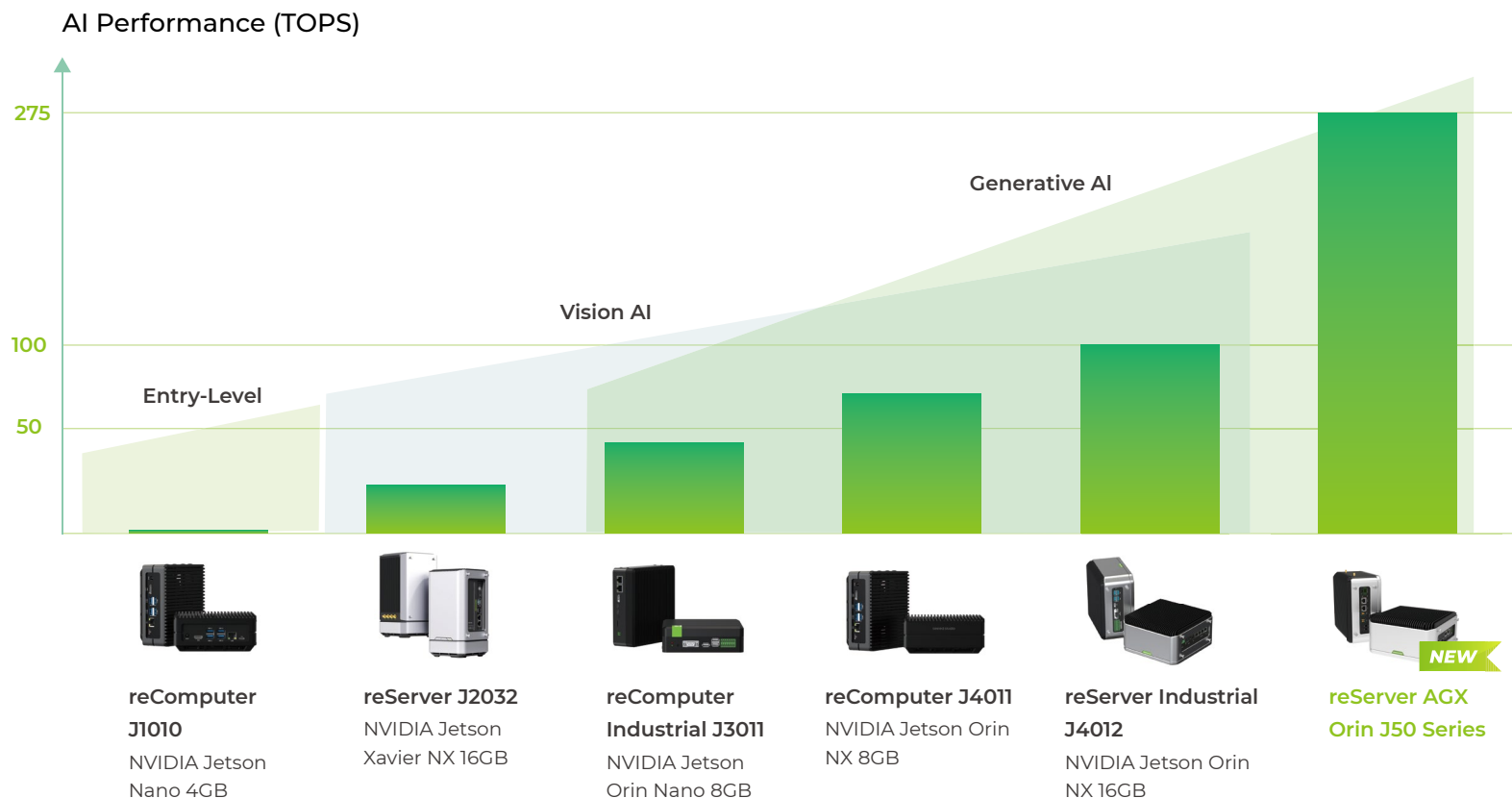
Remote Device
Management



Facility
Management

Devices		reComputer B6712	reComputer R1000 Series
			
MSRP		Coming Soon	Start from \$150, coming soon
Description		An ultra-low power industrial vision AI computer powered by BeagleY-AI board form BeagleBone	High-performance and Cost-effective edge IoT controller based on Raspberry Pi, ideal for smart buildings and energy management
	CPU	TI AM67x	Raspberry Pi CM4
	Storage	4GB RAM	1GB/2GB/4GB/8GB RAM; Lite/8GB/16GB/32GB eMMC
Wireless	Wi-Fi	2.4 GHz, 5.0 GHz IEEE 802.11 ax	2.4 GHz, 5.0 GHz IEEE 802.11 b/g/n/ac (optional)
	Bluetooth	Bluetooth 5.4, BLE	Bluetooth 5.0, BLE (optional)
	Cellular	x	Mini-PCIe for 4G (optional)
	LoRa	x	Mini-PCIe for LoRaWAN (optional)
	Zigbee	/	Mini-PCIe for Zigbee (optional)
Interface	Ethernet	1000M RJ45 *1	1000M RJ45 *1; 100M RJ45 *1
	HDMI	HDMI 2.0 *1	HDMI 2.0 *1
	USB	USB3.0 Type A *4; USB2.0 Type C *1	USB2.0 Type A *2; USB2.0 Type C *1
	RS BUS	x	RS485 *3 (isolated)
	Mini-PCIe	Mini-PCIe *1	Mini-PCIe *2
	M.2 socket	requires separate M.2 HAT or other adapter	Support M.2 2280 NVME SSD card
	40-pin GPIO	inside	x
Power	Power Range	5V DC	9~36V DC/12~24 AC
	PoE	x	IEEE 802.3af Standard (optional)
	Power Switch	NO	NO
	Reboot Switch	YES	YES
Extra features	UPS	x	UPS Supercapacitor (optional)
	RTC	optional	RTC
	Watch Dog	x	Hardware Watch Dog
	Security	x	TPM2.0 or ATECC608A(optional)
	Operation Temperature	0 to 55 °C	-20 to 60 °C
	Ingress Protection	IP40	IP40
	Fan	Fanless	Fanless
Mechanical	Dimension	130mm x 50mm x 90mm	130mmx93mmx49.6mm
	Mounting	Din-Rail	Din-Rail/ Wall Mounting
EMC	ESD	EN61000-4-2, Level 3	EN61000-4-2, Level 3
	EFT	EN61000-4-4, Level 2	EN61000-4-4, Level 2
	Surge	EN61000-4-5, Level 2	EN61000-4-5, Level 2
Certification		RoHS, CE, FCC, REACH, TELEC	
Warranty		2 Years	

reComputer & reServer Jetson Series Selection Guide



Generative AI at the Edge

Bring generative AI to the world with NVIDIA® Jetson™



Text Generation

Run LLM-based chat bot on Jetson



Text + Vision

Run multimodal Vision-Language models to give your AI access to vision



Image Generation

Run diffusion models to generate stunning images interactively on Jetson



Vision Transformer (ViT)

Vision Transformer examples, with models optimized to run in realtime on Jetson



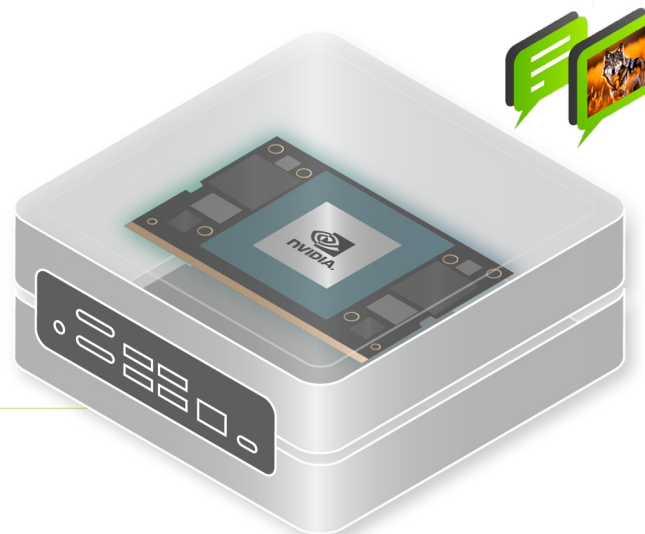
Whisper

Run OpenAI's Whisper model to transcribe audio



Llamaspeak

Live interaction with Llama LLM using NVIDIA Riva ASR/TTS



reComputer Jetson Classic Series

5+ Years Supply

AI-Native



Compact Edge AI computer, classic design covered wide range of NVIDIA® Jetson™ modules

SKU

Jetson Nano
[110061362](#), [110061441](#)

Jetson Xavier NX
[110061381](#), [110061402](#)

Jetson Orin Nano
[110110146](#), [110110147](#)

Jetson Orin NX
[110110144](#), [110110145](#)

Price from:

\$219

Features



• Design for Both Development and Production

Open-source carrier board with rich set of I/Os: 4x USB3.2, HDMI, GbE, M.2 KEY M, M.2 KEY E, GPIO, etc.



• Immediately Go-to-Market

Pre-installed Jetpack, Linux OS BSP Certification including ROHS, CE, FCC, KC, UKCA, REACH



• Long Life Time Supply

Available through 2030

Vision AI & LLM Framework



Hugging Face



ONNX



PyTorch



AI Performance

0.5 TFLOPS



100 TOPS

reComputer Jetson Industrial Series

Industrial-Grade

5+ Years Supply

AI-Native

Robotize machines in the harsh environment of facility or the wild

SKU

Jetson Xavier NX
110110188, 110110189

Jetson Orin Nano
110110192, 110110193

Jetson Orin NX
110110190, 110110191

Price from:

\$799

Features



- **Industrial Interfaces, Robotize Machine Facilities**
2x RJ-45 GbE(1xPoE), RS232/422/485, 4x isolated DI/DO, 1x CAN



- **Fanless Compact PC, Designed for Harsh Environment**
Thermal reference design, wider temperature support -20°C ~ 60°C



- **Support Flexible Mounting Options**
Desk, DIN rail, wall-mounting, VESA



Vision AI & LLM Framework



Hugging Face

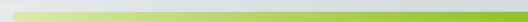


ONNX



AI Performance

20 TOPS



100 TOPS

reServer Jetson Industrial Series

Industrial-Grade

5+ Years Supply

AI-Native



Local Inference Center with ultra high computing power, ideal for vision AI and Large Language Models

SKU

Jetson Orin Nano
[114110250](#), [114110249](#)

Jetson Orin NX
[114110248](#), [114110247](#)

Jetson AGX Orin
114110267, 114110268, 114110269, 114110270, 114110271, 114110272

Price from:

\$899

Features



- **Support Multiple Streams for Complex Task Inferencing**
4x PoEs in 5x GbE interfaces Optional GMSL2, FPD LINK III



- **Local Storage Expansion**
2x SATA SSD/HDD



- **Hybrid Connectivity**
1x M.2 KEY B, 1x miniPCle for 4G/5G/LoRaWAN, 1x GbE, 1x 10GbE(RJ-45)

Vision AI & LLM Framework



Hugging Face



ONNX



PyTorch



AI Performance

20 TOPS

275 TOPS



Production Module	Jetson Nano	Jetson Xavier NX	Jetson Orin Nano	Jetson Orin NX		Jetson AGX Orin
Device						
Product Name	reComputer J1020v2	reServer J2032	reComputer Industrial J3011	reComputer J4011	reServer Industrial J4012	reServer Industrial J5014
SKU	110061441	110061403	110110193	110110144	114110247	114110268
Production Module	Jetson Nano 4G	Jetson Xavier NX 16GB	Jetson Orin Nano 8GB	Jetson Orin NX 8GB	Jetson Orin NX 16GB	Jetson AGX Orin 64GB
AI Performance	0.5TOPS	21TOPS	40 TOPS	70 TOPS	100 TOPS	275 TOPS
Storage	16GB eMMC 5.1 1* M.2 Key M Connector	16GB eMMC 5.1 2* 2.5"/3.5" SATA HDD/SSD (SATA III 6.0Gbps)	M.2 Key M PCIe Gen4.0 SSD (M.2 NVMe 2280 SSD 128G Included)	1* M.2 Key M (128G NVMe SSD Included)	M.2 Key M PCIe Gen4.0 SSD (M.2 NVMe 2280 SSD 128G Included) 2* Drive Bays to support 2.5" SATA HDD/SSD (SATA III 6.0Gbps)	1* M.2 Key M (128G NVMe SSD Included) 2* Drive Bays to support 2.5" SATA HDD/SSD
Networking	1* RJ45 GbE (10/100/1000Mbps)	1* RJ45 GbE (10/100/1000Mbps) 1* RJ45 2.5 GbE	1* LAN1 RJ45 GbE PoE (PSE 802.3 af 15W) 1* RJ45 GbE (10/100/1000Mbps); 1* LAN1 RJ45 GbE PoE (PSE 802.3 af 15W) 1* LAN2 RJ45 1* RJ45 GbE (10/100/1000)	1* RJ45 GbE (10/100/1000Mbps)	1* LAN0 RJ45 GbE (10/100/1000Mbps) 4* LAN RJ45 GbE PoE (PSE 802.3 af 15 W, 10/100/1000Mbps)	1* LAN1 RJ45 GbE; 1* LAN2 RJ45 10GbE
USB	4* USB 3.0 Type-A 1* USB 2.0 Type-C for Device Mode	2* USB 3.1 Gen 2 Type-A Connector 1* USB 2.0 Type-C for Device Mode 1* USB Type-C for RP2040 Coprocessor	3* USB 3.2 Gen1 1* USB 2.0 Type-C for Device Mode 1* USB 2.0 Type-C for Debug UART & RP2040	4* USB 3.2 Type-A (10Gbps) 1* USB2.0 Type-C (Device Mode)	4* USB 3.2 Gen1 1* USB 2.0 Type-C for Device Mode 1* USB 2.0 Type-C for Debug UART & RP2040	4* USB3.2 1* USB2.0 Type C (Device mode) 1* USB2.0 Type C for Debug UART
Display	1* HDMI 2.0 Type-A 1* DP	1* HDMI 2.0 Type-A 1* DP 1.4	1* HDMI 2.0 Type-A	1* HDMI 2.1	1* HDMI 2.1 Type-A	
Fan	1* Fan Connector for Module	1* Fan Connector for Module 1* Fan Connector for Device	Fanless, Passive Heatsink 1* Fan Connector (5V PWM)	1* 4 pin Fan Connector (5V PWM)	Fanless, Passive Heatsink 1* Fan Connector (5V PWM)	1* 4-pin Fan header
M.2	1* M.2 Key E (Disabled)	1* M.2 Key B Support 4G/5G (Module Optional)		1* M.2 Key M 1* M.2 Key E	1* M.2 Key B Support 4G/5G (Module Optional)	1* M.2 Key B Support 4G/5G
PCIe	-	1* Mini PCIe for 4G/Lora		-	1* Mini PCIe for 4G/Lora	1* Mini PCIe for 4G/LoraWAN
Multifunctional Header / IO	2* CSI (2-lane 15pin) 1* 40-Pin Header (GPIO,I2C,I2S,SPI,USRT)	-	2* CSI (2-lane 15pin) DI/DO/CAN RS232/422/485 TPM 2.0 Header	2* CSI (2-lane 15pin) 1* 40-Pin Header (GPIO,I2C,I2S,SPI,USRT) 1* 12-Pin Control and UART header	4*DI,4*DO,3*GND_DI,2*GND_DO,1*GND_ISO,1*CAN 1* DB9 (RS232/RS422/RS485)	1* RS232/422/485 4* isolated DI/DO 1* CAN TPM 2.0 Header GMSL2/FPD LINKIII (optional)
Power Adapter	DC Barrel Jack 12V/2A	DC Barrel Jack 12V/5A	19V Power Adapter (without Power Cord)	DC 12V/5A (Barrel Jack 5.5/2.5mm)	24V /5A Power Adapter (Without power cord)	24V Power Adapter (without power cord)
Dimensions	130 x 120 x 50mm	159 x 124 x 233mm	159 x 155 x 57mm	130 x 120 x 58.5mm	194.33 x 187 x 95.5mm	194.33 x 187 x 95.5mm

reTerminal, reCamera, reSpeaker

Harness AI to revolutionize human-computer interaction and data acquisition



reTerminal

Low-Power

5+ Years Supply

Raspberry Pi
Approved Reseller

Raspberry Pi
Design Partner

A 5-inch Hand-size Raspberry Pi CM4-powered HMI for Home and Industry

SKU [110070048](#), [110070108](#)

