blues wireless

Building a GPS Asset Tracking Device

"Solve your asset tracking, monitoring, utilization, and maintenance issues with a simple cellular IoT solution."

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Developer Relations Lead

Instructions on Hackster

What is GPS asset tracking? By leveraging the powerful simplicity of IoT, you can track and manage high-value assets with low-cost devices that provide data security by design. This will result in greater efficiency and cost-savings, whether you're using GPS asset tracking to prevent theft, improve safety, or monitor the status of materials in transit.

When building IoT device PoCs or prototypes it's best to use a Blues Wireless Notecard System on a Module because it's the quickest and most affordable way to add connectivity. The Notecard is a cellular and GPS-enabled device-to-cloud data pump. You can view asset location in real-time, capture additional data such as temperature and acceleration with its other onboard sensors, or add custom IoT sensors via the Notecard's open firmware.

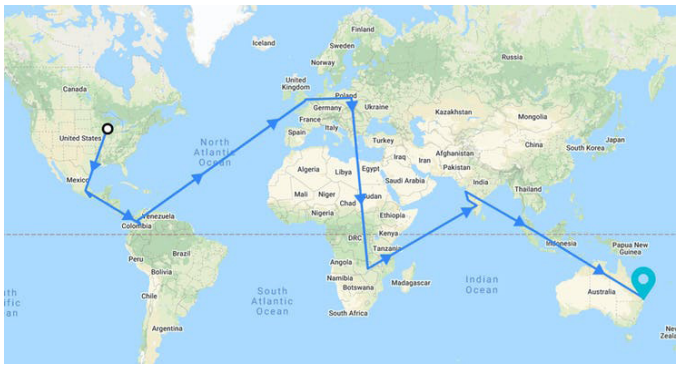
Learn how to build a cellular IoT sensor prototype for GPS asset tracking for $100 or less, using only 3 hardware components.

Asset Tracking at Scale

Monitoring physical assets is an immense challenge at scale as there are many technical and logistical hurdles to clear. Many organizations track assets using outdated labor-intensive methods that result in significant inefficiencies and material losses. This presents additional challenges with a large quantity of assets or those that are geographically dispersed.

You can solve your asset tracking, monitoring, utilization, and maintenance issues with a simple cellular IoT solution:

- **Continuous Monitoring** - Examine asset-related data including location, environmental factors, and physical condition to determine the health of a specific asset or an entire fleet.



- **Track Mobile Assets** - Using GPS/GNSS technologies, actively track assets on a continuous or periodic basis around the world.
- **Minimize Loss with Geofencing** - With active tracking of assets, you can be alerted to an unexpected departure of an asset from a predefined geofenced area.

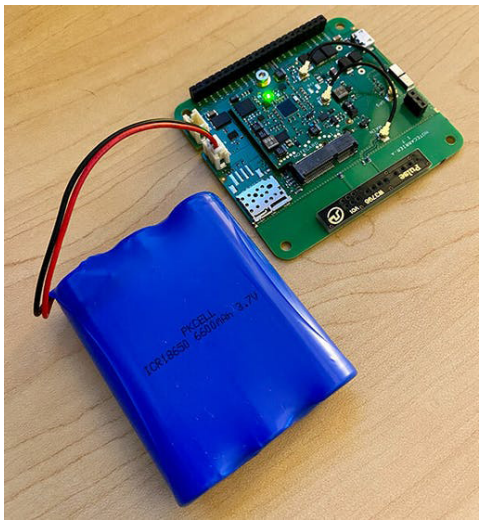
Using Blues Wireless Notecard and Notehub for connectivity, you can deploy low-cost GPS tracking devices for a fleet of assets that allows holistic data access from anywhere using a cloud-based dashboard. For the fastest development time, plug the Notecard into a Notecarrier, a host board with extensions for headers, battery connections and antennae. You can go from unboxing to sending arbitrary data over the global cellular network in less than 30 minutes.

Behind the GPS Asset Tracking Device

If you've been searching for a scalable GPS tracking solution with global connectivity and no monthly fees, this is the best project to follow. The Notecard comes with 500 MB of data usable over 10 years. You can find the complete project assembly instructions on Hackster.

