LINK LABS

Worlds Finally Collide
Indoor/Outdoor Asset Tracking

It's happened again.

You're already retracing your steps and racking your brain about where you might have laid it down. Of course, you know where it "should be," but not where it "actually is." And when you call the number, you hope that it will ring somewhere nearby ... but it doesn't. Was it on vibrate? Has the charge run out? Or did you leave it at the restaurant? When you still don't hear anything, you know for sure that once again ... you've lost your phone.

Let's face it. We have all at some point spent precious time frantically searching for something we needed to keep moving in life. Yesterday it was the phone, today it's the $2,500 piece of equipment your company needs to find in one of four work. Like your phone, you think you know the general area where that asset might be sitting, but you can't pinpoint its exact location—which will inevitably mean taking valuable time out of someone's workday to find it.

Sound remotely familiar? If it does, you might need to find a better solution for keeping track of your important resources. But with all the vendors and options out there, it's hard to know where to start. So, here are a few questions to ask before you leave the gate:

» **Does your business or organization have high-value assets to safeguard, locate, and maintain in real-time?**

» **Is the cost of replacing lost supplies and equipment taking a big bite out of your bottom line?**

» **Does the time spent looking for things adversely affect your operational efficiency?**

» **Is regulatory compliance an ongoing headache?**

» **Do your high-value assets move between indoor and outdoor storage and use?**

If you have answered yes to any of these questions, you should probably invest in a high-tech, real-time asset tracking system that cost-effectively meets your unique needs, both current and future.

Up until now, there have been a number of viable options designed to monitor all sorts of assets-from gas cylinders and baking racks to backhoes and mining trucks—from either indoor or outdoor locations, using a variety of proven technologies.

While these "smart" systems do the job well at each individual leg of the supply chain (e.g. the manufacturer, the distribution center, the reseller, or the user) they are not designed for seamless end-to-end visibility.

So, there is no way to establish a continuous audit trail for documenting an asset's journey through the chain, as it moves from indoor to outdoor and outdoor to indoor locations.

But the world is about to change.

This innovative device blends the best of both indoor positioning and outdoor tracking technologies into a single, long-lasting package in a compact size.

Put simply, it provides seamless, end-to-end asset intelligence at an affordable price, a groundbreaking solution we will cover in much greater detail further into this whitepaper.

Before we do, however, let's take a deeper dive into the past and current state of asset tracking technologies, to set the stage for the future and the SuperTag.

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Link Labs holds the key to solving this problem with its AirFinder SuperTag, the next revolution in smart asset tracking.

From Branding to Barcodes to Bluetooth and Beyond

Throughout the ages, humans have struggled to keep track of the stuff they own and use. Take livestock, for example.

Thousands of years before we began marking time, farmers regularly monitored livestock by simply counting their animals—a difficult method at best.

So, to make the job easier, they invented brandingas a way to permanently identify and keep up with the livestock assets

they owned should they stray off the home farm.

And in the centuries that followed, brand marking became a universal system for designating one's valuable possessions.

Unfortunately, it was a tedious, manual process that involved hot irons, caustic chemicals, and tattooing for sturdier items, or sew-on labels for the more delicate ones (like clothing).

Then in 1951, Norman Woodland and Bernard Silver patented a game-changing invention they called the barcode, a marking system grounded in elements of Morse code that were expressed in a series of thick and thin lines.

The idea was to track grocery inventories, by affixing these codes to products that would then be scanned or "read" under a powerful light.

Of course, it took two decades before their invention could be widely implemented, thanks to the wonders of computer technology, which heralded the modern evolution from manual marking schemes to ever "smarter" asset tracking systems across a variety of

industries. And since then, barcodes have become a ubiquitous inventory tracking method.

To begin with, barcodes are easy to purchase in bulk and economically feasible for monitoring low-value items. Likewise, they can be read by multiple devices, from handheld scanners to smartphone cameras, and are incredibly easy to affix to just about any surface.

Barcode technology also beats other conventional asset tracking methods such as pen and paper or computer-generated spreadsheets. Pen and paper is highly subject to human error and vulnerable to natural disaster, while the spreadsheet option leaves little room for running business rules or collaborating across the organization.

