

The logo for Senzemo, featuring the word "senzemo" in a white, lowercase, sans-serif font. The text is centered horizontally and is positioned over a dark gray background that is split diagonally from the bottom-left to the top-right. The upper-left portion of the background is a lighter shade of gray, while the lower-right portion is a darker shade.

senzemo

Usecases

Extended

Empowering society with cutting-edge
IoT solutions for a resource-efficient and
sustainable world.

Senzemo mission

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Cold Rooms

Cold rooms food temperature control



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Retail Cold Chain

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Smart Cleaning of Beverage Production

Usecases >

Cold Rooms

FOOD TEMPERATURE CONTROL, LUXURY HOTEL CHAINS



30% HIGHER
PROFITABILITY!

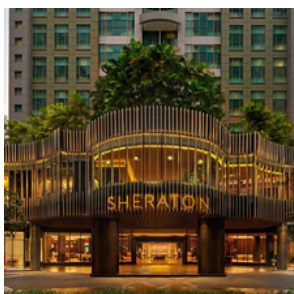
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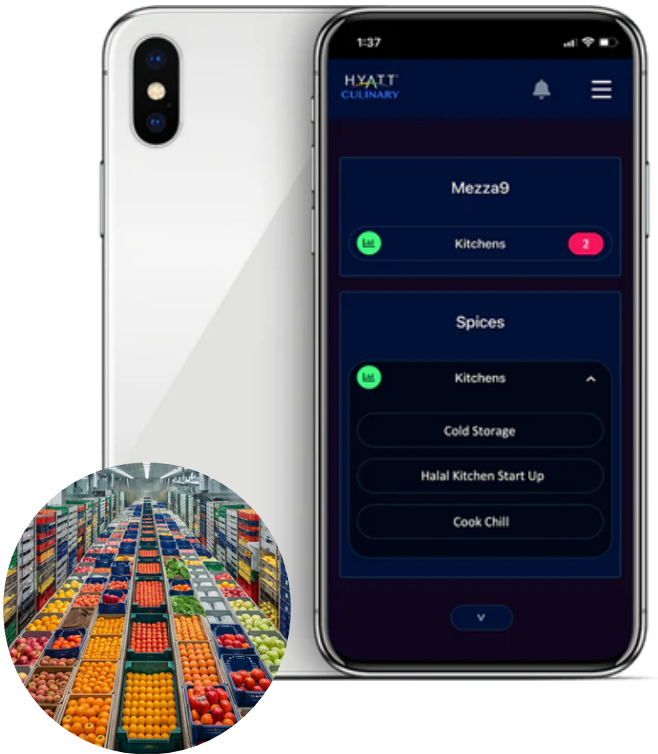


Addressing food waste and safety

Food safety protocols are very important for 5-star hotel chains and their restaurant businesses. For Sheraton, Hyatt, Intercontinental, and Accor, the quality of food is very important to their guests, and there are a lot of internal rules that need to be obeyed to fulfill that promise. Controlling food storage temperature is one of the most important ones, and using sensors makes for a more efficient, flexible, and economically sound process.

The purpose of cold room storage monitoring is to ensure that the cold room is being used and maintained in a way that preserves the quality and safety of the food or other products being stored. Proper cold room storage monitoring can help to prevent food spoilage and waste, as well as reduce the risk of foodborne illness.





Smart temperature control

Over 1000 Senstick MicroClimate sensors were shipped to Australia and Singapore, where MFC Safe integrator managed their deployment inside the cold rooms of the largest hotel chains like Sheraton, Intercontinental, and Hyatt.

Senstick had no problems with the signal coming from the isolated cold rooms. The sensors replaced manned temperature monitoring performed by kitchen personnel, thus saving 30% on labor costs. The expected ROI for the sensors is going to come around in just 14 months.

HYATT®


INTERCONTINENTAL®


SHERATON
EST. 1937


ACCOR



SENSORS REDUCE EXPENSES,

PROVIDE A SAFE WORK ENVIRONMENT AND ALLOW HOTELS TO FULFILL
THEIR PROMISE OF A LUXURY EXPERIENCE FOR THEIR GUESTS.

How it started

Food waste, big loss

High cost of manpower

Risk of damaging brand image

Manual readings

How it ended

14-month ROI

Reducing manpower by 30%

Improved food safety

Automated HACCP

Retail Cold Chain

GROCERY TEMPERATURE MONITORING, RETAIL CHAINS



25 MINUTES
SAVED PER DAY!

Deployed at:

7-ELEVEN

TROPIC

PETROL

Dealing with inefficiency

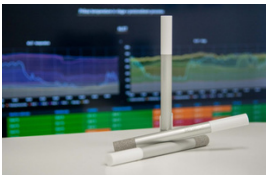
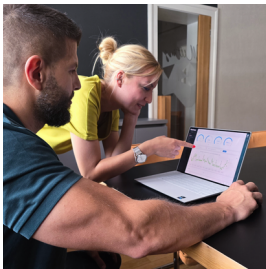
Retail chains often struggle with inefficient and error-prone manual temperature checks, leading to inconsistencies, human errors, and increased labor costs. Compliance with food safety regulations such as HACCP and FDA standards becomes challenging due to unreliable record-keeping, increasing the risk of fines and operational disruptions. Without real-time alerts, they are often unaware of temperature fluctuations, resulting in product spoilage,

financial losses, and customer dissatisfaction. Additionally, equipment failures go unnoticed until significant damage occurs, leading to higher maintenance costs and waste. The lack of data-driven insights prevents retailers from optimizing energy consumption, further increasing operational expenses.



Turnkey solution

When IoT, LPWAN based temperature monitoring solutions are deployed, retail chains benefit from real-time data tracking, automated alerts, and seamless compliance with food safety regulations, reducing human error and labor costs. Continuous monitoring ensures that temperature-sensitive products remain within safe thresholds, preventing spoilage and waste while enhancing product quality and customer satisfaction. Automated record-keeping simplifies audits and regulatory compliance,



mitigating the risk of fines or operational disruptions. Additionally, predictive maintenance capabilities help detect equipment failures early, reducing downtime and repair costs. Energy efficiency improves as IoT systems optimize refrigeration usage, lowering operational expenses and contributing to sustainability efforts. Ultimately, IoT solutions enhance efficiency, reduce losses, and ensure a more reliable and cost-effective retail operation.



STO10

Temperature Only



SMC30

Temperature & Humidity

How it started

Manual checking

Time consuming

Location specific monitoring

How it ended

Reallocation of staffing
towards value-add tasks

25 minutes saved per day

Easy to scale system

Food Temperature

FOOD SIMULANT TEMPERATURE MONITORING, RETAIL & HOSPITALITY



SAVE 10% ANNUALLY
PER FRIDGE

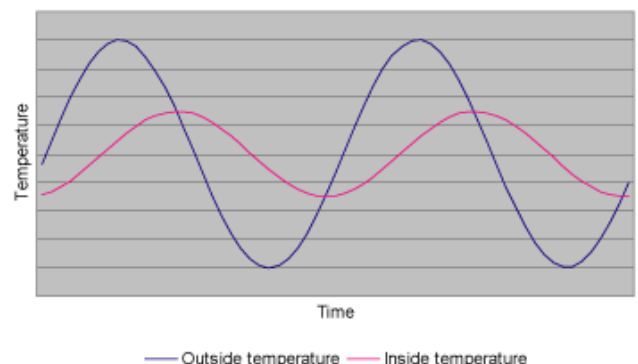
The challenge of reliable cold storage monitoring

Cold storage of food is operated under strict standards for food safety and guest satisfaction. Temperature-sensitive goods such as fresh produce, beverages, and prepared meals must be kept within precise ranges to meet safety regulations and maintain quality. In busy industries like retail & hospitality frequent door openings cause sudden

ambient temperature shifts. Standard sensors react instantly to airflow changes, giving misleading readings that do not reflect the food's true, slower-changing temperature. This results in unreliable data, false alarms, and unnecessary interventions.



Effect of thermal mass on inside temperatures



Food simulant IoT Sensor solution

By using special food simulant sensors that use glass beads like STB10 from Senszemo, retailers, hotels, restaurants or businesses involved in cold chain systems can avoid unreliable air-based readings that cause false alarms, wasted service calls, and unnecessary stock disposal.

This ensures accurate monitoring that reflects real food conditions, preventing 5–10% in intervention costs and 2–5% in food waste per fridge, while also reducing compliance risks and safeguarding reputation. The result is smoother rollouts, fewer disruptions, and measurable cost savings across operations.



- DUAL TEMPERATURE SENSING
-40°C TO +85°C
- ACCURACY
±0.2°C
- WIRELESS RANGE
Up to 1km
- BATTERY LIFE
7+ yrs
- DATA LOGGING
Up to 40 days if read hourly

- IP67 Grade Enclosure
- Ultra Low Power

Other cold chain sensors

STO10
Temperature Only

SMC30
Temperature & Humidity

How it started

- Unnecessary checkups
- Compromised food
- Compliance risk

How it ended

- 5–10% saved on interventions
- Reduced food waste by 2-5%
- Significant risk reduction

Cook Chill

FOOD STORAGE TEMPERATURE CONTROL



35K FRESH MEALS
PER DAY!

