

SMART & EASY

The customer magazine of ZENNER International

02 2026

A JOINT SUCCESS STORY

How LoRaWAN® has been driving smart city digitalisation for a decade.

Anniversary issue:
10 years of Smart & Easy



ZENNER



Dear readers,

Over a decade ago, in January 2015, the LoRaWAN® wireless standard was just starting out with the release of Version 1.0. That same year, the LoRa Alliance was established for the further development, standardisation and promotion of LoRaWAN®. ZENNER has been a member of this alliance from the very beginning. We believed from an early stage that LoRaWAN® would be a success, which is why we took the strategic decision to get on board. It was a bold decision that called for far-sightedness – and a move that turned out to be spot on.

LoRaWAN® now connects smart city, energy sector and water management applications. Combining long-range capabilities with low operating costs and excellent data security, this technology makes data available exactly where it's needed for reliable processes and sound decision-making. We're delighted about the widespread market acceptance now enjoyed by LoRaWAN®, and we're also proud to have played a key role in its growth.

Our LoRaWAN® network is one of the biggest in the world and is connected to around twelve million sensors, creating a reliable basis for solutions in Europe and beyond. Together with our customers and partners, we're looking to continue this journey and open up potential new applications.

Alexander Lehmann
Managing Director of ZENNER International
GmbH & Co. KG

CONTENTS

Cover story

LoRaWAN® and smart cities:
A joint success story 3-5

Making heating smarter:
Smart radiator control
in Lünen's town hall 6-7

Greater transparency in the grid:
Monitoring local network
transformer stations in Altdorf 8-9

Smart lighting:
Intelligent control of street lighting 10

New at ZENNER:
Smart & Easy blog 11

Lights, camera, action:
Our video shoot at Europa-Park 12-13

Come and visit us at this autumn's trade fairs!

**Smart City Expo
World Congress
in Barcelona:
3-5 November 2026**

SMARTCITY
EXPO WORLD CONGRESS

**Enlit Europe 2026
in Vienna:
10-12 November
2026**



**Metering Days
in Fulda:
17-18 November
2026**



LORAWAN® AND SMART CITIES: A JOINT SUCCESS STORY

It's ten years since the first issue of Smart & Easy was published. The ZENNER customer magazine went to press on 28 August 2016, and there have so far been over 20 further issues. The magazine came about as a result of the industry's growing focus on digitalisation and marked the start of ZENNER's realignment. The company has evolved from a meter manufacturer into a leading provider of smart, digital solutions for public utility companies, energy suppliers and water management applications.

Since its realignment, ZENNER has been focusing on developing smart solutions for the Internet of Things (IoT) based on the LoRaWAN® open wireless standard. This technology had only just been developed in 2016, but it has now become firmly established and is widely regarded as a byword for digitalisation in the energy sector as well as in towns, cities and municipalities. That's what makes this a joint success story.

Looking back is always interesting if it provides key insights for looking ahead. What has turned out differently than expected, and what strategies can now be derived from that for the future? Smart water is a good example. Whereas remote reading of water meters was still an isolated use case ten years ago, water is now a key element of cutting-edge smart city concepts and central to numerous use cases.

Development of smart cities

Germany's towns and cities have undergone a significant transformation over the past decade, progressing from individual digitalisation projects to strategic smart city development. This is particularly evident from the annual surveys by Haselhorst Associates, which has been observing the development of more than 400 German towns and cities since 2018.



Whereas only 14 percent of the towns and cities in the survey were carrying out smart city projects back in 2018, they all were by 2025. Over 200 of them even have “advanced city” status. René Claussen, Head of the Measurement Systems, IoT and Digital Solutions Business Unit at ZENNER, has been monitoring this process from the outset. “Projects initially related to individual digital applications such as smart parking or smart waste, but the main focus now is on networked solutions for water, energy, climate protection and resilience. This shows that, in Germany, the smart city has gone from being a topic for the future to a municipal design task. Implementation remains challenging, though. The emphasis has now switched from individual flagship projects to a long-term strategy that combines digitalisation, sustainability and the needs of the public,” he explains. On pages 6 to 9 of this issue, we tell you about two new projects in Lünen and Altdorf.

