

Data loggers increase transparency and security when transporting high-value goods

Five dangerous mistakes in transportation – and how data loggers expose them

The globalization of markets has led to a worldwide increase in freight volume. For many goods, this is mostly not a problem; however, sensitive capital goods are exposed to a high risk with every shipment – they must be protected from damage caused by temperature fluctuations, moisture, and impacts. Manufacturing companies generally feel well prepared in this regard; nevertheless, in practice, frustrating - and above all, costly - damage to the goods occurs time and again. Five common misconceptions about transportation and how data loggers can help correct them.

The number of shipments worldwide is enormous and continues to rise: In 2024, more than 183 million TEU (twenty-foot equivalent units) were transported by shipping containers alone – this represents a 6 percent increase compared to the previous year.[1] Containers that are handled at ports or via rail or road transport are not even included here. Logistics is therefore becoming a key issue for companies to ensure that the goods they produce reach their customers safely. Damage during transport must be prevented, especially in the case of sensitive capital goods – these goods are often custom-made and high-value; damage in

[1] „How Many Shipping Containers Are in Motion Around the World Every Day? “, HZ Containers, 28.09.2025, https://hz-containers.com/en/news/how-many-shipping-containers-are-in-motion-around-the-world-every-day/

transit results in additional time and costs. “While shippers try to protect their goods with sturdy packaging and professional load securing, even elaborate protection strategies can reach their limits,” says Peter Adam, Marketing Manager at ASPION. The high-tech company from Karlsruhe, which specializes in modern sensor technology, offers innovative and user-friendly data loggers that can be used to monitor and protect valuable goods in global supply chains. In practice, it has been observed that cargo shifting due to emergency braking, rough handling during loading at transshipment points, or even the opening of packaging at customs are not uncommon and can result in significant damage. “This is supported by data collected by our data loggers during transit,” Adam explains. This data thus also refutes five common assumptions that prevail in companies regarding transport safety.

1: “The packaging is sufficient”

Although capital goods are generally well-packed in shipping crates, not every item arrives at its destination undamaged. “A box could, for example, tip over or get bumped while being loaded,” Adam explains. “And once goods are opened for customs inspection, even the best packaging no longer provides protection.” Moisture can then easily seep in and cause damage. A data logger attached to the product ensures that impacts and vibrations are recorded, noticeable fluctuations in temperature and humidity are also documented. These data are not only helpful in the event of damage but also help companies improve their internal processes. Adam: “Data loggers provide transparency and show just how well packaging actually protects the goods. This allows companies to identify and eliminate weaknesses.”

2: “The means of transport is suitable”

Trucks, ships, airplanes, trains – companies have access to different modes of transport. Depending on the route and the goods, one option is certainly more suitable than the other, and cost is also a factor in the decision. “Such decisions, however, should not be made based on mere assumptions, but rather on valid data,” says the expert. Companies generally have little way of knowing to what extent goods are exposed to shocks and impacts, for example, across different modes of transportation. A data logger records relevant events - threshold values can be set individually depending on the product - and ensures transparency in this regard. “When companies identify that a product is repeatedly damaged during transport, they can choose a different mode of transport from the outset and thereby minimize the risk,” Adam says.