On the other hand, barcodes do have their limitations. For one thing, they require line of sight, meaning you must be able to scan them directly. For another, they can get scratched, warped, or otherwise damaged.

What's more, they have to be scanned individually, by hand—so there is no such thing as bulk scanning from a distance. Still, if items are correctly scanned as they move in and out of storage, these simple codes afford timely and accurate data for tracking stock and asset locations in real-time.

Equally important, in 1994, the Japanese auto industry introduced a more advanced version known as QR ("quick response") codes.

Using a matrix design rather than a series of lines, they transmit hundreds of times more information, which can then be efficiently read with a smartphone.

They are easy to make with a QR code generator and, like their predecessors, inexpensive to produce. Yet because anyone can create them, they are also a less secure solution.

But like every great invention, barcode technology paved the way for increasingly sophisticated asset tracking methods that were not only automated (rather than manual) but could also monitor resources in real-time from a distance, under multiple conditions.

And the Internet of Things or IoT provided the bedrock for meeting all of those criteria.

IoT Explained

Put simply, IoT has empowered us to connect literally billions of physical devices, everyday objects, animals, and people, to engage in two-way communication that closes the gap between real and virtual worlds, with little or no human intervention. This interrelated system of things allows businesses, as well as people, to maintain better control over what is, according to one IoT expert,

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the 99% of objects and environments that remain beyond the reach of the Internet.[1]

So by sending, receiving and acting on a constant flow of information in real-time, we are able to create smarter processes and structures—including cost-effective and resource-efficient asset tracking systems that no longer depend on manual operation.

These systems use a combination of sensor tags—affixed to the items being tracked—and asset management software to continuously document movement as it occurs, thereby allowing you to know where those items are at any given point in time. Likewise, different systems employ different technologies for tracking an asset's physical location, condition, and overall usage—with new and more effective options hitting the market every year. For example, continuous innovation in low-power

"beacon" technology is driving ever more sophisticated real-time asset tracking solutions. Beacons are typically Bluetooth-based devices that transmit data through radio signals with the help of a small radio transmitter and battery.

But regardless of the technology deployed, asset tracking is now the fastest growing industrial IoT market.

And no wonder, given the many benefits afforded when these devices are used to manage industry-essential assets.

Case In Point - Hospital Equipment Tracking

One study conducted among nursing staff in a small hospital demonstrated the efficacy of implementing a real-time location system (RTLS) when it came to significantly improving patient care.

Designed to meet the unique attributes of a medical environment, this system used a combination of active tags—attached to medical treatment equipment—and Bluetooth Low Energy (BLE) sensor beacons. Given that these tags were deployed to track highly mobile medical treatment assets that regularly moved between rooms

and floors, they were battery-operated. As such, they transmitted equipment location information based on data received from the beacon.

And after three months, the nurses who took part in the study reported experiencing positive results overall (despite occasional glitches in the technology):

» Although patients often moved around while receiving tests, procedures, and exams, it was easier to identify and round up the required medical equipment as needed, thereby reducing the critical wait time for both patients and staff.

» Patients were also able to receive emergency medical interventions more quickly.

» Having a computer dashboard to use in managing equipment quantity and location, nurses no longer had to find and manually count critical equipment at the end of each shift.[3]

In fact, a recent study conducted by ResearchandMarket.com projects that by 2030, the IoT supported asset tracking market will account for over 90% of all connected enterprise and industrial solutions.[2]

90% **of all connected enterprise and industrial solutions**

Like the nursing staff, managers in many other industries have reported positive outcomes after implementing IoT asset tracking systems.

