Performance-based Waste Management
Fair billing for Bremen's Waste Management

deister electronic

Project target
- Fast and fair charging of fees
- Time saving

Challenge
- Exact billing for more than 360,000 households
- Compliance with the requirements of the City of Bremen
- BDE-compliant collection of waste disposal data

Solution
- RFID-based waste identification system biTech

Benefit
- Smooth and more economical waste disposal
- Saved time due to simplified workflows

Nowadays, waste disposal is a high-tech industry. This not only applies to the separation and producing energy from waste, but also to the collection of household waste. In many regions, the frequency of emptying is recorded in order to charge fees in accordance with the causation principle. This means that a household pays its waste fees depending on the actual emptyings.

Since 1995 such a performance-based billing system is used in the City of Bremen. The company "Entsorgung Nord GmbH (ENO)" is carrying out the Waste Management on behalf of the City of Bremen for more than 360,000 households. They equipped 220.000 containers with TCX transponders to be able to identify the individual waste containers. For the detection of the individual

waste container, the vehicles have been equipped with low frequency RFID readers and on-board computers. To specifically avoid interference with metal, they decided to settle with RFID wireless standard 134.2 kHz. The on-board computer collects the data and prepares it for transfer and analysis. For data transmission memory cards are used. They are handed to the administration at the end of the day. There, the data gets processed by the ENO and sent to the City of Bremen authorities as a basis for billing.

System Optimization

After more than ten years of operation, the TCX transponders at the containers proved to be particularly robust (IP 67) with a less than 1% failure rate. However, the growing needs of the City of Bremen for a rapid transfer of the data into the SAP software as well as BDE-compliant data acquisition of the waste management data triggered the need to modify the existing system slightly. ENO chose all-in-one GmbH as a systems integrator. This Bremen-based company had already proven to be very competent in introducing the in-house ERP system. At the same time deister electronic was already known to ENO as a reliable supplier of components.

New Software and new Antenna

The core of the optimized system is the software "Lewin identification" of the company all-in-one GmbH. Its standard ▶

components allow mobile data transmission which makes work much easier. Due to a continuous development of software and hardware components, the ENO is ready now for all future tasks. deister electronic developed a powerful antenna specifically for the roll-out in 2005. It allows to attach the RFID tag onto the bin at eight alternative positions. Herewith the current demand of the Association of German waste management (BDE) is satisfied and it is compliant with the new DIN standards.

BDE-compliant

The BDE-compliant data acquisition was an important requirement of the project and therefore a crusial factor for the hardware. The antennas must read the transponder safely, quickly and reliably in this difficult environment. Not only has deister electronic developed an antenna with a high read range, they provided the "on-board unit" as well. This unit controls the entire reading process and the sensors. It stores all data locally before transfer. Thus, a dual data storage strenghtens the data security.

WLAN Data Transfer

The transfer of the data, recorded on tours is done at the depot of the „Entsorgung Nord GmbH" directly via WLAN. In less than two minutes, the waste collection data from up to 1,000 households gets transmitted to "Lewin ID Office." for control and conversion. At the same time, the tours data of the next day and the current "black list" containing information on stolen bins is loaded onto the vehicle system. Today, more

than 60 vehicles are equipped with this technology. During two discharges per day at the depot, the data of 1,000 containers is transferred automatically. In case a transponder was not read at collection it is immediately detected and the waste container gets replaced. The same applies to the missing „black listed" waste containers. Up to five different messages can be captured directly at the rear of the vehicle. For example the information that a bin is crowded at pick-up or when a rubbish bag was placed next to the barrel. This data is recorded by pressing a button and gets transferred directly to the on-board system in the drivers cab. These messages are then associated with the transponder data and provided for evaluation.

Challenges during the project realization arose in dealing with various fillings (small and large vessels) and regarding the connection of the on-board unit to the automatic stop system. A solution for off-system operation needed to be found as well. During the roll-out the ENO-own garage "ktec Kraftfahrzeugtechnik GmbH" was heavily involved. They mounted the system components supplied by deister electronic to the vehicles and "all-in-one GmbH" put them into operation. Just a few hours were required to train the users of the vehicles and the administration.

Since the new system has been implemented, Bremen is operating a performance-based waste management very smoothly and more efficiently then ever. Work processes have been simplified and the automatic data collection and transfer to the depot and the City of Bremen is saving a lot of time. ■

About the Entsorgung Nord GmbH & Co. KG

Entsorgung Nord GmbH (ENO) is the specialist for waste disposal logistics and cleaning services in Bremen. With its 400 employees, ENO is responsible for street cleaning in the city of Bremen.

ENO

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About deister electronic

deister electronic is an innovative, family owned global business with 40 years of experience in developing electronic and mechanical products for security and industrial automation. Widely acclaimed for our expertise and specialist implementation of RFID technology within practical applications, from key management and access control to logistics and process control.

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