

Embedded System



System Elements

We start with a simple question: **what is an embedded system?**



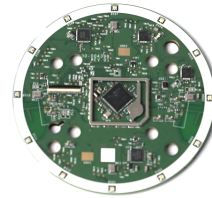
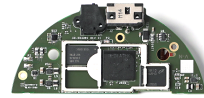
Why *embedded*?

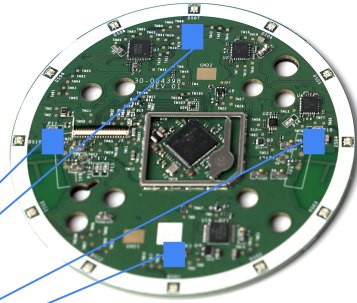
definition: "(adj) fixed firmly and deeply in a *surrounding mass*; implanted."



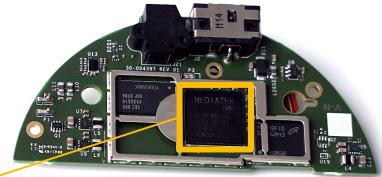
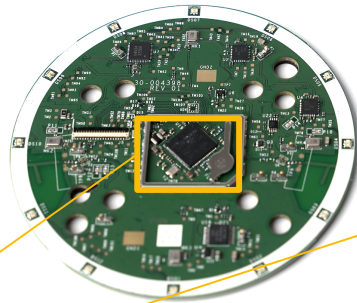




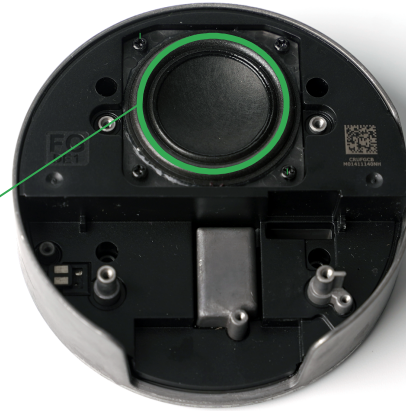




**sense
(input)**

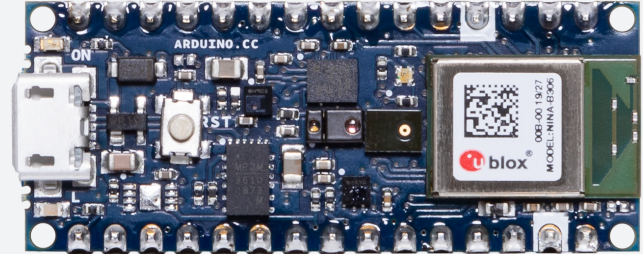
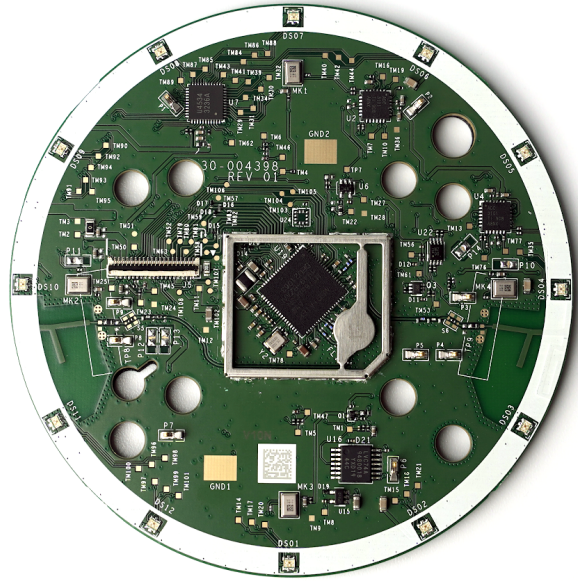


