



# TEKTELIC

communications

## IoT for Asset Tracking

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Organizations that depend on physical infrastructure, equipment and logistics need to constantly track, monitor and manage a wide range of physical assets, including inventory, machinery, vehicles and workers.

Historically, organizations found it difficult to connect and track a wide variety of remote assets in real-time, resulting in a mix of systems and techniques, some automated and some manual. Today, the proliferation of IoT and LoRaWAN® technology provides real-time insight into assets that can be analyzed and acted upon, enabling businesses to achieve seamless end-to-end monitoring of both indoor and outdoor assets at a low cost.

Maintaining accurate asset tracking is no easy task, particularly when assets are constantly in motion, being transported between warehouses and production facilities. Organizations can now create a digital thread, not only across their own assets but across their entire value chain, from sourcing through to customers, giving complete real-time end-to-end visibility of the lifecycle of all assets.

Industries including transport and logistics, field service, manufacturing, energy and healthcare are using asset tracking to:

- » Improve asset utilization,
- » Optimize supply chain management
- » Manage workflow and scheduling
- » Achieve compliance
- » Automate auditing
- » Generate real-time reporting
- » Prevent equipment losses
- » Improve worker productivity and safety
- » Harness predictive maintenance
- » Continuous improvement in operations and processes
- » Reduce time-to-market for goods

### ***Real tangible use cases include:***



Vehicle Tracking



Railway Cars



Pallet Tracking



Lone worker safety



Animal Tracking



Geo-fencing

Most businesses need to track both indoor assets such as plant machinery, and outdoor assets such as remote equipment, requiring different technological approaches as part of an end-to-end system. Leveraging its expertise in IoT and LoRaWAN technology, TEKTELIC has developed solutions for both outdoor and indoor asset tracking.

### Outdoor Tracking

Today, GPS is the most widely utilized technology for outdoor asset tracking. GPS technology combined with the long-range communication capabilities of LoRaWAN®, is opening new opportunities for automating asset inventories, optimizing supply-chain flows and increasing traceability throughout the value chain. This enables businesses to track a wide range of outdoor, un-powered, and high-value assets including railcars, shipping containers, shipped crates and parcels, mobile trailers, fleet vehicles, industrial equipment, shipping pallets, and deep storage assets.

TEKTELIC's GPS Asset Tracker is the ideal tracking device for geolocating assets in the field. This device provides GPS enabled near real-time satellite location tracking with LoRaWAN®. The rugged IP67 design allows for operation in diverse deployment environments, with an operable temperature range of -40°C to +65°C and an optional BLE integration. The device contains 2x D Cell batteries for optimal battery life of up to 8-10 years. The unit is equipped with an accelerometer to accommodate event-based start-up, minimizing unnecessary battery usage. The Industrial GPS Asset Tracker is seamlessly integrated with TEKTELIC's end-to-end IoT solution.



Industrial GPS Asset Tracker

### Indoor Tracking

Many organizations are beginning to reap the benefits of indoor asset tracking, with applications ranging from healthcare to construction. Bluetooth Low Energy (BLE) technology is quickly gaining traction as the most cost-effective, low energy means for reliable indoor asset tracking. These technologies are becoming easier and more cost-effective to deploy.....

TEKTELIC's BLE and LoRaWAN asset tracker combines the long-range, low power benefits of LoRaWAN with the universal availability and reliability of BLE to deliver the ideal solution for locating, tracking, and managing assets in challenging RF environments such as hospitals and factories. The asset tracker is equipped with an accelerometer to enable event-based start-up, minimizing unnecessary battery usage.



BLE Asset Tracker

The BLE and LoRaWAN asset tracker is seamlessly integrated with TEKTELIC's end-to-end IoT solution.

### LoRaWAN for Smart Asset Tracking

LoRaWAN® has emerged as the ideal technology to address the challenges of smart asset tracking, providing long-range, low power, and secure bi-directional communication and allowing reliable and cost-effective city-wide coverage.

LoRaWAN® is a globally standardized communication protocol that operates in the unlicensed ISM (Industrial, Scientific, Medical) radio spectrum, which reduces operating expenses associated with having licensed wireless connectivity like cellular 4G or LTE for each end device in your network. LoRaWAN® is capable of transmitting over long distances with deep indoor penetration, making it ideal for both outdoor and indoor tracking applications. One of the primary benefits of LoRaWAN® technology is it has been proven to result in one-tenth of the power usage, or in the case of battery-powered devices, 10x the battery life of competing M2M technologies.

Not only is LoRaWAN® ideal for long-range and low power deployments, its multi-usage capabilities accommodate high device capacity in a single network. A carrier-grade LoRaWAN® collection hub, known as a gateway can have the capacity to simultaneously send and receive hundreds of messages every second from the devices deployed in its vicinity.

|    |    |    |    |
|--|--|---|--|
| Long Range   | Maximum Battery Life   | Multi Usage   | Low Cost   |
| <ul style="list-style-type: none"> <li>• Greater than cellular</li> <li>• Deep indoor coverage</li> <li>• Star topology</li> </ul> | <ul style="list-style-type: none"> <li>• Low power optimized</li> <li>• 10-20yr lifetime</li> <li>• &gt;10x vs cellular M2M</li> </ul> | <ul style="list-style-type: none"> <li>• High capacity</li> <li>• Multi-tenant</li> <li>• Public/Private network</li> </ul> | <ul style="list-style-type: none"> <li>• Minimal infrastructure</li> <li>• Low cost end-node</li> <li>• Open Software</li> <li>• Growing Eco-system</li> </ul> |

|                               |                                |   |                    |
|--|---|---|---|
| Geolocation  | Bi-Directional (FDD)  | Global Standard   | Secure  |
| <ul style="list-style-type: none"> <li>• In/out door</li> <li>• Accurate</li> <li>• No Battery Impact</li> </ul> | <ul style="list-style-type: none"> <li>• Acknowledge</li> <li>• Scalable Capacity</li> <li>• Broadcast</li> </ul> | <ul style="list-style-type: none"> <li>• Global Standard</li> <li>• True Mobility</li> <li>• Seamless</li> <li>• Roaming</li> </ul> | <ul style="list-style-type: none"> <li>• Unique ID</li> <li>• Application</li> <li>• Network</li> </ul> |

**LoRaWAN® Features, Differentiators and Benefits**

## Summary

A business's assets are often the biggest item on its balance sheet, its biggest capital investment, the part of the business that depreciates most quickly and costs the most to maintain, and yet are the lifeblood of its sales and operations. They aren't just limited to a company's own assets, every business has a supply chain of vendors and customers and partners, all of which are vital to the success of the business and its long term profitability. So whether the asset is in the organization's building, in a remote location, or operated by a third party, having real-time visibility into all those assets has become essential for businesses to operate and thrive, and IoT / LoRaWAN is making that a reality.

Visit [www.tektelic.com](http://www.tektelic.com) to learn more about the end-to-end LoRaWAN® solutions being utilized by smart cities around the world today.