Example Benefits

Manfacturing

Increased productivity by reducing the amount of precious time spent looking for tools, equipment, and materials

Pharmaceutical Production

Better able to maintain regulatory compliance by having the capacity to store, track, and develop a chain of custody for important records related to clinical trial participation, while also enabling digital proof of delivery for high-value or time-sensitive shipments

Mining Operations

Can monitor employees' safety should their vehicles and/or equipment move into unsafe work areas

Academic Organizations

Able to keep a closer eye on valuable items like lab equipment, library books, test samples, high-value documents, and computers

Construction Companies

Lower theft rates of expensive materials left onsite during off hours, as well as increased ability to locate small equipment like generators and compressors in laydown yards

Rental Companies

Ensure leased items are returned on time and in good condition

Farmers

Have a real-time system for monitoring livestock, harvested crops, and high-value equipment like combines and tractors, in addition to implements, like haybalers, that go with them

Logistics Companies

Improved delivery times

Emergency Management Agencies

Increased capacity to track the location, quantity, and condition of disaster relief supplies and equipment for quicker and more accurate emergency response

500 km

GPS:23.585.39585.234
Driver 001-4237-2437
ID:48572:874-9549583
direction: 494-57-12
location: 4975-41-724

control check message
online: 24-98-11-3400
control check message

The Ins and Outs of Asset Tracking Technology

 "Smart" asset tracking systems are a wise investment with a big return for any number of businesses. If you know what you own, you won't purchase something you don't need; and more importantly, if you know where it is, you won't spend valuable staff time and energy trying to track it down. Likewise, if you can't monitor an asset's age and condition, location and use schedule, you may find yourself at risk of non-compliance with industry-specific regulations.

And if you still favor manual tracking methods—like pen and paper, barcode scanning, or spreadsheets—you are far more vulnerable to human error, which can result in one or all of the following: unnecessary purchases, wasted staff hours, and non-compliance.

So, given that an intelligent RTLS can potentially save you hundreds of thousands of dollars, it makes sense to look for a solution that fully meets your unique business needs, both now and going forward. Because there is no "one size fits all" technology, that will probably mean

implementing a hybrid solution that integrates the right combination of compatible technologies to get the right job done.

With that goal in mind, the following section provides a general overview of those technologies most widely used for both indoor and outdoor asset tracking systems.

This overview includes the strengths and shortcomings of each, based largely on three comparative attributes identified in a recent survey published by a global working group of research engineers:

» **Accuracy refers to the difference between estimated and actual positions, which can vary depending on the environmental conditions under which they are operating at a given point in time.**

» **Coverage is the amount of territory—or range—in which a tracking technology or system can locate an asset, given variable environmental factors.**

» **Cost covers the resources—human, environmental, and financial—required for installing, operating, maintaining, and scaling a system that uses one or more of these technologies.[4]**

Indoor Tracking Technologies
Radio Frequency Identification (RFID)

RFID is a form of wireless communication that sends or receives messages from asset tracking tags, using specific radio frequencies, to locate an object, animal, or person. Given that these tags do not require line of sight like say barcodes, they make it possible to scan multiple items at one time, from within a closed container. Likewise, RFID tags can track items as they enter and leave a facility—a real bonus for inventory management. There are two basic types: passive and active.

Passive RFID tags, commonly used for inventory control (think retail clothing), incorporate readers that send out a powerful radio frequency signal, which is then picked up by a simple antenna that reflects it back to the reader.

Strengths

✓ Active tags have a much longer read range-more than 300 feet.

✓ These tags yield important information beyond simple positioning (e.g. the temperature of heat-sensitive items), which makes them a better choice when you need to safeguard high-value assets.

✓ Likewise, the real-time location information they provide is generally more accurate.

✓ Active tags are quite durable, so there is less risk for damage from weather, chemicals, or basic wear and tear.

✓ Active tags, specifically "BLE" tags, are interoperable with smartphones and tablets, lowering the barrier to entry for any individual or business that wants to use them.

Shortcomings

✓ Passive tags have an extremely short read range—from two to 20 feet—and do not track assets in real-time.

✓ Because they lack a battery, they have extremely limited capacity for storing information and can't "talk first."

✓ And because sensors require constant power to operate, passive tags are pretty useless for most sensing applications.

✓ Although the tag cost is lower, the overall system is expensive, given that these tags must have a high-powered reader to "wake up" the antenna.

✓ Passive RFID Tags (with the exception of short-range NFC) are not generally interoperable with smartphones or tablets, limiting the individuals and locations that can leverage the technology.