Done in
partnership with:



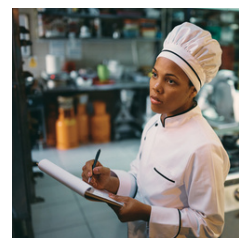
&



Cook chill offers numerous benefits

Restaurants, hotels, and their Chefs often use the Cook-Chill process, a food production, and storage method that involves cooking food to a high temperature to kill pathogens, cooling it rapidly to a temperature at which bacteria cannot grow, and storing it at that temperature until it is needed. Proper cook-chill method storing can help to prevent food spoilage and waste, as well as

reduce the risk of foodborne illness. It allows Chefs to produce large quantities of food that can be stored and served at a later time, while at the same time reducing food waste and improving efficiency by allowing food to be prepared in advance and stored until it is needed for service.



SINCE 1979



The case of TASTY FRESH

Tasty Fresh is an Australian family-owned and operated business that has been operating since 1979. It delivers fresh, hot food, snacks, and drinks right to the door of workplaces daily in Melbourne, Perth, Sydney, Newcastle, and Queensland. It has 4 in-house industrial bakeries that produce a range of high-quality pies, pastries, sausage rolls and much more.

They have six outlets across four states and service around 35,000 customers per day served in 153 vans and up to 100,000 units per day. Over 500 employees around Australia make that happen.

With such a large number of meals, they need to control some of the preparation that is based on the cook-chill method. Only a specialized technological solution that provides on-point, accurate temperature measurements would therefore come into play.



35,000 customers per day
100,000 units per day
500 employees
153 vans

Finding the right solution

Cook-chill requires cook temp at typically 75°C, then verifying cooling rates where the product chills from 60°C to 21°C within 2 hours, then 21°C to <5°C within 4 hours. This is to limit the risk of *Clostridium perfringens* bacteria re-vegetating and producing heat-stable SET toxins.

We adopted a continuous monitoring process so both cook and chill safety verification data are obtained in real-time. We have designed the world's first set-and-forget, hands-free cook-chill system. Users simply put the sensor into a product, and the process starts. The temperature journey is tracked in real-time, so pre-emptive actions can be taken. Warnings and critical alarms are triggered to keep the kitchen absolutely aware.

The cook-chill probes are placed on quality Senszemo sensors. Sensor probes are used daily by Tasty Fresh to monitor and verify the cook-chill process without any user interaction with the software. It's totally "hands-free". The process on the server starts when the sensor hits 75°C. So once inserted, you can walk away, and the sensor + software takes care of the rest.



Old
STF30



New
STF40



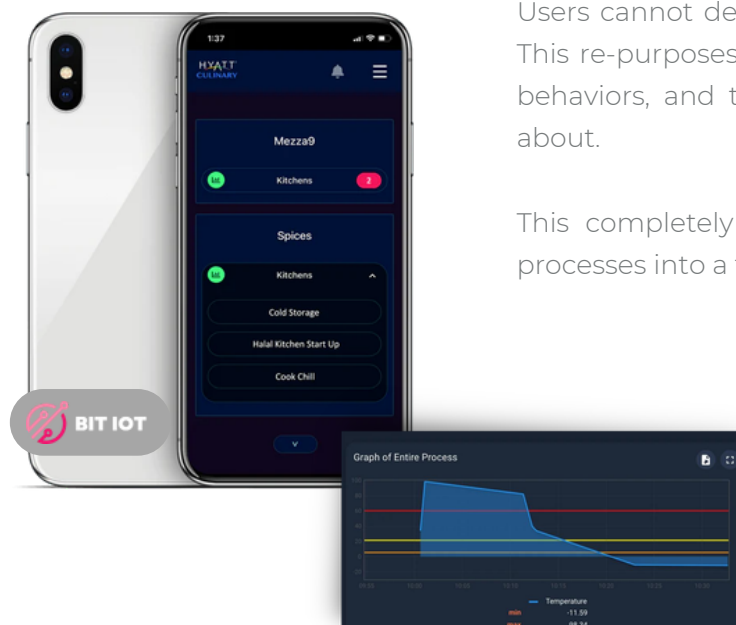
STF30 IS AN EFFECTIVE COOK CHILL FOOD TEMPERATURE PROBE.
IT OPERATES ON LORAWAN AND LASTS UP TO 7 YEARS ON ONE SET OF BATTERIES.

Tangible benefits

The process removes the bureaucracy of HACCP - not only is it paperless, but it's smart and easy.

Users cannot deviate, it's true time/temperature monitoring. This re-purposes the users to focus on the process itself, the behaviors, and the practice - this is what food safety is all about.

This completely changes the face of managing cook-chill processes into a tech-enabled solution.



Tasty food Executive Chef, Andy McCoy

Since we've introduced sensors to our kitchen's daily operations, we have been able to focus most of our time on other activities.



How it started

Time spent on bureaucracy

Possible mistakes in the process

Risk of damaging brand image

How it ended

Saves time

Removes HACCP bureaucracy

Paperless, smart, easy

Sydney Olympic Park Irrigation

SMART PARK IRRIGATION IN SYDNEY, AUSTRALIA

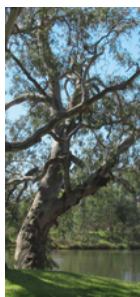
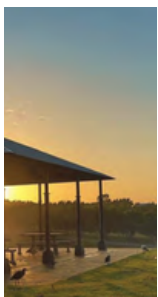


20% SAVED ON
IRRIGATION BILLS!

One of the largest irrigation systems in Australia

Bicentennial Park at Sydney's Olympic Park, a suburb of the city, has some unique urban heat and irrigation challenges. Spreading over 42 hectares, it's actually got one of the largest irrigation systems in Australia, but because its land is spread on an uncapped landfill, the soil is really thin so the plants are quite susceptible

to drought. With heat waves of up to 50°C becoming more common, and irrigation getting more costly, the use of cutting-edge science is needed in order to monitor water use and temperatures, allowing Sydney Olympic Park Authority to optimize its water management and irrigation system.



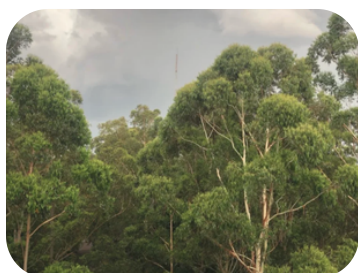
The project

The climate is getting hotter.

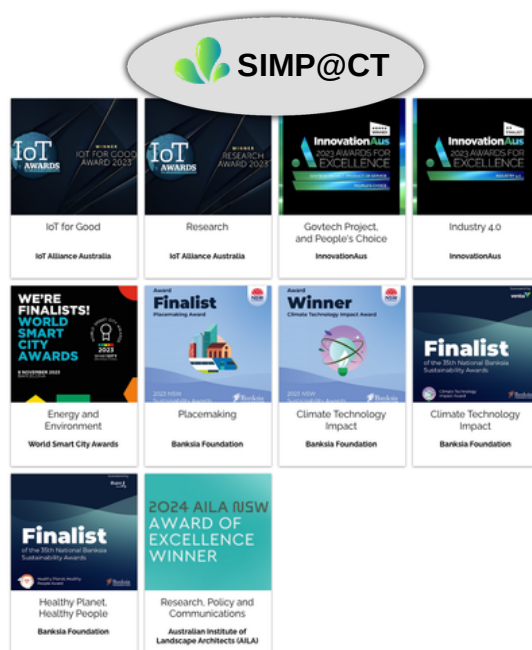
Authorities need to find ways to cool cities down that are practical and that are actually efficient. Called the Park Cool Island Effect, the Sydney Olympic Park Authority (SOPA) is trying to maximize the effect by optimally hydrating every plant throughout the whole park.

The project is called SIMPaCT, which stands for Smart Irrigation Management for Cool Parks and Towns. This project is making the irrigation system more effective and modifying irrigation to give the greatest cooling. Deployed in the park, is a network of cost-efficient smart city sensors measuring meteorological variables like wind, rain, and sunlight so that the authorities can understand how the built environment and plants and different kinds of management approaches alter urban heat on a really fine scale at the scale that people live and work and play.

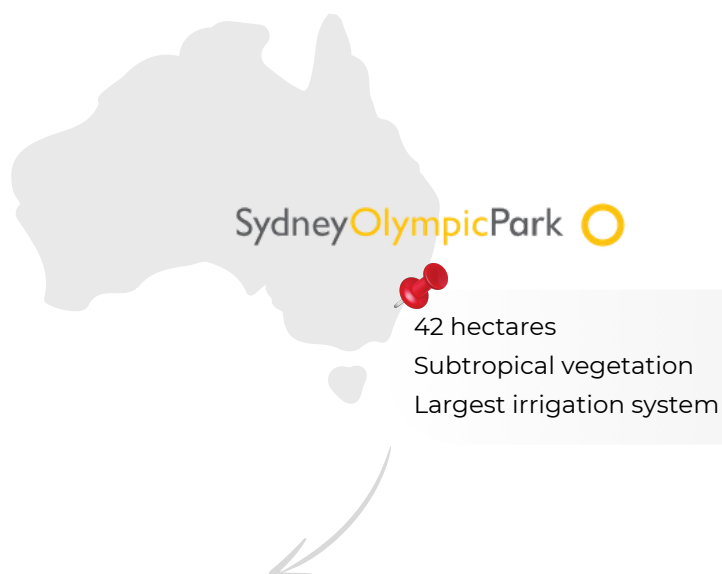
IT MADE SENSE TO TURN TO SMART TECHNOLOGY AND SENSOR TECHNOLOGY TO SEE IF THERE COULD BE IMPROVED WAYS OF RUNNING THE IRRIGATION SYSTEM.