A game-changer – LoRaWAN® technology

When it comes to carrying out challenging smart city projects, LoRaWAN® has without doubt become the number one basic technology over the past ten years and, over this same period, ZENNER has become the leading supplier of this technology. The Minol-ZENNER Group now operates one of the world’s biggest LoRaWAN® networks, with around twelve million sensors. This energy-efficient wireless network enables cost-effective reading and networking of numerous sensors over long distances. For example,

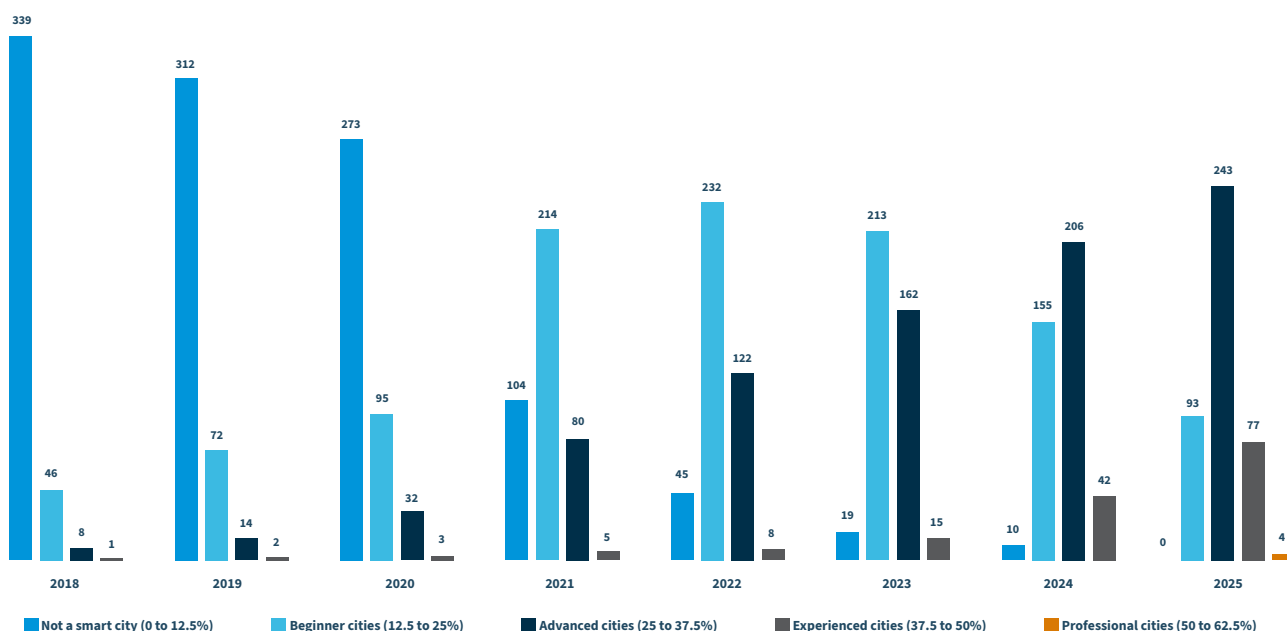
fill levels of waste containers can be monitored, the occupancy of car parks recorded, street lighting controlled, weather data evaluated, energy consumption analysed and data evaluated digitally. That gives towns and cities a reliable database for making more efficient use of resources, optimising processes and establishing new digital services.

Agile and resilient – the smart city

In smart cities, it’s particularly important for strategies and plans to remain agile so they can react flexibly to the latest developments and new conditions. Whereas the main focus a decade ago was on digital solutions to improve process and cost efficiency, topics relating to environmental and climate protection have increasingly come to the fore over time. Examples include saving energy, reducing CO₂, developing climate-neutral building stocks, and monitoring air and water quality. What’s more, towns, cities and municipalities have been facing new challenges for a number of years now due to the consequences of climate change.