Bluetooth Low Energy (BLE)

As stated earlier, power-efficient beacon technologies are driving the new generation of indoor positioning systems. More specifically, Bluetooth Low Energy (BLE) - also known as Bluetooth 4.0 - is a wireless technology that uses small, strategically mounted radio transmitters called "beacons" to broadcast signals to "smart" devices within a relatively close range.

And while classic Bluetooth is a better choice for continuously streaming large amounts of data, BLE is best suited for periodically transmitting smaller packets of data.

Strengths

✓ BLE consumes far less power than classic Bluetooth, which translates into a much longer battery life.

✓ Other than passive RFID, BLE tags are the least expensive.

✓ Depending on the solution, there is little or no IT integration involved.

✓ BLE can establish as many as 20 simultaneous connections, compared to classic Bluetooth that is limited to seven; thus, it can be configured to track a greater number of assets in real-time.

✓ Because accuracy is based on the number of beacons installed, you can start off slowly in one area or with a single function, and work your way up through a range of precision needs—which of course, makes this option cost-effectively scalable.

Shortcomings

✓ Because this technology has a fairly limited range of about 100 feet, it requires a sufficient network of readers, which can be expensive, depending on the coverage needed.

✓ At the same time, distance calculation accuracy is affected by such environmental variables as signal blocking and reflection (although Bluetooth signals can pass through light materials).

✓ The beacon's power consumption is directly proportional to how often data is broadcast, as well as the signal strength required-so as frequency and signal strength increase, so does power consumption, which shortens battery life.
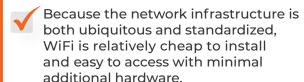
WIFI

WiFi works off of a local wireless network that uses radio waves to communicate large amounts of information, at transfer speeds of as many as several gigabits.

That said, it is often employed for indoor asset tracking, with the help of two basic techniques - Received Signal Strength Indication (RSSI) and fingerprinting - although both are susceptible to environmental factors that may have an impact on overall accuracy.

Still, it is a highly viable option for tracking assets in large indoor areas that are relatively clear of any major obstructions.

Strengths

- ✓ Because the network infrastructure is both ubiquitous and standardized, WiFi is relatively cheap to install and easy to access with minimal additional hardware.

- ✓ Given its high data throughput rate when compared to Bluetooth, it can transfer much larger amounts of data.

- ✓ It also has a much longer range—as many as 150 meters—than Bluetooth, and can detect floor level.

- ✓ WiFi signals are, for the most part, reliable and difficult to interrupt.

Shortcomings

- ✓ Accuracy at the higher end of 15 meters is a major concern, which makes WiFi less desirable for precise location compared to Bluetooth with two to four-meter accuracy (although accuracy can be greatly improved with fingerprinting, a greater number of access points, and combined use with other technologies).

- ✓ WiFi signals are inexact and distance estimates are sensitive to environmental changes, such as opening or closing doors.

- ✓ Data security is also a problem, given that as a common technology, WiFi has had more than its share of security breaches. Simply put: Your IT Group will not want IoT sensors on their network.

- ✓ Wifi Tags are generally expensive and power-hungry and have shorter lifespans when compared to other technologies.

Case In Point: AirFinder RTLS

Of course, with so much information to digest, you are probably wondering how an indoor positioning system actually works. And given the sheer number of systems on the market today—with many more in development—we thought it wise to provide a graphic depiction, using our own proprietary, cloud-based RTLS, AirFinder.

To set the stage, AirFinder employs "smart," battery-powered RFID tags, grounded in BLE technology to continuously, accurately, and efficiently generate asset location and condition data—completely independent of WiFi. That said, its location beacons can be configured to meet individual precision needs. So, you can pinpoint where your assets are and where they have been at any given point in time.

Developed with cost in mind, AirFinder requires little or no additional infrastructure or IT integration and uses off-the-shelf (rather than custom-made) components for the most part. Likewise, it runs on its own network and is highly power-efficient. And when it comes to coverage, AirFinder can be—and actually is—deployed in locations

with at least 200 rooms and many with upwards of 2,000. It can also be used for tracking assets outdoors.

With all of that in mind, here's a nifty diagram that illustrates how AirFinder actually works:

On the Move
When a tagged asset moves, its BLE Asset Tag "listens" for Location Beacons which "broadcast" a special ID.