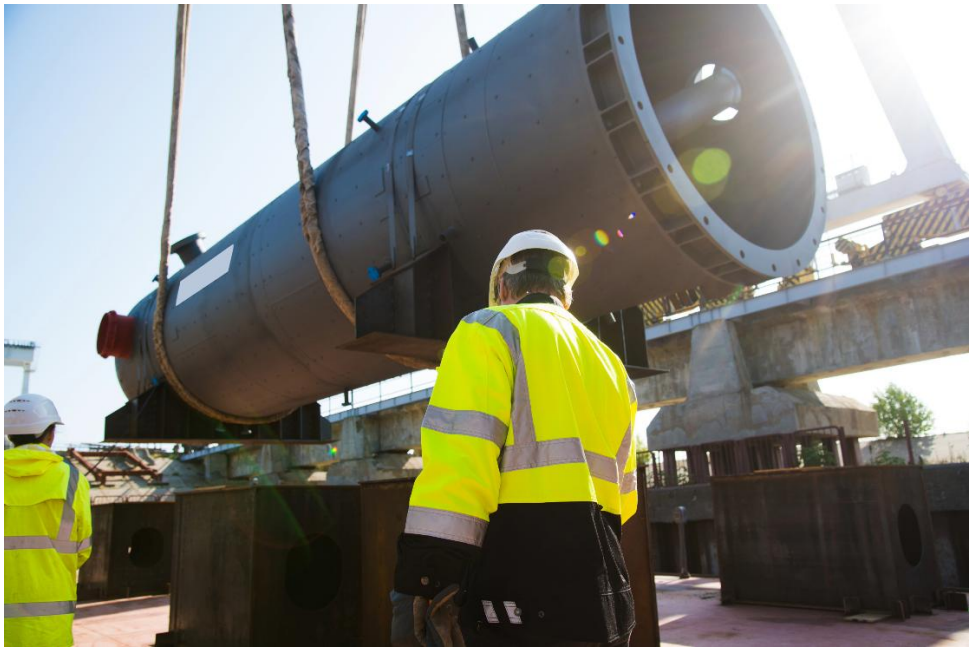
3: “This route is low-risk”

As with the modes of transport, the same applies to the route: Shippers can hardly predict in advance how bumpy a road will be, how high the waves will be, or how intense the heat will

be at the terminal. A data logger tracks the goods throughout their entire journey, records excessive stress caused by shocks, temperature, and humidity, and time-stamps these events. “This means that when we analyze the data, we can see when and where the damage occurred, and we can identify critical routes,” Adam explains. Data loggers with live tracking capabilities offer the added benefit of allowing companies to monitor the current location and condition of their goods around the clock and take immediate action if necessary. Adam: “For example, if it’s clear that the goods were damaged early on in the route, companies can prevent them from being transported further, thereby saving time and money.”

4: “Such incidents occur only rarely”

Damage in transit is rare, isn't it? Unfortunately, this is far from true: A study by the University of St. Gallen, the Swiss Federal Institute of Technology Zurich, and Basler Insurance shows that, in the globalized flow of goods, one in three shipments is rejected due to damage or delivery delays, and that transport damage is commonplace in logistics.[2]“ Unfortunately, damage in transit caused by so-called rough handling is all too common,” the expert notes. For industrial companies, a data logger offers two key advantages: It records events that cause damage, making it possible to clearly identify the cause and quickly determine who is at fault. And it provides the necessary transparency to avoid critical points in the supply chain in the future or to reconsider the choice of service provider.



Data loggers increase transparency and safety during the transport of high-value goods. Image: ASPION

[2] „Transportstudie Basler-Sicherheitswelt Cargo Prävention. Schadenanalyse, Expertenbefragung und Wirkung eines aktiven Präventionsmanagements“, Universität St. Gallen, ETH Zürich und Basler Versicherung AG, 2010, https://www.alexandria.unisg.ch/server/api/core/bitstreams/81380f95-3458-4846-b479-3eb6ea0eaba5/content

5: “The insurance company covers the damages”

Companies take out cargo insurance particularly for capital goods, which is intended to provide cover in the event of a claim and compensate for any damage. “In the event of a claim, however, companies must prove that the damage actually occurred within the scope of the insurance coverage,” Adam emphasizes. Without valid data, this is a lengthy process or even impossible. However, with a data logger, companies can quickly and reliably provide the necessary documentation. “This makes it possible to assign responsibility, avoid discussions with insurance companies and service providers, and settle the claim quickly,” says Adam.

Conclusion

Practical experience clearly shows that damage to sensitive capital goods during transport is not an isolated incident, but rather a structural risk in global supply chains. The assumptions widely held by companies - ranging from the belief that packaging is sufficient to the false sense of security provided by insurance - do not hold up to a data-driven analysis. Data loggers provide a new level of transparency in this area: They deliver objective evidence of stress factors, environmental influences, and the exact timing of critical events. This not only provides companies with a reliable basis for determining the cause of damage and communicating with service providers and insurers, but above all, it offers an effective tool for continuously improving packaging, the choice of transport mode, and route planning. By basing transport safety on reliable data rather than assumptions, companies will be able to measurably reduce risks, lower costs, and make their supply chains more resilient in the long term.

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