This demonstrates that changes can’t always be predicted and can quickly turn existing assumptions on their head. A flexible infrastructure based on LoRaWAN® provides the necessary scope to make the most of opportunities, identify risks at an early stage, and react appropriately to new developments and challenges. This creates resilience at all levels.

Haselhorst Associates Smart City Ranking 2025 – level of development of smart cities between 2018 and 2025



Source: Haselhorst Associates Consulting, 2025



Looking back to the future – water management

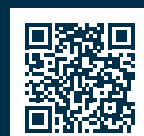
One of the earliest use cases, which we told our readers about in the very first issue of Smart & Easy, was the extensive automated remote reading of water meters using LoRaWAN®. This is the use case that is developing most dynamically right now. Climate change and frequent drought periods, even in Central Europe, and the resulting scarcity of water are presenting new challenges, including for municipal water utility companies. The goal is to prevent future water shortages by using water resources more efficiently and improving the protection of these resources. Towns, cities and municipalities need to adapt their infrastructure to safeguard the supply and quality of water over the long term. In other words, the water supply must become resilient.

In the water management context, resilience means water systems need to be resistant to climate change, extreme weather events, environmental pollution and other adverse effects. Digitalisation offers key tools and solutions. “With appropriate sensors and using LoRaWAN®, measurements can be transmitted directly to our B.One element suite platform and accessed by water utility companies. Our customers

use the same method to transmit water meter readings and monitor their pipe networks for problems such as leaks. As a smart water solution provider, we supply appropriate applications for all process steps,” says Claussen. This example shows how LoRaWAN® can help turn individual use cases into complex, digital ecosystems. In this way, ZENNER is laying the foundations for further success stories.

WEBLINK

Further information
about smart cities





Some 250 smart radiator thermostats have been installed in Lünen's town hall.

MAKING HEATING SMARTER IN LÜNEN

Thanks to a smart radiator control system from ZENNER, the City of Lünen municipal authority is saving up to 30 percent on heating its town hall.

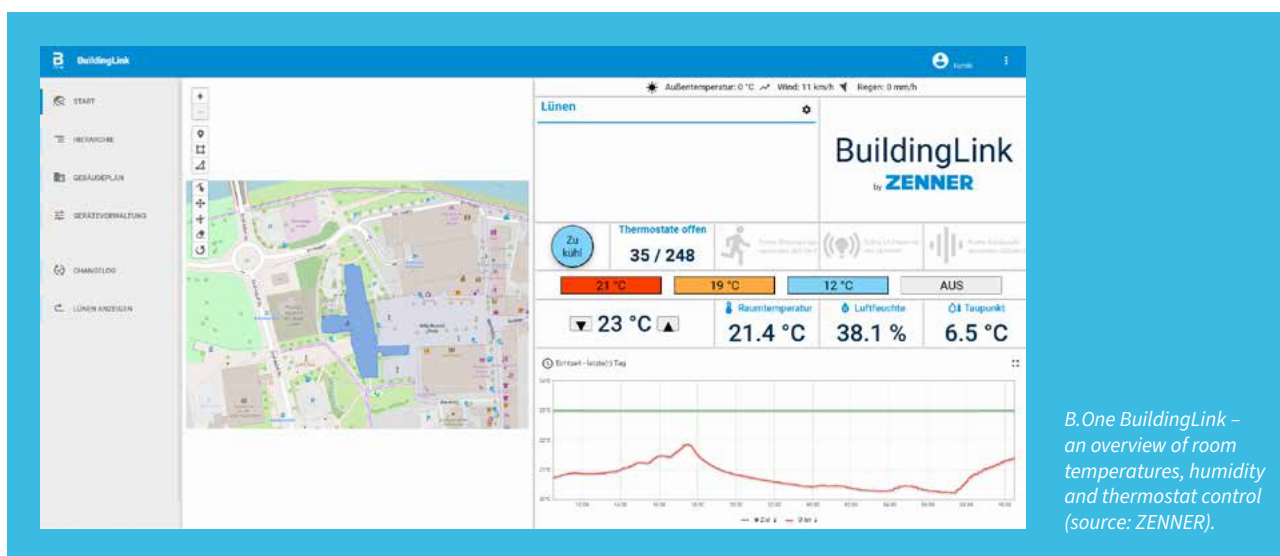
According to an analysis by the German Energy Agency (dena), buildings account for around 35 percent of final energy consumption in Germany. Rising energy prices and the need to significantly reduce CO₂ emissions in the buildings sector are placing growing emphasis on improving energy efficiency.