process

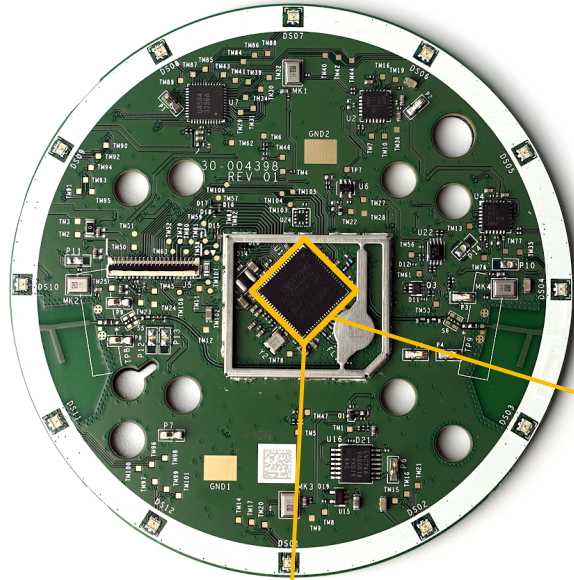


**actuate
(output)**

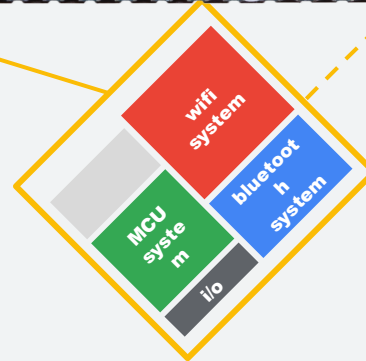
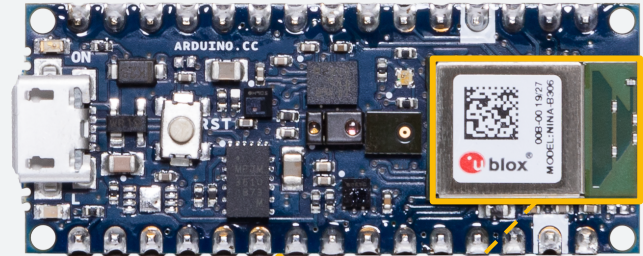
Your Embedded System



