

Transforming Church by Utilizing Device-Enabled Research Projects

Casterney, Netherlands

Applications
Smart Buildings and Church
Indoor Ambience Monitoring
Temperature and Humidity Monitoring

Number of Devices Deployed
11 * Milesight EM300-TH Sensor

Location
Casterney, Netherlands

Papers & Media Coverages

- Research Paper
[https://www.cell.com/current-biology/abstract/S0960-9822\(23\)01304-0](https://www.cell.com/current-biology/abstract/S0960-9822(23)01304-0)
- Media Coverage
 Bionews, December 15, 2023
- Media Coverage
 Science, November 20, 2023
- Media Coverage
 Scientific American, November 21, 2023
- Media Coverage
 Sky News, 20 November 2023
- Media Coverage
 Daily Mail, November 20, 2023

Background

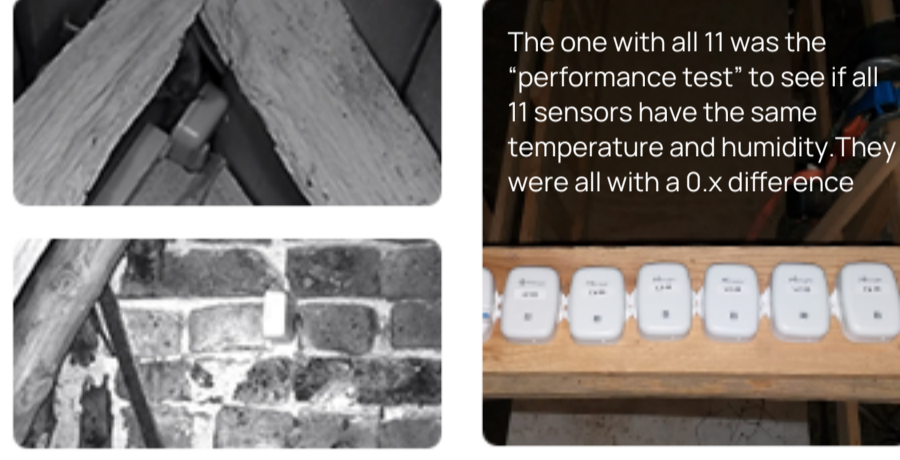
The church is home to Europe's largest colony of Laatvlieger-bats, a species of bat. The purpose of Jan Jeucken's research is to record temperature and humidity for 3 years so that a so-called zero measurement has taken place. In the current habitat, the Serotine bat feel optimal. Should the church be modified for another (residential) purpose, the habitat in the church attic will have to remain identical in order to prevent the habitat of the Serotine bat from being disturbed.



Challenges

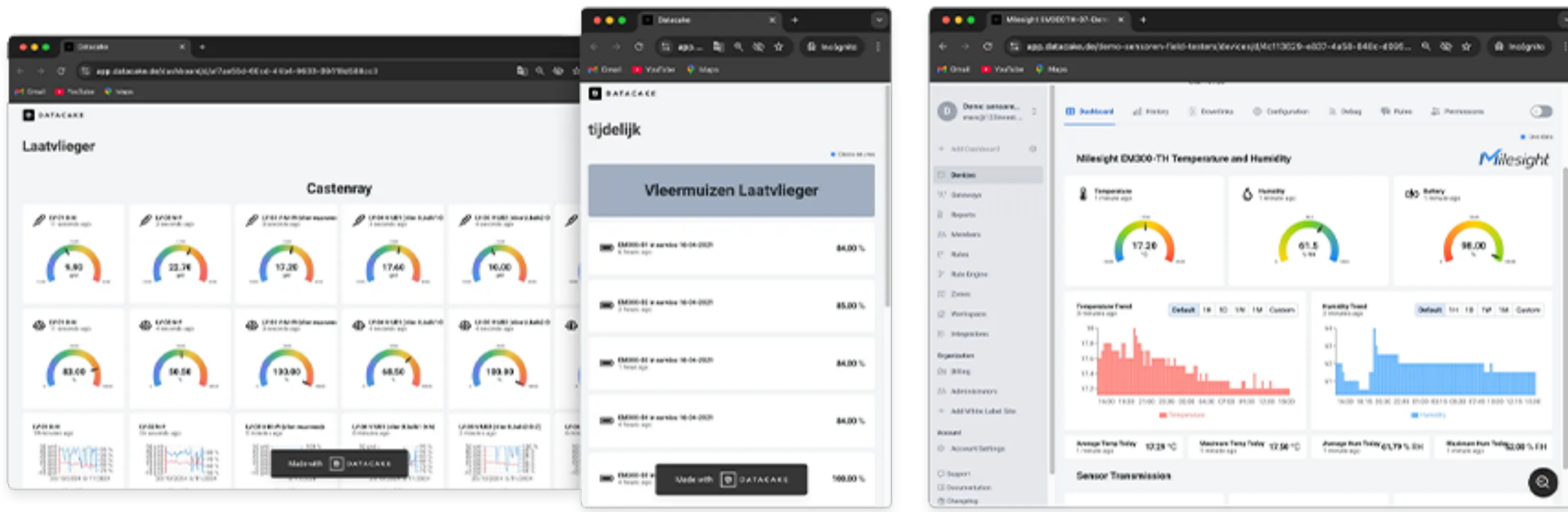
"The church of Casterney may possibly be repurposed for another (residential) use in the future. The current microclimate is perfectly suited for the colony of Laatvliegers (bats) that have been housed there for many decades. If the church is to be modified for another (residential) purpose, the living environment in the church attic must remain identical to prevent the habitat of the late flyer from being disturbed."