Location Gets Updated
Asset Tags are smart enough to identify the closest Location Beacon. Once an Asset Tag has figured this out, it checks to see if it's in a new location. If it is, it prepares the next step. Otherwise, it goes back to sleep.

Location Data Sent to Access Point
Once an Asset Tag «knows» it is in a new location, the tag sends that information to a device called an AirFinder Access Point.

Relaying Location
Access Points receive and aggregate location data from nearby Asset Tags.

Access Points Connect to Gateways
When Access Points have aggregated location data from Asset Tags, they transmit that information to a Gateway.

Gateway Transmits Data to the Cloud
Gateways gather data from multiple Access Points and send them to the Cloud. Plus, Gateways can send configuration updates "over the air" to Tags, Location Beacons, and Access Points. From there, the AirFinder User Interface (UI) displays asset location and provides reports, alerts, and analytics.

AirFinder is a real- time location system (RTLS) that uses smart, active RFID tags based on Bluetooth Low Energy (BLE) technology to provide location and condition data. What's more, AirFinder requires little to no additional infrastructure or IT integration. It's even WiFi-independent.

Outdoor Tracking Technologies

Radio Frequency Identification (RFID)

Global Navigation Satellite System (GNSS) is an umbrella term used to denote all global satellite positioning systems, while its component, the Global Positioning System (GPS) refers specifically to NAVSTAR, a constellation of satellites developed by the U.S. Department of Defense (DoD). As a whole, this technology is not only ubiquitous (think Google Maps), it is also ideal for outdoor asset tracking.

Based on a global system of satellites that communicate with on-ground receivers (e.g. smartphone antennas), GNSS works in collaboration with GPS to enable assets to continuously broadcast accurate information about their current position—whether standing still or in motion. The primary difference between the two lies in the fact that GNSS-compatible equipment can access navigational satellites from other networks beyond GPS.

With that in mind, GNSS/GPS technology is widely used for geofencing—a technique

that establishes a virtual geographic boundary, which acts like an invisible fence to control and monitor high-value assets such as vehicles, shipping containers, or livestock.

Likewise, GPS has paved the way for vehicular telematic devices deployed to map and record, in real-time, the speed, location, and operating condition of vehicles like tractor trailers, combines, and delivery vans.

Strengths

✓ GNSS/GPS tracking devices have become increasingly more affordable.

✓ Likewise, when outdoors, these devices provide extremely reliable location accuracy (most to within three meters), as long as they have a clear line of sight to the sky.

✓ Because GNSS-compatible devices can use more satellites, they are even more accurate and reliable than GPS equipment.

✓ This technology prevents the theft of expensive equipment and high-value cargo, given its capacity to monitor assets in real-time, while also establishing geofences and setting up motion alerts.

✓ Satellite-enabled devices also help improve a company's bottom line, as well as its driving record, by keeping track of mileage, speed, and fuel consumption.

✓ In addition, they can help ensure employee safety, by immediately sending an alert should a driver go missing, break down, or have an accident.

✓ Because GNSS/GPS uses public telecommunications networks, tracking systems require no additional IT infrastructure or expense.

Shortcomings

✓ While prices are coming down, it is still relatively costly to either equip an entire fleet of vehicles with GPS tracking devices, or to use this method for monitoring low-value assets.

✓ GPS trackers become significantly less location-accurate in big cities with tall buildings; under bridges; inside tunnels and garages; or upon entering densely wooded areas (however, this issue can be remedied somewhat when combining GPS with a "booster" technology, like WiFi sniffing or a correction service like real-time kinematic (RTK).

✓ GNSS/GPS is a power-hungry process, which means that tracking devices have a shorter battery life (although there are improvements underway to address this shortcoming).

✓ While GNSS receivers are GPS-compatible, GPS receivers are not always compatible with GNSS.

Cell ID

As the simplest outdoor locator available, Cell ID lies at the other end of the outdoor positioning spectrum. Here's how it works.

Every base station—or cell tower—sends out a unique ID with a combination of different sector parameters that when read through an IoT mobile tracking device (such as a smartphone) provides a gross geopositioning reference.