Price from:

\$209

Features



• Raspberry Pi All-in-One Board

RPi CM4, WiFi&Bluetooth, IPS Touch Screen, pre-installed Linux



• Rich Interfaces

USB, Ethernet, HDMI, micro-SD, MIPI camera interface, 40-pin GPIO



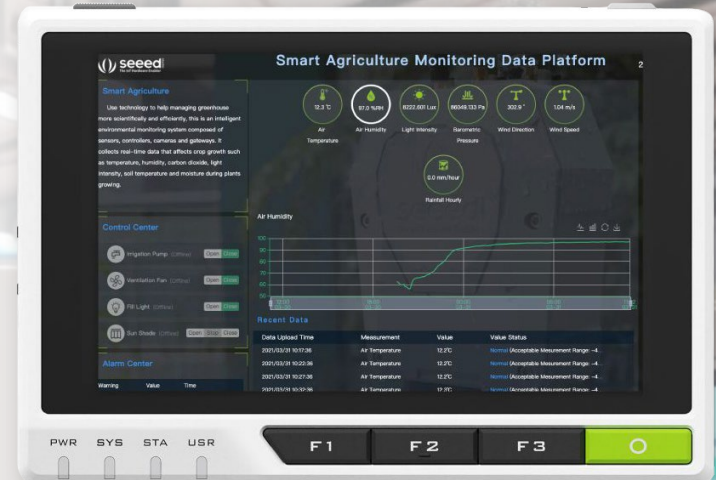
• Neat AI and Automation Assistance

Built in light&proximity sensor, accelerometer, buzzer, RTC, and programmable buttons



• Industry-ready Modular Design

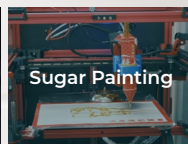
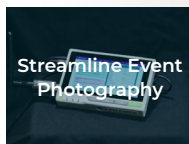
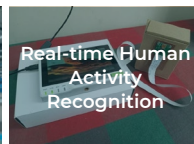
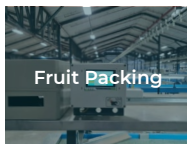
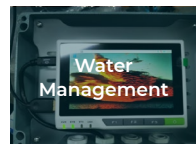
DC Jack, PoE, UPS, LoRaWAN, RS485/232, CAN, SATA2.0



Supported Software



Applications



reTerminal DM

Industrial-Grade

Low-Power

5+ Years Supply



Raspberry Pi
Approved Reseller



Raspberry Pi
Design Partner

A 10.1-inch Raspberry Pi CM4-powered Integrated Device Master, Industrial-grade HMI/ PLC/ Panel PC All-in-one

SKU [114070201](#), [114070221](#)

Price from:

\$389

Features



- **10.1" HMI, PLC, Panel PC and Gateway in one**

Perfect for distributed hub device with build-in camera



- **Low code programming for event-driven applications**

Natively integrated Node-RED for flow based editing and one click deploy, compatible with all software runs on Raspberry Pi



- **Rugged design for harsh working environment**

IP65 front panel, -10~50°C Operating Temperature



- **Hybrid Connectivity**

Support 5G, 4G LTE, LoraWAN, Wifi, BLE, RS485/232, CANBUS



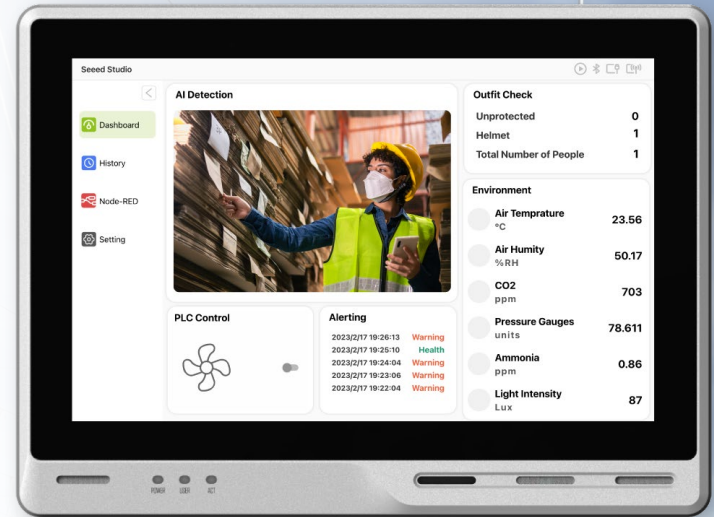
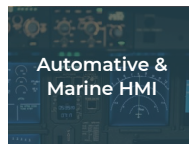
- **Open-source design in software and hardware**

Welcome customization or derivatives

Supported Software



Applications



Strict electromagnetic protection allows it to work in complex electromagnetic environments. With strong vibration and impact resistance, it can be used on boats, tractors and other agricultural machinery vehicles.

EMC Protection	ESD	EN61000-4-2, Level3	Contact discharge: $\pm 6\text{kV}$; Air discharge: $\pm 8\text{kV}$
	EFT	EN61000-4-4, Level2	Power: $1\text{kV}/5\text{kHz}$; Signal: $1\text{kV}/5\text{kHz}$
	Surge	EN61000-4-5, Level2	Line-Line: 0.5kV / Line-PE: 1kV
Shock & Vibration	Mechanical shock	IEC 68-2-27	50G, half sine, 11ms
	Vibration	IEC 68-2-64	5-500HZ, X/Y/Z, 1hour

Application Scenarios



Devices		reTerminal	reTerminal DM
			
MSRP		\$209	\$389
Description		A 5-inch hand-size HMI with integrated modular design. Flexible with high expandability for home and industry.	10.1-inch Integrated Device Master, HMI, PLC, Panel PC and Gateway in one, perfect for distributed hub device.
	CPU	Raspberry Pi CM4	Raspberry Pi CM4
	Storage	up to 8GB RAM; up to 32GB eMMC	8GB RAM; 32GB eMMC
	Display	5-inch 720x1280 LCD, Capacitive touch	10.1-inch 1280 x 800, 10-point Capacitive
	Camera	x	Supported (optional)
Wireless	Wi-Fi	2.4 GHz, 5.0 GHz IEEE 802.11 b/g/n/ac	2.4 GHz, 5.0 GHz IEEE 802.11 b/g/n/ac
	Bluetooth	Bluetooth 5.0, BLE	Bluetooth 5.0, BLE
	Cellular	Expansion Board Supported (optional)	Mini-PCle for 4G (optional)
	LoRa	Expansion Board Supported (optional)	Mini-PCle for LoRaWAN (optional)
	Zigbee	x	x
Interface	Ethernet	1000M RJ45 *1	1000M RJ45 *1; 1000M RJ45 *1 (optional)
	HDMI	Micro HDMI *1	HDMI 2.0 *1
	USB	USB2.0 Type A *1; USB Type C *1	USB2.0 Type A *2; USB3.0 *2 (optional)
	RS BUS	Expansion Board Supported (optional)	RS485*1 > Terminal Block; RS485*1 > DB9 (optional) RS-232 *1 > Terminal Block; RS-232 *1 > DB9 (optional)
	CAN BUS	Expansion Board Supported (optional)	CAN-BUS *1 > Terminal Block
	PCIe	PCIe 1-lane Host *1	Mini-PCle *2
	M.2 socket	Expansion Board Supported (optional)	Support M.2 2280 NVME SSD card
	Digital IO	/	DI *4 > Terminal Block; DO *4 > Terminal Block
Power	Power Range	5V DC	12-24V DC
	PoE	Expansion Board Supported (optional)	IEEE 802.3af Standard (optional)
	UPS	Expansion Board Supported (optional)	/
Extra features	RTC	RTC	RTC
	Watch Dog	/	Hardware Watch Dog
	Security	ATECC608A	ATECC608A (optional)
	Operation Temperature	0 to 60 °C	-10 to 50 °C
	Ingress Protection	/	Front Panel IP65
Certification		RoHS, CE, FCC, REACH, TELEC	
Warranty		2 Years	

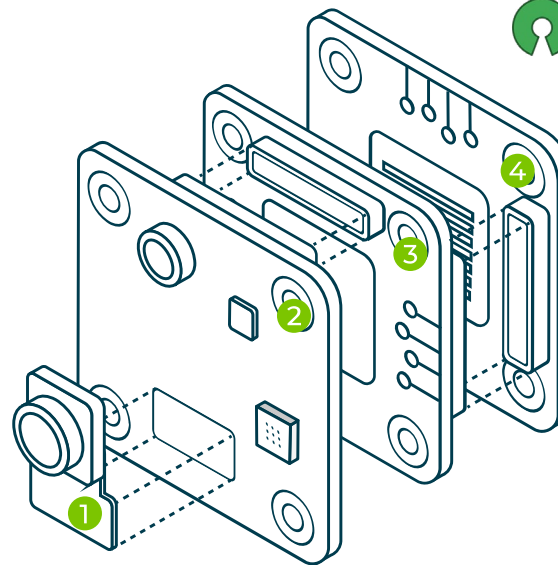
A programmable AI camera

Accelerate your product from prototype to mass production



Features

- **Modulized Design**
Quickly modify the parts and realize your idea.
- **Plug & Play**
Shipped with reCamera OS, quickly setup with built-in web UI.
- **One-step to Product**
Compact design, suitable for any kind of application and mass production.
- **Continuous Training**
Continuous collecting new data during deployment and retraining with Sensecraft AI platform.



1

Camera Module

Compatible with Pi Camera Module

5MP
Auto Focus

2

Sensor Board

Customize your sensor and light surrounding camera

Microphone
Visible&IR Light
IR Cut
Dual Camera

3

Core Board

Minimum system with all the necessary peripherals

SG2002
1GHz
RAM 256MB
Onboard EMMC
1 Tops @ Int8
WIFI & BLE

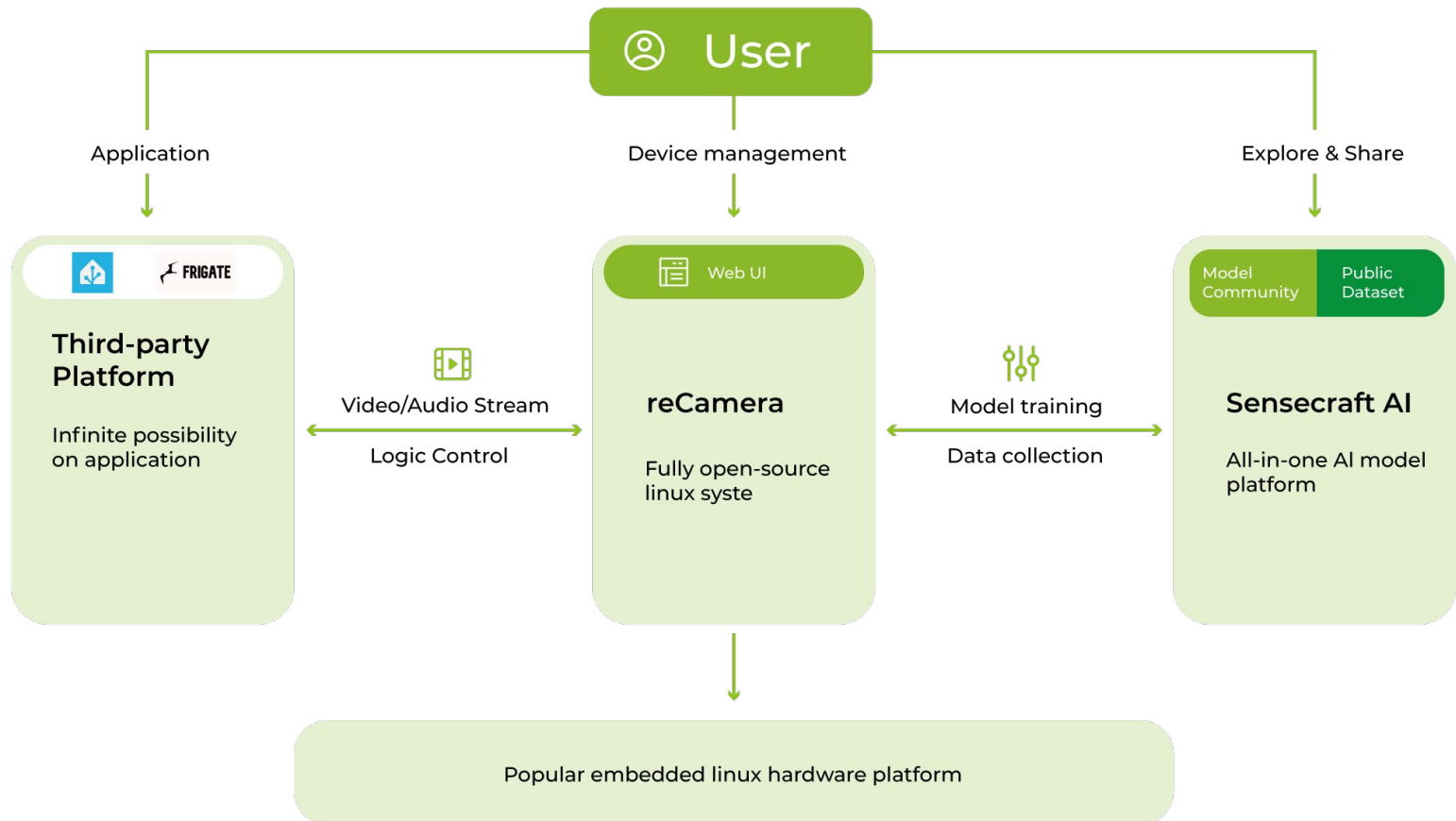
4

Base Board

Define the interfaces and your product from factor

100MB Ethernet
USB 2.0 Type-c
TF Card Slot
Speaker
CAN
DSI
POE

reCamera & SenseCraft AI



ReSpeaker USB 2-Mic Array

NEW

SKU 107990273

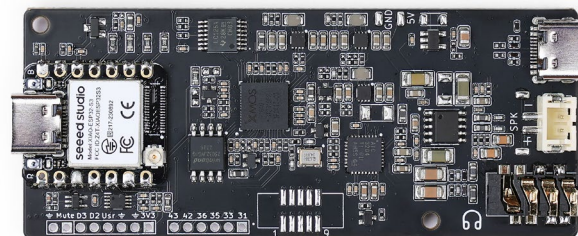
The ReSpeaker USB 2-Mic Array is a voice interface device designed for capturing voices in noisy environments. It features the XMOS XU316 for advanced voice processing, reducing the number of required microphones and costs. It supports two audio connectivity modes: USB plug-and-play and I2S, making it easily integrated into various computing hosts and embedded systems. Additionally, it can connect to Home Assistant through the onboard XIAO ESP32 WiFi module, serving as a voice input device for smart home use.

