

Selecting a Data Logger for Monitoring Food Shipments

5 Important Factors to Consider

Final product quality is critical in all industries, and is especially important when transporting food and other perishable products. Perishables are environmentally sensitive, and depending upon the goods being transported, it may be necessary to monitor elements such as the temperature, humidity, or CO₂ conditions in which the items are being shipped. When certain perishable goods are subjected to environmental factors outside their ideal ranges, undesired affects can occur such as over-ripening, over-heating, over-cooling or increased moisture content, with all results being costly.

Data Loggers are small, battery powered devices that measures various environmental parameters over time. Such parameters include temperature, humidity, CO₂, light, pressure, shock and more. The data logger records environmental parameters (model dependant) at user-specified intervals over a period of days, weeks or months.

While there are a vast range of data loggers available on the market, there are some key aspects that should be looked at before making a purchase.

1. Single-Use verses Reusable

Shipping data loggers are available in both reusable and single-use models. Depending upon the application, one may be more suited for a specific type of shipment than the other.

Single-use data loggers are normally less expensive than reusable. If the shipper generally doesn't transport perishable goods, than a single-use data logger could be the perfect choice. It provides a means of validating a shipment, without investing a significant amount of time or money.

Single-use data loggers are also popular for shipments going long distances, where the shipper doesn't want to burden the receiver to send back the data logger after use. Instead, the device can simply be downloaded for analysis, and then discarded.

Reusable shipping data loggers are an economical and green choice for companies that make frequent food shipments. While they tend to be more expensive than single-use models, the benefit of being able to utilize them repeatedly out weighs the cost.

2. Accuracy

The accuracy of a shipping data logger is another important specification to consider. Understanding the accuracy requirements for the specific foods being transported is essential to properly validating a shipment.

In the food transportation industry, many food shipments are able to be validated with a temperature accuracy of $\pm 0.5^{\circ}\text{C}$ ($\pm 0.9^{\circ}\text{F}$) or better. This is product dependent though, so it's always best to research the food being shipped to make sure the correct accuracy is achieved.

3. Operating Environment

The data logger operating environment specifies the temperature and humidity conditions in which a data logger can be placed in. When selecting a data logger, the operating environment should be compared to the conditions in which the food is being shipped. For example, a freezer truck stores shipments at much lower temperatures than a non-refrigerated truck, so it would need a data logger with an operating environment that extends to lower temperatures than the non-refrigerated truck.

Another significant aspect to review is the Ingress Protection, or IP, rating. The IP rating indicates the degree of protection the device provides against solid objects and liquid. For shipping applications, the main concern would be the development of condensation, or possibly water on the data logger. If the shipping method being used exposes the data logger to these types of conditions, it is recommended to purchase a device that is rated IP64 (splash proof) or higher. This reduces the risk of water leaking into the data logger, and corrupting data.

4. Starting Method

Many data loggers offers users the option to start the device in multiple ways. This provides the ability for the data logger to seamlessly fit into a company's workflow.

Common start methods include immediately start, delay start and push-button start.

Immediate Start – Once programmed, the data logger starts recording instantly.

Delay Start – This method allows the user to program a date and time for the device to start recording. The delay start feature is useful for shipments that aren't leaving immediately. The device can be programmed in advanced, packed into place within the transportation vehicle, and it will automatically start recording at the date and time specified.

Push-button – Push-button data loggers function just as they sound; the device is programmed to start, but doesn't start recording until a button on the data logger is pushed. This is helpful for shipments that don't have a define depart time. Unlike the immediate start, and delay start methods, the device doesn't start recording immediately or at a certain time. This leaves more room for error, in that if an individual overlooks pushing the button, no data will be recorded.

5. Alarms

When a shipment arrives at a facility, it's essential to be able to quickly tell whether it was shipped within the proper environment. If a facility accepts compromised goods, it could mean thousands of dollars in lost revenue, or even worse, the growth of bacteria can cause illness upon consumption.

Many shipping data loggers are equipped with software programmable alarms. These allow the user to program in the conditions that are acceptable and unacceptable for the shipment. Some software programs allow for users to enter in high, low and even warning alarms. If the conditions go above the high point, or below the low point, an alarm is triggered.

There are multiple methods in which data loggers can communicate an alarm condition. These include LEDS, audible alarms or just through downloading the data.

LEDS – LEDS are a quick and useful way to tell whether a shipment stayed within safe conditions. Many data loggers have multiple LEDs to show if a high or low alarm was triggered, or if the shipment is safe to accept.

Audible Alarm – Data loggers equipped with an audible alarm will simply resonate a tone to signify an alarm has been breached. Unlike data loggers equipped with LEDs, users can't immediately tell which alarm settings were exceeded.

Downloading Data – Data loggers that aren't equipped with visual or audio alarms have to be downloaded in order to verify the environmental conditions stayed within a safe range throughout transport. This method isn't as convenient for many shippers, due to the process taking more time to ensure the shipment is okay to accept.

For more information on food shipping data loggers, please contact MadgeTech at (603) 456-2011 or visit www.madgetech.com.

About MadgeTech

MadgeTech engineers and manufactures data loggers in the USA. The extensive data logging line measures parameters such as temperature, humidity, pressure, voltage, shock and more. MadgeTech is dedicated to providing technologically advanced measurement solutions for a variety of industries, including food, pharmaceutical, alternative energy and life sciences.