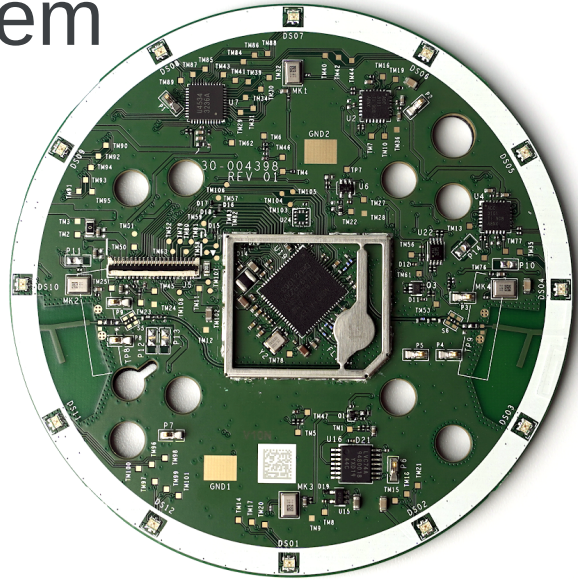
Your Embedded System



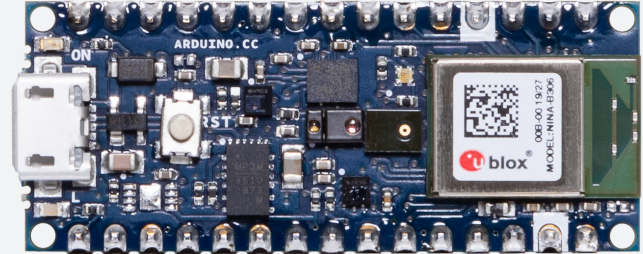
MediaTek 7658CSN: Wi-Fi +ARM® Cortex-R4

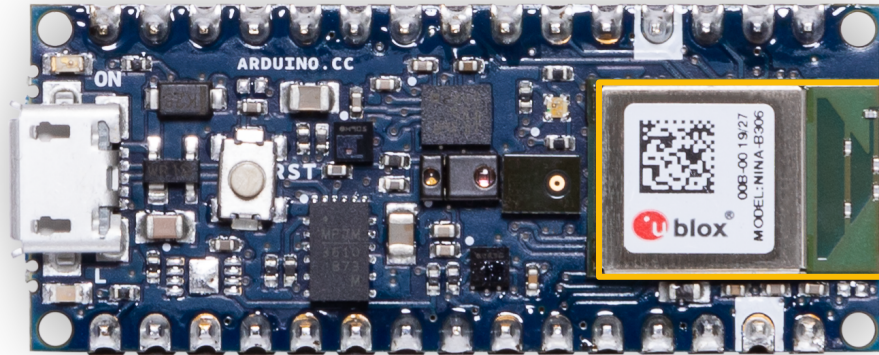


Real Embedded System

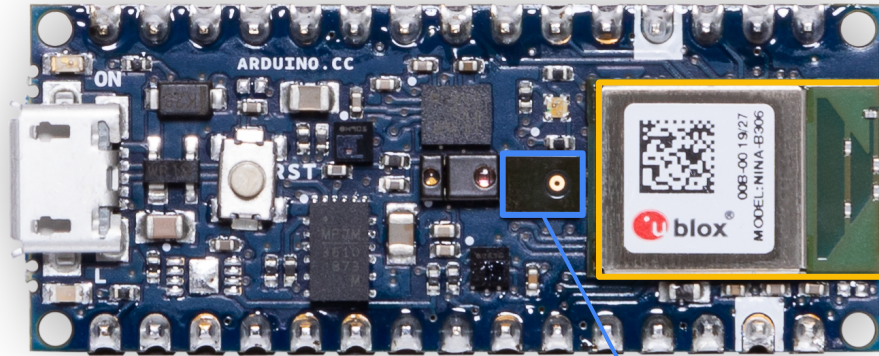


