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WIRELESS®

Advanced Asset Tracking Solutions With Environmental Monitoring Enable Cargo Visibility

How the IoT is revolutionizing supply chain management

Supply chains are becoming more complex and prone to disruption, a situation that has only been made worse by the recent pandemic as well as ongoing geopolitical uncertainty. For logistics managers, being able to track assets anywhere in the world and get real-time information on both their location and their condition, is a major advantage. Not only does this allow them to dynamically manage their logistic routes and minimize disruption, it reduces the threat of damage, loss or theft, while ensuring regulatory adherence.

This e-book looks at how Sierra Wireless' Acculink™ Cargo Asset Tracking & Monitoring Solution is revolutionizing supply chain management, and the benefits this is having for companies and carriers.

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How the IoT is transforming supply chain management connectivity

A number of key technology trends are combining to transform global logistics planning. Internet of Things (IoT) devices are becoming smaller, lighter and more sophisticated. Advanced sensors, compact enough to be placed in individual packages, can now monitor a wide range of different indicators, from temperature to light exposure. Edge computing allows devices to filter and send only the most relevant information, so bandwidth is not wasted. Meanwhile, cloud computing is allowing managers to collate and analyze information from hundreds of thousands of distributed devices in real time. For the first time, stakeholders are able to pinpoint the location of their cargo, throughout the supply chain. In addition, they can get reassurance that it is being transported in the precise environmental conditions required. The result is that companies now have far greater control over their supply chain. They can predict deliveries with accuracy, minimize waste and damage, and proactively mitigate against costly disruptions.

The key benefits of IoT-based asset tracking

Being able to closely track and monitor cargo as it travels through the supply chain has many benefits for producers, manufacturers and freight carriers. We look at some of the ways that IoT-based tracking solutions can help companies cut costs, improve the customer experience and drive business performance.



Real-time visibility

For most companies, once a cargo load leaves its point of origin, they have no real insight into where it is, what is happening to it and what condition it is in until it arrives at the destination and is inspected. You could have goods languishing in a port, waiting to be loaded onto a ship, or heat sensitive products that are being transported at the wrong temperature. It is not until the delivery schedule has been missed or the products are spoiled, that the supply chain managers are aware of the problem. With an advanced IoT solution you can get accurate insights into the location of the cargo, as well as precise monitoring of the environment that the goods are being transported in. Sensors can provide data on parameters including temperature, humidity, shock, tilt and light exposure. The information is available in real time, so if there is a breach, then the carrier can be notified and the situation rectified before further damage occurs.



High-value asset tracking

By leveraging cellular IoT technology, it is possible to track assets down to the individual unit as they travel throughout the supply chain using Acculink cargo visibility solutions. Location updates can be configured based on a company's exact needs. This may be every 15 minutes for assets that are moving, or hourly for goods that are stationary. Asset tracking allows companies to manage their deliveries far more accurately than before. If there is a disruption in the planned route, a new approach can be quickly established to minimize lost time. Transport data can also be analyzed over time to ensure that the optimal routes are being used. Advanced technology makes it possible to track goods when they are inside buildings or stored in basements. As a result, managers can closely track dwell time in factories, or see if certain goods have not been loaded. This is vital for just-in-time supply chains and to meet the needs of consumers that increasingly expect, next day or same day delivery.



Exception-based monitoring

While real-time visibility over shipments is a major operational benefit, it is unrealistic to expect managers to constantly monitor data feeds looking for anomalies. Exception based alerts can notify personnel via text, email or computer message when certain events happen, such as if a temperature threshold is exceeded. The alerts can be configured for the specific product being shipped. It is also possible to geofence the shipment, so that there is a notification if the product or the carrier goes outside a predefined route.



Managing liability

Many products have to adhere to strict regulatory requirements during transport. Some food and pharmaceutical products have to be kept at precise temperatures to prevent spoiling, while hazardous materials will have to follow complex guidelines. Falling short of these standards can result in fines or reputational damage. IoT data provides key evidence that can be used to audit processes or that can be submitted to the regulatory authorities. This data can also be used to settle disputes if goods are damaged in transit. Often such disputes can dissolve into a protracted negotiation between the company and the carrier. But if you can prove, for instance, that while under the responsibility of the carrier a pallet of goods was dropped or suffered undue shock at a certain time or place, then compensation can be arranged.



