

Condition Monitoring Temperature – Humidity – others

Application Note

ZOMOFI®

ZOMOFI--Application_Note--ConditionMonitoring--e.doc

Concept, Customer Solution and Benefits

Condition Monitoring is a large application area for active RFID products. Cold chains with temperature, supply chains with humidity or special cases for e.g. glucose monitoring in bio-chemistry are implemented customer projects based on ZOMOFI® technology.

The goals and the concepts for each project are similar. Transport of goods, failures in cooling systems or no control in condition quality often lead to waste in the supply chain.

This application note shall give insights into **three concrete customer cases** whereof the following functions are successfully implemented:

- Criteria TIME
 - the customer has the **online** visibility incl. temperature graphs
 - temperature measurements are **offline** stored at the object
 - temperature and humidity measurements by the minute
- Criteria LOCATION
 - monitoring of critical goods in moving vehicles
 - stationary infrastructure for warehouses

In the described cases the customers improve profitability by minimizing the waste in food items and in less hassle for short-term replacement deliveries.

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The logo for Albis Technologies, featuring the word "albis" in a bold, blue, sans-serif font with a green swoosh above the 'i', and the word "technologies" in a smaller, blue, sans-serif font below it.

Case I – Online Temperature Monitoring for moving vehicle

Business Requirements

The restaurant wagons of the railway company drive through Europe from North to South and East to West. For breakfast, lunch and dinner the wagon carries food items which are cooled at all times. It is crucial that the guest and the operator can count on a guaranteed cool chain even when wagons are parked or cooling aggregates are failing for whatever reason.

It is required that the operator of the restaurant wagons is automatically alarmed when the cool chain is broken and temperatures start raising for any of the food items.



Fig 1: Restaurant Wagon and Cooling Aggregates with Food Items

Concept

The ten aggregates are individually “tagged” with the Z-Tag Temperature. One reading station of ZOMOFI which is placed in the back of the railway wagon is capturing the measured temperature every minute and is sending the values over the built-in GSM/GPRS module to the central server.



Fig 2: Transponder “Z-Tag Temperature” for long-range transmission

Solution and GUI

The temperature data which are sent by the Z-Controller GSM / GPRS are construed by the central server. The users can view the graphs for each individual cooling aggregate per wagon. The responsible supervisor is alarmed by SMS when the temperature value(s) exceeds pre-configured limits.

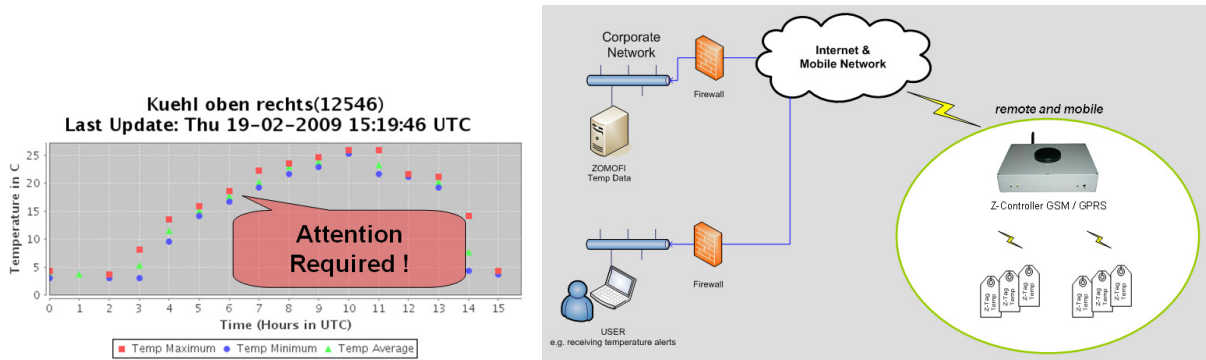


Fig 3: Temperature Graph and Solution Architecture

Customer Benefits

The benefits leveraging the active RFID solution are:

- Knowing temperature value and history of each individual cooling aggregate at any given time.
- 52x7x24 around the clock with battery backup of reader and GSM module.
- Reduced operational effort and cost when being alarmed before the food is spoiled.
- Guests = customers can fully be satisfied for the paid transportation package including meals.
- No penalties or re-imburements.

Case II – Online Humidity / Temp. Monitoring at many Objects in Warehouse

Business Requirements

The customer of Albis Technologies is storing, assembling and delivering “HUMIDITY CRITICAL” objects. The objects may lay many weeks on stock. It is necessary to know the quality status before any shipments. The reasons are evidence and claim management.

Concept and Solution

One Z-Controller WiFi/LAN is setup in the warehouse. The reader collects all measured values at the different spots in the room and on the objects. The reporting, history and alarming logics are done in at the central station.