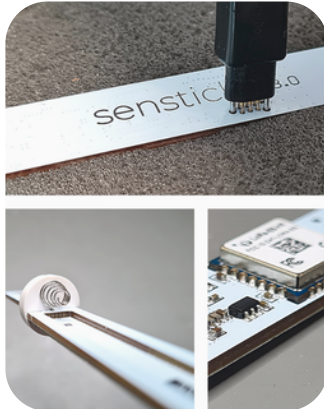
Bicentennial Park has some unique challenges with urban heat and irrigation. It has one of Australia's largest irrigation systems, but because it's on capped landfills, the soil is really thin, so the plants are susceptible to drought.



This project puts forward the knowledge and expertise of Smart City technologies that Professor Sebastian Pfautsch from the Institute for Sustainable Futures at Western Sydney University advised during his research on heat and its control around the Sydney area.



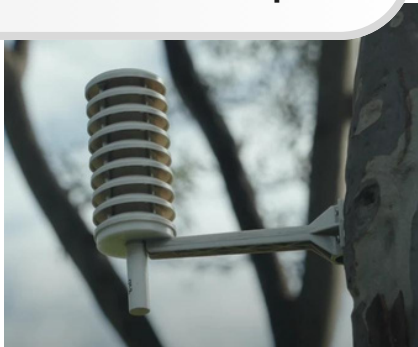
Wireless measurements in the ground and in the air



The project involved the deployment of a network of more than 200 Senstick (SSM30) soil sensors and 50 Senstick (SMC30) microclimate sensors to record soil moisture, air temperature, and humidity.

Microclimate Sensors were placed on trees or poles, 3 meters off the ground, while Soil Moisture Sensors were dug 15 cm into the ground. They were put into PVC casing and despite them being underground the transmission of data is sent through LoRaWAN connectivity every 15 minutes.

50 Microclimate Sensors
were placed on
trees or poles.



Senstick
Soil Moisture
SSM40



- Up to **10 years of operational life**
- Suitable for **harsh environments**
- Measures **soil moisture**



-  **Customizable Settings**
-  **IP68 Water & Dust Resistant Rating**
-  **Easy Installation Integration**
-  **NFC or OTA Reconfigurable**

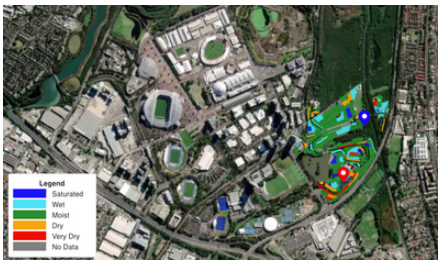


200 Soil Moisture Sensors were dug 15 cm into the ground. They were put into PVC casing and still the transmission of data went smoothly.

Dashboard control

In order to understand the current state of the park and then build a solution to apply the appropriate mitigation measures, various, disparate data sets are required to be interrogated together. This, along with assembling bespoke workflows and building fit-for-purpose machine learning models, the project required all of these components to be accessible in one platform in order to build the desired solution.

Together with weather forecasts, the microclimate data captured is used to fine-tune the park’s active cooling management. This can make a substantial contribution to reducing urban heat and ensuring residents about the safety in accessing the outdoors.



AI Management of Water Pumps



Irrigation in Bicentennial Park can only occur at certain times of the day. Irrigation window is in place through the night, to avoid wetting park visitors and to ensure infiltration of water into the soil. The fixed irrigation infrastructure in Bicentennial Park is a large network of pipes connected to a pump room.



Water supply for irrigation during standard operation of the system is recycled, sourced from the ‘brick pit’ reservoir 1.3 km to the north. The reticulated pipe network is divided into five areas, each defined by a ‘console’ (a pumping booster station for maintaining water pressure).

Each console comprises 30 to 60 ‘stations’, with a total of 200 stations in the park. A station is an operational area defined by a relatively uniform vegetation type, soil type, slope, and aspect.



Sebastian Pfautsch

Professor of Urban Management and Planning
at Western Sydney University

For the first time, AI will be able to control when and how much water is distributed across an entire park to cool its microclimate.



Each station contains a series of sprinkler heads connected to a 'solenoid' (a controllable open/close valve), with all solenoids connected back to a console. A station can be managed based on the specific needs of the soil and plants within it. The irrigation infrastructure is controlled through wired communication between each solenoid and the Irrinet local control system.

Optimal irrigation scheduling is based on advanced analytics modeling. Commands are issued to the irrigation management platform in the form of scaling factors (expressed as a %) which indicate required changes to the existing irrigation schedule.

This project uses only recycled water and represents a large-scale prototype of how smart water management can ease the pressure on our most valuable natural resource.

One of the main sponsors of SIMPaCT is Sydney Water, who came on board with a specific request that the project can be upscaled or downscaled inside the AI module for any irrigation system.

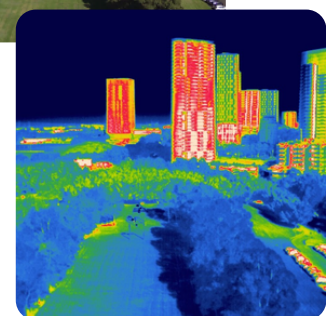
SIMPACT MANAGES THE IRRIGATION SCHEDULE BASED ON SOIL MOISTURE LEVELS, VEGETATION/LANDSCAPE, AND WEATHER FORECASTING.



Urban Heat Island Mitigation

The Urban Heat Island Effect doesn't just make things uncomfortable; it leaves communities living in urban centres exposed to health risks and at higher risk of dying, reduces work hours and can have detrimental impacts on urban flora and fauna. It also drives up power use and increases the carbon intensity of our cities and towns – exacerbating the root cause of increasing urban heat.

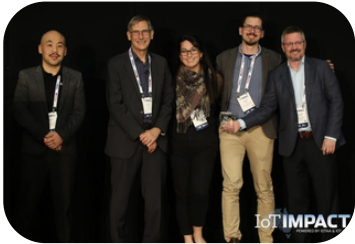
The absorption, storage, and radiation of heat by grey infrastructure leads to urban warming. Plants and water bodies help cooling our cities. Increasing the area in cities covered by parks, forests and gardens is the most effective way to tackle the issue of the Urban Heat Island (UHI) effect and urban overheating.



PARK VISITORS ARE ALSO BE ABLE TO CHECK ON THEIR MOBILE PHONES WHERE THE COOLEST SPOT FOR A PICNIC IS OR WHERE THEY SHOULD EXERCISE.

Multiple award winning IoT research project

SIMPaCT stands as Australia's largest project focused on smart green infrastructure and represents a significant stride in advancing heat-responsive urban design. It is an incredible example of cutting-edge technology being used to improve sustainability. As a result of this, it's won several awards focused on sustainability.



These include winning the Climate Technology Impact category in the Banksia Foundation NSW Sustainability awards, the Research and also the IoT For Good categories at the IOTAA Awards, the Gov Tech and People's Choice Awards at InnovationAUS, and being a finalist in the World Smart City Awards 2023 in the Energy and Environment category.

The IoT Impact Awards are the most high-profile awards in the Australian IoT sector. The project won two of them in the 'IoT for Good' category.

See Video:
SIMPaCT Project



It has garnered widespread national recognition, which will hopefully translate into ongoing support for this exciting and innovative project.



IRRIGATION IS NOW MUCH CHEAPER.

WITH THE INTRODUCTION OF
AI-CONTROLLED WATERING
THE PARK AUTHORITY
SAVES ABOUT 5 MILLION AUD
EACH YEAR ON IRRIGATION!

THIS PROJECT CAN BE TAKEN INTO OTHER ENVIRONMENTS
WHERE THE COMPLEXITY IS LOWER.

How it started

Costly irrigation

Dangerous heat waves

Public needs info about safe areas

How it ended

20% decrease in irrigation costs

4°C reduction in temperature

Possibility to expand safe zones

Coburg Microclimate Monitoring

URBAN THERMAL COMFORT, SMART CITIES



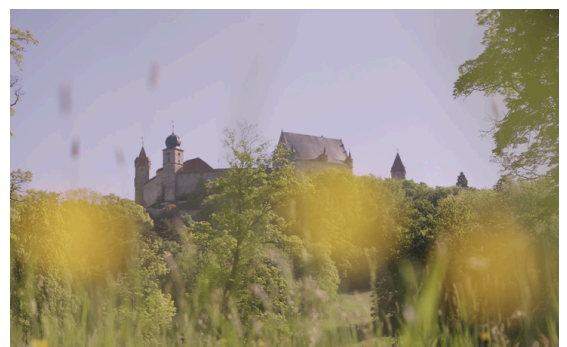
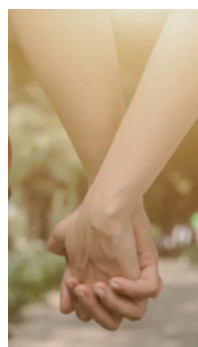
CLIMATE CHANGE MANAGEMENT!

Combating City Heat

Given the accelerated climate change, the placement of microclimate sensors in urban areas is becoming increasingly important. With rising temperatures and more frequent heatwaves, these sensors provide critical real-time data to guide citizens to cooler zones and enhance public safety. They help mitigate the increasing heat threats in cities. Urban planners can use this information to make informed decisions about green spaces and infrastructure,

ensuring cities adapt to changing climatic conditions. The integration of IoT technology for monitoring microclimatic conditions makes cities more resilient, livable, and sustainable.

This proactive approach protects citizens and promotes climate-resilient urban environments.



Technology behind

The sensors are of high quality and are distinguished not only by their design but also by the fact that they are manufactured and assembled in the European Union (Slovenia). They are made from premium materials, making them significantly more reliable and accurate.

