

# RUGGED EDGE COMPUTERS FOR MOBILE EQUIPMENT

From simple, low-cost CAT M1/NB-IoT tracking devices to highly-capable, well-connected mobile computers, Appareo's telematic and connectivity solutions can meet a broad range of tracking and communication needs.

## TECHNOLOGY APPLICATION

Asset Tracking | Machine Control | Telematics | Virtual Terminal Support

On one side of the spectrum Appareo offers low-cost, cellular, IP69K-rated asset tracking devices with ultra-long battery lives. These products can be globally deployed using CAT M1 LTE and NB-IoT networks with GPS, with battery life lasting up to five years without the need to service the device.

With capabilities beyond that of a simple tracking device, your cloud application can reach out to the device to change its configuration, such as frequency of updates and sensor-interface settings (e.g. receiving a movement report from the device's integrated accelerometer). For extended battery life applications, the device can persist for long periods in a low-power sleep state and be woken on demand by a text message requesting that it sends its current location.



On the other side of the spectrum, Appareo manufactures a series of telematic control units (TCUs) combining the high-power computing performance of a dual-core processor with the ruggedness of an IP67 or IP69K enclosure. Appareo TCUs are trusted by global OEMs, and meet their stringent environmental requirements. They contain up to 6 CAN buses, Automotive Ethernet, WiFi, Bluetooth, and Cellular Connectivity for EU, North America, South America, Australia, and Russia.



### I/O customized to include:

- Up to 6 CAN buses
- 802.11 b/g/n WiFi
- Bluetooth
- BroadR-Reach
- Ethernet
- LTE CAT 1/4 with 2G/3G
- GPS
- Short-range 433 MHz radio
- Iridium SBD

## CAN CONTROL UNIT (UNDER DEVELOPMENT)

### Features:

- 32-bit Arm Cortex-M7 processor (550 MHz)
- 128 KB flash, 564 KB RAM
- Facilitate low-power wake-up modality, handle CAN messaging, and networking logic
- Internal power protection
- Built for rugged environments: IP67, high/low temperature extremes, high vibration, for machine mounting
- 4x CAN supporting bandwidth speeds up to 1Mbps that are also FD CAN capable
- Possible to swap some CAN to LIN communications
- Possible to add RAM (64 MB) if needed

### Use Cases:

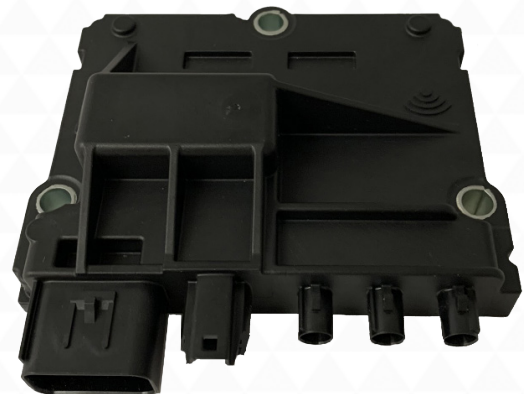
- Security Gateway
- CAN data pass through or translation
- Engine Hours (key on)



## TCU 210 (UNDER DEVELOPMENT)

### Features:

- Single or Dual core i.MX8 processor (1.2 GHz) with companion Cortex-M4
- Global certification options
- 4-8 GB Flash, 512 - 1024 MB RAM
- Cat 4 / Cat 1 modem as primary data link when machine is operating LPWA modem for remote wakeup when machine is off
- Embedded eSIM
- 2 CAN ports (CAN FD capable)
- WiFi 5 (802.11 a/b/g/n/ac)
- Bluetooth 5.0
- Automotive Ethernet 100-BASET1
- USB 2.0 Device interface
- Keyswitch input
- Power protection: low-power consumption and multiple wake-up methods (key, CAN, SMS, time, and voltage)
- Built for rugged environments: IP67, high/low temps extremes, high vibrate



### Use Cases:

- Wired and wireless telematics
- Remote diagnostics
- Buffer data and send with strong cellular signal only

## SOFTWARE DEVELOPMENT KIT (SDK)

Appareo TCUs are built on Yocto Linux with Docker support to allow developers to quickly deploy applications, whether that software be written by your in-house team, or by Appareo on your behalf. In addition, hardware-abstraction libraries are provided to provide easy porting to variants of hardware platforms. As custom variants, technology improvements and upgrades are built into future designs, the same abstractions can be used to run on multiple platforms. These libraries also allow for rapid development of custom applications to be run on target. Hardware abstraction libraries exist in C/C++, but Python, Rust, Google Go (GoLang), and .NET and can all be run on Appareo TCUs.

### SUPPORTED LANGUAGES:

**C/C++, Python, Rust, Google Go (GoLang), .NET**

## POSSIBILITIES

From remote diagnostics (securely accessing TCUs to troubleshoot equipment in real time) to inexpensively deploying firmware updates through differential software updating tools, Appareo has the real-world telematic deployment experience to support your business. Beyond the wide area network capabilities of the TCUs, Appareo products have been used extensively for the local area network connection of phones and tablets to off-highway equipment for both control and monitoring purposes.

## REGULATORY & NETWORK CERTIFICATION

Iridium Network | Verizon Network | Vodafone | CE | IC | FCC | RCM

**The team at Appareo is dedicated to turning acumen and ambition into tangible technology, and we're always ready to work with partners that share our drive.**

**Visit our website to learn more about our services and capabilities:  
[appareo.com](http://appareo.com)**

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BATTERY-POWERED DEVICES | ARTIFICIAL INTELLIGENCE | SATELLITE