

Smart Museum Management with Advanced Temperature and Humidity Monitoring IoT Solutions in Slovakia

Location: Museum in Tatranská Lomnica, Slovakia

Milesight Partner

Heliotics

Location

Museum in Tatranská Lomnica, Slovakia

Deployed Products:

AM102, EM300-TH, EM320-TH

Applications

Temperature and Humidity Monitoring, Smart Building

Background

Museums often stores fragile artifacts made of canvas, wood, parchment, or paper—materials that are highly sensitive to temperature and humidity. Even minor fluctuations caused by lighting, visitor presence, or outdoor climate can lead to irreversible damage to manuscripts, paintings, and other valuable exhibits.

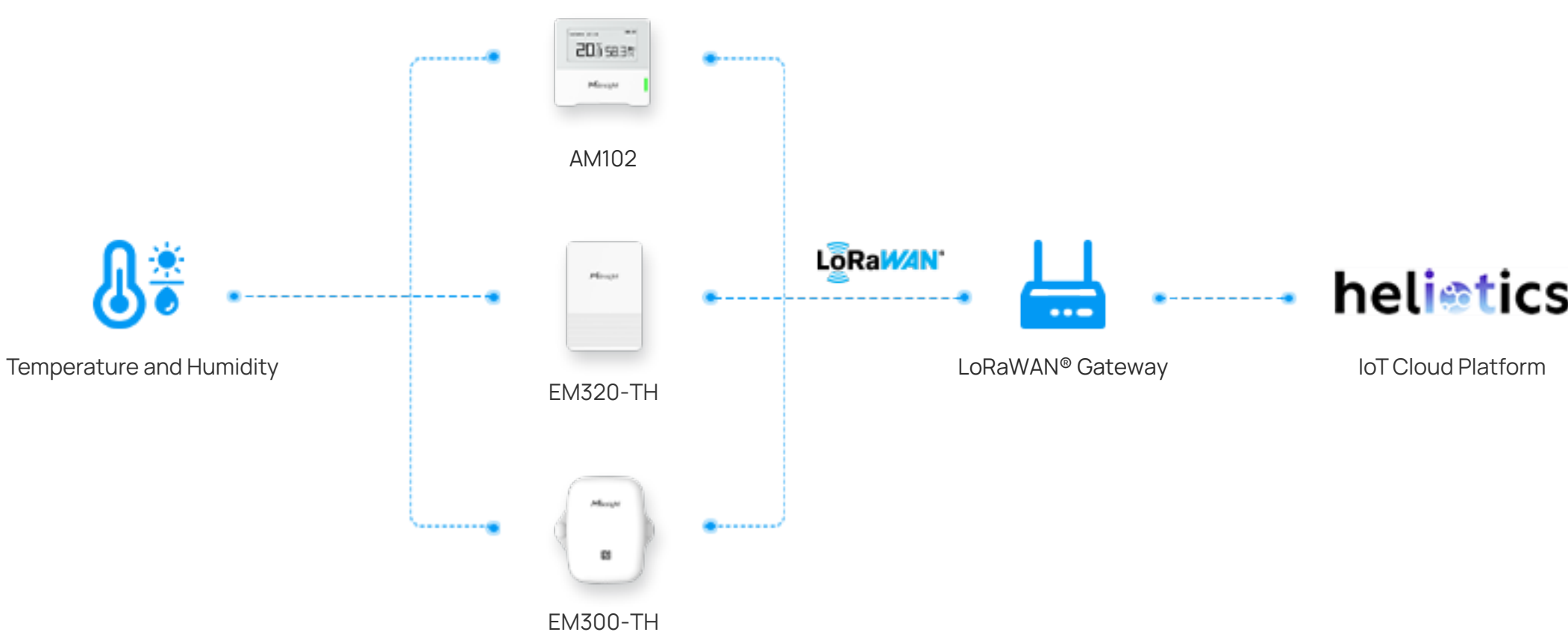
To address this challenge, our partner Heliotics implemented a smart IoT solution using Milesight LoRaWAN® sensors and gateways. The system, managed through the Heliotics CORE platform, enables automated environmental monitoring, real-time remote access to data, and instant alerts in case of anomalies. This helps facility managers maintain stable conditions and reduces the need for manual inspections.