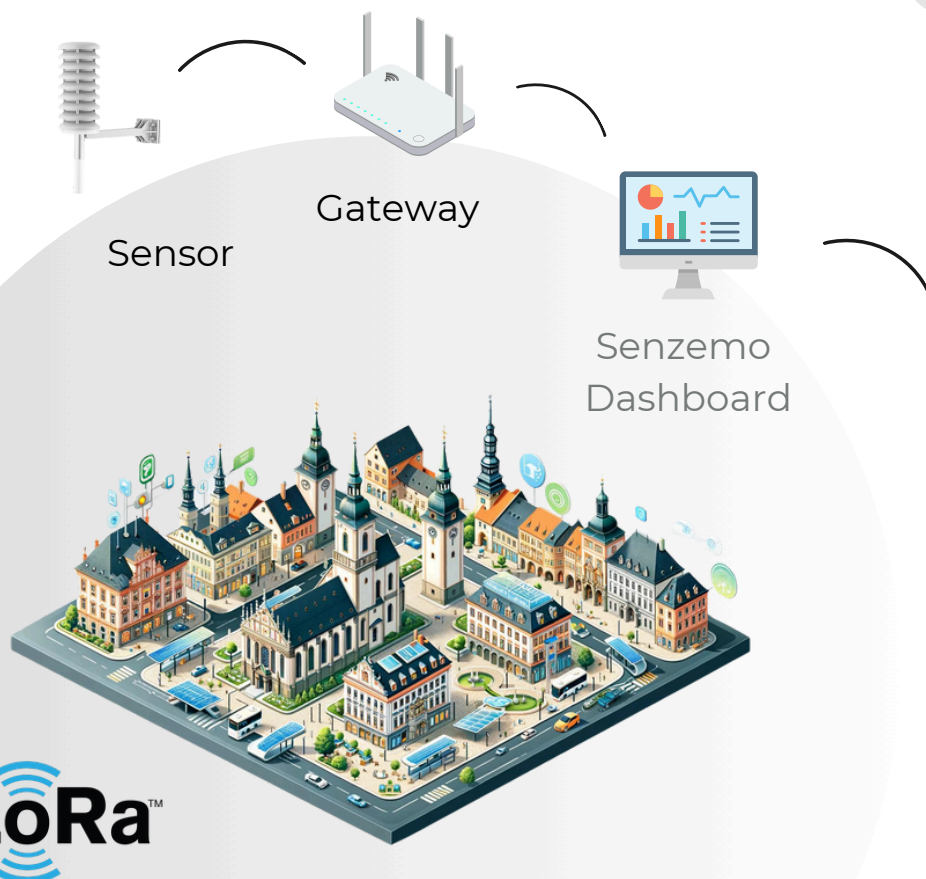
They are designed for durability, and apart from the batteries, the sensors can last for decades. On LoRaWAN, they can operate up to 50 km from the gateway and are easy to install, providing a high-quality experience for both integrators and end customers.



Senstick Microclimate SMC30 with Shield



- Up to **10 years** of operational **life**
- Suitable for **harsh environments**
- Measures **temperature, humidity, and air pressure**



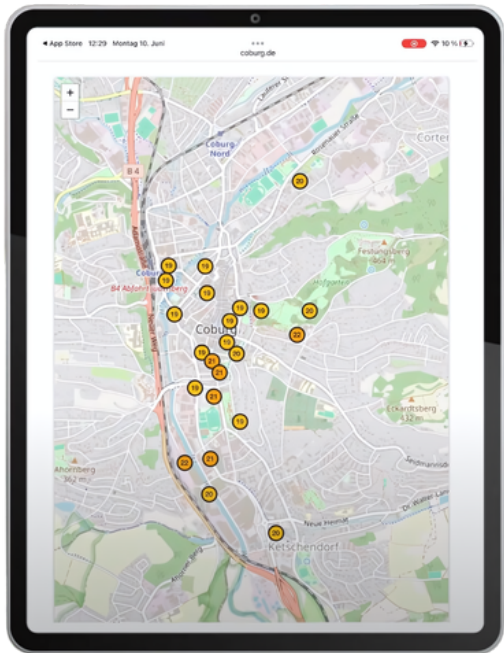
OR
Platform of
your choice

 **DATA CAKE**

 **akenza.io**

 **ThingsBoard**

...



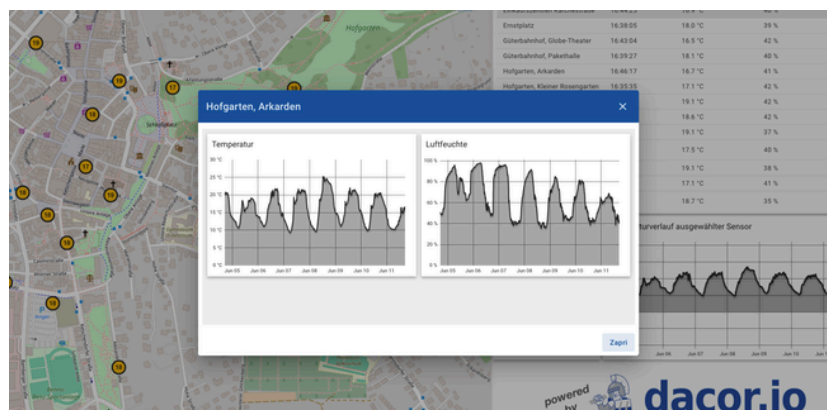
Live-Data on Dashboard

The live microclimate data is available at any time on the City of Coburg's website for all devices. The dashboard displays each sensor and the measurements for current and past data. This allows citizens or city employees to view the data whenever needed.

Currently, 25 locations are already active, and the network will be expanded to cover the entire city area (including districts) in the coming weeks and months. A total of nearly 50 measuring stations will initially be established.

You can find data on Temperature and Humidity on the Coburg Climate page at the following link:

<https://www.coburg.de/boersen/kuehle-orte-in-coburg/Klima-in-Coburg.php>



See Video:

Coburg Microclimate Management



SENSORS PROVIDE INSIGHTS

TO HELP CITIZENS FIND
A COOL SPOT IN THE SUMMER,
THE CITY OF COBURG
HAS INSTALLED
CLIMATE SENSORS AT
SELECTED LOCATIONS
THROUGHOUT THE CITY.

Stefan Fey

Department of Digitalization, City of Coburg

It is about generating value in urban planning, identifying hotspots, such as areas that become extremely hot in the summer, and determining where improvements can be made in the future.



42,000 inhabitants
50 microclimate sensors
42.5 hectares, Coburg city center



Andreas Kücker

Digital Manager at süc//dacor GmbH

Solutions like these with LoRaWAN connectivity are a cost-effective way to make cities smart.

**CITIES
REDUCE RISKS**

GUIDING CITIZENS
TO A SAFE LIVING
ENVIRONMENT AND
ENABLE URBAN
PLANNERS
TO BETTER DESIGN
GREEN SPACES.



How it began

Dangerous heat hazards

No data available

No network

Unoptimized green spaces

How it ended

Public safety on hot days

Guidance to cooler zones

Information for urban planning

Possibility to expand the sensor network

Other Examples



Smart Park
Town of Cary,
USA



Pilot Site
Leuven,
Belgium



Heat Control
Parramatta,
Australia

Downtown Cary Park installed 30 x SMC30 temperature sensors that provide insights into how the various parts of the park feel at different times of day, in all seasons, and in various weather conditions, which can be used to make future decisions about the evolution of the park's features.

Pilot area for VARCITIES is a former hospital site in the medieval centre of the city. Sensors measure local climatic conditions, with various climate parameters such as air quality, air humidity, temperature and amount of precipitation.

The city of Parramatta measures microclimate data, so that they can control the evaporation cooling devices and turn them on based on the actual air temperature and humidity.