Solution



In an increasingly digital world, even the most traditional institutions are embracing technology to enhance operations and ensure the comfort and safety of their congregation. To preserve the church's microclimate, Jan Jeucken implemented a smart monitoring solution using Milesight EM300-TH sensors and Datacake's cloud platform. With Milesight EM300-TH sensors and Datacake, Jeucken can capture real-time temperature and humidity data to preserve this essential habitat. By seamlessly integrating Milesight's wireless sensors with Datacake's scalable platform, the team can easily expand the system, adding more sensors as needed while maintaining the integrity of the church's historic structure. Here's how the solution was designed and executed:

- Step 1: Wireless Temperature Sensors**
 LoRaWAN-enabled temperature sensors were strategically placed throughout the church's interior to monitor temperature levels in real-time. These sensors were designed to be discreet and unobtrusive, ensuring they did not detract from the building's aesthetic appeal. The one with all 11 was the "performance test" to see if all 11 sensors have the same temperature and humidity. They were all with a 0.1 difference
- Step 2: Gateway Installation**
 A LoRaWAN gateway was installed within the church premises to collect data from the temperature sensors and transmit it securely to Datacake's cloud platform for analysis. On March 26, 2021 (Placement gateway in Casterney) the user placed a LoRaWAN Wireless gateway in the church of Casterney. In this church lives the largest colony of Laatvlieger bats in Europe. To measure the temperature and humidity, 2 (and later 1) Milesight EM300 sensors were placed here. On March 14, 2023, Jan Jeucken of the De Laatvlieger Foundation installed 11 pieces of temperature and humidity sensors in the church of Casterney. With these 11 sensors, a micro climate survey will be conducted for the next 3 years. Every 20 minutes the 11 sensors record temperature and humidity, 10 sensors are placed in front part of the ship and 1 sensor is mounted on the north side on the outside so that the relationship between inside and outside temperature and humidity can also be determined.
- Step 3: Cloud-Based Monitoring Platform**
 The data from the sensors is sent to Datacake's platform, where it is displayed on an easy-to-interpret dashboard, enabling Jeucken to make real-time assessments of the microclimate conditions. Datacake's platform also provides one-year data retention and export functionality, enabling researchers to analyze historical data and collaborate effectively on long-term studies. The platform's scalability further ensures that the system can be expanded as more sensors are needed over the course of the study.



Featured Products



EM300-TH Temperature and Humidity Sensor

- IP67 Rated and UV Resistance
- Support Retransmission for Reliable Communication
- Up to 10 Years Battery Life
- Detect Temperature and Humidity with Higher Accuracy
- Store Capacity with 2,800 Sets of Historical Data Records
- Certified for EN12830 Standard

Results

"The ultimate goal of Jan Jeuken is to create a knowledge document of the Laatvlieger / Serotine bat, so that we can better protect them. I am also building church attic-like constructions with similar microclimate conditions, in order to be able to place them worldwide as an alternative to churches that are about to disappear or are given a different purpose," says Jeucken. This is also threatening for the church in Casterney, "I'm not religious at all, but I do hope that we can preserve many churches and other historic buildings and stop the merciless madness of insulating cavity walls. With the prospect of Christmas, it is impossible to sell that there will soon be nowhere for bats to give birth to their young."

Why Choose Milesight



"I have 11 of these EM300 in a church to study the indoor climate of a bat colony, the biggest Laatvlieger colony in Europe. After 2 years battery life still on 92-95%. Great how IoT can be used"

--Marc van Bracht, TTN Venray

Partner



About The Things Network Venray

The mission of #TTN0478 is to establish and maintain a 100% coverage, free, open, and freely accessible LoRaWAN network in and for the municipality of Venray.

The initiators aim to achieve this network together with entrepreneurs and enterprises from the municipality of Venray.

About Delmation

Delmation is at the forefront of IoT innovation, driving businesses to fully unlock and utilize the potential of IoT technology. Specializing in advanced IoT solutions, we offer an extensive range of products like routers, gateways, and sensors tailored to meet the unique demands of various industries. Delmation's deep technical expertise ensures seamless integration, from design through implementation and ongoing support, making them an essential partner for companies aiming to lead in the connected world. Additionally, Delmation excels in developing custom solutions to meet specific client needs.



About Datacake

Datacake is a powerful, end-to-end IoT platform with a built-in LoRaWAN Network Server (LNS), designed for effortless deployment—no coding required. It features custom dashboards, real-time alerts, data storage, reporting, user management, white labeling, and multi-tenancy, making IoT monitoring and control easier than ever.