

# Container security comes of digital age



**Fitting advanced telematics solutions with sensor support to dry containers can transform cargo security, supply chain resilience, and risk management, says ORBCOMM's Christian Allred, Executive Vice President and General Manager of International Sales.**

Christian Allred, ORBCOMM | Apr 09, 2024

Confronted by an array of security threats ranging from opportunistic intrusion, tampering and theft to the trafficking of drugs and people by transnational organised crime networks, container and cargo integrity is understandably a significant concern for shipping lines. The complexity of the security challenge is compounded by the ever-evolving nature of the threat, as those with nefarious intent continue to develop and refine methods to counter traditional security measures.

As an example, fuelled by the rise in drug use - by as much as 23% over a [decade](#) to an estimated 296 million users in 2021 - traffickers and other smugglers use whatever means possible to capitalise on this profitable trade. Amongst other tactics, organised crime networks are coercing employees, running front companies, [hacking](#) into customs computer systems to pre-clear consignments before inspection, arranging complex routing plans and using sophisticated and often ingenious means of concealment to evade detection. Combined with the “sheer volume of international maritime container traffic, with approximately 750 million containers shipped annually ... [this] invariably makes successful interdiction difficult”, [notes](#) the World Customs Organization (WCO).

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And, of course, it isn't just drug smuggling that is of concern. Shipping lines have to protect the integrity of containers against criminals bent on breaking them open along the supply chain to steal cargo or to load people or other types of illicit cargo inside. Increasingly, shipping lines also have to contend with desperate stowaways seeking irregular opportunities to migrate to developed countries.

While law enforcement endeavours to counter such issues, shipping lines can also contribute to enhanced supply chain security by adopting, at scale, the latest technological solutions. Recent developments mean it is now possible for Internet of Things (IoT) technologies to offer new security insights thanks to the integration of container telematics with wireless sensors. In tandem, container telematics with door sensor support monitors a container's vulnerable point(s) remotely, regardless of the mode of transport and its location in the supply chain. This capability marks the next evolution of supply chain governance and promises to redefine container security in the 21st century.

## **The evolving face of cargo security**

While padlocks, crossbar locks, bolts and ISO-certified tamper-proof seals reduce opportunistic crime, a determined assailant can overcome them. Bolts can be cut, doors and hinges can be removed to access cargo without triggering alarmed locks, and duplicate or cloned seals can be used to conceal tampering.

Pairing telematic solutions with sensor support augments traditional physical security devices and creates a more comprehensive cargo security model. Such sensors can detect door openings and trigger immediate alerts to authorised personnel via email, text messages, or API notifications, allowing prompt investigation and intervention. This is a step change to mitigating the risk of theft, intrusion by stowaways or the introduction of illicit goods during transit.

In addition to revealing potential security incidents, like unauthorised container access, the latest generation of IoT technologies can reliably monitor a container's location throughout the supply chain, send automated alerts if a container moves outside of predetermined virtual routes or time boundaries (geofences) and can potentially help owners to recover stolen goods should intervention fail to prevent theft, as responders can search the port terminal and outgoing vehicles, for example, before the thieves have a chance to move them on.

Such a capability is a significant step-change, but the security benefits of telematics solutions and sensors go beyond monitoring access to the cargo area in real time and helping track and recover missing and stolen containers. Analysis of historical telematics data can also help shipping lines make informed operational decisions to reduce the likelihood of future security incidents. Factoring in reliable sensor data allows shipping lines, shippers and BCOs to identify incident patterns and security risk hotspots in their supply chains, anticipate potential criminal activities, reroute shipments and rethink business relationships.

Such capabilities can position shipping lines as leaders in secure, reliable, and efficient transport services. As the industry continues to embrace innovative change, the future promises a safer and more secure global supply chain.