Preventing theft

Cargo theft costs tens of billions of dollars each year in North America. Mobile assets are particularly vulnerable, with 74% of all incidents happening when the shipment is in transit.¹ With real-time IoT tracking it is possible to alert authorities immediately if a piece of cargo is stolen, and to locate the items. By using light sensors, you can see if a trailer or even an individual package has been opened, which can alert a manager to tampering or theft. Alternatively, a package or pallet may simply have been misplaced in a warehouse. IoT tracking makes it easy to find the item without wasting time and resources searching the facility.



Reducing costs

Together these benefits combine to result in significantly lower costs, which translates into improved margins. Depending on the product, logistics can amount to between 5-50% of the final cost.² By monitoring the condition of goods, companies can prevent waste or damage to high value products and fines or negative press coverage due to regulatory breaches can be avoided. Arguably, the most valuable application would be to reduce unnecessary delays. For example, shippers can face huge detention and demurrage costs because they find it difficult to coordinate their schedules with truckers.³ With more accurate data they could synchronize loading and unloading times and improve efficiency and speed. Presently, manufacturers have to keep buffer stocks of goods in warehouses to help smooth delays in transport.

¹BSI, 2020:BSI and TT Club Cargo Theft Report 2021: Available at:

<https://www.ttclub.com/-/media/files/tt-club/bsi-tt-club-cargo-theft-report/2021-02-23---bsi-and-tt-club-cargo-theft-report-2021.pdf>. Accessed April 2021.

² A&A. 'Strategies for Reducing Logistics and Supply Chain Costs.' Available at:

<https://www.aacb.com/reducing-logistics-costs-supply-chain-costs/>. Accessed April 2021.

³ IOSC, June 2020:Reducing Detention and Demurrage Charges With Supply Chain Visibility: Available at: <https://www.ioscm.com/blog/reducing-detention-and-demurrage-charges-with-supply-chain-visibility/>. Accessed April 2021.



Acculink Cargo – A managed solution for high-value cargo asset tracking

Acculink is an end-to-end managed solution that provides stakeholders with unprecedented visibility over their assets. Whether they are being transported by road, sea or air, Acculink allows you to establish the exact location of your goods in real time and validate their condition. It uses high-tech, durable sensors that can track a variety of indicators, including temperature, shock, humidity and light, to ensure that your products are being transported in precise conditions and that regulatory requirements are being met. Sierra’s reliable connectivity solutions provide global cellular coverage.

Comprehensive management application

The Acculink cloud-based management platform allows managers to get a consolidated view on all of the assets in their network from one user-friendly screen. Stakeholders can get real-time locations and delivery expectations as well as accurate data on transit conditions. The solution is fully configurable to allow exception monitoring, with alerts being sent if certain environmental thresholds are breached, or if a product exceeds its defined dwell time in a certain location. Reports can be downloaded for regulatory purposes.



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Acculink cloud-based platform



Reduce time-to-market with a managed solution

Building out an IoT infrastructure is notoriously complex and requires significant resources and internal expertise. This is why it is estimated that approximately 60% of IoT projects are unsuccessful.⁴ First, a company has to select and set-up the IoT devices, then it has to negotiate with multiple mobile network operators (MNO) to establish the connectivity solution. Finally, it has to orchestrate and manage the data to ensure that it is delivered to the cloud in a useable format and ensure it has the application to manage it. There is also the security element to consider. A complicated and disjointed deployment could result in vulnerabilities that are exploited by hackers.

Acculink is an end-to-end solution that bundles the hardware, software, connectivity services and management platform in a single solution, allowing businesses to reduce complexity and maximize their time-to-market. Sierra is a reliable partner with more than two decades' experience deploying complex IoT solutions, ensuring that our partners can have confidence that their project will be handled using all of the available expertise and knowledge. We also provide ongoing support to troubleshoot any issues that may occur.