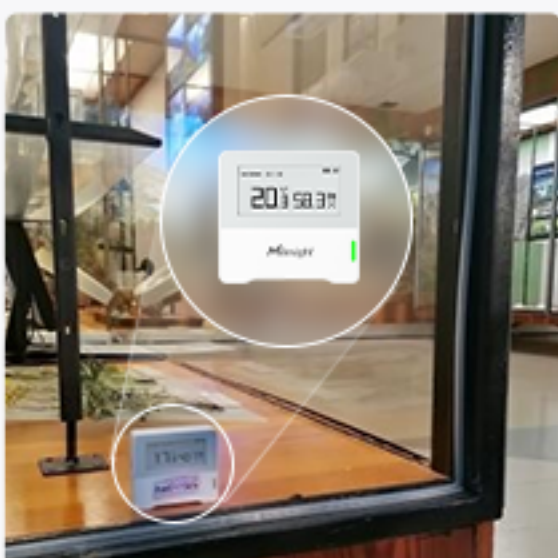
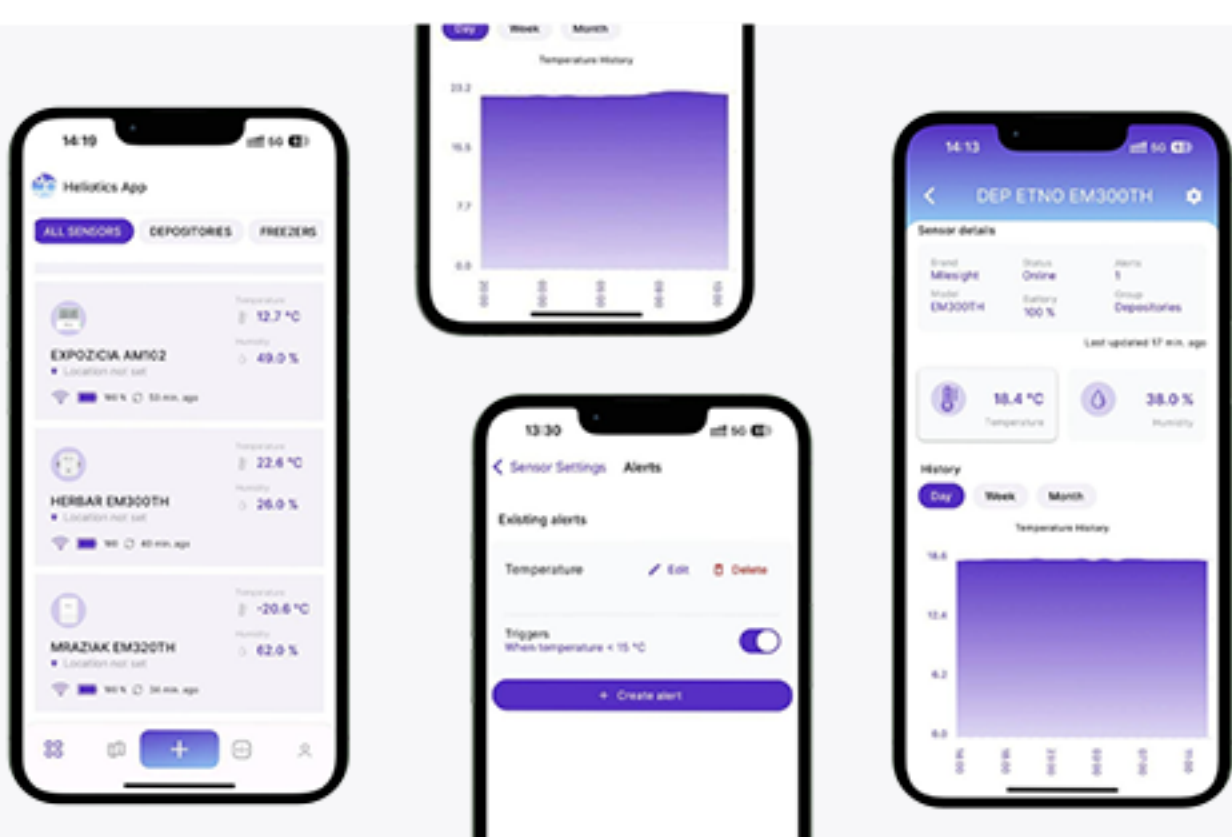
Challenges

Maintaining optimal temperature and humidity is essential; however, manual inspections are both time-consuming and disruptive to the exhibition space. Frequent checks can inadvertently impact the environment and heighten the risk of damaging delicate artifacts.

