

Container tracking: RFID vs. Satellite – an honest evaluation

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One recent article contrasting RFID and satellite tracking for cargo containers raised some interesting points. Unfortunately, instead of focusing on positive aspects of what satellite tracking could offer, it concentrated on making some fairly dubious assertions about the 'faults' of RFID. So, what is the truth about satellite versus RFID for container tracking?

Satellite communications that go beyond mere GPS information can provide information not only about the location of a container but also about its environmental conditions, whether it has been tampered with, and other useful data. What's more, this can be achieved with in-transit containers virtually anywhere in the world. For some applications, such as tracking of munitions, hazardous materials, pharmaceuticals and other sensitive goods, having access to that kind of information in real time can enable the cargo's owner to take immediate corrective action (if any is possible).

For the majority of supply chain applications, however, access to this type of data at the point of receipt is perfectly adequate.

Misconceptions

The issue isn't whether satellite communications between a container and a head office can offer benefits in certain applications, the issue is that the article misstates RFID's capabilities, costs and limitations with the intent of supporting the assertion that, "RFID is not good for global supply chain usage and satellite is good. In fact, RFID usage is actually dangerous for applications in US seaports."



Yard and port operators are installing various RFID reading systems to expedite shipments in and out of their facilities and to provide a value-add service to customers.

The article's review of the benefits of satellite is sketchy at best. The major support for its premise is based on a biased and, in some cases, untrue evaluation of RFID.



Having a container communicate directly with the driver of a truck instead of a head office can sometimes be more efficient.



The benefit for Port and yard operators using RFID equipment is the more efficient transport of containers through the system – freeing containers for reuse and reducing required storage space.

Technical applications

The article states that RFID cannot be used globally because there is no worldwide agreement on frequencies and hasn't been authorised for use in countries such as China. While true in some measure, the article overlooks the inconvenient and obvious fact that all major international trading countries including Japan and China have approved active RFID products operating at 433 MHz that are based on ISO 18000-7 standards. The global RF community is moving to authorise the common HF, UHF and microwave frequencies to enable RFID usage around the world. The frequency differences cited in the article apply to UHF, not in 433 MHz active tags. And, in any event, UHF systems are capable of handling those differences.

Infrastructure

The assertion that fixed location antennas might be difficult to place because of legal and operational issues is unsupported in real world application. Yard and port operators are installing various RFID reading systems to expedite shipments in and out of their facilities and to provide a value-add service to customers. Mounting readers on cranes and at certain locations at ground level address many reading needs. Readers on cranes and tugs can also provide absolute linking between container movement and the equipment or operator.

Timeliness & features

It is true that RFID typically works by having goods and containers move past a reader and that RFID data logging and e-seals offer historical data. Satellite can transmit the occurrence of unwanted events in a far timelier manner. In some instances, this can trigger urgent, necessary responses. In other instances, however, having this data go from the container to a head office isn't a particularly efficient or even necessary scheme. Sometimes, having the container communicate directly with, say, the driver of a truck, is more efficient. If a refrigeration unit on a trailer fails, the driver, not the main office in some other state, is going to have to take corrective action.

Risks

The most specious statement made is that RFID is downright dangerous because RF signals used to interrogate container tags could be used by terrorists to trigger bombs inside containers (which assumes, somehow, an external antenna since the tag interrogator signals don't penetrate the container). And the article overlooks the fact that the supposed RF-sensitive device would have to be able to differentiate interrogation at the port of origin and the port of entry in order to be an effective threat. How that might be done, when the signal would be identical in both locations, is not explored. Thus, the 'danger' posed by RFID is an entirely specious argument, possibly borrowed from the recently hyped hypothetical threat posed by RFID-enabled passports, and one that seriously undermines the credibility of the article.

Costs

The article states that costly handheld RFID readers will be necessary because the infrastructure will be unable to adequately track containers. While there will certainly be some requirement for hand held readers for e-seals, they are neither required nor desired for the majority of applications. And, while satellite linking doesn't require the same hardware infrastructure as RFID systems, it does require subscription to a service – an ongoing, rather than a one-time cost.

The more significant problem with the cost analysis is a lack of understanding of the business case. Container owners, not shippers or consignees, must foot the bill for equipping containers with either RFID tags or satellite equipment. Port and yard operators pay for installation of RFID reading equipment. The benefit for both these parties is the more efficient transport of containers through the system – freeing assets (containers) for reuse and reducing required storage space.

While some shippers and consignees could see some benefit from having real time data from containers, the majority would not. Most would not see any real benefits and would be reluctant to pay much, if any, additional fee. Thus, container owners would have little incentive to satellite enable their containers.

Finally, for ground transportation of containers, there is a growing use of GPS and other fleet and rail management tools that could provide much the same information as offered by satellite although, admittedly, the service is not generally available to customers at this point.

The fundamental structure of the article, as an attack on RFID rather than a real examination of the benefits of satellite, calls into question whether there are commercial rather than technical motives behind it – particularly since the list of RFID's 'flaws' had to be supported by dubious and erroneous statements.

Satellite does offer some real benefits, as does RFID. The nature of the shipment itself and whether corrective actions could be taken are the key factors in determining which system should be considered. Those are commercial motives that favour the customer (shipper and consignee), not a technology provider.

ABOUT THE AUTHOR AND THE ORGANISATION

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AIM is the global trade association for automatic identification and mobility technologies. AIM members are providers and users systems that capture, manage and integrate accurate data into larger information systems. As a not-for-profit industry organization, AIM's mission is to stimulate the understanding and use of the technology by providing timely, unbiased and commercial-free information.

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