ASSET TRACKING: HOW TO IMPROVE YOUR LOCATION INFORMATION

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A white paper from Nexo

Introduction

Your coolers are being automatically mapped onto your BI portal, but locations may not always be precisely accurate. What's behind this- and what can you do to improve things?

The situation

Knowing the location of assets is crucial to your marketing equipment effectiveness, and budget. Coolers that are vulnerable to being moved or stolen must be closely monitored, while logging the relocation of assets improves the auditing of your asset registry, reducing costs. What can be done to ensure high quality in your cooler location information, right from the outset? The Nexo solution has been developed with this in mind.

The technology

Asset Management techniques

Your asset is located during the data collection process. When commissioned in field, and/or when the cooler is re-synchronized, the mobile device or modem used in the field sets a location for the cooler. The mobile device or modem, not the smart controller or beacon, determines the location. Setting up your cooler and its sensing technology automatically locates it in Nexo Discovery. You can then review the cooler's location, at your desk, alongside that of your whole fleet.

> The mobile device or modem, not the smart controller or beacon, determines the location.

A related part of asset management is the asset audit. The Movement History tool in Nexo Discovery shows a record of the assets that have moved more than 200 meters since the last time data was collected. Collecting data for coolers regularly ensures you maintain an up-to-date asset registry, confirming and/or changing addresses. And when data is updated frequently, and over a large volume of coolers, the precise location of assets can be improved upon over time.

This is related to the variety of performance seen in Smart phone location pinpointing. Why are differing levels of location accuracy found in different areas? The answer lies in the layers of technology used by most connected cooler vendors, including Nexo, to determine a location.

Smart phone location technology
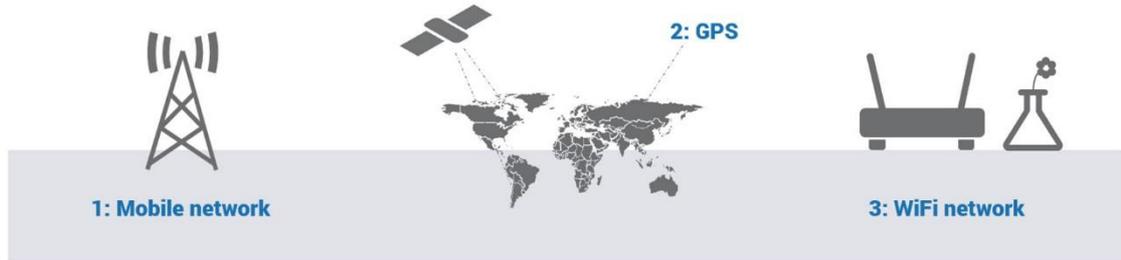
Smart phones determine their location through several geo-locating technologies. Cell towers, WiFi networks, and satellites- using GPS- can all contribute to the determination of a location. The level of accuracy varies across these methods, and is summarised in table 1.

Method	Cell tower triangulation	WiFi network triangulation	GPS (satellite positioning)
Accuracy	100m Medium	10-20m Good	Less than 10m Good
Pros	• Widely available • Low battery consumption	• Accurate • Low battery consumption	• Accurate
Cons	• Not accurate	• Depends on density of network	• High battery consumption • Does not work inside buildings

Table 1.

With all three location services switched on, a Smart phone will determine the optimal combination of these to use in each situation. It therefore follows that, with all three services switched on, you have the best chance of the Smart phone selecting the correct location. Note that the location of the cooler is not shown on a map to the person collecting data through the Nexo App.

Using the Nexo solution to optimize geo-location

Low quality
Low accuracy

Low quality
High accuracy

High quality
Low accuracy

High quality
High accuracy

Figure 1.

Nexo knows that the quality and accuracy of location data points vary (Figure 1). To address this, the Nexo solution has been designed to continually assess and improve the location data collected when coolers are visited, or polled by a modem. Further, to avoid incorrectly marking a cooler as having moved, a specially developed algorithm checks the quality of data point. In this way, the likelihood of the location data being high quality is continually improved.

> The natural process for managing connected coolers involve regular collection of cooler data.

In-field examples conducted by Nexo and its clients have shown that location data points can vary depending on terrain, urban/rural, and country. Furthermore, repeated syncs of data improve the accuracy of location data. As the natural process for managing Nexo connected coolers involves regular collection of cooler data through synchronization, location accuracy is continually improved through no deliberate intervention.

Yet, you can take steps to accelerate this process. Ensure that coolers are synchronized frequently to collect more location data points, as well as maintain all other Nexo metrics. Monitor the Location Management dial on the Nexo dashboard to help you prioritise coolers for syncing. Enable as many location services on Smart phones as possible: the cellular network, GPS, and WiFi. Switching on WiFi is not, as is sometimes assumed, a drain on the battery. A good location estimate can be created: it will 'listen' for nearby networks, even if they are not in the same building.

> Monitor the Location Management dial on the Nexo dashboard to help you prioritize coolers for syncing.

Having a picture of the changing shape of your data can enable efficient planning. Consider the growth of both cooler numbers, and location accuracy, as the waves of cooler commissioning and synchronization are undertaken. Use Table 2 as a way to frame your thinking.

Phase 1: low cooler number, medium location accuracy	Phase 2: medium cooler number, medium/high location accuracy	Phase 3: high cooler number, high location accuracy
What are your priorities? How can these be combined with a focus on location accuracy? *What testing and education can be undertaken?*	*What kind of things are you going to focus on testing and evaluating going forward?* *What do you need to test at scale, that you learned in phase one?*	*How can you maintain high levels of lo`cation accuracy?*

Table 2.

The future

Beyond the rollout of your connected cooler program lies the ongoing work of asset renewal. Each year, the addition and removal of equipment from service must be managed alongside servicing and sales initiatives. After you have set up your connected cooler deployment plan, how will information about the estate be continually refreshed? We recommend initiatives to educate maintenance staff, and regularly reassess asset processing, in light of the outcomes from the phases above.

Resources

Communication technology is not static, and asset management techniques may change with the evolving services available. Try these sources to maintain an up-to-date strategy for connectivity programs:

http://www.electronicdesign.com/
https://electronics.howstuffworks.com/
https://wigle.net/

Android advice for using location services:
https://support.google.com/accounts/answer/6179507?hl=en

Apple advice for using location services: https://support.apple.com/en-gb/HT203033

See also: Nexo, *Smart Phone Location-Iss1 / Smart Phone Location-Iss1 -ES,* 2018