⁴Beecham Research, 2020. 'Why IoT Projects Fail.' Available at: <https://www.whyyiotprojectsfail.com/>. Accessed April 2021.



Use Cases

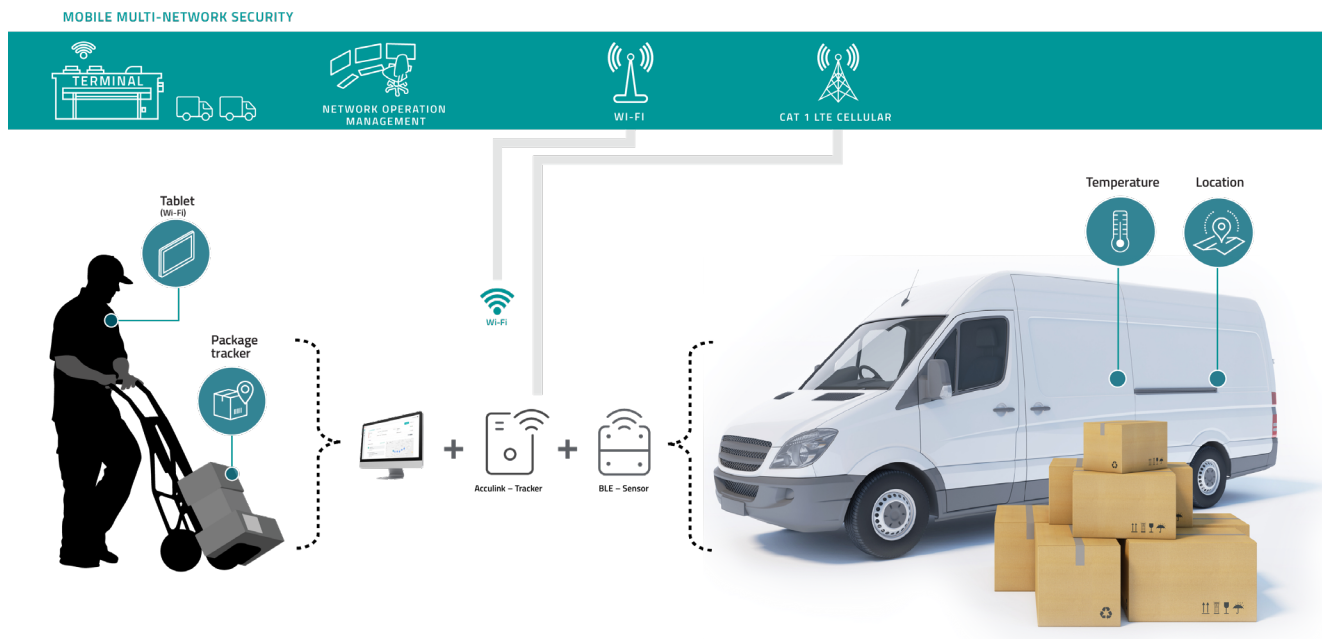
Acculink Cargo has supports these popular use-cases:

Cargo Freight Tracking

LIGHT CARGO VISIBILITY (DISPOSABLE TRACKER WITHOUT SENSOR)

Every year tens of billions of tons of goods are transported around the world by truck, rail, ship or plane. Keeping track of this flow of goods and ensuring timely deliveries, while minimizing loss and theft, is vitally important for companies.

Acculink's general cargo solution is based on real-time location tracking. Our disposable tracking device can be placed in individual packages and provides real-time location data. It is the ideal solution for tracking shipments in different weather conditions and when device retrieval is not necessary.



Cargo Freight Tracking

HEAVY CARGO VISIBILITY WITH ENVIRONMENTAL SENSOR MONITORING

This solution is designed for carriers and brand owners that need to report both the location and environmental conditions of their assets, including temperature, light, shock and humidity. Many goods have to be transported in precise conditions over long distances.

The smart-tracking device is LTE/CAT-M-enabled. Depending on various usage characteristics, these devices can be used multiple times and can be kept in the field for years without the need for battery replacement.