Features

- Improved audio quality through noise suppression, echo cancellation and AGC.
- 2 High Performance Digital Microphones
- Supports Far-field Voice Capture
- Speech Algorithms On-Chip
- Sensitivity: -26 dBFS (Omnidirectional)
- Acoustic Overload Point: 120 dB SPL
- SNR: 64 dB
- Power Supply: 5V DC from USB Type C
- 3.5mm Audio Jack Output Socket
- Compatible with Linux, macOS, and Windows
- 1 programmable RGB LED via XIAO module



ReSpeaker USB 2-Mic Array



ReSpeaker 2-Mic Voice Assistant Kit

Applications



ReSpeaker USB Array

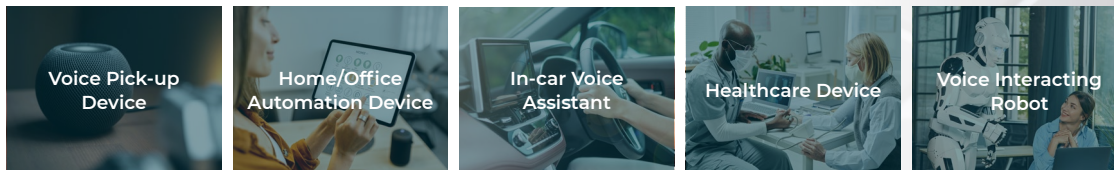
SKU [107990193](#)

ReSpeaker USB Array is an plug and play microphone array with 4 PDM mics. it's a hardware-based solution for creating or adding voice-interface to your projects. The board is a far-field microphone array device capable of detecting voices up to 5m away even with the presence of background noise. The onboard hardware-enabled algorithms are powered by the XMOS XVF-3000.

Features

- Plug & Play (No driver required), compatible with Windows , Mac, Linux and Android that support OTG.
- Voice Pick-up device, Far-field voice pick-up up to 5m and supports 360° pick-up pattern
- Acoustic algorithms implemented: DOA(Direction of Arrival), AEC(Automatic Echo Cancellation), AGC(Automatic Gain Control), NS(Noise Suppression)
- Built-in audio jack, which allows for plugging in headphones or speakers (speaker not included)
- Power Supply: 5V DC from Micro USB
- 3.5mm Audio Jack Output Socket
- Compatible with Linux, macOS, and Windows

Applications





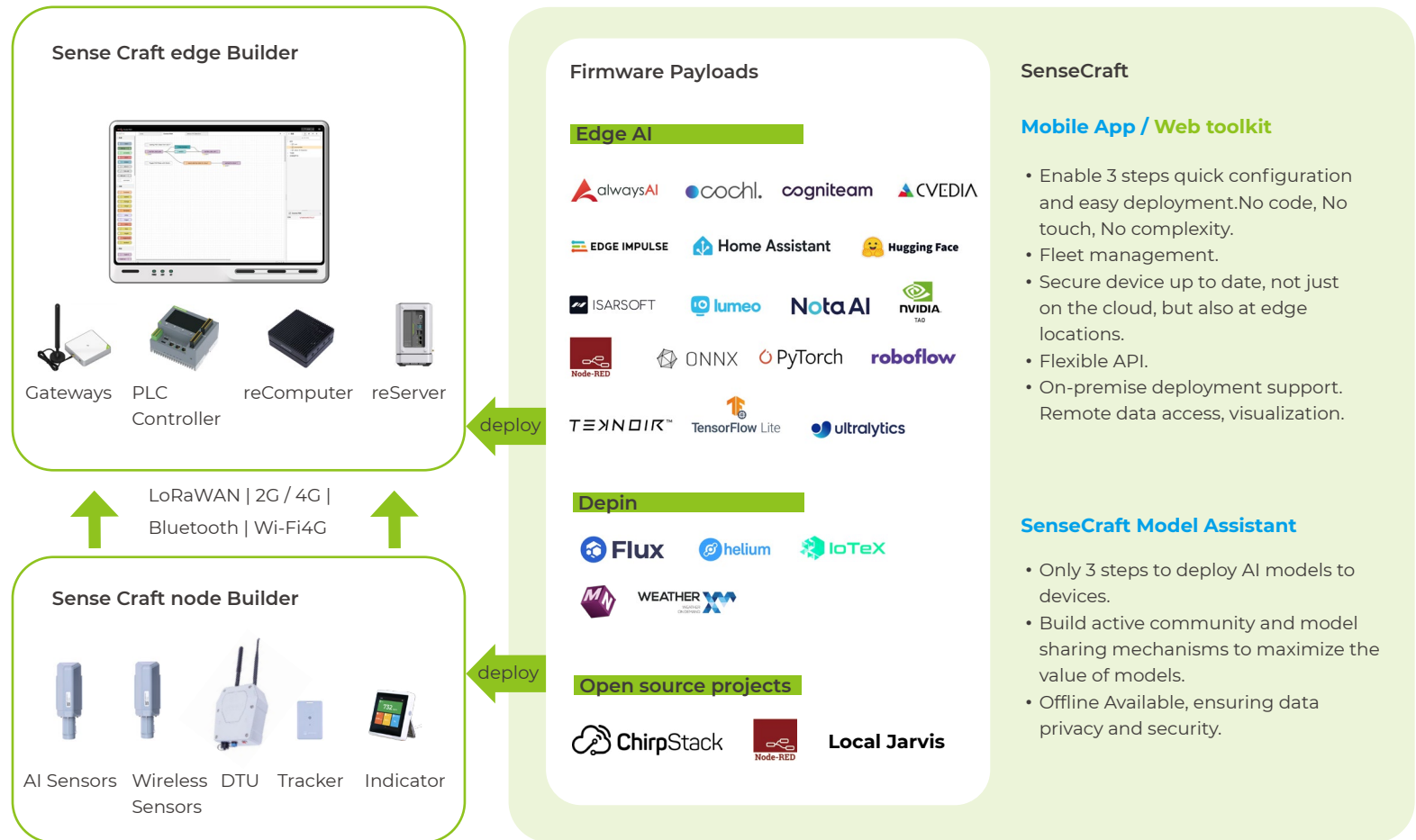
Software Suites

Integrated no code tools to orchestrate them all.

SenseCraft

<https://sensecraft.seeed.cc/>

Automate device deployment and MLOps in the field



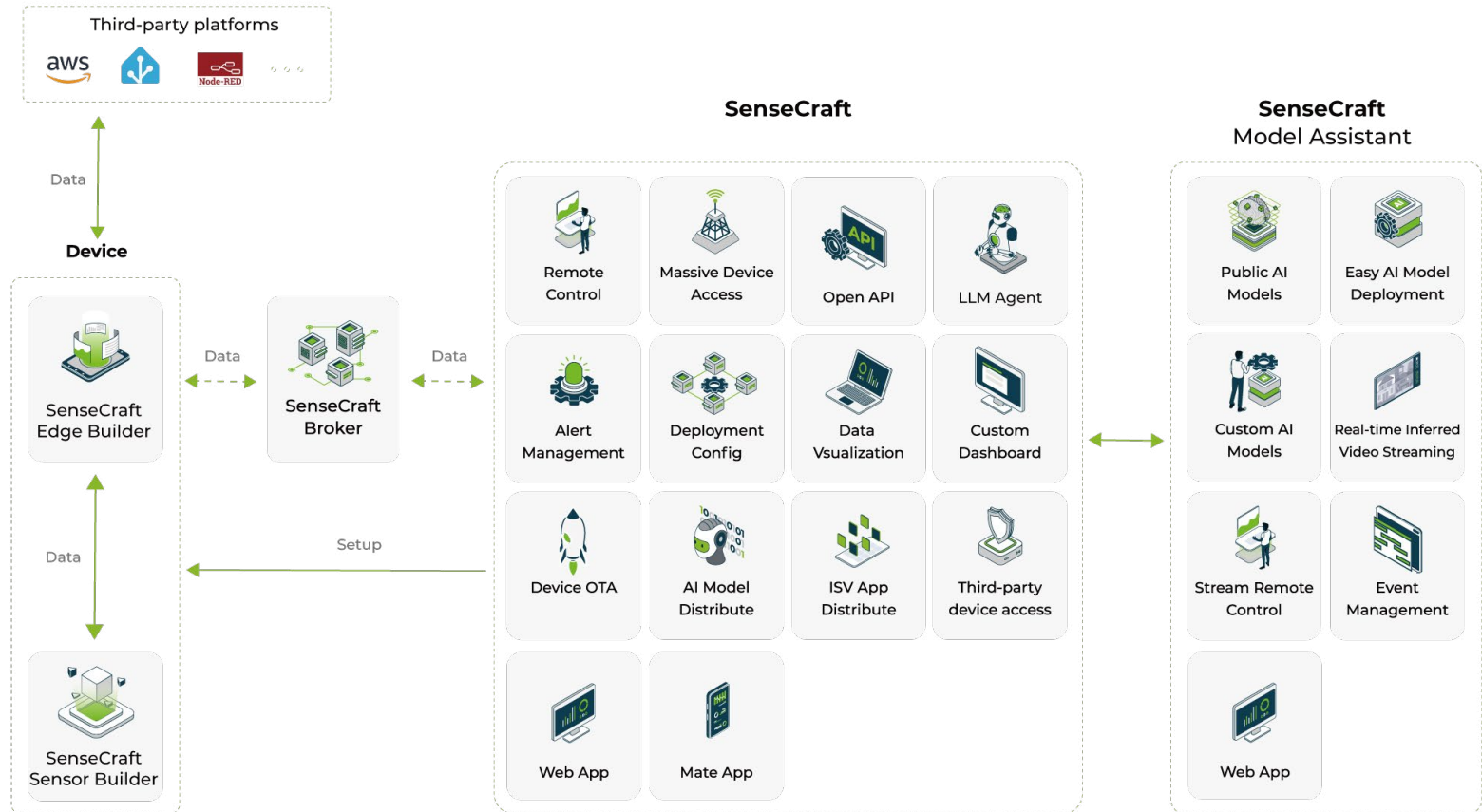
SenseCraft Under the hood

We work closely with software partner to enable easier and more powerful solutions for customer of any skillsets. All firmware on devices are open source, and you have full control on your data flow for edge center systems.

1. the open source client firmware for MCU/
Linux based devices

2. one stop management tool available in
mobile and web

3. MLops service for on-site data collection and
model distribution



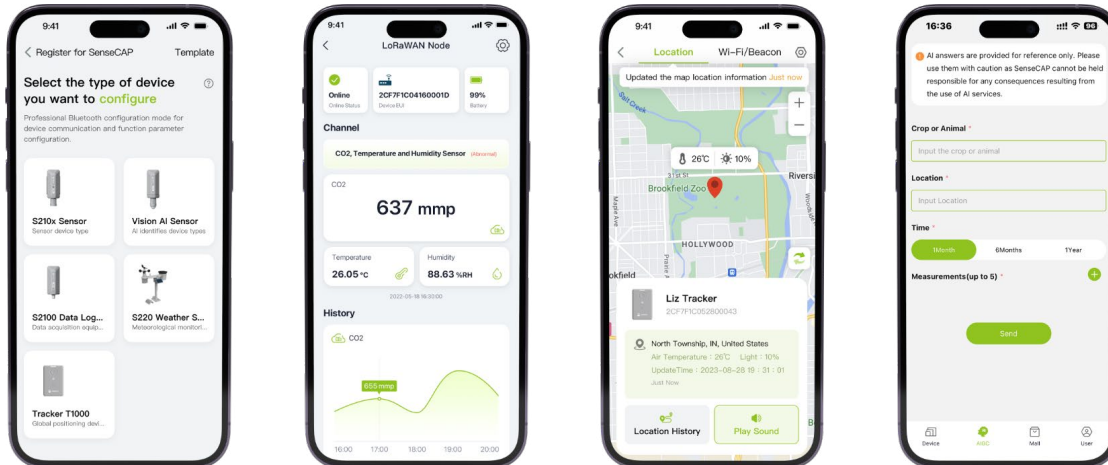
SenseCraft mobile app / web toolkits

One stop management tool available in mobile and webextensibility

SenseCraft provides convenient and practical applications for IoT device control and management, which can help users to realize remote monitoring and control of a series of IoT devices and provide data monitoring, alarm, and visualization functions, allowing users to manage IoT devices more conveniently



Download QR Code



Customized services

Application	 IoT Web	 IoT Web		
Multiple Database	 MySQL	 MongoDB	 redis	 influxdb
Multiple Network Server	 THE THINGS NETWORK	 helium	 ChirpStack	 MQTT
Multiple deployments	 Local Physical Device(Reserver)	 Local Virtual Machine	 Cloud Servers	

Enterprises have their
your private cloud

White label your own platform and App. Build your brand.