Smart radiator thermostats that automatically regulate room temperatures via the Internet of Things (IoT) are supporting these efforts and can

help reduce energy losses. The City of Lünen is an example of how this plays out in practice. Working with ZENNER, it has opted for B.One BuildingLink in order to benefit from smart radiator thermostat control.

Intelligent radiator control with LoRaWAN®

B.One BuildingLink is an IoT solution for the intelligent control of radiator thermostats using LoRaWAN®. It enables centralised, needs-based temperature control at room, floor or building level, which can significantly lower energy consumption and CO₂ emissions.



“B.One BuildingLink helps reduce CO₂ emissions, provides complete transparency and controls heating performance across all properties, which makes targeted heating possible,” explains René Claussen, Head of the Measurement Systems, IoT and Digital Solutions Business Unit at ZENNER. This IoT solution is ideal for using LoRaWAN® networks to efficiently manage heating systems in public buildings, schools and office buildings.

Smart radiator control in Lünen’s town hall

The City of Lünen has been focusing closely on smart city development since 2024. The goal – based on its own smart city strategy – is to improve quality of life in Lünen, with a particular emphasis on sustainability and climate protection. The introduction of a smart thermostat control system in the town hall marks an important step in this strategy.

A total of 250 smart radiator thermostats and eight gateways have been installed in the building. The thermostat data is collected and visualised in B.One BuildingLink. Room temperatures and humidity levels can be monitored on dashboards whenever required and the thermostats controlled centrally. Comparing actual and target values highlights discrepancies in real time and reveals potential for optimisation. Room temperatures throughout the entire building can be adjusted with a single click. The team in charge also obtains an overview across

all properties, can monitor KPIs, sees all devices that are in use and benefits from predictive maintenance functions.

“The implementation of smart thermostats using LoRaWAN® in collaboration with ZENNER has demonstrated how existing buildings can be operated significantly more efficiently thanks to retrofit IoT solutions. During the heating season, we were able to reduce consumption in some facilities by up to 30 percent. As we see it, the system is an important element of our smart city concept for urban infrastructure and actively contributes to our sustainability and focus on the future,” reports Gregor Spanke, the City of Lünen’s Smart City Coordinator.

WEBLINK

Best practice – City of Lünen



STADTWERKE ALTDORF:

GREATER TRANSPARENCY IN THE GRID

Stadtwerke Altdorf has opted for smart monitoring of its local network transformer stations in the urban area of Altdorf, in collaboration with ZENNER. This means the public utility company can pinpoint faults faster, identify peak loads quickly and plan maintenance work in a more targeted way.

The energy transition is placing growing demands on power distribution networks. E-mobility, charging infrastructure, the expansion of renewables and the increasing electrification of the heating sector are resulting in significant changes to grid load flows. Whereas households and companies mainly used to draw electricity from the grid with relatively consistent load profiles, grid conditions now fluctuate to a far greater extent. As well as being consumed, energy is also fed into the grid on a decentralised basis.

This is making it much more challenging for grid operators to ensure grid stability at all times and to detect faults at an early stage. To prevent supply outages and identify critical conditions in good time, the grid needs to be more transparent. The digitalisation of local network transformer stations plays a key role in this context.