Developer Embedded Systems





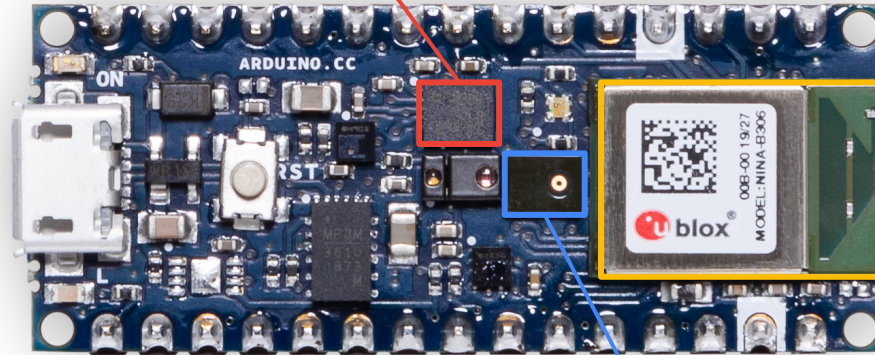
Processor
+ Bluetooth



Microphone

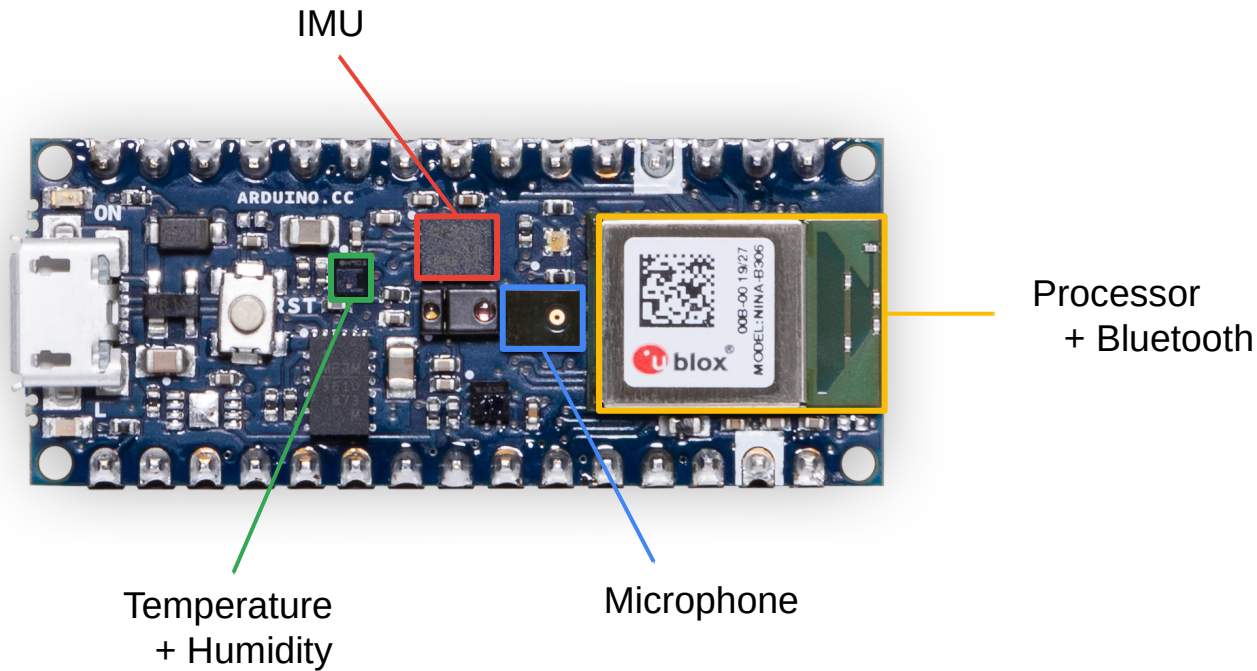
Processor
+ Bluetooth

IMU

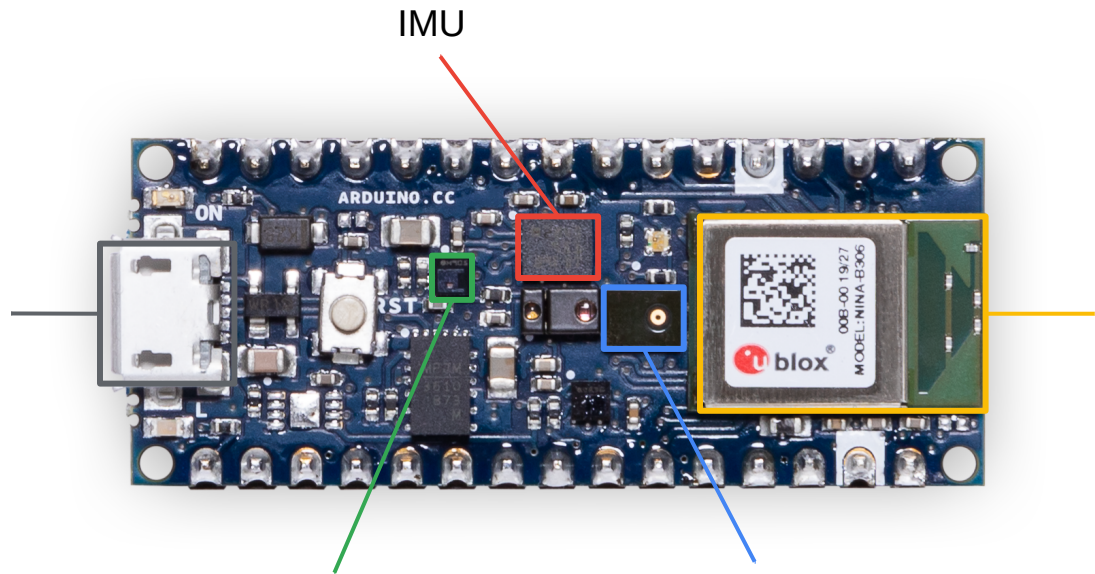


Processor
+ Bluetooth

Microphone



I/O
(USB)