Source Code: <https://github.com/Seeed-Studio/SenseCraft-Web-Toolkit>



SenseCraft - Sensor Builder

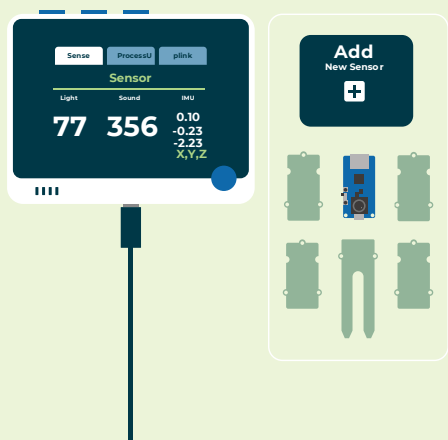
The open source client firmware for MCU based devices

SenseCraft is an open source software platform to build smart sensors with no-code. It delivers a complete out-of-the-box solution to sense the real-world, process data and send the data to the cloud in the easiest and fastest way possible with no coding experience at all! It is now compatible with Wio Terminal, and we hope it will be open and inclusive to support hardware platforms such as M5 Stack, XIAO and MCU with screen on the basis of community contribution. With this toolkit, we'll break down the process of displaying sensor data into 3 actions:

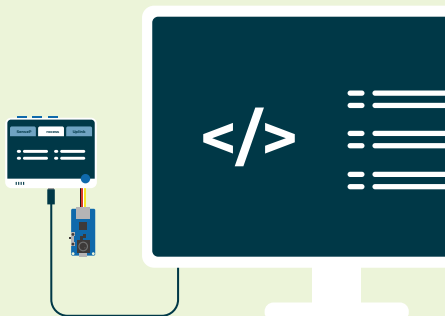
<https://github.com/Seeed-Studio/SenseCraft-Wio>

- Sense: Connect all the sensors to supported hardware platform.
- Process: Data handling and Machine Learning.
- Uplink (Network): Sending data to the cloud via WiFi/ LoRaWAN.

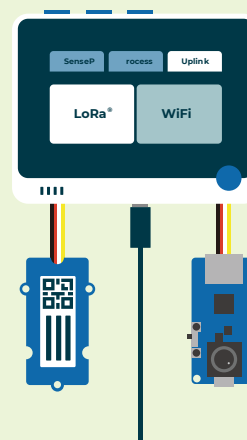
1 Sense Built in & Add on



2 Process Data Handling & Machine Learning



3 Uplink Network Connectivity



* The LoRa® Mark is a trademark of Semtech Corporation or its subsidiaries.

SenseCraft - Edge builder

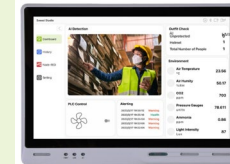
The open source client firmware for Linux based devices

- **Hardware:** Compatible with popular hardware platforms such as NVIDIA Jetson, BeagleBone, and Raspberry Pi.
- **ISV:** Supports expanding the functionality of the device by adding ISV applications to meet industry needs.

Application Examples



AI



HMI



Blockchain

Supported Hardware and Functions



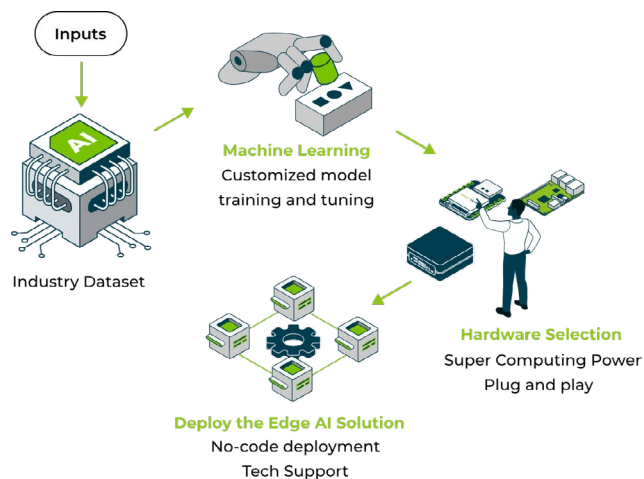
SenseCraft - Model Assistant

<https://sensecraft.seeed.cc/ai/>

MLops service for on-site data collection and model distribution

SenseCraft Model Assistant is an AI platform dedicated to simplifying the training, distribution, and deployment of AI models. With just a few clicks, you can easily deploy models and say goodbye to tedious configuration and coding. It supports users to upload and share self-trained models, build a shared model library, and promote collaboration and innovation among AI enthusiasts. Currently supports computer vision algorithms (such as target detection, image classification, image segmentation, and pose) and LLM, making it possible to realize high-speed and accurate inference on low-cost hardware, unlocking the powerful potential of AI in edge devices.

Build Your Own AI Solutions



Key Functions

Explore AI Solution Public AI Models

Ready-to-use public AI models are powered by SenseCraft and Model Maker to solve your problems.



Share your own AI Model Custom Model

You can add your own AI models and can publish them to SenseCraft!



Real-time Inference Device Workspace

Remotely managing devices for edge AI analytics, accessing inference video streams



Ready-to-use Model
Public Models

Model Maker
Customized models

easiest way
Deploy to Device

Real-time Inference
Device Workspace

Roboflow
Dataset

SSCMA
Train AI Model

Add Custom
Model

Publish to
SenseCraft AI

Matching
Model Users

SenseCraft - DePIN Suite

Deploy web3 hardware and diagnosis with ease

SenseCAP Hotspot App



APP Store



Google Play



APP Center

Decentralized Sensors



Community powered
weather network



Helium WXM Weather
Station



Decentralized IoT
Platform



DePIN Dev Kit

Decentralized Sensors



People-Powered Networks

~200K



SenseCAP M1
Hotspot



SenseCAP M2
Hotspot



Decentralized VPN
Network



SenseCAP M4
Square



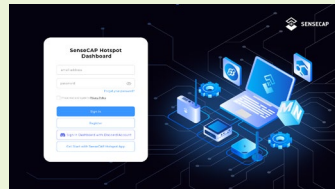
SenseCAP M1
Hotspot

Decentralized Compute



SenseCAP M4 Square

Power By



SenseCAP Hotspot App/Dashboard



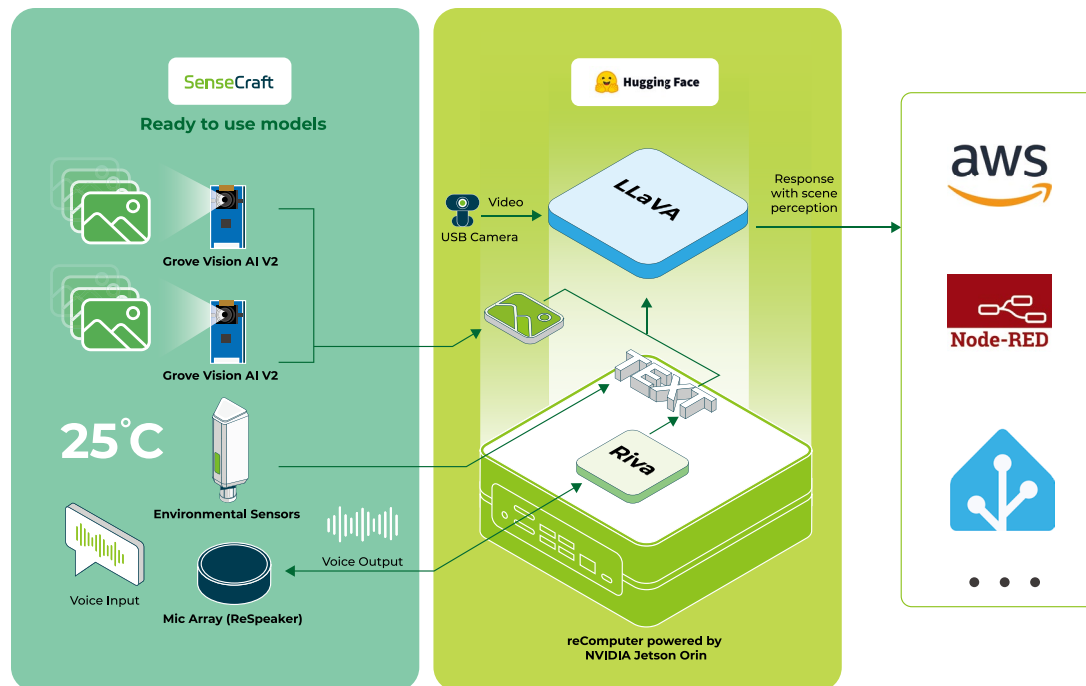
SenseCraft Device Management

Firmware payloads : Local LLM based projects

Upgrade no-code system with generative AI interaction

Combining tinyML with Generative AI at the edge represents a forward thinking approach to harnessing the potential of AI technologies for real-world applications. Leveraging tinyML's capability to efficiently process sensor data (vision, voice, sound, environmental) directly on edge devices, it serves as a trigger for activating more powerful, local Generative AI models like LLMs on NVIDIA Jetson.

<https://github.com/Seeed-Projects/LocalJARVIS>



Advanced Edge AI (AI-Processing MCU + Powerful GPU)

- Ultra-Efficient, Lower Bandwidth: processing heavy workload filter only by key frame event, focusing on crucial data.
- Simplifies deployment an easy Setup: support battery power and wireless.
- Superior ROI: Delivers greater cost savings and performance benefits

Firmware payloads : growing ISV partnerships

<https://www.seeedstudio.com/blog/ecosystem>

AI ISV partners specialize in training models, designing applications, and scaling for deployment, thereby accelerating project development and implementation. Solution partners deliver comprehensive, integrated hardware and software solutions to end customers.



Balena

Balena provides a full technology stack to help customers develop, provision, deploy, and manage IoT fleets at any scale. It delivers balenaCloud, a comprehensive cloud-based device deployment and management infrastructure, to allow developer deploying container-based AI/ML applications to fleet of devices.

Application:

container-based AI application deployment, fleet managementSupported

Hardware:

All Seeed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit.



Edge Impulse

Edge Impulse is the leading development platform for machine learning on edge devices, free for developers and trusted by enterprises. Edge Impulse made ML development is easier, accelerate ML solution development using low-code to advanced integrations with the support from an expert.

Application:

Embedded Machine Learning, Computer Vision.Industry:Industry 4.0, Manufacturing, Retail.

Supported Hardware:

All Seeed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit.



Lumeo

Lumeo is an open and flexible video analytics platform to bring intelligence and automation to market through vision AI. The no-code platform lets clients harness AI with their existing cameras and infrastructure to make sense of video data for alarm monitoring, customer experience, marketing, compliance, physical security, and many more use cases.

Application:

Video Analytics

Supported Hardware:

All Seed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit.

roboflow

roboflow

Roboflow is an end-to-end computer vision platform that streamlines the process between data labeling and training custom models, and deploy them in any edge device or server. It also provides the roboflow inference server, which is the easiest way to use and deploy computer vision models to perform object detection, classification, and instance segmentation and utilize foundation models like CLIP and SAM.

Application:

Computer Vision

Hardware:

All Seed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit. All Seed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit. NVIDIA dev kit.

Nota AI

NOTA AI

Nota AI is a forward-thinking tech startup dedicated to revolutionizing AI model optimization based on Python for target edge devices. The company's cutting-edge platform, NetsPresso provides an efficient workflow for creating AI models, including seamless model training, compression, framework transition, and benchmarking.

Application:

Hardware-aware AI model optimization and edge AI

Supported Hardware:

All Seed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit.



YOLOv8

YOLOv8 is a family of state-of-the-art object detection, classification, and segmentation models trained on the COCO and ImageNet dataset, and exports to ONNX, CoreML and TFLite. It also delivers Ultralytics HUB to enhance seamless AI model training and deployment without any code.

Application:

Object Detection, instance segmentation, image classification, pose estimation

Supported Hardware:

All Seed Studio's NVIDIA compatible carrier boards and devices, Official NVIDIA dev kit.

Solutions and Case Studies

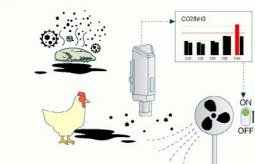


Micro Environment Monitoring

Environmental variables directly impact poultry productivity. A constant frequent monitoring network is critical to ensure chickens' welfare and reduce mortality. Seeded wireless sensors and controllers enable remote data access and timely intervene for optimal environment.



Temp x Egg production Heat leads to increased stress level and reduced egg production. Coordinate the temp sensors with cooling system to maintain the comfort.

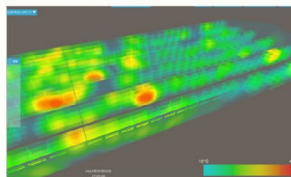


Air x Food intake High level of CO2&NH3 can cause respiratory problems and affect food intake. Turn on the ventilation system timely to bring fresh air.



Light x 24hr rhythm Control the duration of light and dark to help chicken develop healthy growth rhythms and immune system.