Hackster: https://www.hackster.io/rob-lauer/sending-a-cellular-gps-tracker-around-the-world-literally-4b830c

Price: $179.94	Languages: JSON
Lines Of Code: < 50	
Project Time: 1 Hour	

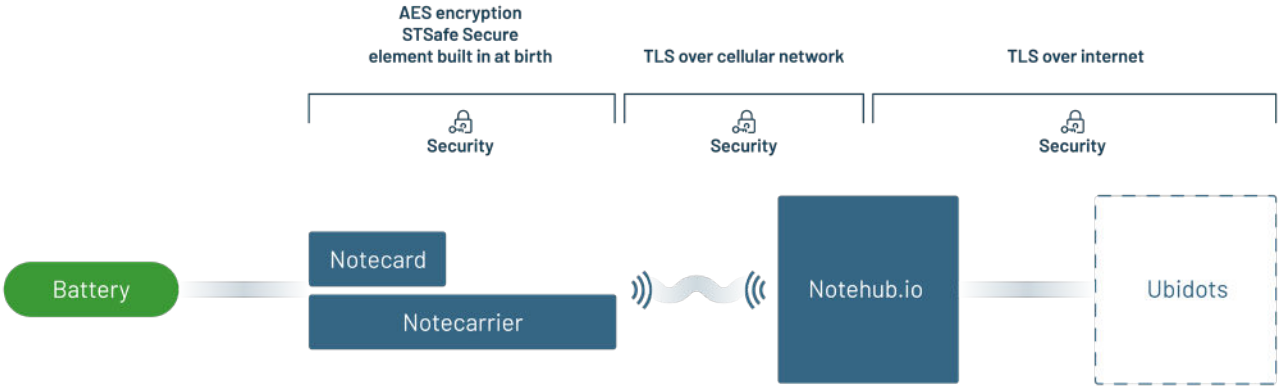


Hardware

- Blues Wireless Notecarrier-AL
- Blues Wireless Notecard SoM
- 2000 mAh LiPo Battery

Software apps and online services

- Blues Wireless Notehub.io
- Ubidots

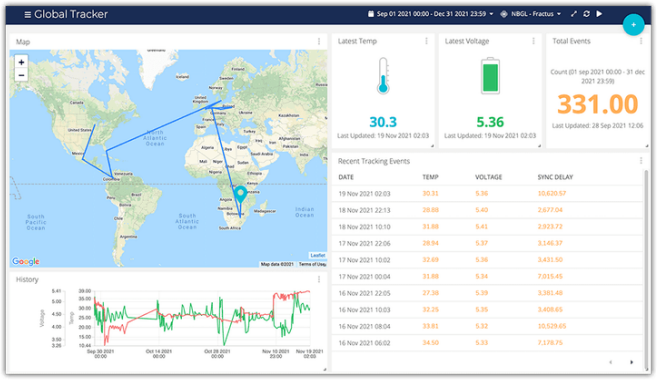


The main parts of the project are:

- Setting up the Notecard as a standalone asset tracker.
- Storing and receiving tracker data.
- Creating a dashboard for displaying animated tracker data.

Using the Notecard as an Asset Tracker

The Notecard can be configured as a standalone asset tracker that captures GPS readings and uploads those to the Blues Wireless cloud service, Notehub.io, on a periodic basis. It can also be used with a host microcontroller or Single-board Computer to add cellular to your project. To configure the Notecard as a standalone tracker, connect it to a Notecarrier-AL.



GPS & Data Tracking

Data captured by the Notecard can be tagged with time and location using the cellular network and a GPS receiver. The Notecard does not maintain an active connection to Notehub.io, rather it reconnects periodically to send and download data. Each Notecard comes pre-paid with 500 MB of data and 10 years of cellular with no activation costs, monthly charges, or surprise fees.

Security

Modern services require that the cloud and the device perform bidirectional authentication to provide stronger safeguards. For many applications it's important that data is encrypted. For this reason, the Notecard integrates an STSAFE Secure Element which contains symmetric keys manufactured into the chip. With this functionality, there's no need to handle or manage secure key material.