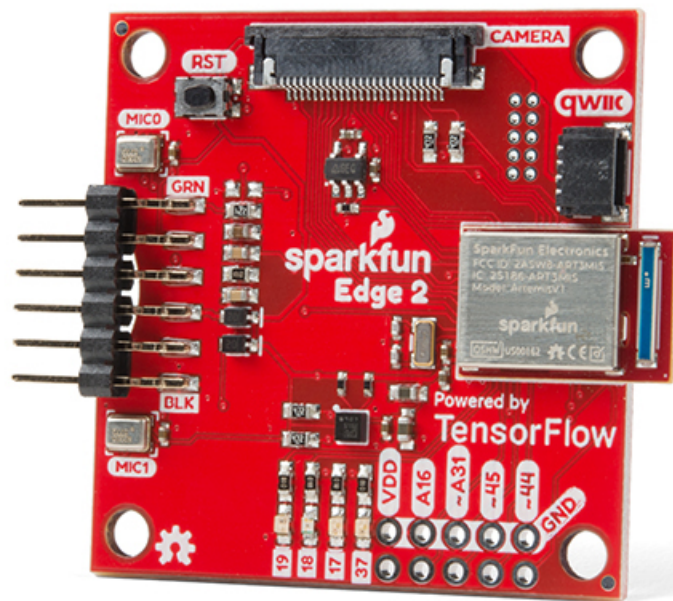
IMU

Temperature
+ Humidity

Microphone

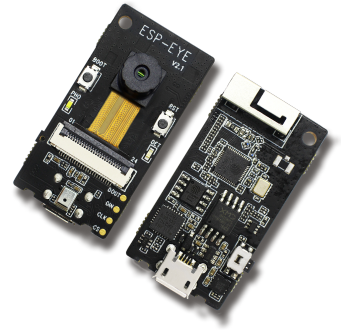
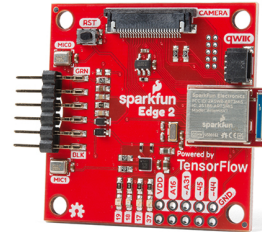
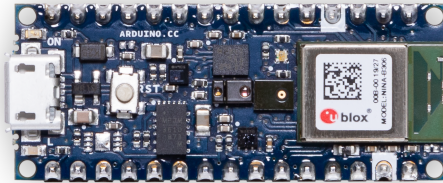
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+ Bluetooth











Embedded Systems



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

| Board | MCU / ASIC | Clock | Memory | Sensors | Radio |
|---|-----------------------------|---------|------------------------|--|--------------|
|  Himax WE-I Plus EVB | HX6537-A 32-bit EM9D DSP | 400 MHz | 2MB flash 2MB RAM | Accelerometer, Mic, Camera | None |
|  Arduino Nano 33 BLE Sense | 32-bit nRF52840 | 64 MHz | 1MB flash 256kB RAM | Mic, IMU, Temp, Humidity, Gesture, Pressure, Proximity, Brightness, Color | BLE |
|  SparkFun Edge 2 | 32-bit ArtemisV1 | 48 MHz | 1MB flash 384kB RAM | Accelerometer, Mic, Camera | BLE |
|  Espressif EYE | 32-bit ESP32-D0WD | 240 MHz | 4MB flash 520kB RAM | Mic, Camera | WiFi, BLE |

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Fullscreen Show Presenter