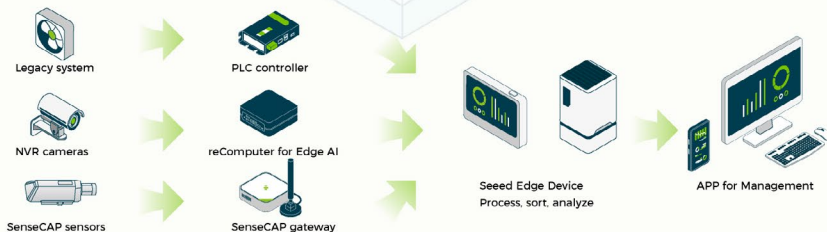
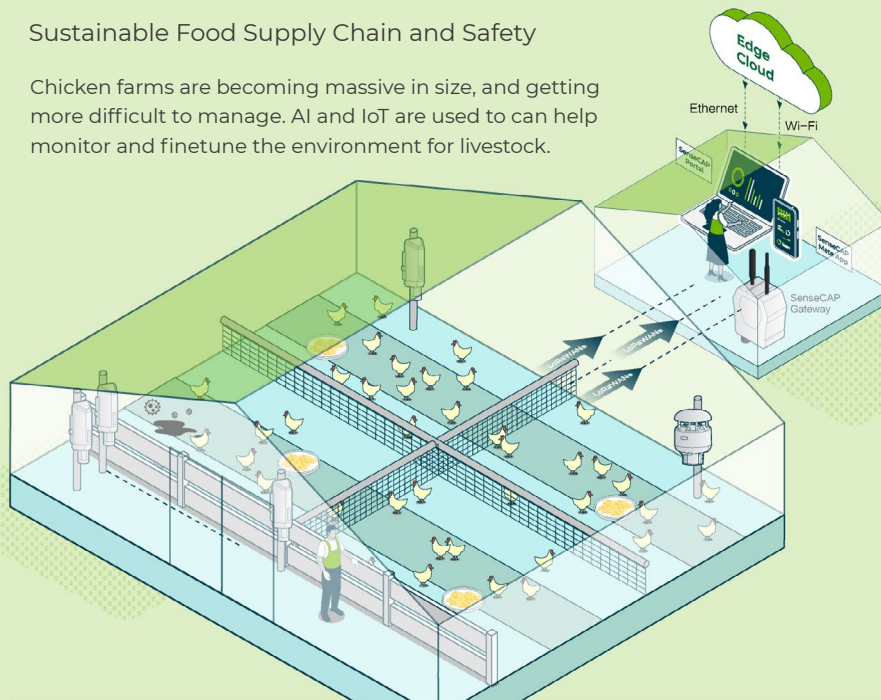
Usage:
Identify the hot spots for livestock
Perceived Temp is calculated based on temp, humi & wind speed. with our distributed sensor network, it's able to be illustrated accurately on heatmap.



Upgraded Poultry Farms with AI and IoT

Sustainable Food Supply Chain and Safety

Chicken farms are becoming massive in size, and getting more difficult to manage. AI and IoT are used to can help monitor and finetune the environment for livestock.



Automate Workflows

A rule-based system that can work independently reduces human errors and eliminates many time-consuming and repetitive tasks, such as turn on the feeders on 9:00 AM everyday, send warning when 31°C. reTerminal DM is the latest edge devices to coordinate legacy systems for automated workflow with adaption.

Usage:
Generate the checklist and execute the inspection when there is an alarm without manual entries.



Anomaly Detection with AI

Early detection of anomalies can help to identify issues before becoming serious, allowing fast action to reduce losses. Add AI enabled visual analysis to your existing farm cameras using reComputer for edge to enable timely detection.

Usage:
Intelligent diagnosis of livestock



Robust product design, sustained performance under harsh condition of animal farms. Maintenance-free for the whole animal farming life cycle.

Designed for rapid large scale deployment and easy network upgrade.

RESTful API ready to integrate with other systems.

Revolutionizing Pizza Production with Edge AI

Machine Learning

Open Source Hardware

GOPIZZA has developed an innovative automated pizza-making system that utilizes the NVIDIA Jetson Nano developer kit for edge AI inferencing. By employing computer vision to recognize pizza topping combinations, the system guides in-store operations and controls product quality. It consists of an automatic topping selection table, ovens that monitor the baking process, and a final product inspection station. This setup streamlines store operation management, reducing the required number of employees from four to one while ensuring consistent, high-quality pizzas. This revolutionary smart kitchen technology has the potential to allow pizza restaurants of all sizes to optimize their operations and reduce their workforce requirements.



<https://www.seeedstudio.com/blog/2023/05/25/automated-pizza-making-system-and-consistent-high-quality-food-production-with-intelligent-guidance/>

Digitalizing Fruit Packing with Raspberry Pi-Powered HMI

Machine Learning

Open Source Hardware

NoSoft, a leading automation solution provider for fruit packhouses and exporters in South Africa, deployed 450 customized reTerminal units with their smart packing software in multiple fruit packhouses to reduce labor costs and improve packing efficiency. Together with the whole system, reTerminal enables functions such as labeling, bin tipping, carton verification, pallet weighing, and data collection. To meet the demands of semi-automated packhouses in harsh environments, NoSoft wanted to offer their clients an HMI that meets environmental requirements with a durable design. With the surge in demand for HMIs, they sought ODM services based on reTerminal (an all-in-one Raspberry Pi CM4-powered HMI device with a touch screen) to obtain high-performance HMIs that satisfy their requirements.



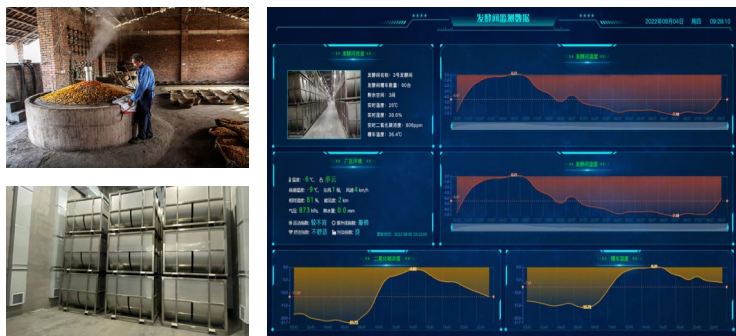
<https://www.seeedstudio.com/blog/2022/10/08/odm-services-for-smart-packing-the-reterminal-for-semi-automated-packhouse/>

Empowering Baijiu Fermentation Control with Smart Sensing Technology

Advanced Sensor

Wireless

Seed Studio has revolutionized the traditional Baijiu brewing industry in Shanxi, China, by introducing an Intelligent Fermentation Control Platform at a state-owned distillery. This solution, integrating SenseCAP S2103 CO₂, Temperature, and Humidity Sensors, along with LoRaWAN technology, automates and optimizes the fermentation process crucial for Baijiu production. Unlike the previous manual and inefficient methods, this advanced system provides real-time monitoring and control over the fermentation conditions, significantly improving the quality, consistency, and sustainability of Baijiu production. The technology enables precise adjustments based on the fermentation tanks' internal environment, ensuring optimal yeast growth and alcohol yield. With this digital transformation, the Baijiu manufacturer can now achieve higher production efficiency, reduce energy consumption, and support sustainable practices, aligning with several Sustainable Development Goals and marking a significant leap towards Industry 4.0 in the brewing sector.



<https://www.seedstudio.com/blog/2023/08/29/sensecap-devices-enabling-sophisticated-fermentation-control-in-baijiu-distillery>

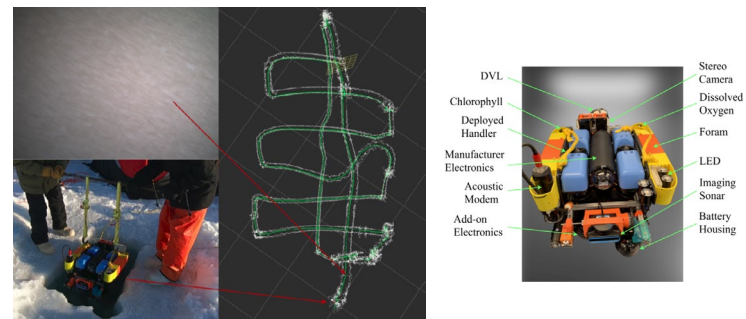
Enhanced Under-ice Sensing ROV with NVIDIA Jetson-Powered Mini PC

Open Science

Machine Learning

Open Source Hardware

The EdgeAI2Wild project, spearheaded by the Smart Ocean Systems Laboratory at the University of Rhode Island, focuses on developing an affordable, portable ROV for under-ice sensing to monitor the Arctic's changing environment due to climate change. Utilizing the BlueROV-2 platform, enhanced with an NVIDIA Jetson-powered mini PC and a suite of sensors for improved navigation and data collection, this initiative aims to advance the study of biogeochemical processes beneath sea ice. Field tests conducted in Utqiagvik, Alaska, demonstrate the ROV's capability to navigate and collect data under ice, offering new insights into the impacts of climate change on the Arctic. By integrating advanced technologies like the Robotic Operating System (ROS) and visualizing tools such as RViz, the project showcases the potential of accessible, high-performance tools for environmental research and monitoring, aligning with the global need for innovative solutions to environmental challenges.



Field operation: Top-left panel shows the under-ice camera image; Bottom-left photo shows the ROV deployment; right panel depicts the ROV trajectory from the online odometry. The image was taken at the Great Lake Research Center, Michigan Technological University.

<https://www.seedstudio.com/blog/2022/06/09/edgeai2wild-integrate-buerov-2-with-nvidia-jetson-for-an-affordable-under-ice-sensing-rov/>

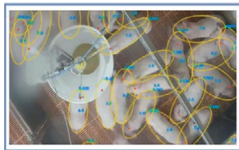
Precise Livestock Management with Machine Learning at the Edge

Machine Learning

Open Source Hardware

Intflow has developed the EdgeFarm solution, which utilizes Seeed's reComputer edge AI devices and on-site cameras to optimize livestock productivity by perceiving livestock injuries and diseases. Each camera captures real-time data of piglets, including eating habits, exercise, fighting frequency, and weight gain. Intflow is expanding its business, using reComputer J1010 to provide AI inference capabilities for every 8 IP cameras, with AI algorithms optimized through NVIDIA TensorRT to process multiple cameras simultaneously. Seeed Studio supports EdgeFarm's global expansion in terms of hardware and fulfillment.

Detect



a) Detect location and area of each animal in the camera

Track



b) Distinguishes differences in path and appearance of each detected animal

Recognize



c) Recognizes the specific behavior of each detected animal



<https://www.seeedstudio.com/blog/2022/07/01/edge-ai-at-the-farm-precise-livestock-management-helps-farmers-optimize-livestock-productivity/>

Live Streaming Pig Farming on Helium Network with SenseCAP

Advanced Sensor

Wireless

Stal Data, a Netherlands-based company, provides technology solutions for farmers. They use Helium gateways and SenseCAP sensors to monitor parameters such as CO2 concentration, temperature, humidity, and ammonia concentration in pig barns. This process is shown to the public through live streaming to optimize the barn environment and improve the health and growth of pigs. SenseCAP sensors have advantages such as water resistance, ammonia resistance, vibration resistance, long battery life, and good portability. By measuring temperature and humidity, Stal Data found that the rear of the barn was 5 degrees higher than the front, so they added a ventilator to make the temperature uniform. By monitoring CO2 concentration, they can check the minimum ventilation of the ventilation system and ensure that the CO2 concentration does not exceed 3000ppm. Monitoring ammonia concentration is also important for pig health, with concentrations needing to be below 8ppm for piglets and 15ppm for pigs over 30kg.



<https://www.seeedstudio.com/blog/2022/07/20/have-you-ever-seen-a-pig-live-stream-%f0%9f%98%b2-iot-application-on-helium-network-with-sensecap-s210x-series/>

Smart Poultry Farming Accelerates Sustainable Animal Husbandry

Advanced Sensor

Wireless

The Smart Poultry Farming Project demonstrates how SenseCAP LoRaWAN gateways and sensors are sustainably transforming the traditional animal husbandry industry through IoT technologies. Kinghoo AgroTech collaborated with Seeed to deploy SenseCAP Wireless LoRaWAN series products as an IoT solution in poultry farms in Hebei Province, China. The main reasons why Kinghoo AgroTech chose SenseCAP products are their watertight, dustproof, and robust design, low-power consumption, long battery life, long-distance transmission, and simple installation. SenseCAP LoRaWAN sensors are wireless, easy to disassemble and reinstall, and can be temporarily removed while cleaning and disinfecting poultry farms, reducing manual workload. Since the pilot project, it has been scaled up in various farms across China since January 2020.



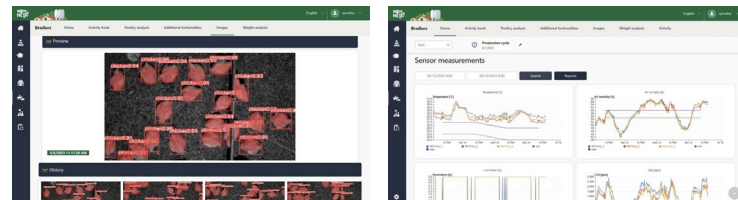
<https://www.seeedstudio.com/blog/2021/09/28/welcome-to-the-future-sensecap-lorawan-devices-deployed-for-poultry-farming-accelerate-sustainable-animal-husbandry/>

Enhancing Production Efficiency and Animal Welfare with AIoT Technologies

Advanced Sensor

Wireless

To address the challenges of inefficient practices, animal health, and consumer demands for transparency in poultry farming industries, DunavNET collaborated with Axceta and deployed the poultryNET, an IoT/AI-based solution powered by Seeed Studio SenseCAP LoRaWAN devices in the Montreal area in the poultry barns of Sollio Agriculture. poultryNET combines edge and cloud functionalities, utilizing SenseCAP LoRaWAN sensors and video cameras to monitor environmental conditions, chicken behavior, and operational parameters, which improves animal welfare, production efficiency, and establishes a traceable food supply chain. The project reduced mortality rates, improved feed conversion ratios, and empowers farmers with real-time guidance and decision support to optimize poultry production, offering a promising approach to enhance efficiency and profitability in poultry farming.