Low Power Consumption

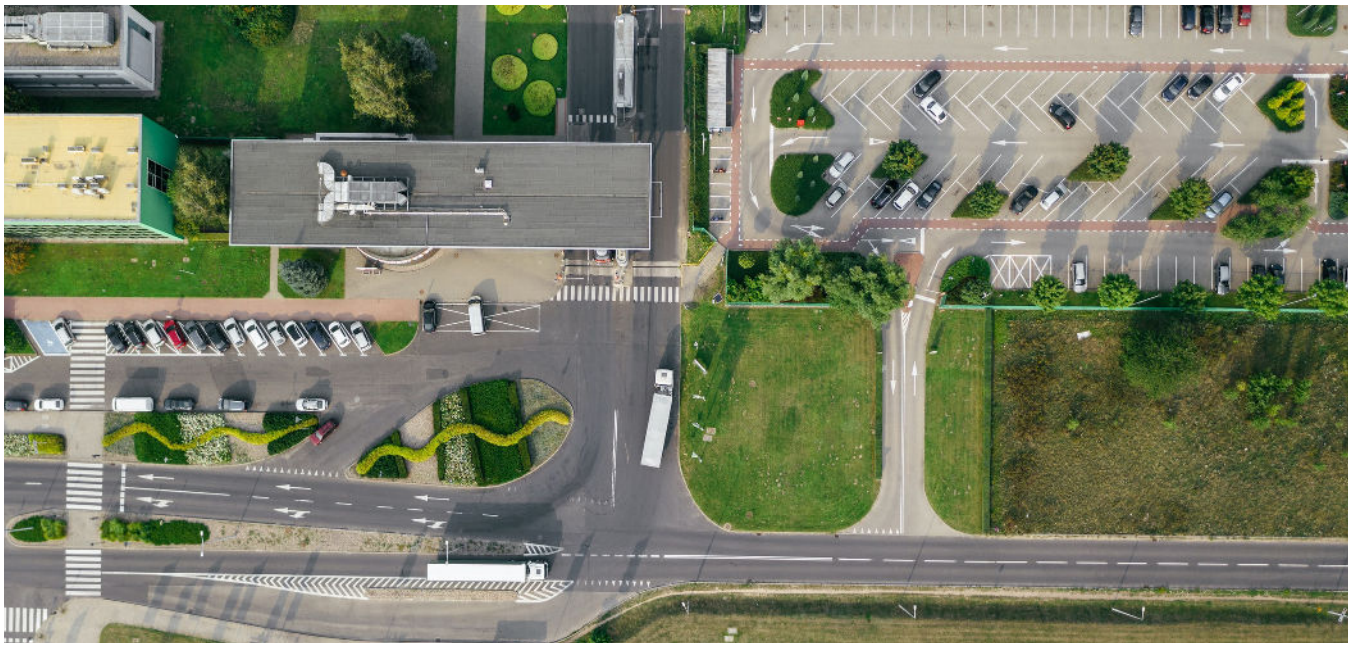
The Notecard has a built-in accelerometer, meaning it pays attention to device movement but does not capture new GPS data if the Notecard hasn't moved. This gives it a typical idle current consumption of ~8uA at 3.3V. You can adjust the sensitivity of the accelerometer to ensure that you're tracking the right movements to trigger GPS activation and add a daily heartbeat command, to make sure that each tracker checks in daily even when stationary.

Fleet Tracking

Multiple Notecards can be used together for GPS fleet tracking. Fleets allow for the organization of Notecard devices into logical groupings and are managed at the project level. You can utilize your own naming convention and use it in any way that fits your individual project. However, if you are looking for guidance, we recommend the following organizational structure:

- **New**: View and triage Notecard devices added to a project.
- **Operational**: Denote and organize active devices by device type, region, or relevant environmental variables.
- **Repair**: Segment devices that have been taken out of service but may be put back into service.
- **Decommissioned**: Archive devices that are out of service and will not return to service.
- **Custom-Tagged Fleets**: Identify specific devices that may need to be monitored for anomalies, associated with a geolocation, linked to a specific custodian, or other conditional factors.

For more on Fleet Management visit the Blues Wireless Fleet Administrator's Guide, and for detailed technical information, view the Notecard datasheet here.



Applications of This Project

Whether you are tracking the physical location of an asset, monitoring certain sensors to track the health of an asset, or some combination of the two, there are myriad applications for this device, including:

- **Equipment**: track engine hours and maintenance history for heavy-duty equipment such as loaders, cranes, dozer and backhoes.
- **Trailers**: monitor every trailer in your fleet from your office or on the go.
- **High-value assets**: having the right tools for the job is one thing. Knowing that the right tools are at the right site when they're needed is another.
- **Biological material**: monitor the temperature, humidity, and fall detection of a critical bio shipment such as vaccines
- **Perishable goods**: eliminate waste by monitoring and optimizing the entire supply chain from harvest to shipping to distribution

You can follow these instructions to learn how to build a GPS asset tracker using the Blues Wireless Notecard.