ULDs start to get smart

New developments in monitoring containers and pallets could lead to piece-level or shipment-level tracking, report ***Tom Willis*** and ***Will Waters***

Klein: Smart ULDs coming sooner than we think

What constitutes a 'smart ULD' is still up for discussion within the air freight industry. But this is not necessarily a negative thing and may help promote innovation as the sector looks to new, creative ways to transport and monitor cargo shipped in containers and on pallets. Technological innovations spurred by increasing digitalisation are dominating progress and developments within air freight currently, and smart ULDs look set to be a key a part of this.

ULD pooling and management specialist Unilode sees smart ULDs as absolutely crucial to the development of air cargo. Chief information officer Floris Kleijn says smart ULDs "represent a game-changing opportunity for our industry. They will not just enable timely and accurate tracking of the pallets and containers and their contents, they will also add valuable sensor-based data regarding the condition of the ULD and its contents."

That can include things like temperature monitoring as well as impact sensors to measure shock "so that we can introduce accountability for damaged goods and ULDs, and light sensors which will assist in discovering load-tampering events", Kleijn notes.

In spite of recent efforts, including awareness programmes run by ULD Care and various initiatives undertaken by ULD management service providers, the level of damage sustained by ULDs in the industry remains "huge", he says. "A capability that allows us to hold the perpetrator of the damage accountable can

help to significantly reduce the wasted cost of damage and greatly reduce the associated administrative claims process that often ensues."

While reducing damage to ULDs is particularly important for companies like Unilode, Kleijn says different stakeholders in the aviation supply chain have different interests and priorities. And he sees the widespread use of smart ULDs coming "sooner than we think", adding: "From a technical perspective, all the enabling platforms and supporting technologies exist."

He sees the barriers to adoption being more about regulation than technology, noting: "As we all know, we operate in a highly regulated service industry where nothing is more important than maintaining and extending our safety record.

Unilode 'smart ULD' DQF container featuring its award-winning 'CanTrack' device

As a result, there are a lot of sign-offs, buy-ins, and consultations required prior to being able to deploy the technology, especially in-flight."

But to attract the level of investment required, companies need to demonstrate the value of the benefits of investing, "for which a mixture of robust business cases and entrepreneurialism will be essential towards adopting smart ULDs in more widespread deployments", Kleijn says.

In the meantime, he says Unilode continues to explore other innovations in ULD design and management – as evidenced by the company's win of IATA's inaugural Innovation Award in 2015. The award-winning CanTrack GPRS tracking solution for ULDs consists of a solar panel and a customised power converter fitted onto the container that harness solar energy to charge the on-board batteries. CanTrack provides real-time information on temperature, humidity, impact and the location of the ULD and its cargo, enabling damage reduction, greater visibility and improved velocity through the supply chain.

"Since that time we have continued to refine our technical solutions whilst collaborating with leading customers and service providers in the industry," Kleijn notes.

Other developments in the pipeline for Unilode include automating a logistics planning function; improving a full pooling option; increasing the functionality of its IT systems; developing the exchange of data with customer's ERP systems; and a tracking application for galley carts – which "includes the same sensor capabilities present in the smart ULD technology and uses long-range Bluetooth technology".

These new functions are already being rolled out. "We continuously build and roll out new functionality which increases visibility of our operation to our customers," Kleijn says. "The automated planning function for our pooling operations has been deployed with a pilot customer in June and is expected to be rolled out across our customer base starting from July."

Digital visibility

Marcus Franke, general manager and head of sales at ULD producer and repair specialist Dokasch, believes that "sooner or later, smart ULDs will become standard in the aviation industry". Dokasch's intention, he says, is to "make a ULD visible in the digital world", adding: "A ULD will be part of the internet of things, telling all the necessary information to the owner and interacting with other devices", including with aircraft. Franke believes widespread adoption of such devices will be "less than five to ten years". He says this is currently a "hot topic" for the company, which is working on solutions for its customers that include "smart applications".

And in another example where ULD developments meet new technology, related to the increasing presence of technology containing lithium batteries within air freight, Franke says Dokasch is "also working in parallel on fire-resistant containers, especially for main deck usage, due to exponential growth of cross border e-commerce and related requirements of the airlines and integrators".

Smart business case

Teijin Aramid, a lightweight-materials specialist whose products have been applied to ULD containers, is also optimistic for the future of smart ULDs. However, Koen Boendermaker, market and sales manager for aviation, says making the business case for smart ULDs is less easy than it has been for investment in lightweight materials for ULDs.

"If we can make smart ULDs robust enough, I think the potential is very great," Boendermaker says. "The current generation ULDs are made lightweight to save fuel, as airlines can easily do the math on fuel costs. It is a lot more difficult, though, to calculate the opportunity value of containers that are available always, also during peak season. (But) I do see many airlines investing in the systems to track such costs nowadays, building up sufficient datasets to analyse and support the right business decisions."

Boendermaker: Data generated will also be important

Boendermaker believes the most valuable contributions from smart ULDs would be in tracking location; monitoring "acceleration", to know at an early stage when to check for damage; and tracking temperature, including detecting fire at an early stage.

But Boendermaker agrees that data generated from smart ULDs will also be important, especially to the pooling companies, "as they are already set up to analyse large sets of data. I expect these companies to be the early adopters. It will also depend on how easy it is to introduce such technology into the existing fleet. In such case it could go quite

fast," Boendermaker says.

Container specialist ACL Airshop believes e-commerce will drive the development and use of smart ULDs, as volumes transporting consumer-led orders by air grow and customers demand more and more detailed information, down to the minute, on their order. "E-commerce is encouraging innovation within the ULD community and has already triggered smarter processes," the company says. "With every single piece of cargo and e-commerce order being tracked, the ULD itself cannot be simply tracked on a written piece of paper. Air cargo must evolve to keep up with e-commerce."

ACL Airshop, which claims to be "constantly developing ways to control ULDs and collect information", has developed its own stand-alone repair software solution that means customers can easy

Franke: Smart ULDs will become standard

report damages, locate where damages occur, and account for the total cost of ownership. This can be shared through an interface with any third-party software.

With the help of ULD controllers, ACL Airshop has developed a web-based ULD tracking system, which can show 24/7 where ULDs are, based on UCM/CPM/SCM or LUC messaging, the company said. The system shows historical data and can advise on station performance and assist with upcoming shortages or overstock.

ULD tracking standard

Currently, ACL Airshop is developing a new standard to track customers' ULDs, which can communicate with existing software solutions. "As ACL Airshop's fleet is very substantial, we will set the standard and create global uniformity available to all airlines," ACL Airshop's executive team stress. "Airlines need to manage their own fleet based on their sales department, but need the right tools to control the complete ULD and cargo process. This will enable an airline to track everything. We are very close to a full rollout."