APPLICATION NOTE

CAS DATALOGGERS

Cold Chain Validation For DHL Using CAEN RFID Tags

Pharma Products Remain Safe within ThermoNet

Since 2008 CAEN RFID has provided the temperature monitoring solution for international freight forwarder DHL. DHL's pharmaceutical customers asked the company to provide a service to further protect temperature-sensitive products such as vaccines and drugs. The industry-standard practices were not able to alert customers in advance, so DHL needed a cold chain validation hardware solution.

CAEN RFID's CMO Stefano Coluccini explains: "CAEN RFID first met with DHL in 2008. DHL had experience with cold-chain products over many years and just requested that we manufacture a custom solution. So we modified our existing RT0005 tag into the DHL data logger and now we're working with DHL's corporate HQ to roll it out. DHL is using this custom tag in their new ThermoNet shipping network, with RFID checkpoints installed in their shipping hubs."

ThermoNet is a unique new service in the market—this cold chain validation and temperature tracking service utilizes RFID technology to alert customers if the temperature of their life science and healthcare products go outside safe limits. This global air service is available for a fee to DHL's Pharma B2B customers with temperature-sensitive products which must be tracked. This service saves resources and time, allowing companies to focus on their core business.

With ThermoNet DHL continually monitors the temperature of customers' shipments and makes the information available online from anywhere at any time. Validated for Pharma applications, DHL SMARTSENSOR also complies with regulations such as US 21 CFR Part 11, EU GMP Annex 11, and EU GDP. Since the tags' memory is read-only in storage, it can never be altered, only deleted. This feature serves as a form of data security and is a major benefit of using UHF RFID for regulatory compliance.

On the flexibility of CAEN RFID products, Stefano Coluccini comments, "Regarding the logistics side I must say that all our products are ideal depending on the particular operation."

Semi-Passive UHF RFID Tags

DHL's current SmartSensor data logger used in the ThermoNet service is based on CAEN RFID's RT0005 RFID Temperature Datalogger. These temperature sensors run on battery power and utilize UHF RFID technology to make the temperature data accessible and easy to collect. The tags are designed with integrated temperature sensors to monitor the interior or exterior temperature of the attached package. While the SmartSensor tags are disposed of after their use in the ThermoNet service, the unmodified RT0005 tags can be used over multiple trips in other applications.

Usable with air, land & sea transportation, CAEN RFID dataloggers use Semi-passive UHF RFID tags. Using BAP—Battery Assisted Power—these smart temperature tags have a low cost of deployment and a longer range than passive RFID tags so there's no need to travel to packages to read the temperature. Data can simultaneously be read from multiple tags and at long distance.

Using an RFID reader, users can even read data without opening the box. For ease of deployment, CAEN RFID products are a Plug and Play solution with no interference to the existing IT infrastructure.

The SmartSensor dataloggers are compact and lightweight enough to be attached to the exterior of the package, although if desired they can also be placed inside the parcel owing to the readability of UHF RFID. Using an RFID reader, tag data can be collected even from outside the package without having to open the box and risk damaging the product.

Continual Temperature Monitoring

CAEN RFID products enable DHL's certified ThermoNet stations to setup strategic checkpoints where the shipment can either change its mode of transportation (e.g., from road to air), go into storage or some other change of status. The RFID system checks and reports the temperature of the shipment at each supply chain checkpoint along the journey so DHL staff is alerted in advance if there is a problem. This procedure enables DHL to stop the shipment and initiate a replacement with minimal impact on the customer.

Now when customers ship with DHL's ThermoNet service, they get a Tracking Number as usual, but they also get the complete temperature history of their parcel! DHL automatically publishes the data to their online web portal where customers can track their product temperatures 24/7 by product shipment number. If a temperature excursion occurs, DHL sends the relevant temperature data to the host station, which can take preventative actions before the product is further damaged.

Data Capture

CAEN RFID readers are available for customers' applications and have many useful features for a variety of deployments. Using the readers to collect the temperature data from the tags, users can easily integrate RFID into their existing infrastructure, unlike competing products.

- To automate a production line or a conveyor belt for dispatching goods, Embedded RFID Readers can be used to build custom reading points for items passing on the line.
- For manual collection the qIDmini can be connected to a smartphone or a tablet as a mobile solution.
- For a fixed solution, the Slate desktop reader can be used to read tags locally on a table, on a point of sale or for programming tags.

Benefits

Since DHL adopted UHF RFID products into its logistics infrastructure, its B2B customers now have proof for regulators and their own customers that their pharma products remained within safe temperatures for the duration of the trip. CAEN RFID tags also give DHL the ability to proactively respond to shipment problems in transit down to package level. In the event that products go out of temperature, DHL has advance warning and can act to remedy the situation before the product is lost or further damaged. This has resulted in improved customer satisfaction and added proof of DHL's best practices.

DHL has steadily increased its number of checkpoints from 15 to 60. CAEN RFID currently supplies 10,000 RFID data loggers each year as DHL continues to expand the ThermoNet service.

Stefano Coluccini summarizes the benefits of this growing technology: "Most of our customers only need a simple way to read and get their temperature data. However, DHL shows how UHF RFID is also suited to the largest operations to prove best practices. While RFID has many emerging uses, it has a particular benefit in logistics for many types of cold chain tracking and validation."

For further information on CAEN's UHF RFID temperature tags, cold chain validation or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Application Specialist at **(800) 956-4437** or www.DataLoggerInc.com.