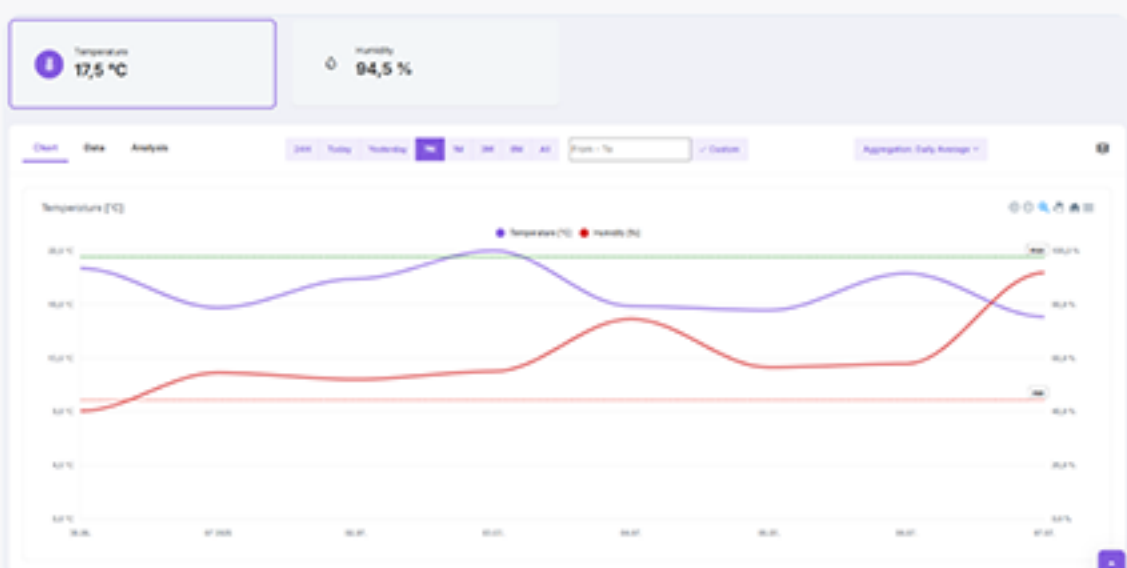
Solution



To maintain stable preservation conditions across the museum, Milesight LoRaWAN® sensors were installed in key areas - from exhibition halls to storage rooms, herbaria, and freezers. These sensors monitor temperature, humidity, and potential leaks, with data streamed to the Heliotics CORE platform, a plug-and-play system enabling real-time insight and rapid response.



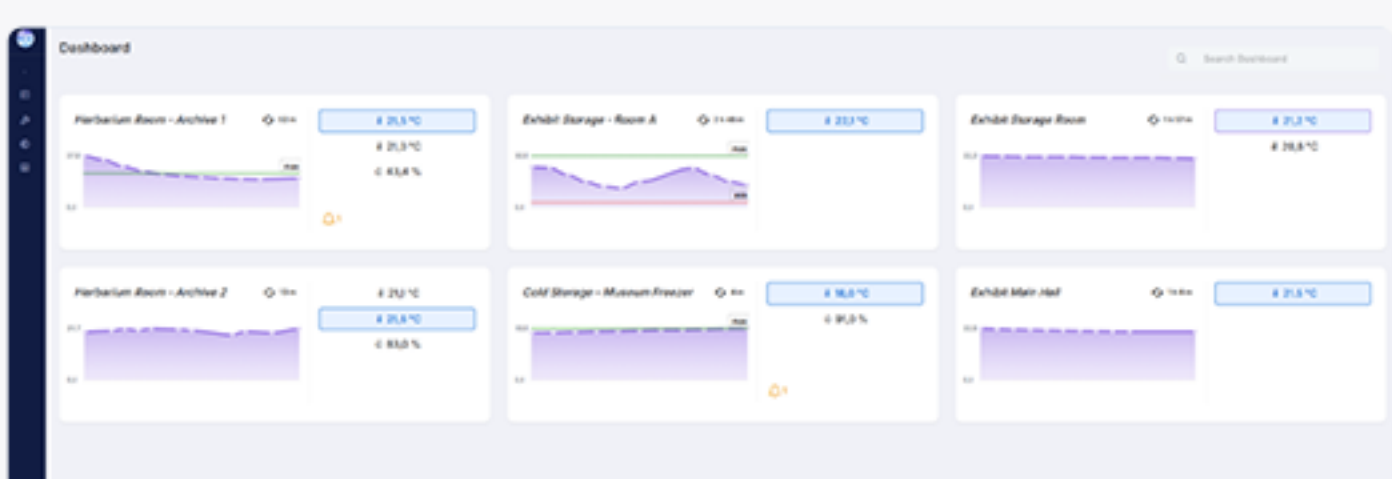
In the exhibition area, Milesight AM102 sensors monitor temperature and humidity while blending into displays thanks to their discreet E-ink screens. In storage and herbaria, EM300-TH and EM320-TH sensors provide reliable long-term monitoring and buffer data in case of connection loss. Freezers were equipped with EM320-TH sensors for their waterproof, food-safe design and precision.