Using LoRaWAN® to monitor local network transformer stations

Many local network transformer stations still undergo maintenance at fixed intervals, and faults are often only detected during these manual interventions. In many places, there is also a lack of real-time data to show the latest grid conditions. The fact that numerous transformer stations are not yet networked



The screenshot shows the ZENNER B.One element IoT platform interface. On the left, there is a sidebar with a list of transformer stations: Altdorf West, Am Berglein, Bahnhofstr., Bayernstr., E-Weck Traflo 1, E-Weck Traflo 2, Feuerweg, Fischbacher Str., Frankenstr., Freibad, and Fritz-Bauer-Str. The main area displays a table of measurement data for these stations. The table has columns for time, active power (I, II, III), current (I, II, III), and reactive power (I, II, III). The data is presented in a grid format with alternating light and dark rows.

Station	Time	active_power_I	active_power_II	active_power_III	current_I	current_II	current_III	reactive_power_I	reactive_power_II	reactive_power_III	timestamp
Altdorf West	03:52										2025-09-24T13:30:52
Am Berglein	03:58										2025-09-24T13:30:58
Bahnhofstr.	04:05										2025-09-24T13:30:52
Bayernstr.	04:11										2025-09-24T13:30:47
E-Weck Traflo 1	04:18										2025-09-24T13:30:40
E-Weck Traflo 2	04:24										2025-09-24T13:30:34
Feuerweg	04:30										2025-09-24T13:30:27
Fischbacher Str.	04:37										2025-09-24T13:30:21
Frankenstr.	04:43										2025-09-24T13:30:15

View of the measurement data in ZENNER's B.One element IoT platform (source: ZENNER).

means notification of faults is not provided automatically. Consequently, there is often a delay in detecting such faults, and a considerable amount of effort is involved in locating them. Using a LoRaWAN® wireless network, along with appropriate measurement and transmission technology in these stations, the necessary data relating to grid conditions can be transmitted to IoT platforms such as ZENNER's B.One element IoT. This data can then be prepared and processed in line with the specific use case for monitoring by grid operators.

Smart monitoring of transformer stations thanks to LoRaWAN® creates the necessary transparency for efficient grid management. Grid operators can detect critical operating conditions at an early stage, before faults occur. This means costly system damage – and, in the worst-case scenario, power outages – can be prevented. It also boosts grid stability. What's more, the retrofit sensor technology is both inexpensive and easy to install.

Stadtwerke Altdorf – electricity grid transparency thanks to LoRaWAN®

According to Stadtwerke Altdorf GmbH, the total length of its low-voltage grid amounts to 280 kilometres. Around 60 million kWh is drawn from this grid every year. The public utility company supplies electrical energy to around 4,800 service connections in the urban area of Altdorf.

To improve grid transparency, Stadtwerke Altdorf has digitalised its transformer stations in collaboration with ZENNER. Out of a total of 80 stations, 50 have been equipped with smart LoRaWAN® transmission technology. This is connected directly to the transformer's measurement technology, thereby ensuring efficient and reliable transmission of the data collected.

“Using LoRaWAN® as a retrofit solution for our local network transformer stations means we now have direct insight into their operating status and are no longer working blind. We obtain live data and can therefore react much faster when something isn't as it should be,” explains Jörg Paulus, Assistant Manager Electricity Grid Operation / Energy Data Management at Stadtwerke Altdorf GmbH.

“As ZENNER's project manager, it was especially exciting for me to see how we were able to work with the public utility company to drive forward this digitalisation process. Our close partnership not only resulted in us creating genuine added value for grid management – we also learned a lot from each other as a team. It's really great to see how an idea delivers tangible benefits. This kind of thing is what makes innovative work on grids so enjoyable,” adds Patrick Leiner, Senior Project Manager IoT at ZENNER.

SMART LIGHTING:

INTELLIGENT CONTROL OF STREET LIGHTING

LoRaWAN® and the Internet of Things (IoT) enable customised, needs-based control of street lighting. The resulting benefits are reduced energy consumption and lower costs. Smart lighting also dovetails perfectly into an overarching smart city strategy.