Other Products for Smart Cities



SRM10

Senstick Rain Meter

- Measures **rainfall**
- Stormwater management



STP40

Senstick Temperature Probe

- Measures **temperature**
- Road, Railroad Management

Green Roofs

SOIL MOISTURE MONITORING OF BUILDING GREEN FACADE



REDUCE WATER
USAGE BY 30-50%

Optimized irrigation for Green walls, roofs & facades

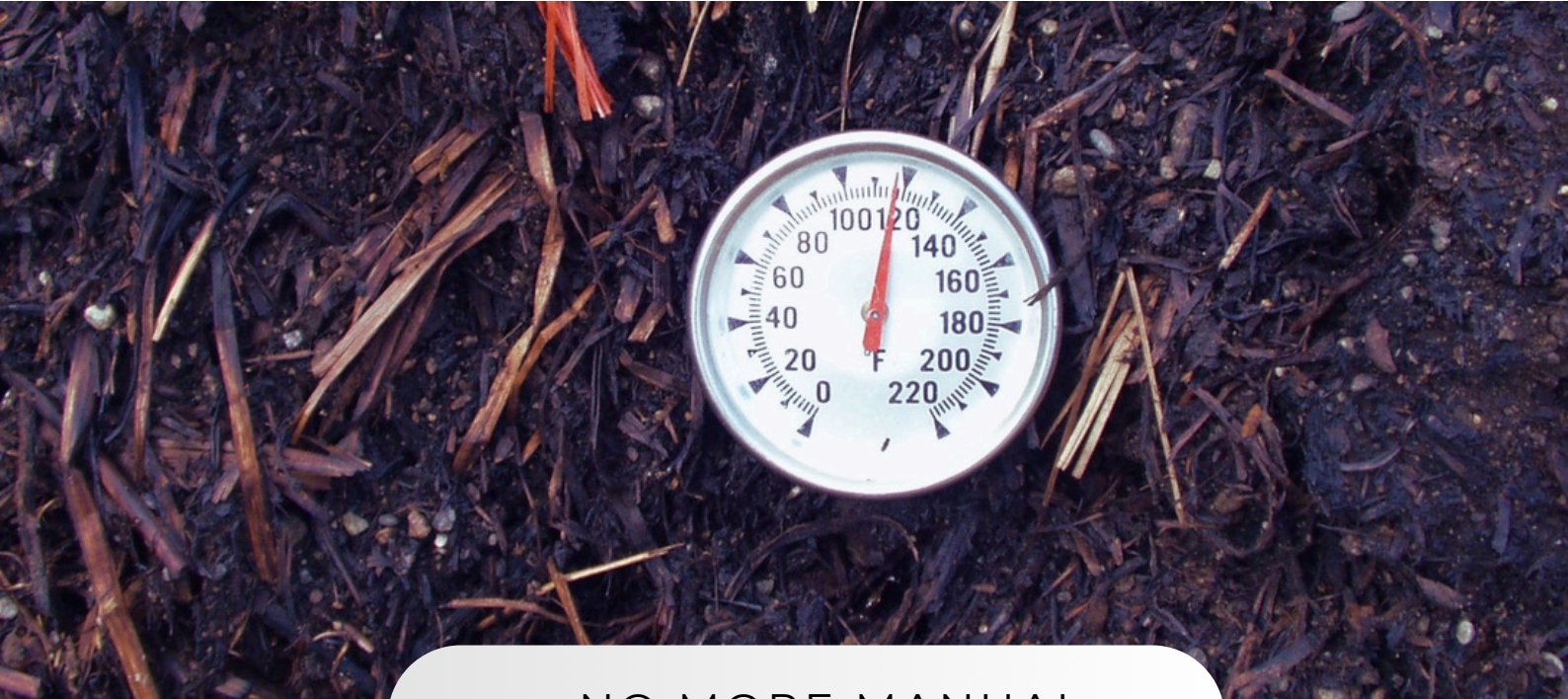
The soil moisture sensor offers a highly effective solution for optimizing irrigation, addressing critical challenges such as overwatering, drought stress, and water waste. In green roofs, urban landscaping, and agriculture, improper soil moisture levels can lead to plant stress, inefficient water use, and increased maintenance costs. The sensor enables precise, real-time moisture measurement and transmits data wirelessly using LoRaWAN technology, ensuring sustainable water management.

This eliminates the need for manual soil checks, enhances irrigation efficiency, and reduces labor costs while ensuring optimal water management without guesswork. Early detection of soil moisture levels prevents overwatering and drought stress, promotes healthier plant growth, and conserves water, making the soil moisture sensor an indispensable tool for modern greenery managers and their green infrastructure.



Compost Temperature

TEMPERATURE MEASURING AT WASTE MANAGEMENT SITE



NO MORE MANUAL
TEMPERATURE CHECKING

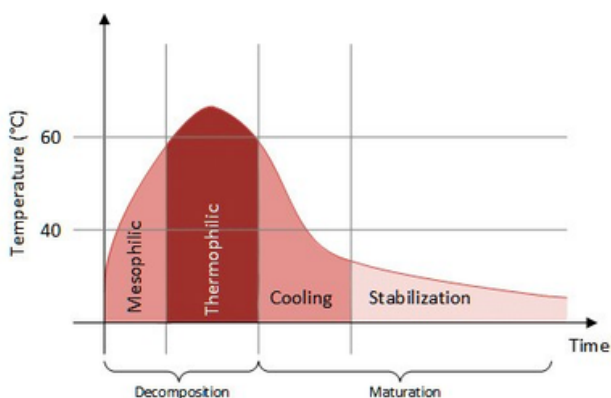
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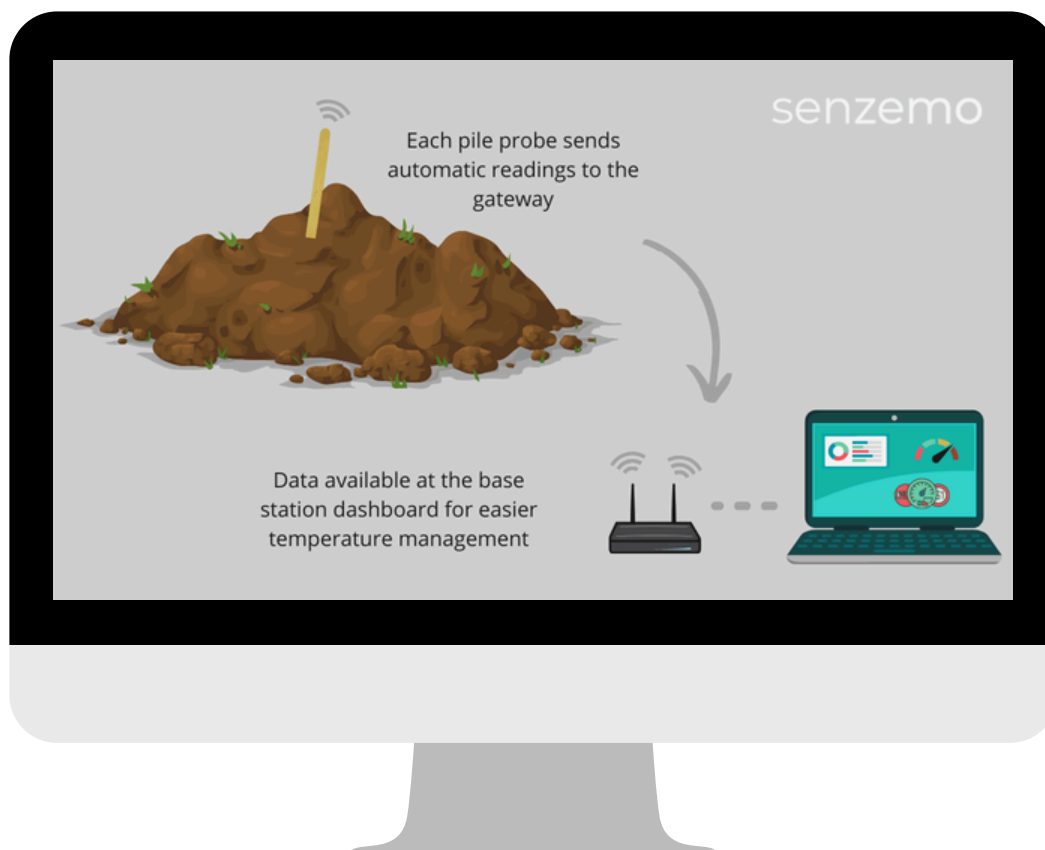


Composting depends on temperature

Compost has to be monitored throughout the whole process. The rate at which composting occurs depends on physical and chemical factors. Temperatures above 65 °C burn carbons and turn into 'invaluable ashes'.

Producing high-quality compost requires the employment of specialized personnel. While temperature readings seem simple, it takes a lot of time for a worker to constantly stuff the temperature probes into compost piles.





Composting in the IoT Era

The IoT monitoring system provides real-time and continuous temperature monitoring to optimize the transformation process of biowaste into compost. Wireless temperature probes which are dug into piles at different depths, allow you to monitor your compost piles continuously and effortlessly without being tethered by cables. The temperature history gives a complete view of the composting process from fermentation to curing and maturation.



Producing high-quality compost requires the employment of specialized personnel. While temperature readings seem simple, it takes a lot of time for a worker to constantly stuff the temperature probes into compost piles.



KOU20 is a cost-effective compost temperature probe. It operates on LoRaWAN and lasts up to 7 years on one set of batteries.

User benefits

Comparing different types of compost temperature-checking solutions brings up an obvious advantage to the automated readings provided by IoT smart sensors. A simple calculation shows that labor costs over a 5-year period, result in extremely high expenditures.

While temperature readings seem simple, it still takes a lot of time for a worker to go around the compost area and stuff the temperature probes into compost piles. Because the temperature changes during the day, I presumed it takes about half a person to do that constantly (having the other half for other activities).

IoT sensors provide automatic readings, but there are other costs that have to be taken into account. The probes themselves are more expensive, there has to be some kind of software or middleware installed in the base computer to provide the readings. Then there is also battery life.

If we compare WiFi or cellular to LoRaWAN, there is also a noticeable edge on the side of high performance, low power, and affordable connectivity. LoRaWAN networks provide long-range, low-energy use readings which result in almost maintenance-free operation over a 7-year battery lifetime. They also have a significantly longer range (up to 50km) which means there can be only one gateway installed over a large compost management area.

Five years cost - Compost temperature checking											
				Manned				Senzemo			
								Competition			
Labor cost per year				\$15,000							
Cost of sensors				\$700				\$5,300			
Software cost								\$7,500			
Total 5 years				\$75,700				\$12,800			
ROI (months)								8 months			
Battery lifetime								7 yrs			
Sensor range								50000m			
								13 months			
								1 yr			
								100m			

IT MAKES SENSE TO REPLACE MANUAL LABOUR.

AUTOMATED LORAWAN SENSOR READINGS CAN PAY A SIGNIFICANT DIVIDEND IN THE LONG RUN ESPECIALLY IF DEPLOYED IN LARGE QUANTITIES!

