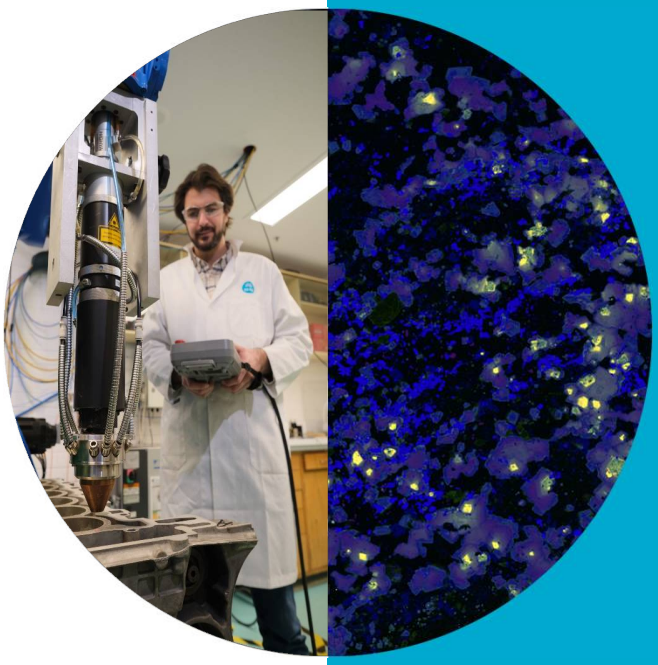
Embedded Intelligence Platform: Wireless ultra low-power IoT in food production



FDMF February 2023

Australia's National Science Agency

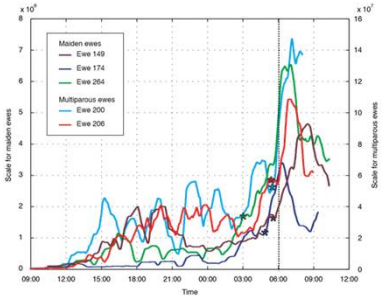
1

IoT for sensing and tracking

Field sensing – crop, livestock and resources

Intake tracking

Food processing sensing and tracking



Product and shipment tracking

Product exposure and quality sensing

Re-useable crate and container management

Production equipment retrofits

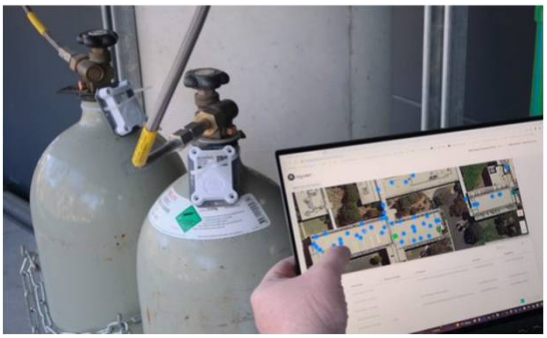
2

Now versus then …

DEVICES **GATEWAYS** **CLOUD**

- CPU: 30x faster 8x less power
- Radio: 8x faster, 30x lower power, 10x longer range
- Global standards
- Better interoperability
- Bluetooth, wifi, satellite and/or 4G/5G options

- Edge computing
- Wireless and low power
- Cloud-based data and analysis services
- Discoverable and addressable
- Always communicating



3

IoT today

- IoT systems tend to work in their own ecosystem “out of the box”
- Increasingly easy interoperability between systems
- Although some vendors may lock-in data, data streams are often easily accessed “in the cloud”
- IoT security and fault tolerance can be a challenge (e.g., device disabling, data injection, a path into corporate IT systems)
- IoT and control/OT integration is not a fully solved problem
- IoT standards and advancements don’t solve enterprise integration, which remains a cost, time and capability bottleneck

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CSIRO Future Digital Manufacturing Fund

Intelligent fault-tolerant and secure IoT in a Box

for end users and product developers

Valencia, Philip (Data61, Pullenvale) 7:10 pm

- BLE-WiFi Gateway (Fanstel https://www.fanstel.com/bwg840f-industrial-wifi-bluetooth-5-iot-gateway) with USB power supply (AU plug)
- 6 x Relays (Loci4 with LTE, BLE, LoRaWAN, GPS, SD logging, Humidity, Temperature, Pressure, Volatile Gas, Light, 3 accelerometer, and 9 axis IMU, Buzzer, Wireless Qi Charging or optional alternate lid for solar panel)
- 6 x Relay wall attachment for quick release relays
- 10 x Orion Tags (3 Axis Accelerometer, Humidity and Temp, Buzzer, Button Battery, IP67 (in water with a depth of up to 1 meter for up to 30 mins)

optional hex jewel screw drivers - probably handy for developers

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