However, the benefits of telematics data are not restricted solely to shipping lines and their customers. If security incident data was shared with law enforcement agencies, they could use it to target specific containers for inspection, for example, those opened unexpectedly during transit. By enhancing law enforcers' ability to assess risk, telematics solutions and sensors can contribute to global efforts to curtail the movement of illicit cargoes, trafficked people and stowaways.

### **Reinforcing trust and reducing costs**

Shipping lines that opt for telematics solutions with sensor support to improve container security and cargo protection are an attractive prospect to customers. GPS location data means shipping lines that have adopted container telematics can provide precise, real-time information on the location and condition of cargo shipments, offering a comprehensive audit trail of the supply chain. The ability to also remotely detect possible security incidents, such as unauthorised intrusion, takes assurance to the next level, strengthening trusted partnerships, reducing costs and protecting against potential insurance claims (fraudulent or otherwise). In short, easily accessible container-specific data, not to mention alerts and notifications tailored to meet the specific customer needs, provides unprecedented transparency, control, and accountability.

Telematics solutions with door sensor support set new standards for monitoring cargo movements by creating an unbroken chain of custody, which documents the handling, control, access to and transfer of a container through the supply chain. Timestamped data forms a robust and auditable digital record of the cargo's journey from origin to destination, and such information can be crucial when providing evidence to BCOs and shippers if a seal breaks in transit.

Shipping lines that deploy sensors can further differentiate themselves from competitors by providing superior cargo care. For example, alerts of a container door intentionally or inadvertently left open allow for a speedy intervention by workers on the ground to close the door and protect against damage or loss caused by environmental exposure. Being able to remotely monitor container access also saves carriers from reputational damage and financial penalties that can arise from cases of human trafficking, smuggling and stowaways. Such capabilities can attract high-value cargo customers willing to pay a premium to protect the integrity of their shipments.

In addition to strengthening relationships between shipping lines and their customers, automated reporting of intrusions also simplifies the interaction between insurers and ship operators, potentially reducing customer claims and insurance costs for shipping lines. Access to reliable, real-time data also reduces the risk of fraudulent cargo insurance claims, which could allow shippers to make tangible cost savings through reduced insurance risks. It's a win-win scenario where risk mitigation and financial prudence go hand in hand.

### **Plotting a course toward a secure tomorrow**

With their real-time monitoring capabilities, container telematics and compatible sensors provide an unbroken chain of custody to mitigate business and regulatory compliance risks and help identify criminal attempts to subvert legitimate cargo operations. As the shipping industry continues to evolve to meet the demands of global trade, such technologies are poised to become the cornerstone of a secure and resilient multimodal container transport ecosystem.

Such sensors, including ORBCOMM's optional [DS 300](#) for its dry container solution, are compatible with both single and double-door containers, quick and easy to install, ruggedised to withstand harsh operating environments at sea and powered by long-lasting batteries to ensure they require minimal maintenance. The low operational costs of such sensors mean they are ideal for deployment across large fleets.

As we walk the path to digitalisation, it is clear that IoT technologies and data integration will continue to enhance transparency, interconnectivity, predictability and resilience across the global supply chain. Yet, while technology is undoubtedly a game-changer, collaboration is crucial to optimise its benefits. Shipping lines and governments must work together to ensure digitalisation is mutually beneficial.

Only sustained engagement can help tackle the rise of transnational organised crime and the existential threat it poses to the security of maritime operations, the integrity of the global supply chain and the fabric of our societies. By sharing IoT data and the insight it provides, we can develop a more comprehensive security framework to counter criminal activities.

The widespread deployment of IoT technologies and the sharing of telematics data can facilitate the movement of legitimate goods, mitigate the impact of criminality and exploitation, and minimise trade disruption resulting from future 'Black Swan' events. It can help to reinforce trust, reduce the costs associated with stolen or lost cargo, and ensure a more secure global supply chain. In short, it can bring cargo security and supply chain resilience into the digital age and actively contribute to a safer maritime industry.

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