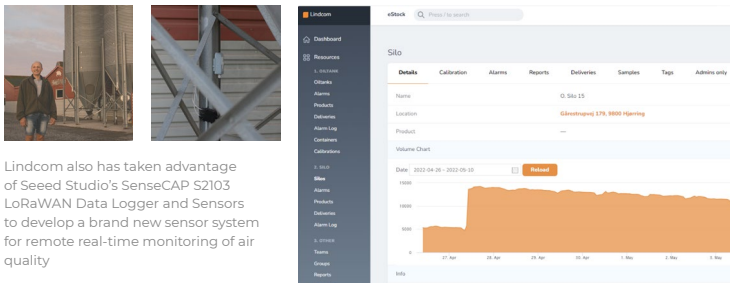
<https://www.seeedstudio.com/blog/2023/10/13/smart-poultry-farm-in-canada-enhancing-production-efficiency-and-animal-welfare-with-aiot-technologies/>

Remote Real-Time Monitoring for Silos with SenseCAP LoRaWAN Devices

Advanced Sensor

Wireless

The Danish company Lindcom has selected Seeed Studio's SenseCAP S2100 LoRaWAN Data Logger for its existing sensor systems to remotely monitor the content within silos, oil tanks, and slurry tanks. The SenseCAP S2100 is being deployed at existing and new installation sites. Lindcom has also taken advantage of Seeed Studio's SenseCAP S2103 LoRaWAN Data Logger and Sensors to develop a brand new sensor system for remote real-time monitoring of air quality. SenseCAP sensors and data loggers offer a groundbreaking, easy-to-install, and durable design while being more cost-efficient compared to traditional gateways. Furthermore, the LoRaWAN-compatible SenseCAP sensors and data loggers open up new doors in IoT connectivity with lower hardware costs. Lindcom's MultiSense Oil system enables end users, suppliers, and transporters to monitor the content of individual oil tanks, provides access to consumption history, and automatically generates forecasts for the next oil delivery. Seeed Studio's SenseCAP technology has enabled Lindcom to improve the company's existing sensor systems and expand its product portfolio, comprising state-of-the-art remote real-time monitoring of parameters crucial to suppliers', transporters', and end users' logistics, productivity, health, and learning abilities. Copy



Lindcom also has taken advantage of Seeed Studio's SenseCAP S2103 LoRaWAN Data Logger and Sensors to develop a brand new sensor system for remote real-time monitoring of air quality

<https://www.seeedstudio.com/blog/2023/03/13/sensecap-lorawan-devices-provide-remote-real-time-monitoring-for-silos-in-denmark/>

Rice Pest and Disease Monitoring Solution to Ensure a Bountiful Harvest

Advanced Sensor

Wireless

The Rice Pest & Disease Monitoring and Forecasting solution by Seeed Studio, in collaboration with Chengdu Yunyi Technology Co., has been implemented in Guangxi, China, to address the critical issue of pests and diseases in rice cultivation. Utilizing advanced technology like the SenseCAP weather station, pH and dissolved oxygen sensors, and a 4G sensor hub, this system collects real-time environmental data to predict and prevent potential outbreaks, thus enhancing rice field management. This approach not only facilitates timely interventions such as irrigation, fertilization, and pesticide application but also leverages historical data for predictive analysis, offering a proactive solution to maintain crop health and yield. Deployed in a significant rice-producing region, the project aligns with Sustainable Development Goals, aiming to improve food security, support smart agriculture practices, and promote technological innovation for better crop management and efficiency.



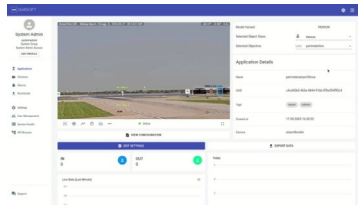
<https://www.seeedstudio.com/blog/2023/08/30/rice-pest-and-disease-monitoring-solution/>

Improving Airport Operation Efficiency and Safety with Enhanced Video Analytics

Machine Learning

Open Source Hardware

Isarsoft delivered an AI-powered video analytics solution for airports, fully supported by the NVIDIA Jetson Orin NX edge device, to maintain constant operation, improve efficiency, and enhance surrounding safety. The solution utilizes a data-driven management system to create shorter routes for passengers, saving valuable time and improving accessibility. Additionally, airport infrastructure can be expanded and improved based on in-depth analysis of different areas and occupancy statistics. The solution also offers luggage analysis capabilities to shorten waiting times at baggage carousels and identify misplaced luggage. Outside the airport, Isarsoft's solution provides perimeter protection through the Object Flow application. It identifies and detects objects, measures volume and density, and analyzes key performance indicators (KPIs) such as speed, trajectory, and dwell time using various maps. Creating lines within the Object Flow application is significant. Marking areas or zones with lines enables further processes and actions. This is a valuable tool to measure pedestrian or vehicle flow, enabling enhanced analysis and insights.

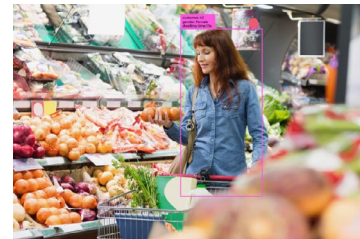


<https://www.seedstudio.com/blog/2023/06/29/video-analytics-solution-in-airports-for-operation-efficiency-improving-and-safety-enhancement/>

Improving Customer Satisfaction with Vision AI

Machine Learning

The retail operation management solution, running Lumeo people recognition model and region of interest method through NVIDIA Jetson Orin Nano, collects intricate customer behavior data, including the number of consumers gazing at shop windows or entering stores, visitor trajectories, and the most frequented areas within the store. Retailers can analyze shopper flow, gauge dwell times, calculate conversion rates, and make data-driven decisions to improve customer experiences. The system also offers proactive customer service management through real-time video analysis, tracking the number of customers being served, automatically detecting queues, and precisely calculating waiting times. This helps retailers optimize staff resource allocation, enhance customer satisfaction, and ensure a seamless and personalized shopping experience.

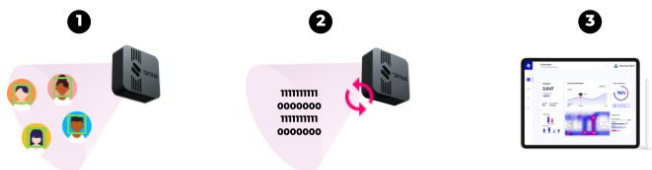


<https://www.seedstudio.com/blog/2023/09/28/vision-ai-helps-improve-customer-satisfaction-learn-from-your-customers-behavior-and-respond-fast/>

Empowering Retail Industry with NVIDIA Jetson-Powered Sentiment Analysis

Machine Learning

Brands need to deeply understand customers, but passive solutions like facial analysis are difficult to deploy in stores. Zenus and Seeed provide an all-in-one solution powered by NVIDIA Jetson to simplify the process and meet needs. The device connects to cameras, processes video, and sends metadata to the cloud to generate actionable reports. Users can access real-time metrics like foot traffic, demographics, and sentiment analysis, used to calculate conversion rates, predict sales, understand target audiences, and see what works and why. Seeed supports the Zenus AI camera with the A206 carrier board. The board provides multiple NVIDIA SOM-compatible interfaces, allowing Zenus smart devices to capture high-quality images via standard interfaces like CSI and USB for processing by NVIDIA SOMs, enabling advanced facial analysis at the edge and delivering valuable insights into consumer behavior.



<https://www.seeedstudio.com/blog/2021/12/03/sentiment-analysis-in-the-retail-industry-becomes-more-accessible/>

Revolutionizing Smart Building with Intelligent Control Systems

Open Source Hardware

A well-established Chinese smart building solution provider with 15 years of experience collaborated with Seeed to develop an intelligent control system for multi-story office buildings using Raspberry Pi-powered EdgeBox-RPi-200 and reTerminal DM. The system employs adaptive control methods to provide a comfortable and constant environment. Challenges faced include large-scale deployment, high stability requirements, openness, 24/7 operation, and high power efficiency demands. Seeed's Raspberry Pi-driven HMI and edge controllers offered nearly the same stability and control performance as the customer's current product at a lower cost, while the open-source system allowed customers to easily and quickly port software. Customers highly praised the product design and expressed satisfaction with the system's stability and performance.

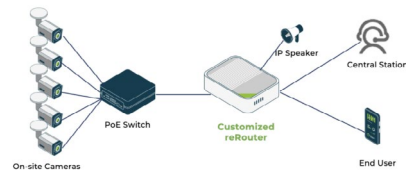


<https://www.seeedstudio.com/blog/2023/06/30/revolutionizing-smart-buildings-with-raspberry-pi-powered-intelligent-control-systems/>

Enhancing Security Monitoring with Advanced Visual Alarm Solutions

Open Source Hardware

Our partner is a leading system integrator specializing in advanced visual alarm monitoring solutions. They decided to upgrade their devices using our Raspberry Pi CM4-powered reRouter to accommodate the growing customer base and expanded coverage area that requires more cameras and computing power while supporting the Linux operating system for easy software migration. We customized the reRouter to include PoE and 3.5mm audio capabilities, making it more versatile in the visual alarm monitoring system. The reRouter acts as a bridge by binding alarm inputs and cameras, pairing cameras with existing alarm panel zones, converting video analytics alarm signals for central station response, and providing remote talk-down capability. Hundreds of reRouters have been delivered to the partner for further deployment in end-users' home, commercial, industrial, and educational security scenarios. Both the end customer and partner highly value our expertise and collaboration.

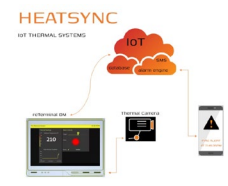
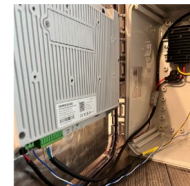


<https://www.seeedstudio.com/blog/2023/06/08/a-safer-tomorrow-rerouter-is-enhancing-security-monitoring-solution/>

Innovating Fire Detection and Prevention System for Industrial Safety

Open Source Hardware

An innovative engineer from Texas, Jordan Broome, has developed a unique approach to fire monitoring and prevention for extensive industrial applications. He integrated Seeed Studio's Raspberry Pi-powered device, reTerminal DM, into a fire detection system. The system employs an ethernet-based thermal camera to identify the highest temperature spot in the video frame every 500 milliseconds, displaying the current temperature and plotting a running chart of the temperature over the past minute. When temperatures surpass a user-defined threshold, the application activates the reTerminal DM's internal buzzer, sends a notification to a server resulting in an SMS alert, and triggers outputs. This empowers end-users to implement customized automated responses tailored to specific safety requirements. The reTerminal DM, with its robust build quality, IP65 protection rating, wireless connectivity capabilities, and an ideally sized 10.1-inch display, was an obvious choice for the project.



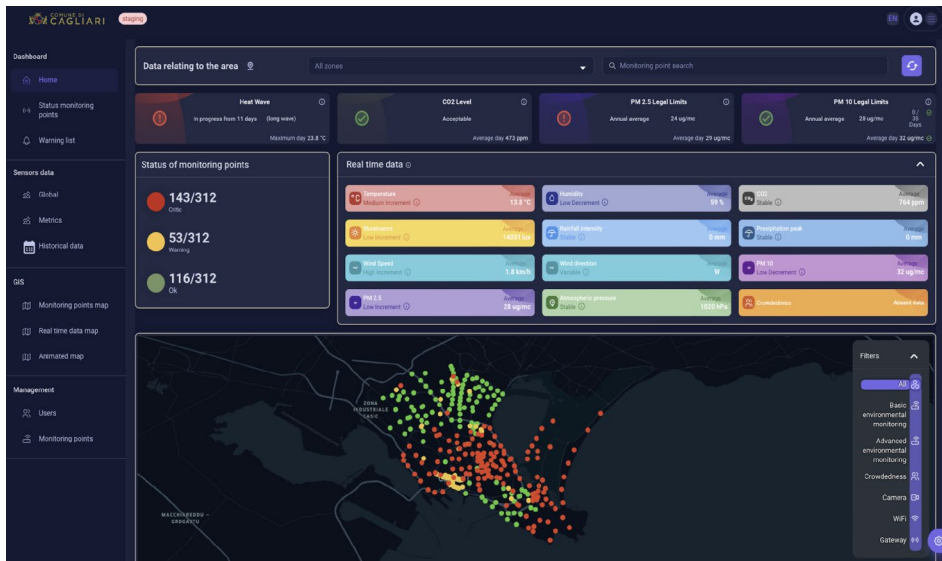
<https://www.seeedstudio.com/blog/2023/12/08/raspberry-pi-powered-unique-approach-to-fire-monitoring-and-prevention-for-extensive-industrial-applications/>

Mitigating Urban Heat Waves in Smart City with SenseCAP LoRaWAN Devices

Advanced Sensor

Wireless

To combat urban heat waves in Cagliari, Italy, a Smart City Project was initiated, deploying over 500 SenseCAP sensors across more than 300 locations. Partners WiData and Abinsula collaborated with the University of Cagliari and Fastweb, using technology such as the SenseCAP S1000 weather sensor and SenseCAP S2100 LoRaWAN DTU. This initiative facilitates urban heat island monitoring, enabling local administration to undertake building color changes and green space planning to alleviate the heat island effect. The deployment aims to provide comprehensive microclimate data for city governance and academic research, fostering a more sustainable urban environment. Utilizing LoRaWAN technology for its low power, wide area networking capabilities, the project integrates a vast environmental monitoring network. Real-time data collected is vital for urban planning, enhancing green areas, and promoting lighter building facades in heat-affected zones. The project's success not only aids in mitigating urban heat but also supports the expansion of public WiFi and security measures, contributing to a safer, more connected, and environmentally friendly city.



<https://www.seedstudio.com/blog/2023/04/25/smart-city-500-sensecap-lorawan-devices-deployed-to-mitigate-urban-heat-island-in-cagliari-italy/>

Open Hardware and Co-Create

Sseed Fusion Service elevates your innovative ideas to products and solutions for various verticals.

With the full range of **open-source modules** and **industry-grade devices**, expertise in product **design**, experience in **production**, and resources in glocal **community** and **marketing**,

Sseed is your go-to partner from 0 to ∞. Co-create with Sseed Fusion, you can leverage Sseed's capabilities in **Prototype**, **Produce**, and **Promote**, ranging from custom design, manufacturing to selling, covering the full product lifecycle from idea to delivery and iteration!

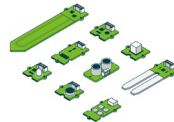
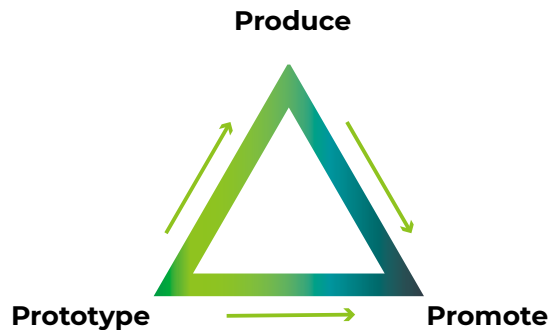


Co-Create with Seeed Fusion

Fast Track from Idea to Market

Seeed Fusion Service offers one-stop services catering to your needs, from **design & customization** to **production** and **promotion**. Focus on your strengths, co-create and co-grow with Seeed Fusion!