The cost of public lighting is a relevant factor in local authority budgets. What's more, outdated technology such as ripple control receivers (RCRs) is still widely used to control street lighting. Public utility companies and local authorities therefore need a more economical and flexible solution.

Smart custom control of street lighting with LoRaWAN®

Thanks to ZENNER's smart IoT solution, everything from individual light points to entire urban districts can be custom controlled remotely using LoRaWAN® and Greenbox Compact, which is installed in the distribution box or directly in the street light. This is a quick and easy way for public utility companies and local authorities to modernise their existing street

lighting, and to make cost and energy savings by controlling it via the Internet of Things. What's more, motion and brightness sensors can be used to adjust lighting as required.

The benefits of smart lighting:

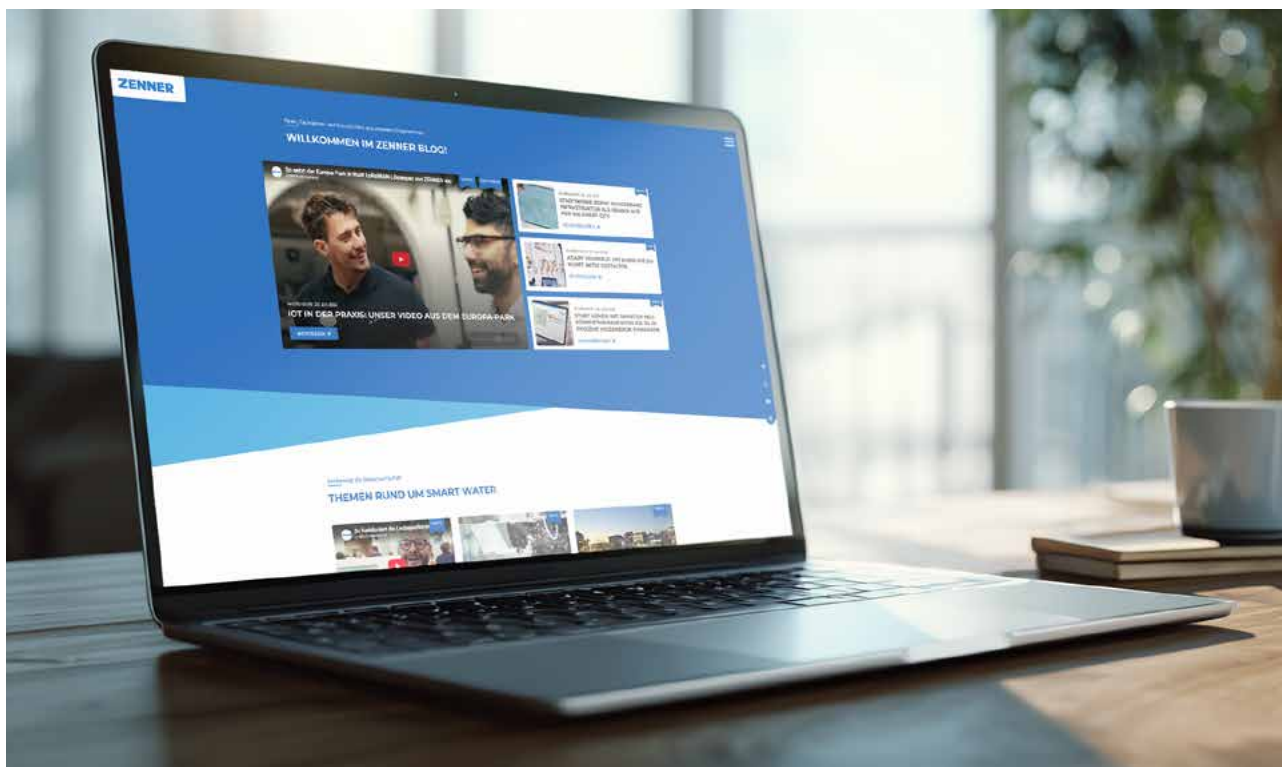
- Excellent payback potential
- Time and cost savings
- Enhanced process efficiency
- Reduced light pollution and energy consumption
- Easy retrofitting in existing infrastructure

Thanks to smart lighting, public utility companies and local authorities are taking an important step towards a digital future, benefiting from cost savings and significantly reducing their environmental impact.

