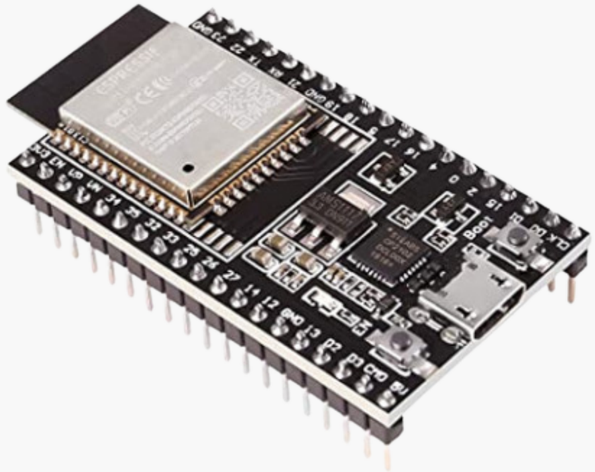
ICowCare

IoT Solution Proposition

Development board

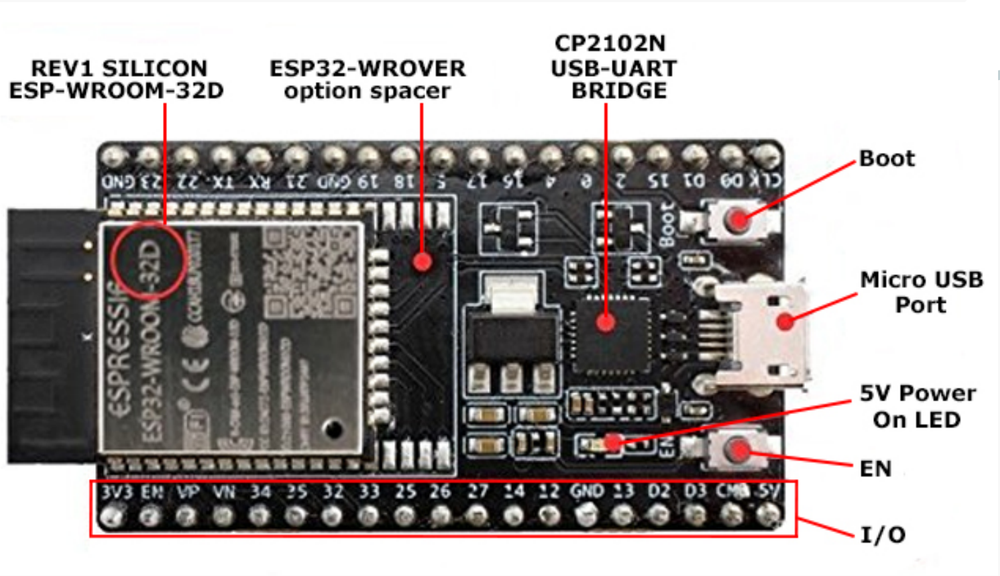
ESP32-DevKitC V4
ESP32 WROOM 32D



Price :42 TND

Datasheet ESP32-DevKitC V4

Datasheet ESP32 WROOM 32D



- CPU clock frequency is adjustable from 80 MHz to 240 MHz
- Integrated SPI flash: 4MB
- Operating Voltage/Power Supply: 3V ~ 5V
- Operating Current Average: 80 mA
- Minimum Current Delivered by Power Supply: 500 mA
- Operating Temperature: -40 °C ~ +85 °C
- Moisture Sensitivity Level (MSL): Level 3
- Dimensions: 54.4 x 27.9mm
- Weight: 10g

Power Supply

Lithium battery CR123/CR123A

CR123A 3V
1300MAH
Price :9.5TND
Seli.tn

ANSMANN 3V
1500MAH
Price :15.5TND
brico-direct.tn

Huiderui 3V
1600MAH
Price :17TND
jumia.tn

Datasheet CR123A ANSMANN

- These keep a voltage of 3V quite constant, at less than 2.7 volts more than 90% of the capacity of a lithium battery is used, at 2.55 volts it is practically empty. Lithium batteries also provide the high short-term power requirements of WiFi operation without any problems. For example, a Varta CR123 (3V, 1700 mAh) can even be used in standby mode for over 5 years, depending, of course, on how often the ESP32 wakes up and has to do something, or how long and how often WiFi or Bluetooth is used.
- As lithium batteries have a very low self-discharge and also function well at -20 °C, these are to be preferred.

Battery Life Calculator

Server

SERVEUR RACK DELL POWEREDGE R230

Price: 2.739

mytek 2.549

- Reliability: The Dell PowerEdge R230 is a reliable server that is built to withstand long hours of operation.
- Performance: The server is powered by an Intel Xeon E3-1220 v6 processor, which offers good performance for tasks such as cow monitoring.
- Storage: The server comes with 2TB of storage, which should be enough
- RAM: The server has 8GB of RAM, which is adequate for running the applications required.
- Connectivity: The server has built-in Ethernet connectivity, which makes it easy to connect to the network and access the data.