Open Source + AI + Hardware



Prototype - Design and Customization for Diverse Needs

- Full spectrum services - from light to deep customization
- Open reference design - lower threshold for rapid prototyping
- Professional expertise - proven product design experience



Produce - From Small-batch to Mass Production

- Instant online quotation & lead time for PCB & PCBA
- Professional experts - guaranteed services for scale-up
- Designated engineers & professional project management



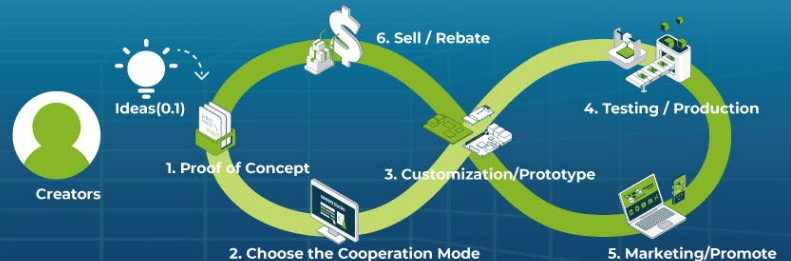
Promote - Rich Resources for Marketing and Promotion

- Online store serving half a million direct customers worldwide
- 200+ global and local distributors via online/ offline channels
- Dedicated resources to create contents with active communities

Co-create and launch your ideas with Seeed Studio

The easiest way to amplify on your ideas and talents

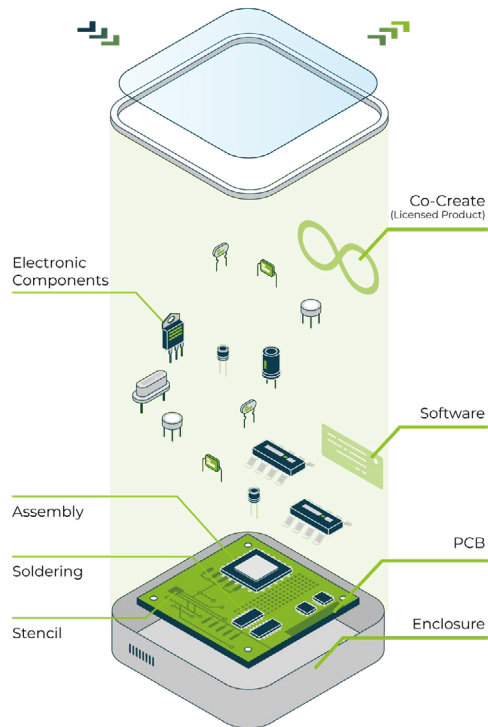
<https://www.seeedstudio.com/odm.html>



Fusion Prototype

Design and Customization for Diverse Needs

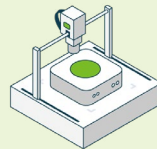
With 100+ in-house engineers, 16+ years experience in product design and production, Seeed Fusion is your go-to choice for AI & IoT hardware design and customization. privacy and security.



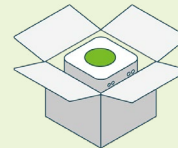
Light Customization

Instant quotation & lead time | NO MOQ, starting from 1 unit |
Quality assurance

[Order online](#)



Logo Customization
(3 ~ 14 days)



Packaging Customization
(3 ~ 29 days)



Firmware Flashing
(3 ~ 7 days)

Deep Customization

Full-stack engineering support | Open reference design | DFM services |
Professional project management

[Talk with experts](#)



Functions Adding &
Trimming



Firmware Development



Robustness Improvement



Certifications

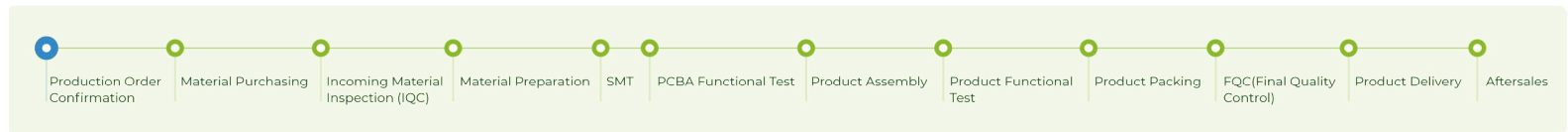
Contact us => Get quotation => Design verification => Golden samples => Pilot run => Mass production



Fusion Produce

From Small-batch to Mass Production

Seed Fusion Produce turns designs into solid products from **1 to 10,000+!** With expertise in electronics, mechanical engineering, packaging, and certification, we ensure **top-notch quality** at every step in the **supply chain** and **manufacturing**. Whether it's a **small or large-scale production**, we offer efficient **fulfillment** to bring your vision to life and exceed your expectations.



30000+

SKU

20+

Types of Test Items

6000+

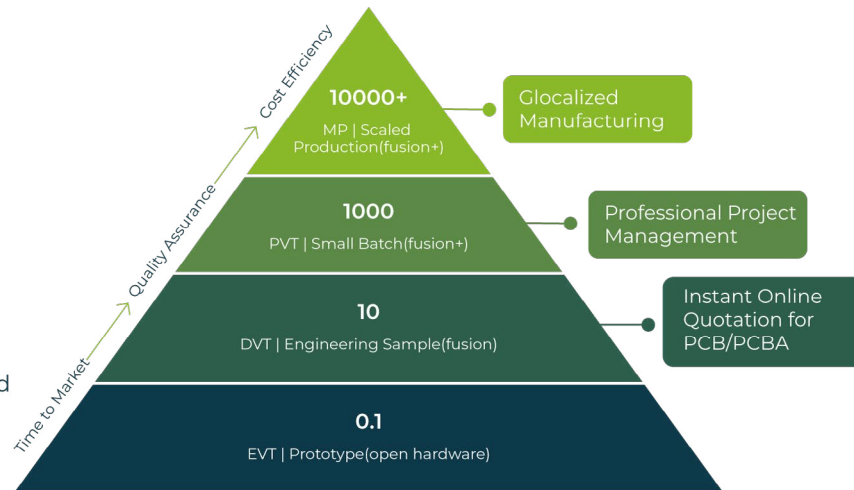
Number of Functional Test Plans

50M+

Shipments

Agile

- Cellular Manufacturing
- Flexible Manufacturing
- Prototype/3d , Production Lead Time/7d
- Open Part Library (OPL) Platform



Professional

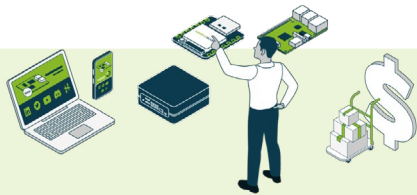
- Wind Tunnel Laboratory
- Digital Production Management
- Multifunctional Testing
- ISO 9001 Quality Management System

Fusion Promote

Rich Resources for Marketing and Promotion

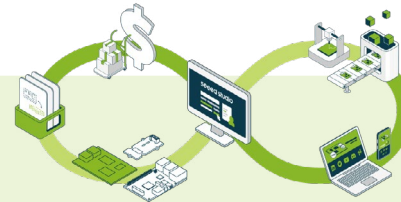
Fusion Promote ushers your products into **vibrant communities** and **vast markets**! You can get **creative content** and **invaluable feedback** by engaging with active online/ offline communities. Our powerful **sales networks** with Seeed **online shop**, global & local **distributors** can promote your products to wider potential customers, serving various verticals, with exponential growth.

What can you get from Fusion Promote?



Solid resources and efforts for marketing and promotion

- Fusion Gallery to test the water and receive feedback
- Seeed online shop to reach half a million direct customers
- 200+ online/ offline distributors to serve global & local needs
- Active engagement with online and offline communities
- Dedicated team to generate and promote user cases
- Suggestions and recommendations for bundled solutions



Hassle-free full product lifespan management

- Global inventory management at warehouses
- Distribution management and joint marketing efforts
- Shipment arrangements to customers and distributors
- Pre-sale promotion and after-sale customer support
- Continuous professional support for product iteration



GitHub



hackster.io
AN AVNET COMMUNITY

YouTube



seeed studio

Co-create Cases

ESPressoscope - Open Source Microscope

Open Source Hardware

Microscopy is a vital tool in various scientific fields, but high-quality microscopes are often expensive and bulky. In September 2023, an open-source microscope called ESPressoscope, developed by Benedict Diederich and Vittorio Saggiomo, caught the attention of the community. This espresso cup-sized microscope, powered by the XIAO ESP32S3 Sense, can observe tardigrades, zooplankton, and microplastics. Seeed Studio partnered with OpenUC2, founded by Benedict, to create an affordable open-source modular microscopy toolkit. The UC2 modular optics kit is based on a concept where optical and electronic elements are mounted in 50 mm cubes, which can be aligned in 3D to construct complex beam paths. The system is open source, allowing users to download, build, and modify it immediately. This kit aims to provide rapid prototyping capabilities and limitless customization options, making it accessible to a broader community, including educational institutions and research laboratories. Seeed Studio and OpenUC2 also hope to make it a tool in underserved regions, with Benedict and his team currently engaged in a malaria detection project in Nigeria.

<https://www.seeedstudio.com/blog/2023/11/03/bring-optics-to-life-extend-perception-network-to-the-microscopic-level/>



Crazyflie 2.1 Micro-Quadcopter

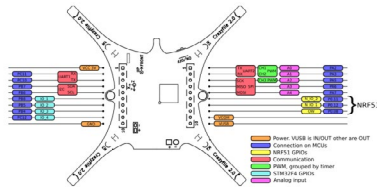
SKU [114991551](#)

Open Source Hardware

The Crazyflie 2.1 is a compact, 27g open-source micro-quadcopter that offers improved performance, durability, and radio capabilities compared to its predecessors. It features low-latency/long-range radio, Bluetooth Low Energy (BLE), and a flexible expansion interface for various decks, allowing control via mobile apps or computer using the Crazyradio PA.

The drone is powered by STM32F405 and nRF51822 microcontrollers, and includes an onboard LiPo charger, IMU, and pressure sensor. With a flight time of up to 7 minutes and a maximum payload of 15g, the Crazyflie 2.1 is suitable for education, research, and swarming applications.

Users can customize the open-source software, firmware, and clients to fit their needs. The platform can be enhanced with expansion decks like the LED-ring for light painting, Flow deck v2 for assisted flying, and Multi-ranger deck for obstacle avoidance and mapping. The Crazyflie 2.1 is a versatile and adaptable micro-quadcopter for developers, researchers, and hobbyists.



<https://www.seeedstudio.com/crazyflie-V2-1-p-2894.html>

Quantum Tiny Linux Development Kit

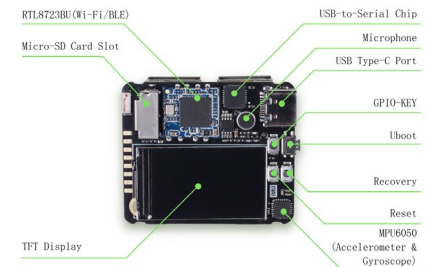
SKU [114992462](#)

Open Source Hardware

The Quantum Tiny Linux Development Kit is an ultra-small (40mm x 35mm) and highly integrated Linux development board that runs Ubuntu Core on a quad-core Allwinner H3 SoC. The kit consists of the Quark-N System on Module (SoM) and the Atom-N expansion board, which are connected through an M.2 interface.

The Quark-N SoM features a quad-core Cortex-A7 CPU, Mali400 MP2 GPU, 512MB LPDDR3 RAM, 16GB eMMC storage, and various interfaces such as Ethernet, SPI, I2C, UART, and GPIO. The Atom-N expansion board adds USB ports, wireless connectivity (Wi-Fi and Bluetooth), onboard peripherals (microphone, motion sensor, buttons, and TFT display), and a micro-SD card slot.

This Linux development kit is suitable for a wide range of applications, including personal servers, intelligent voice assistants, robotics, image processing, and smart home hubs. Seeed Studio provided the designer, Zhihui, with comprehensive services from engineering design to mass production and product promotion, leveraging their expertise in electronic design and manufacturing to bring the product to market.



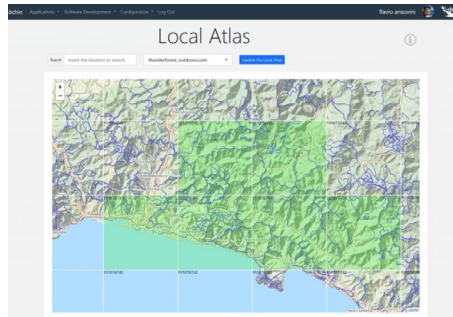
<https://www.seeedstudio.com/Quantum-Mini-Linux-Development-Kit-p-4749.html>

Öchìn CM4 Carrier Board

SKU 103100163

Open Source Hardware

Öchìn CM4 is a tiny carrier board for the Raspberry Pi Compute Module designed for applications where a powerful machine with low consumption and small dimensions are required. The small form factor makes it interesting for applications with space and weight restrictions such as in robotics, home automation and IoT. Öchìn CM4 is now available to purchase worldwide thanks to Seeed Studio Fusion Licensed Products Program.



<https://www.seeedstudio.com/blog/2024/04/01/low-consumption-ochin-cm4-carrier-custom-board-applied-in-robotics-drones-home-automation-and-iot-manufactured-by-seeed-fusion-pcba/>

Loko GPS Tracker

Open Source Hardware

Loko is a cutting-edge GPS tracker by Tomi Piriyeve that leverages the Seeed Wio-E5 module for tracking drones, animals, and equipment in remote locations without cellular networks. Unique for its reliance on a LoRaWAN radio transmitter, it offers long-range communication up to 10km and supports up to 30 devices per unit. The device boasts over 30 days of battery life and requires no monthly fees. Chosen for its simplicity and low power consumption, the Wio-E5 module facilitates rapid development and simplifies certification processes. The collaboration with Seeed Fusion for PCB assembly significantly reduced costs and development time. Loko represents a major advancement in GPS technology, providing reliable tracking in areas where traditional trackers fail, thanks to its innovative use of LoRa technology.



<https://www.seeedstudio.com/blog/2024/04/01/loko-the-tiniest-gps-tracker-with-built-in-lora-e5-module-can-track-any-wild-animals-and-drones-with-seeed-fusion-pcba/>

Community Driven, Ecosystem Builder

At Sseed Studio, we're dedicated to catalyzing digital transformation across industries through collaborative AIoT solutions with our vibrant community and partners. Within this dynamic ecosystem, we collaborate with chip providers, embedded software partners, ML/CV experts, cloud and network partners, and a global community of enthusiasts and innovators.

But our commitment doesn't stop there. We're passionately engaged in driving positive global impact, addressing diverse challenges such as climate action, education, agriculture, etc. Together, we're making a difference that matters.

Growing Partnerships

Chip providers



Embedded SW



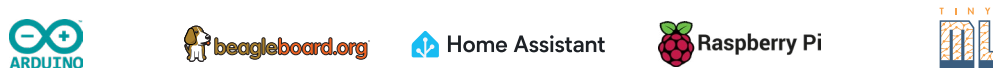
ML / CV



Cloud and Network



Community



Vibrant Online Community



Hackster:

2,599 Published Projects

20,300 Members

<https://www.hackster.io/seed/>



GitHub:

511 Followers

470 Repositories

<https://github.com/Seed-Studio>



Seed Studio Discord:

7,714 Members

<https://discord.com/invite/QqMgVwHT3X>



SenseCAP Discord:

27,565 Members

<https://discord.gg/4mKVXNNrgY>

At Seed Studio, we believe in the power of community-driven innovation. We take pride in our thriving online community, where innovation knows no bounds. Tap into a wealth of knowledge and expertise from **industry professionals, mentors, and fellow developers**, and even share your projects, ideas, and insights with a global audience.