VIDEO ON THE TOPIC

Smart lighting with IoT





SMART & EASY BLOG:

HAVE YOU CHECKED IT OUT?

ZENNER has something new for you! There's now another way of obtaining information – the Smart & Easy blog.

In the new Smart & Easy blog, our editorial team provides content relating to topics such as smart metering, smart cities, smart buildings and IoT in one place. We share our expert knowledge in a range of different formats, including project and background reports, interviews and videos.

WEBLINK

Smart & Easy blog



LIGHTS, CAMERA, ACTION:

OUR VIDEO SHOOT AT EUROPA-PARK

By Stefanie Schröder, Marketing Manager Corporate Communications at ZENNER

What do the Europa-Park theme park and a small city have in common? More than you might think at first glance. Both are teeming with thousands of people every day, their infrastructure is complex, and countless processes need to work smoothly. “Europa-Park, with its many challenges, is like a small city – and our technical department essentially adopts the role of the public utility companies, keeping everything running,” explains Stefan Gehring, who is responsible for electrical and telecommunications engineering at Europa-Park.

Accordingly, the park is following the example of some towns and cities when it comes to digitalisation, and is making big strides towards creating a smart theme park. In collaboration with ZENNER, the team at Europa-Park has set up a LoRaWAN® network that serves as a basis for various smart applications. Our video shows you what these applications are and how they work. But how do you actually go about making a video of this kind?

From original idea to actual filming

It all started with an idea. We didn’t just want to describe the numerous use cases at Europa-Park – we wanted to show them in action with the help of a video. We quickly came up with the approach of comparing the park to a small city.

Before filming could start, though, a lot of planning work was needed behind the scenes. When would filming take place? Who would be involved? Which attractions and locations would we feature? And what would be the best way of telling the story?

Once we’d answered all these questions, we headed off to Rust, where the theme park is located.

A day at Europa-Park

Our first stop, more or less as soon as we arrived, was the Voltron roller coaster. Instead of strolling through the entrance area and gradually getting into the mood for a day out like normal visitors, we were right in the thick of things within a matter of minutes. It was a very surreal feeling.

While the film crew prepared for the first shots, my colleague Patrik and I went over the script one last time with the people appearing in the video and talked through the individual scenes. The sequences in front of the individual attractions were planned in advance, but other clips were filmed spontaneously on the spot. We found ourselves constantly switching





between filming the scripted sequences, capturing spontaneous moments at the park and featuring the sensor technology being used there. In some cases, we even used a golf cart to move between the various filming locations.

It was incredibly exciting to experience the park from a completely new perspective – getting a glimpse behind the scenes, filming in the middle of a queue, venturing off the beaten track and chatting to the people who ensure everything runs smoothly on a day-to-day basis.

And it goes without saying that we couldn't leave without a ride on a roller coaster. After all, when are you ever allowed (or required) to ride a roller coaster while at work?

The result – IoT in practice

The day's filming was followed by the editing process, selecting the best scenes and agreeing on the final version. We'd like to take this opportunity to once again thank our production company brainworks and everyone at Europa-Park for the great teamwork!

The video we've produced enables people to see for themselves how ZENNER's digital solutions are being used in practice at Europa-Park.

USING LORAWAN® AND AI TO MAINTAIN AN OVERVIEW

Europa-Park started planning a LoRaWAN® network midway through 2023, with the official rollout following in May 2024. Some 180 sensors and six gateways have now been connected. In collaboration with ZENNER, the theme park has utilised this digital infrastructure as a basis for the following use cases:

- Water level monitoring for bodies of water at the park as well as the lakes and water features of the water-based attractions
- People counting
- Predictive maintenance based on monitoring of lift motors

VIDEO ON THE TOPIC

LoRaWAN® and AI at Europa-Park



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