What's more, by triangulating signals from all of the available cell towers within a specific area, we can calculate a more accurate position. And because this method operates in most cellular networks, it's a reasonable option as a backup location finder or for ascertaining whether an outdoor mobile tracking device is still working within cell range.

Strengths

- ✓ Cell ID is the least costly of all the location tracking methods.
- ✓ Likewise, it requires very little power in excess of normal cellular communications.
- ✓ This method can also help boost the accuracy of GPS in urban areas with a dense network of cell towers.
- ✓ Cell signals have other attributes that can be optimized to improve location accuracy, both inside and outdoors.
- ✓ Location accuracy can be improved with third-party correct services, such as Polte.

Shortcomings

- ✓ Result accuracy is extremely poor at only 200 to 1,000 meters—although triangulation does make a notable difference.
- ✓ And given that both accuracy and coverage vary significantly depending on cell tower density, this method does not work well in rural areas with far fewer base stations.

The Best of Both Worlds

With years of research and experience under our belts, it wasn't long before the IoT asset tracking world was ready for the next big revolution.

In answering the call, we at Link Labs have come up with a truly innovative solution we call the AirFinder SuperTag.

As previously explained, this system merges the very best indoor and outdoor positioning technology into one, long-lasting device, to provide seamless asset intelligence.

That means having the capacity to track valuable assets from the warehouse to the yard; the farm co-op to the field; the factory floor to the front door... and everywhere in between.

The Nuts and Bolts

Basically, the SuperTag incorporates five technologies that are optimized to work hand-in-hand in providing continuous, end-to-end visibility—Cell ID, GNSS/GPS, WiFi sniffing, the AirFinder Indoor Positioning Network, and Polte® (Position over LTE).

While we have previously covered four of these technology components in depth, we want to devote a little space here to briefly describe the vital role that Polte plays in this revolutionary asset tracking device.

As a proprietary, patent-protected technology produced by our SuperTag partner, the Polte Corporation, it enables cell tower triangulation, which in essence, generates accurate GPS-like location data, both indoors and outdoors.

What's more, in accomplishing this objective, it consumes less power than GPS, simply because it uses cell signals to calculate location. And thanks to Polte integration, the SuperTag will furnish at least some indoor visibility independent of additional infrastructure, should your assets enter a facility you don't control.

Key Attributes

In describing the AirFinder SuperTag, here are its most important attributes:

Power-efficient

Unlike GPS-only trackers, the AirFinder SuperTag sips, rather than gulps, power. In fact, as an intelligent device, it incorporates multiple strategies for determining whether it's worth consuming the power. From WiFi sniffing to accelerometer based "bump" detection, all of these strategies are used to infer motion before activating the tag. Consequently, each AirFinder SuperTag can last for years before replacing its battery.

Unique

Our engineers have come up with just the right combination of leading-edge positioning and backhaul technologies, capable of remotely transmitting signals at very high speeds from anywhere, in real-time. On top of that, this system supports

Firmware

Over-the-Air (FOTA) upgrades to ensure that its capabilities are continuously evolving. Equally impressive, while most vendors will talk about battery life in terms of voltage—which in a vehicle is akin to measuring maximum distance in gallons of fuel, rather than miles traveled—we have created a sophisticated fuel gauge of sorts that calculates "pings" remaining instead of simply battery voltage.

Flexible

AirFinder SuperTag configurations are user-controlled. Want it to talk more often? It can. Want it to prioritize a WiFi network as the preferred location technology instead of GPS? It can do that, too. And if you have no cell coverage, you can still take advantage of the AirFinder network. So, let's say you need measurable precision, but are in a remote area out in the middle of nowhere. AirFinder SuperTag will then use AirFinder location beacons to make that happen. And if you need to ensure your assets stay in one place, it provides you with the capacity to create geofences, as well as alerts if assets leave.