In our commitment to nurturing talent and fostering collaboration, we've introduced the **Seed Contributor Program**, bringing together seasoned developers dedicated to community engagement and knowledge sharing.



Seed Contributor:

NEW

12 Contributors

17 On-going Projects

<https://github.com/orgs/Seed-Studio/projects/6/views/1?pane=isue&itemId=35179519>



YouTube:

13,500 Followers **458** Videos

<https://www.youtube.com/@SeedStudioSZ>



X:

66,927 Followers

<https://twitter.com/seedstudio>



Facebook:

45,019 Followers

<https://www.facebook.com/seedstudiosz>



LinkedIn:

32,855 Followers

<https://www.linkedin.com/company/seedstudio/>

Active Offline Community



Chaihuo Makerspace

The first makerspace in Shenzhen and the second in China, a vibrant community hub where makers come together to share projects, connect with leaders in various fields, improve skills, and participate in community activities.

Become a member:

<https://www.seeedstudio.com/chaihuo-makerspace>

- 12,600+ Registered Members
- 850 Innovative Projects
- 1,370 Community Events
- 28 Countries Members
- 720 m² Co-Working Space



Maker Faire Shenzhen

Showcase your innovative ideas, meet like-minded makers, and explore the specific applications of cutting-edge technologies in various industries at one of the largest maker innovation events in the world.

Get on board:

<https://www.shenzhenmakerfaire.com/>

- 560,900 Visitors
- 112 Country Participants
- 680 Global Exhibitors
- Top 7 Globally Recognized Featured Level Events
- Happen every November



Maker Camp in Shenzhen

Delving into Shenzhen's thriving tech ecosystem, participants will have the opportunity to understand the intricacies of manufacturing processes and supply chain management, learning how to harness these resources to create innovative projects, and sharing their knowledge to empower the maker community.

Register now:

<https://www.seeedstudio.com/blog/2024/01/15/introducing-maker-camp-in-shenzhen/>

- 32 Global University Students
- 10 Research Backgrounds
- 6 Countries



Seed Ranger

The Seed Ranger program is crucial in expanding our community's impact and visibility through organizing workshops, participating in exhibitions, and creating engaging content. Plus, it offers a wide range of benefits for the rangers!

Apply now to become a Seed Ranger:

<https://www.seeedstudio.com/blog/2023/09/15/join-the-seeed-ranger-program-empowering-developers-and-building-communities/>

- 2 Rangers
- 11 Workshops
- 250+ Participants
- 5 Countries

Seed Studio for SDGs

Over the years, Seed Studio has been providing all types of AIoT, IIoT, edge computing, open source hardware products and Seed Fusion services to help businesses, nonprofit organizations, conservationists, citizens, and makers in accelerating the SDGs.

Partnered with global communities, we have developed a comprehensive program of events and activities, including but not limited to 11 Scale-up projects, 7 contests, 6 innovation workshops, 2 webinars, etc., to support initiatives that promote sustainability and social responsibility.

If you're from NGOs, UN agencies, academia, and foundations working on project related to SDGs 2030, Open Innovation, Decentralized Tech, Equitable Equality, and Sustainable Communities, please don't be shy to contact us for collaborations!

Contact Us:

https://docs.google.com/forms/d/e/1FAIpQLSe-ZzStBrhH-VQHqwLH2DpJBwg-cRZ4aVHCCMzqRFGSO1Nmmbg/viewform?usp=sf_link

Learn more:

<https://www.seedstudio.com/blog/sdg/>



Tech for SDG

Smart Citizen

Deployed in: USA, Mexico, Brazil, Argentina, Chile, Puerto Rico, Colombia and more.
An open source hardware and software platform that enables local citizens to collect data in urban areas. This project contributes to SDG 3, 4, 5, 6, 9, 10, 11, 12, 13, 16, and 17.

FarmBeats for Student Program

Deployed in: Global
This program is to facilitate technological empowerment of young people to learn about AI, Machine learning, and IoT in agriculture. . This project contributes to SDG 2, 10, 4, 1, 5, 9, 8, 6, 7, 12, 11, 13 and 17.

Smart Black Soldier Fly Farming

Deployed in: Tanzania
A resource-efficient and low-cost protein production method by monitoring and optimizing BSFs' living environment. This project contributes to SDG 1, 2, 9, 11, 12, 13, 15, and 17.

Marine Litter Detective

Deployed in: Hong Kong
A GPS-tracking device for monitoring marine pollutants, such as plastics and oil spills. This project contributes to SDG 3, 4, 6, 9, 11, 12, 13, 14, 16, and 17.

Animal Behavior Analysis & Habit Pattern Tracking

Deployed in: US, Australia
Leverages computer vision AI models to optimize zoo management, identify and tracks animals within their enclosures. This project contributes to SDG 9, 11, 13, 15, and 17.

Carbon Sequestration Monitoring

Deployed in: Liberia
Monitor climate and greenhouse gas data in rainforests for climate research. This project contributes to SDG 4, 9, 11, 13, 15, and 17.

Protei - Open Source Ocean Cleaning Robot

Deployed in: Global
This is a wind-powered and automated sailing fleet robot designed to resolve the world's oil spill issues caused by the Deepwater Horizon Disaster in the Gulf of Mexico. This project contributes to SDG 6, 14, 11, 15, 3, 1, 7, 9, 8, 12, 13 and 17.

Code Jumper Kit

Deployed in: USA, Canada, Australia, UK, India
Innovative educational tool designed for students with visual difficulties to enhance their computer coding and programming skills. This project contributes to SDG 1, 4, 5, 8, 9, 10, 16, and 17.



Open Wiki Platform



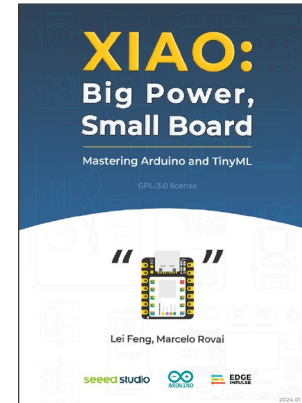
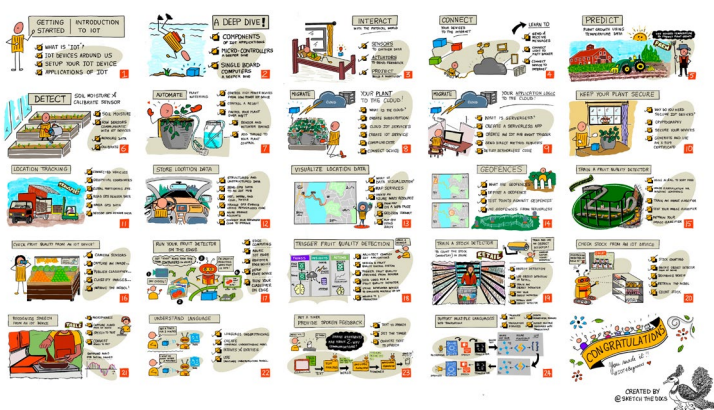
Introduction of Our Wiki Platform

- Preserve all Seed Studio Wiki with clear categorization
- Provide multiple interactions for the viewers
- Discover supported by powerful search engine
- Exhibition supported by functional structure Doc  Docusaurus

Make It Better in Your Ways

- Anyone is able to edit pages anytime on  GitHub
- Create the local website less than five minutes
- All files added / changed will be respected
- Welcome to Seed Studio Contributors Program

Learning Resources



Microsoft IoT for Beginners Curriculum

IoT 24 lessons

Azure Cloud Advocates at Microsoft are pleased to offer a 12-week, 24-lesson curriculum all about IoT basics. Each lesson includes pre- and post-lesson quizzes, written instructions to complete the lesson, a solution, an assignment and more. Our project-based pedagogy allows you to learn while building, a proven way for new skills to 'stick'. The projects cover the journey of food from farm to table. This includes farming, logistics, manufacturing, retail and consumer - all popular industry areas for IoT devices.

<https://microsoft.github.io/IoT-For-Beginners>

XIAO: Big Power, Small Board—— Mastering Arduino and TinyML

tinyML 21 lessons

From the expansive boards of the past, Arduino has come a long way and entered the Screenshot Studio XIAO series: thumb-sized yet power-packed, opening a vast horizon for innovation. "XIAO: Big Power, Small Board" dives deep into these capabilities, guiding readers from the basics of Arduino to intricate miniaturized projects. Whether readers want to illuminate an LED or delve into Embedded Machine Learning (tinyML) with XIAO boards and Edge Impulse Studio, this book covers them. Need for prior knowledge? No worries! This book takes a hands-on, project-based approach, ensuring readers grasp the concepts while implementing them. By the end, they will be adept with XIAO and inspired by many user-created projects showcasing the endless possibilities this small board offers.

https://mjroval.github.io/XIAO_Big_Power_Small_Board-ebook



Three-stage training for No-Code Programming

No-Code

5 lessons

A multi-stage guide to building custom low-cost devices for biological research: using no-code programming to integrate advanced sensors, electronic controllers and wireless communications.

<https://www.biomaker.org/training-programme>



No-Code Programming to Get Started With tinyML

No-Code

tinyML

5 lessons

The No-code Programming tinyML course introduces beginners to Embedded Machine Learning using Wio Terminal and Codecraft. Through seven step-by-step projects, students learn to train and deploy neural network models on microcontrollers for motion recognition, gesture recognition, wake-up words, smell detection, and more, without requiring prior programming or electronics knowledge.

<https://tinkergen.github.io/No-code-Programming-to-Get-Started-with-TinyML/#/>



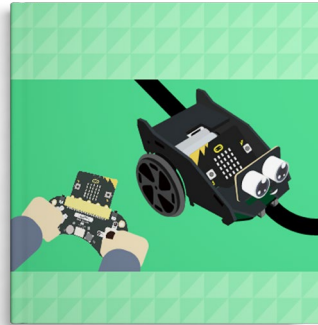
micro:bit Associated Course Materials - BitWearable kit

No-Code

5 lessons

This coursework is developed based on students' cognitive development and learning ability. It builds scenes taken from real life which stimulate students to look deep at a problem. With the combined use of micro:bit, BitWear and MakeCode, students will be able to create realistic solutions for those real-world problems.

<https://make2learn.tinkergen.com/course/?sku=604190001>



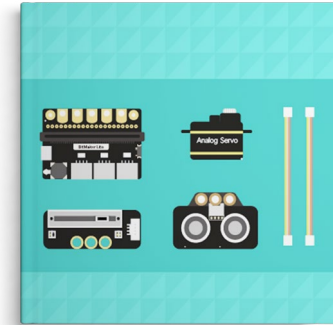
A Guide to RC Car Project for micro:bit - BitCar & BitPlayer

No-Code

14 lessons

This course teaches students how to use micro:bit, BitCar, BitPlayer hardware, and Microsoft MakeCode software to gradually learn how to make remote-controlled cars.

<https://make2learn.tinkergen.com/course/?sku=604190004>



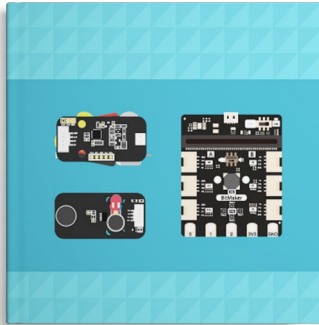
Beginner's Guide: micro:bit projects with the BitStarter Kit

No-Code

12 lessons

It utilizes three technological tools, including the micro:bit which works with a self-made expansion board, the easy-to-use electronics and a graphical programming software, MakeCode, to steer students to complete creative projects independently and discover scientific and intriguing adventures which adopt both the software and hardware knowledge.

<https://make2learn.tinkergen.com/course/?sku=604190002>



Advanced Guide: micro:bit projects with the BitGadget Kit

No-Code

12 lessons

This course is designed based on the cognitive development, learning capabilities, and interests of students, incorporating real-life applications for an engaging learning experience. Utilizing the BitGadget Kit, which includes sensors, motors, a speaker, and colorful lights, students can create fun and exciting micro:bit projects. The kit comprises a BitMaker and up to 9 different Grove modules. All modules are plug-and-play and easily programmable with the Microsoft MakeCode editor, allowing students to enjoy the process of making projects that light up, move, and produce sounds.

<https://make2learn.tinkergen.com/course/?sku=604190003>



GameGo-Game Programming Courses Beginner's Guide

No-Code

16 lessons

This is a collection of game programming tutorials to develop kids' graphical programming skills with TinkerGen's GameGo and Microsoft MakeCode Arcade as teaching tools. Games always hold an irresistible fascination for a lot of kids. In our courses, the process of learning game programming serves as a series of 'wizard lessons', from which kids will unlock their wizard gears step by step to become a more powerful and stronger 'wizard' in the end.

<https://make2learn.tinkergen.com/course/?sku=604182001>

<https://make2learn.tinkergen.com/course/?sku=604182007>

Español



GameGo-Game Programming Courses Intermediate Learners' Guide

No-Code

16 lessons

The GameGo Game Programming Intermediate Learners' Course covers several key concepts in game development, including functions, animation, game extensions, level design, and sprite arrays. By analyzing and practicing classic game examples such as Angry Birds, Ping Pong Duel, and Dungeon Secrets, students enhance their game design and programming skills, laying the foundation to become proficient game developers.

<https://make2learn.tinkergen.com/course/?sku=604182003>

```

#include <Arduino.h>
#include <SPI>
#include <Adafruit_GFX.h>
#include <Adafruit_NeoPixel.h>

// NeoPixel settings
#define NEOPIXEL_PIN 10 // NeoPixel data pin (GPIO 10)
#define NEOPIXEL_COUNT 100 // Number of NeoPixels (100)
#define NEOPIXEL_TYPE WS2812B // NeoPixel type (WS2812B)

// NeoPixel object
Adafruit_NeoPixel neoPixel = Adafruit_NeoPixel(NEOPIXEL_COUNT, NEOPIXEL_PIN, NEOPIXEL_TYPE);

// NeoPixel settings
#define NEOPIXEL_PIN 10 // NeoPixel data pin (GPIO 10)
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```

```

#include <Arduino.h>
#include <SPI>
#include <Adafruit_GFX.h>
#include <Adafruit_NeoPixel.h>

// NeoPixel settings
#define NEOPIXEL_PIN 10 // NeoPixel data pin (GPIO 10)
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```

Seed Studio

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