Cloud option

the pricing for AWS, Azure, and Google Cloud Platform can vary widely depending on factors such as the specific services used, the location, and the duration of usage. However, here are some rough estimates for the cost of running a basic virtual machine in each cloud provider:

- **AWS:** starts at around $10 per month for a basic t2.micro instance with 1 vCPU and 1GB RAM.
- **Azure:** starts at around $15 per month for a basic B1s instance with 1 vCPU and 1GB RAM.
- **Google Cloud Platform:** starts at around $10 per month for a basic f1-micro instance with 1 vCPU and 0.6GB RAM.

- Requires good internet connection
- can incur ongoing costs, such as data transfer and storage fees.

Here are the links to the pricing pages for each provider:

- AWS
- Azure
- Google Cloud Platform

Arduino Cloud

Configure your plan

Choose billing frequency:

Monthly
Pay once per month, cancel anytime

Yearly
Pay once per year
SAVE 15%

Choose plan:

MAKER
25 Things, Unlimited dashboards, Unlimited stora...
$ 6.99
MORE

MAKER PLUS
100 Things, Unlimited dashboards, Unlimited stor...
$ 23.99
MORE

Choose billing frequency:

Monthly
Pay once per month, cancel anytime

Yearly
Pay once per year
SAVE 15%

Choose plan:

ENTRY
10 Things, Unlimited dashboards, Unlimited stora...
$ 23.88
MORE

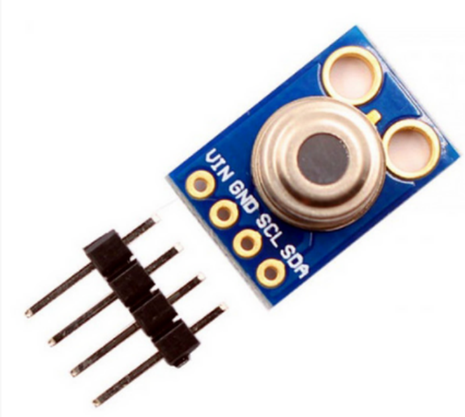
MAKER
25 Things, Unlimited dashboards, Unlimited stora...
$ 71.88
MORE

MAKER PLUS
100 Things, Unlimited dashboards, Unlimited stor...
$ 239.98
MORE

Sensors

- Temperature sensor

GY-906 MLX90614



The GY-906 MLX90614 is a high precision infrared non-contact thermometer module with I2C interface and 5V or 3.3V operation.
Due to its high accuracy and precision, it is also used in a wide range of commercial and healthcare,applications like room temperature monitoring, body temperature measurement, etc.

The main difference between this and most other thermometers is that the temperature reading is taken without contacting the object whose temperature is being monitored

key features:

- Non-contact measurement: perfect for measuring the temperature of moving objects.
- Temperature measurement range: -70°C to +380°C
- I2C/SMBus interface
- Optional PWM and interrupt output

3.3V or 5V operation

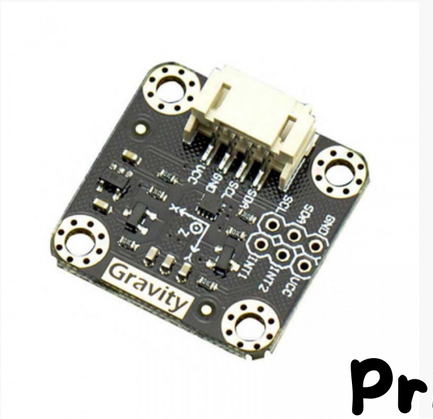
- The module has a 3.3V regulator on it. It can handle up to 6V max
- High precision of 0.5 °C

Price :49 TND

Sensors

- **Accelerometer sensor**

Gravity LIS2DH



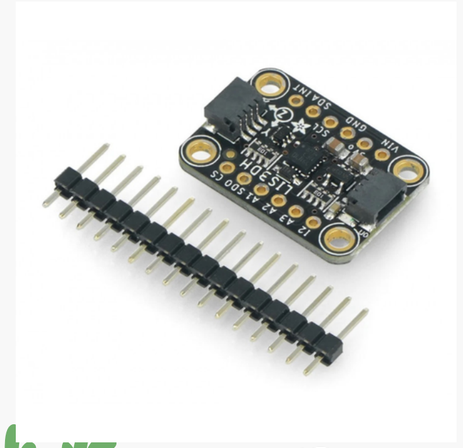
Price :20.5 TND

- Low power consumption:
  - Full Power Mode: 11µA
  - Low Power Mode: 2 µA
  - Sleep Mode: 0.5µA
- Digital output with selectable resolutions (8-bit, 10-bit, 12-bit)
- Four selectable acceleration ranges: ±2g, ±4g, ±8g, ±16g
- Low configurable sensitivity
- 3-axis (X, Y, Z)
- Communication via I2C or SPI protocols
- Operating temperature range: -40°C to 85°C
- Voltage range: 1.71 V to 3.6 V

The LIS3DH is a similar, but more expensive option with the added capability of providing 16-bit output, providing more accurate data.

The choice between the two sensors will depends on the specific needs and requirements of the cow monitoring IoT solution, the budget, and the availability of the products.

Adafruit LIS3DH



Price: 38 TND