Comprehensive

We believe in providing the biggest bang for the buck when it comes to asset tracking solutions. That said, the AirFinder SuperTag's design is all-inclusive:

» **Two-way messaging between the device and cloud**

» **Multiple location technologies that provide seamless tracking anywhere (indoors and out) and under any condition**

» **An IP66 rating, one of the highest levels of ingress protection with respect to dust and airborne particles, water and liquids**

» **Is regulatory compliance an ongoing headache?**

» **Continuous location monitoring and reporting from the cloud**

» **Global operation and coverage**

Affordable

Given its low power consumption, user-controlled configuration, seamless intelligence, and low monthly pricing schedule, AirFinder SuperTag is one of the most affordable real-time location solutions on the market today for tracking assets valued upwards of $1,000 (or assets that are intrinsically invaluable to your processes or compliance needs) - not to mention its seamless indoor/outdoor asset tracking capabilities.

We've achieved these attributes by optimizing the design over the past few years.

Now, we're seeing excellent results and receiving wildly positive feedback from the market.

So how do our users rate AirFinder SuperTag? Let's look at one final Case in Point.

Case In Point-Labware Covid Mobile Test Labs

In the wake of the COVID-19 pandemic, LabWare helped meet the challenge by providing mobile test kits to states, cities and universities.

At a time when rapid, accurate testing was the first step in saving lives, this Delaware-based company worked overtime to deploy all of the essentials for technology-enhanced mobile testing in one convenient field collection kit.

This Portable Disease Surveillance Lab takes advantage of LabWare's innovative mobile, cloud-based system, designed to expedite the testing process, by eliminating cumbersome, error-prone paperwork— thereby increasing the accuracy of and reducing the turnaround time for test results.

In accomplishing this feat, they figured out a way to link a test sample to a patient, using a wireless barcode printer, with the help of an iPad app that connects via mobile hotspot into the company's Laboratory Information Management System.

So, where did AirFinder SuperTag come into play? Asset tracking, of course. It was

a great option for a number of reasons. For starters, in deploying these portable labs, they often traveled hundreds or thousands of miles between the company's warehouse in Delaware and end users in multiple states, moving between indoor and outdoor locations along the way.

On top of that, these kits, highly valuable in both cost and diagnostic benefit, had to be carefully monitored to ensure temperature control and service contract compliance.

That said, the company was quick to sign on for the SuperTag beta testing phase, in the belief that the device would help protect them as they made their way into healthcare facilities across the country. Not surprisingly, our LabWare partners reported significant results:

» **They knew how many mobile test labs they have in inventory (tags on kits in their warehouse) and how many were out in the field.**

» **They were alerted as soon as these labs were delivered to customers.**

» **They not only ensured having the minimum number of devices required in a given state, as per the contract, they also could reliably document their condition upon arrival.**

» **Understanding the real-time location of kits allowed health officials to quickly determine which kits were closest and could be reallocated to a new "hotspot."**

» **Because the SuperTag wasdiscreetly installed within the portable lab case, they were able to quickly recover lost units, which also served to deter loss from theft.**

» **And given that a good number of the sites they supplied were in urban areas where GPS does not work well, WiFi sniffing offered a much-needed alternative for outdoor positioning.**

Final Thoughts

We have come a long way in asset tracking since the early days of brand-marking livestock and using pen and paper to document and control resources. With the advent of sophisticated IoT devices, we have

moved into wholly new and ever more exciting territory, limited only by our ingenuity—which is, of course, what drove us to create the AirFinder SuperTag.

As such, it transitions from one technology to another, as needed, depending upon environmental conditions, while also allowing for flexible, user-controlled configurations based on each customer's unique needs.

Equally impressive, this innovative, power-efficient, and truly compact device carries an IP66 rating and incorporates a battery that can run for years before you will need to replace it.

Just to recap, this "first of its kind" product blends five different technologies to provide seamless and accurate location tracking, both indoor and outdoor—cell ID, GNSS/GPS, WiFi sniffing, PoLTE, and our own AirFinder Indoor Positioning Network.

Add to all of that the SuperTag's highly affordable price, and it's easy to see how this revolutionary device will make it far less complicated to track high-value assets, in real-time, through each leg of the supply chain.

Are you in the market for an innovative solution such as the AirFinder SuperTag, or just want some expert advice around your asset tracking challenges?

GET STARTED

ENDNOTES

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