Smart Wineyard

BETTER MANAGEMENT OF AGRI RESOURCES



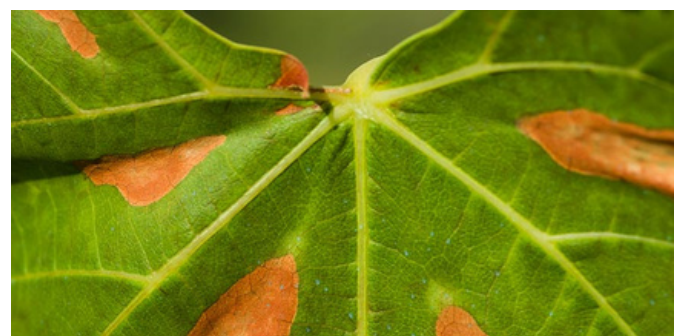
500€ SAVED
PER EACH HECTAR!



Every liter of wine matters

Vineyard farmers know that every liter of wine matters. The problem for many producers is having no real insight into the microclimatic conditions in individual vineyards. Relying solely on general forecast predictions and basic vineyard calendars.

This leads to poor decisions in choosing which grape variety to plant and imprecise judgment in the implementation of green works (including irrigation in dry climates), and the use of plant protection products; especially when and how to tackle the control of fungal infections of the vine.



Overcoming challenges ...

Farmers, like Dvojmoč, can overcome the majority of irrigation and green works challenges through the implementation of microclimate and soil moisture sensors.

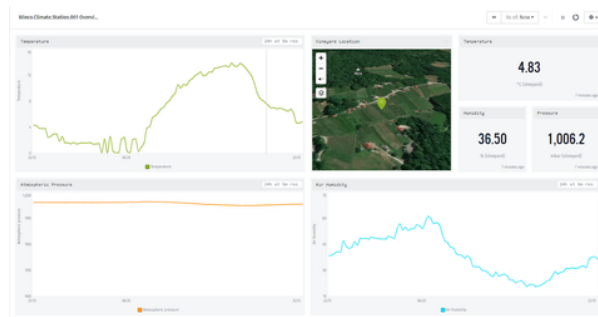
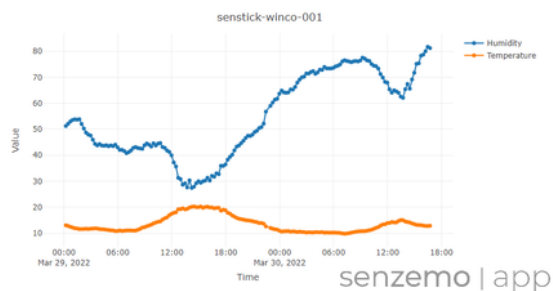
It is a necessity that these devices are also cost-effective, accurate, easy to implement and work with low maintenance.



... with smart sensors.

We installed Senstick Agri SSM30 and SMC30 sensors to measure the above parameters. The measurements done by the sensors are sent directly to Senszemo Dashboard and the Losant platform and are available at all times.

Platforms offer reports with graphs to make the right decisions on planting proper grape variety, what amounts of plant protection to use at different times of the year, and the next steps for climate protection, like adding additional weather covers.



How it started

Costly plant protection

Time-consuming inspections

No microclimate data

How it ended

500€ savings per 1Ha

15% time saved on manual inspections

20% lower use of fungal protection

Apple Orchard

SMART FARMING SAVING VALUABLE RESOURCES



SAVING 25%
ON IRRIGATION!

Done in
partnership with:

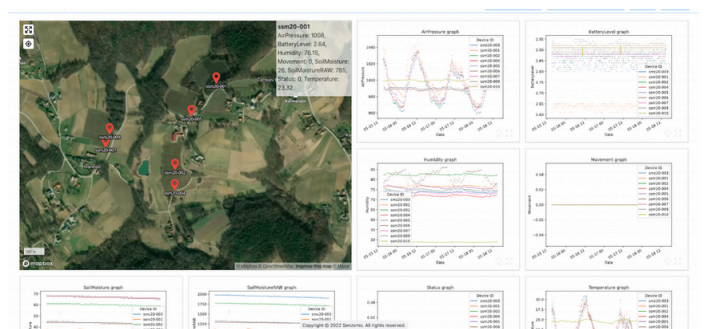


ITC

Using sensors data in agriculture

Monitoring of soil moisture and the exact number of precipitation, allows farmers to set the appropriate amount of irrigation. Switching irrigation on and off, the areas under irrigation can be easily controlled

remotely in an application on a PC, phone, or tablet. After easy installation of the sensors in the soil and on trees and posts, the data will appear in the easy-to-use platform, where you can immediately monitor the necessary data.



Should I invest?

How do I save on pricey resources?
How can I increase yield?
How can I save time on manual inspections?

Those are the questions that Adam Novak, a local apple orchard owner, asked himself.

He was using timer-based irrigation systems to water the apple trees. However, he couldn't monitor the level of soil moisture or potential failures in the irrigation system.



His farming areas differed in soil complexity affecting the level of volumetric water content. Over or under-irrigating meant more spending in terms of water, electricity, and produce.



Smart farms do it

Using Senstick Agri sensors data, he can now save time and optimize resources, which in fruit production at approx. 10ha areas become very important. More optimal water consumption also means lower costs for energy sources that drive the water pump.



SENSORS SAVE RESOURCES,

FUEL, ELECTRICITY AND WATER ARE BETTER MANAGED AND THUS PROVIDE SIGNIFICANT GAINS FOR FARMERS.

How it started

High consumption of water

Time-consuming inspections

High running costs

How it ended

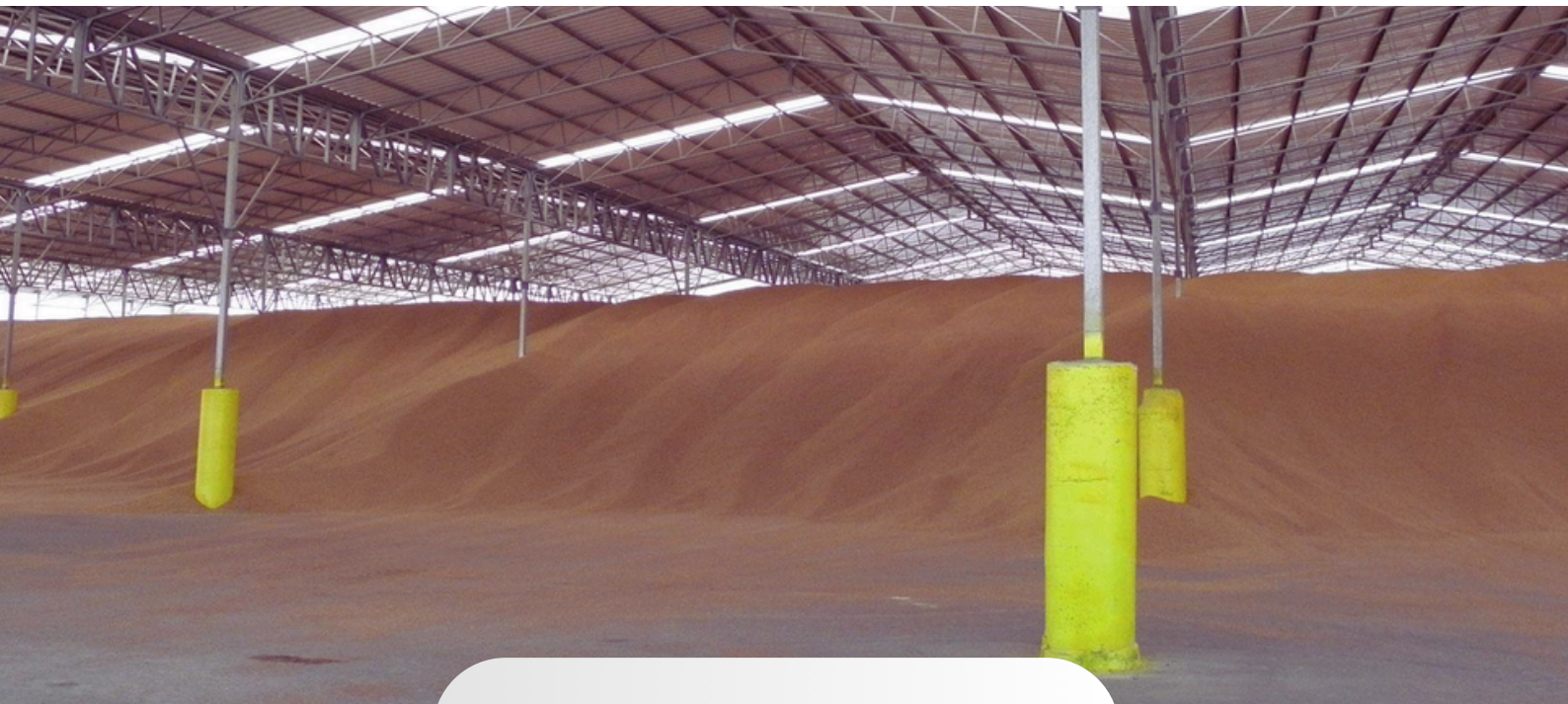
Savings in fuel and electricity

15% time saved on inspections

25% reduction of water use

Grain storage monitoring

TEMPERATURE MEASURING AT GRAIN STORAGE SITE



LOWER THE RISK
OF SPOILAGE BY 50%

Monitor critical challenges in grain / mulch

The KOU20 Compost Temperature Stick offers a highly effective solution also for monitoring grain or mulch storage conditions, addressing critical challenges such as temperature hotspots, spoilage, and safety risks. In large grain silos or piles, temperature variations caused by biological activity or moisture can lead to spoilage, mold growth, and even combustion. The KOU20 enables deep, accurate temperature measurement and transmits real-time data wirelessly using LoRaWAN technology.