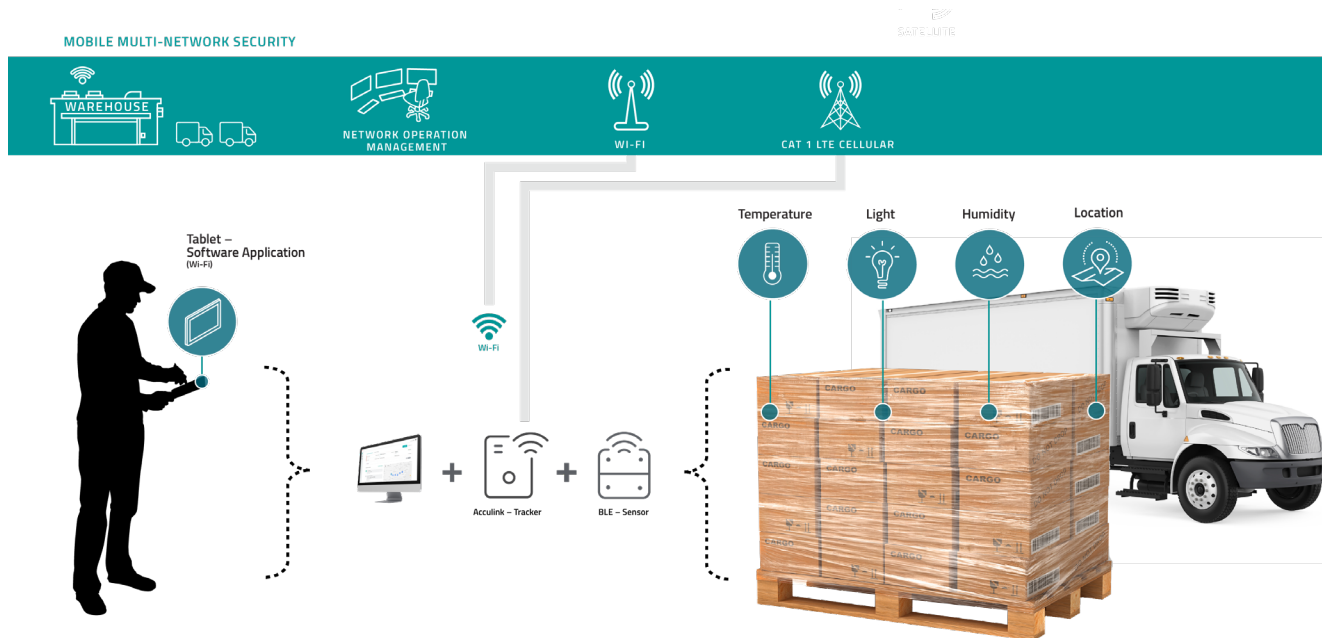


Cold-Chain Cargo Monitoring and Visibility

FOOD, PRODUCE, PHARMACEUTICALS

Many pharmaceutical and healthcare products require a robust cold-chain transportation network. For example, biotech products frequently have to be stored in temperatures ranging from 2-8 degrees C, and sometimes in excess of -20 C. By contrast, some medical devices need to be constantly monitored for tilt and shock to ensure that no components are damaged. Perishable goods such as frozen food and produce often have to be chilled or frozen to prevent spoilage to adhere to strict food and safety regulations.

Acculink's solution enables managers to closely monitor the temperature and humidity of the cargo. If there is any deviation from set thresholds, then managers will receive alerts on the device of their choice. Our smart tags transmit via a proprietary Bluetooth LE protocol through our enabled cargo hubs. They are ideal for managing quality and compliance across all transport modes.