All sensor data is instantly available in the Heliotics CORE dashboard, giving staff a centralized view of environmental conditions. Built-in analytics offer trends and statistics such as average, minimum, and maximum values, with multiple aggregation settings including hourly, daily, weekly, and more.

Smart alerts notify staff via SMS, email, or push message when values exceed limits. Each alert includes a Recommended Action: predefined instruction, helping staff respond quickly with confidence. Staff can also visualize critical min/max thresholds directly within the charts, helping them quickly identify fluctuations. Using the Dataview feature, multiple sensors can be grouped into one clear view showing average, min, and max values - all visualized in a single chart. This simplifies daily monitoring and ensures consistency across rooms.

Thanks to this combination of reliable sensors and the Heliotics CORE platform, the museum now benefits from real-time visibility, visual alerts, and guided response -protecting both exhibited and stored heritage.



Result

Remote Access to and Control over Environmental Data

Allowing staff to monitor conditions without physically entering sensitive areas.

Automated Alerts

Enable timely interventions, preventing potential damage to valuable items.

One specific example illustrates the value of this setup: the Heliotics CORE platform alerted staff to unusual spikes in humidity in two depository rooms. Upon inspection, they discovered developing leaks where water was dripping from the ceiling, threatening valuable archival materials. Immediate action was taken to protect the collections, and thanks to early detection, the museum avoided more severe damage and costly repairs.

The impact of the solution is best reflected in the words of the museum's manager:

"Heliotics provided us with great help in ensuring protection in our museum through design, implementation and subsequent care in monitoring temperatures and humidity using smart sensors. In this way, we gained the opportunity to check the state of the premises without limits, not only in standard museum premises, but also, for example, in freezers, where we temporarily store valuable biological material. It is important for us that with the current solution it is not necessary to physically enter the premises and disturb the climate inside, but we can monitor the data remotely using a PC or a mobile phone, and we also have the option of receiving notifications in case of unpredictable situations."

- Museum Manager

Why Choose Milesight



We selected Milesight temperature and humidity sensors for their exceptional reliability, long battery life, and seamless integration with our Heliotics CORE platform. Their compact, wireless design allows for easy deployment across various museum environments - from exhibition halls to storage rooms and even freezers without disrupting the space or requiring complex wiring.

The sensors offer precise environmental monitoring and ensure consistent data transmission over LoRaWAN®, even in challenging building conditions. Paired with the intuitive configuration tools in Milesight Toolbox, setup is fast and straightforward. Overall, Milesight provides a dependable and maintenance-friendly solution that enables us to deliver smarter, real-time environmental control for sensitive and high-value spaces.



Milesight Partner

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About Heliotics

Heliotics provides comprehensive software solutions for production and industry monitoring, utilizing IoT technologies such as LoRaWAN® and NB-IoT. Heliotics CORE plug-and-play platform offers a highly customizable and scalable solution, integrating a range of smart sensors that empower manufacturers to efficiently monitor and manage their production operations.

Heliotics focuses on delivering seamless connectivity and real-time data analytics. Our platform streamlines monitoring, control and data integration while providing features such as predictive maintenance, downtime reduction, real-time alerts and advanced analytics for deeper insights.

With over a decade of experience across a wide range of industries, including automotive, logistics and machinery, we offer scalable, user-friendly solutions that help organizations optimize their processes, improve efficiency and make data-driven decisions.