This eliminates the need for manual inspections, enhances operational efficiency, and reduces labor costs while ensuring safety by removing the need for workers to enter hazardous environments. Early detection of temperature anomalies minimizes spoilage risks, preserves grain quality, and prevents financial losses, making the KOU20 an indispensable tool for modern grain storage facilities.



Museum Monitoring

SMART IOT SOLUTION AT SCHÖNBRUNN PALACE



SAVE 10% ANNUALLY
ON PRESERVATION



Addressing protection of heritage

Schönbrunn Palace, like other historic sites, faces the challenge of protecting centuries-old architecture, art, and artifacts, where precise environmental control is vital to preserve priceless cultural heritage. Fluctuations in temperature and humidity can cause irreversible damage; cracking, mold growth, or material degradation.

Even small variations in microclimate conditions can accelerate deterioration. Without continuous data, conservators cannot react in time to prevent damage. Manual inspections are costly, inconsistent, and limited to specific points in time, leaving critical blind spots.

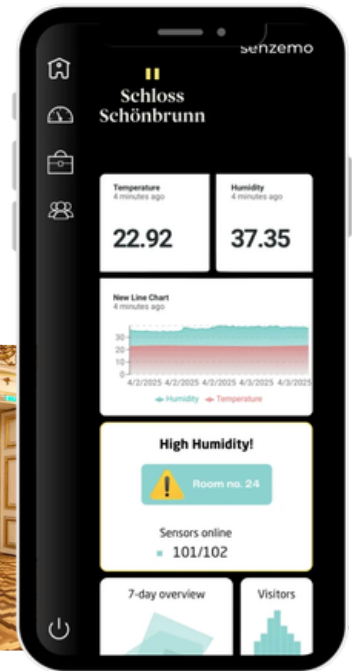
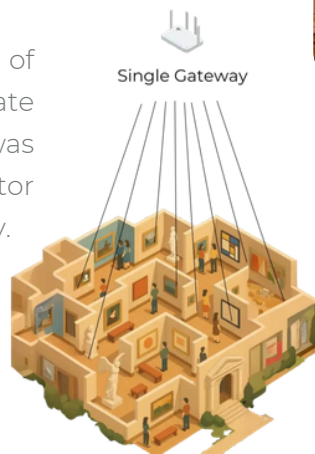


Smart IoT Solution at Schönbrunn Palace

Strict heritage regulations prohibit invasive HVAC upgrades, leaving temperature and humidity control as a critical challenge.

With relative-humidity swings of $\pm 3.8\%$ and daily temperature drifts of $1.6\text{ }^{\circ}\text{C}$ threatening delicate textiles, gilded frames, and manuscripts, curators previously relied on 300 hours of manual checks each year, while reactive heating and cooling wasted €9,500 annually.

A network consisting of more than 200 microclimate sensors (SMC30), was implemented to monitor temperature and humidity.



Over 200 Sensstick SMC30 were deployed. All sensors work on LoRaWAN connectivity that every 15min sends data to the gateway. Data is available for viewing on the Senszemo dashboard.



BATTERY LIFE

7+ yrs

WIRELESS RANGE

Up to 1km

Sensstick Microclimate SMC30 sensor measures Temperature, Humidity and Air pressure.



Quality is the first focus of Senszemo. The sensors, aside from standing out by their design, are sourced and assembled in Slovenia, European Union, and produced using quality materials, which makes them much more reliable and precise.

How it started

Manual climate checks

Risk of improper preservation

High maintenance costs

How it ended

Extended artifact lifetime

Fewer emergency interventions

5–15% saved in annual preservation

Water Leakage Monitoring

REDUCING MOISTURE & FLOODING IN INDUSTRIAL ENVIRONMENTS



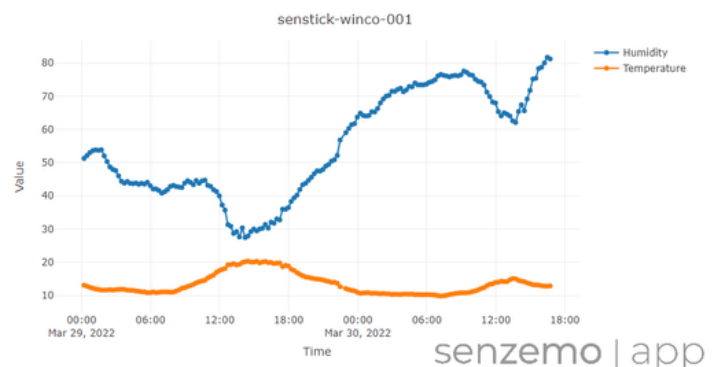
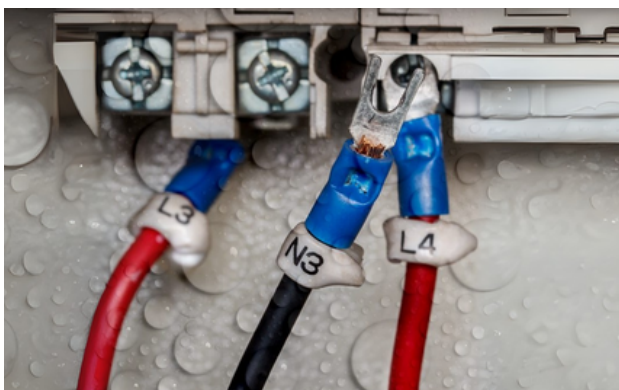
500\$ SAVED
PER ONE CABINET BOX!



Costly failures that could be avoided

Electrical cabinets safeguard the heart of industrial automation, power distribution, and control systems. Inside, vital components such as circuit breakers, relays, PLCs, and controllers must operate in stable environment to ensure uninterrupted operations.

Factors such as sudden temperature rise, condensation, and unauthorized access can compromise safety, reliability, and operational continuity. Without early detection, these risks can escalate into costly failures or safety incidents.



Continuous Smart Monitoring

By continuously monitoring environmental conditions, maintenance teams can detect and resolve moisture issues before they cause damage. An IoT-based monitoring system, such as the R#IoT sensor, provide real-time insight into cabinet microclimate conditions.

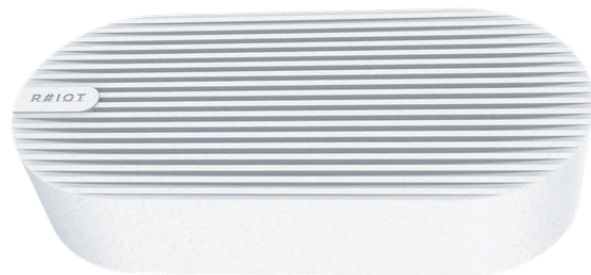
Preventing moisture-related failures can save a lot of money. For a facility with 50 monitored cabinets, preventing just five major failures per year could save 10,000 € annually in avoided repairs and downtime, with payback on the IoT investment in less than 12 months.

 TEMPERATURE RANGE -40°C TO +85°C	 ACCURACY ±0.2°C
 WIRELESS RANGE Up to 1km	 BATTERY LIFE 7+ yrs
 DATA LOGGING 10k readings	

 LoRaWAN compatible

 Ultra Low Power

R#IOT10 Smart Water Leakage sensor



EU Quality

Quality is the first focus of Senzemo. The sensors, aside from standing out by their design, are sourced and assembled in Slovenia, European Union, and produced using quality materials, which makes them much more reliable and precise.

How it started

Moisture-related failures

Operational disruptions

Unnecessary site visits

How it ended

Save 500\$ to 2,000\$ per incident

10–15% saved in annual maintenance

Increased service life by 20–30%

Smart Cleaning of Beverage Production

DIGITALIZING PIPE HYGIENE AND CLEAN-IN-PLACE PROCESSES FOR BEVERAGE FILLING LINES



20% SAVINGS,
UNDER 1 YEAR ROI!

Contamination that could be avoided

Beverage producers rely on Clean-in-Place systems to keep tanks, pipes and filling lines hygienic. However, most CIP processes still run according to fixed recipes: the same cleaning time, temperature, water and chemicals are used

regardless of the actual condition of the line. Biofilm and organic deposits can still develop in hard-to-reach areas such as pipe joints, valves, seals, bends and dead zones. This creates quality risk, unnecessary cleaning, higher operating costs and avoidable production downtime.



Existing Clean-in-place

Traditional CIP systems are essential for hygiene, but they often work like a black box. They monitor basic parameters such as temperature, flow and conductivity, but they do not directly show biofilm risk inside critical pipe sections.