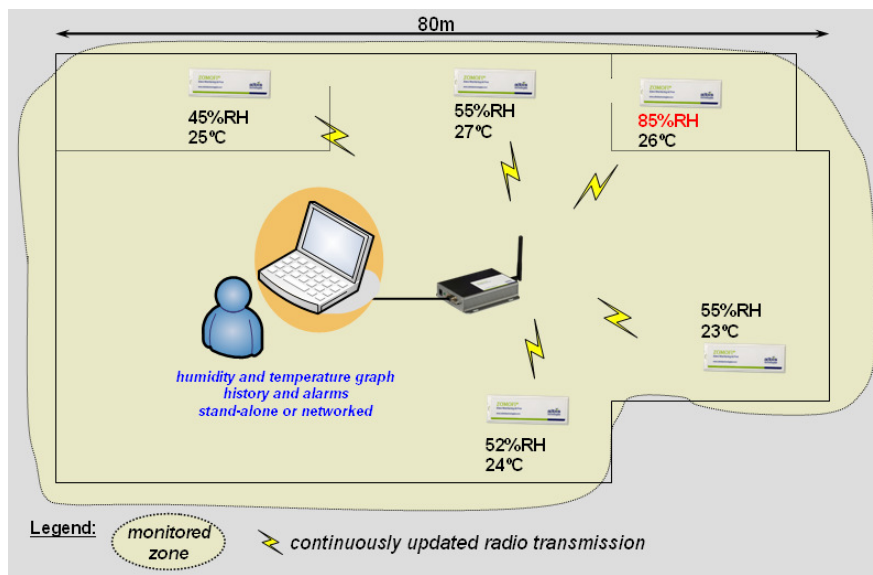


Fig 4: Setup for Humidity/Temperature Monitoring

Customer Benefits

The benefits leveraging the active RFID solution are:

- Knowing humidity and temperature values for each individual critical object at any given time.
- 24x7x24 around the clock.
- Increased quality at object level before assembly and shipment.
- Automatically generated reports as evidence in claim management.

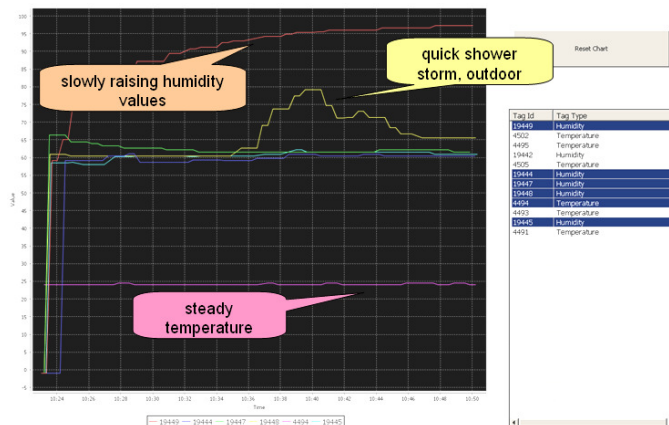


Fig 5: Humidity and Temperature Graph for 6 selected Items

Case III – Offline Temperature Logging during Shipments

Business Requirements

Another customer of Albis who is transporting fresh produce needs to monitor the temperature during the shipments. The start- and stopp-triggers of the monitoring need to be flexible. The measured values need to be stored while travelling.

Concept and Solution

Each box which needs to be closely monitored carries the Z-Tag Temperature Logger. The pre-configured transponders are capturing the values at the required times for the required duration. At arrival of the goods the values are automatically transmitted to the Z-Controller and to the background SW-Application.

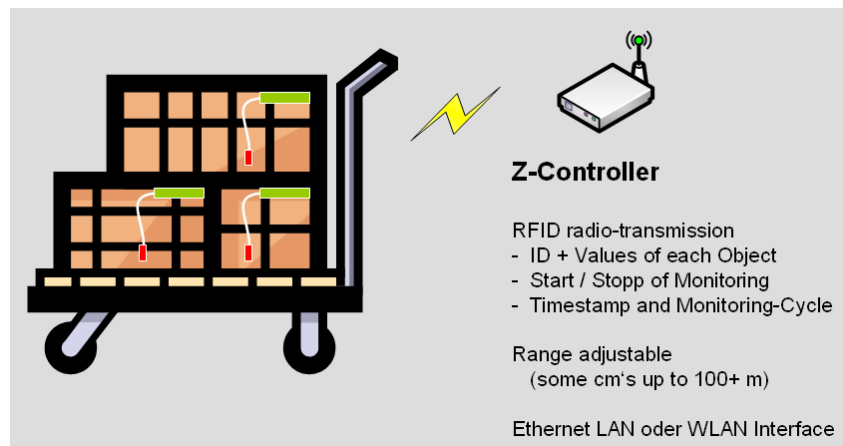


Fig 6: Fresh Produce in the Boxes to be monitored and Values being transmitted

Customer Benefits

The benefits leveraging the active RFID solution are:

- Knowing temperature values at arrival for the hours/days/weeks the goods were travelling.
- Automatic reports of arrival-time, location and temperature graphs.
- Supports preventing loss of fresh produce for the customer.
- Fully prevents any further usage of bad or wasteful food items.
- No penalties or re-imburements.

Extensions

The systems are ZOMOFI based and System Integrators have leveraged the active RFID products for building the end-customer solutions. In such model HW as well as SW can be extended for producing value add to the customer's process and quality management.

About Albis Technologies AG

Albis Technologies is a worldwide technology company that develops and markets innovative electronic systems. For many years, discerning clients from the telecommunications, industrial, logistics, security, power and medical sectors have put their trust in the expertise of its 180 highly qualified staff. One of the dedicated business units beside telecommunications, R&D and certifications is "active RFID". The portfolio of ZOMOFI® is implemented by partners in many European countries since several years.

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