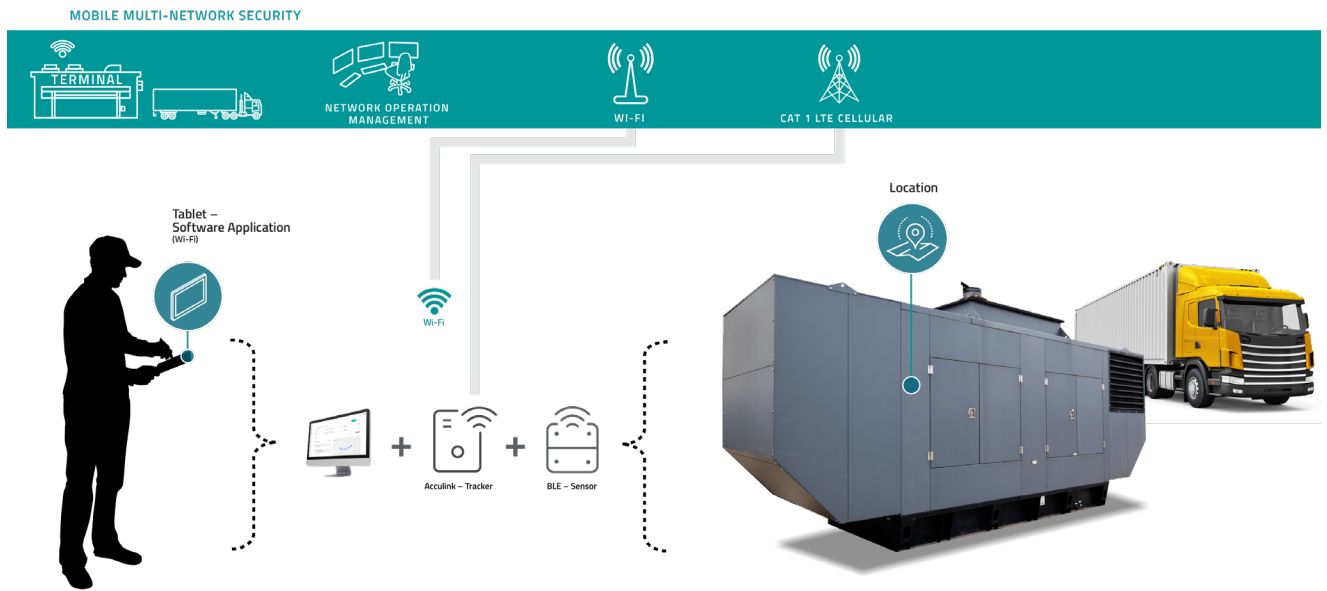
High-Value Asset Tracking

EQUIPMENT, ELECTRONICS, AND MACHINES

For high-value assets it is vital that they are transported in a way that minimizes the potential for damage. Likewise, generators, air conditioners, and other high-value machines need to be properly transported and tracked. Electronic devices such as cell phones, computers, laptops, TVs and headphones can be easily damaged. A pallet may be dropped by a crane, or boxes may not be securely fastened in a truck. There can also be shock events during transport. Any impact between the values of 1G-5G can shake the products enough to damage internal components.

Likewise, tilt is also a problem. For a flat-screen TV, any angle of more than 10 degrees can result in excess stress on the glass of the screen. High-value goods such as electronics, large machinery or construction equipment are also common targets for theft and so have to be closely monitored.

Sierra's solution tracks key parameters such as shock, position, temperature and light exposure, both in transit and during storage and loading. This helps to ensure that goods are always safe and secure wherever they are in the world. The smart devices are LTE/CAT-M enabled, providing robust connectivity.





Conclusion

Start with Sierra from an industry perspective. With 25 years' of wireless IoT expertise, Sierra Wireless helps ensure that your cargo and high-value assets are safe and secure.

For more information visit our Managed Solution Cargo & Asset Tracking info page at sierrawireless.com/acculink, or contact inside sales at 1-877-687-7795 or email sales@sierrawireless.com.

About Sierra Wireless

Sierra Wireless (NASDAQ: SWIR) (TSX: SW) is an IoT pioneer, empowering businesses and industries to transform and thrive in the connected economy. Customers Start with Sierra because we offer a device to cloud solution, comprised of embedded and networking solutions seamlessly integrated with our secure cloud and connectivity services. OEMs and enterprises worldwide rely on our expertise in delivering fully integrated solutions to reduce complexity, turn data into intelligence and get their connected products and services to market faster.

For more information, visit www.sierrawireless.com.