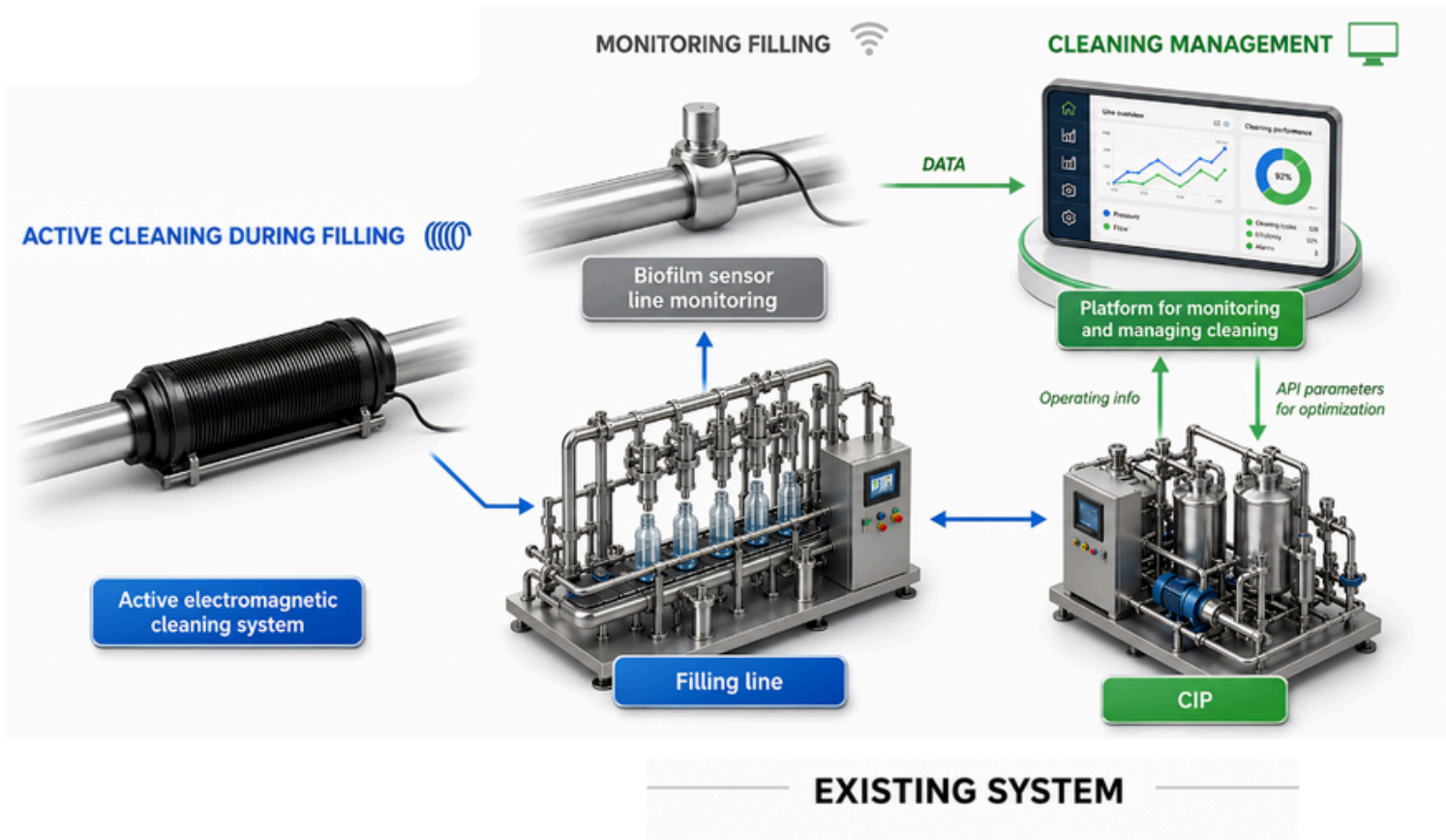
This can lead to two problems: over-cleaning, where water, chemicals and energy are wasted, and under-cleaning, where hidden biofilm remains in the system. Both increase cost, downtime and quality risk.



Optimizing CIP

With IoT monitoring and active pipe-cleaning support, CIP becomes visible, measurable and optimizable. Operators can detect early signs of

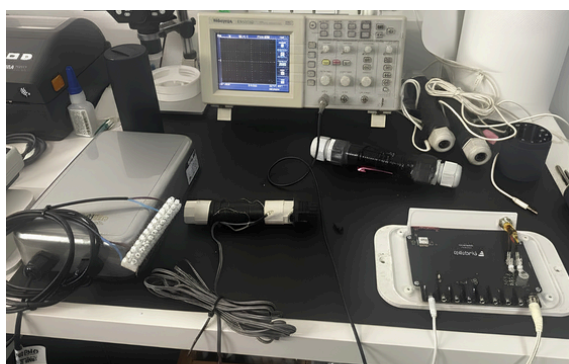
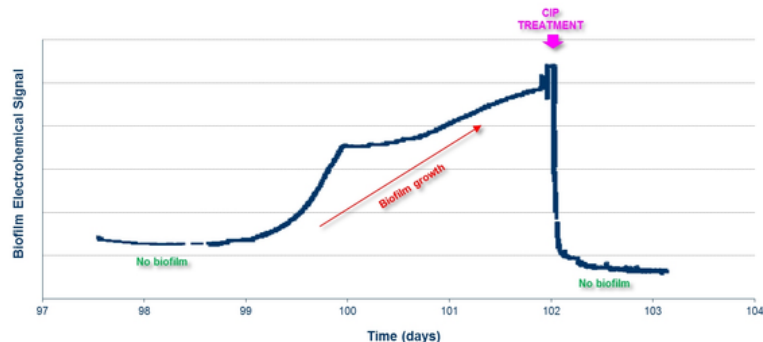
contamination, understand where cleaning is needed most, and adapt the CIP process based on real line conditions.



Retrofit-ready IoT solution

The smart CIP optimization system combines a biofilm sensor, smart electromagnetic coil and IoT cleaning management platform.

The biofilm sensor monitors critical sections of the line. The smart coil supports active cleaning during filling and CIP. The platform collects process data, detects trends, and helps operators optimize cleaning parameters.



How it started

Slow response on biofilm buildup

High OPEX

High water use

The result is a condition-based CIP process that helps clean pipes more effectively, reduce unnecessary cleaning cycles and improve hygiene confidence without replacing the existing production infrastructure.

Smart Coil



Biofilm Sensor



EU Quality

Designed and assembled in Slovenia, European Union, the solution combines industrial IoT, sensor development and practical knowledge of beverage production. The modular retrofit design supports easier installation, maintenance and future scaling across multiple production lines.

How it ended

+15% faster CIP

Savings on chemical cleaning 20%

20% water savings

Trusted by

Food Safety



Smart City

Europe:



merano



Elsewhere:



Our partners



Application / Sensor		Indoor Microclimate	Outdoor Microclimate	Soil Moisture	Temperature Only	Temperature Probe	Compost Temperature	Rain Meter	Food Temperature	Leaf Wetness	Indoor Air Quality
Smart City			✓	✓		✓	✓	✓			
	Agriculture		✓	✓			✓	✓		✓	
	Irrigation			✓				✓			
	Cold Chain	✓			✓	✓					
	Food Safety	✓			✓	✓			✓		
	Industrial Temperature Monitoring	✓			✓	✓	✓				
Buildings		✓			✓						✓

•Dashboard Features:

Real-time Monitoring:
View live sensor data (e.g., temperature, humidity, air quality, soil moisture) in an intuitive interface.

Custom Alerts:
Configure high/low threshold alarms for critical parameters. Receive alerts for motion detection, leakage, or sensor manipulation.

Historical Data:
Access detailed historical logs for trend analysis and reporting.

•LoRaWAN® End-to-End Encryption:

All sensors utilize AES-CTR encryption for data confidentiality. AES-CMAC ensures data integrity and authenticity, preventing tampering.

Data Integrity Protection:
Ensures transmitted data is accurate and unaltered during communication.

Secure Device Communication:
LoRaWAN® Class A end-devices operate with secure and authenticated connections.

Regional Compliance:

Supports various secure frequency bands (e.g., EU863–870, US902–928) across global regions for safe operation.

Configuration Security:
Sensors support NFC and Over-The-Air (OTA) configuration, which is secure and prevents unauthorized access.

Sensor Portfolio

Sensor	Name	Model	Key Features	Technical Needs	Accuracy, Detections, and Range	Application	Justification for Use	Outcomes
	Indoor Microclimate	SMC30	Measures temperature, humidity, air pressure, IP65-rated. Battery: 7 years.	Easy installation / Reliable indoor environment data for HVAC systems	- Accuracy: Temperature $\pm 0.2^{\circ}\text{C}$, Humidity $\pm 1.8\%$, Air Pressure $\pm 1\text{ hPa}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 1-3 km (indoor).	Indoor climate monitoring for smart buildings and HVAC systems.	Monitors indoor climate for smart building optimization.	Enhances energy efficiency and improves indoor comfort.
	Outdoor Microclimate	SMC30-OUT	Measures temperature, humidity, air pressure, IP65-rated. Motion detection. Battery: 7 years.	Reliable outdoor climate monitoring / Rugged for Harsh environments	- Accuracy: Temperature $\pm 0.2^{\circ}\text{C}$, Humidity $\pm 1.8\%$, Air Pressure $\pm 1\text{ hPa}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Outdoor microclimate monitoring for smart cities and urban planning.	Tracks outdoor microclimates and weather conditions.	Enhances environmental monitoring and urban planning.
	Soil Moisture	SSM40	Measures soil moisture, IP68-rated, customizable cable length. Battery: 7 years.	Subterranean moisture monitoring / Customizable for different soil depths	- Accuracy: $\pm 1\%$ VWC Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Soil moisture tracking for agriculture and irrigation systems.	Optimizes water usage and prevents over-irrigation.	Improves crop yields and reduces water waste.
	Temperature Only	STO10	Measures temperature (-40°C to $+380^{\circ}\text{C}$), HACCP compliance. Battery: 7 years.	Reliable cold chain monitoring / Durable for transport / Easy integration into logistics	- Accuracy: $\pm 1^{\circ}\text{C}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 1-3 km (indoor).	Cold chain and supply chain temperature tracking.	Tracks temperature across the cold chain.	Maintains food/product quality and prevents spoilage.
	Temperature Probe	STP40	Measures temperature (-55°C to $+125^{\circ}\text{C}$), IP68-rated. Battery: 7 years.	Accurate soil/mulch temperature monitoring / Customizable probe lengths	- Accuracy: $\pm 0.5^{\circ}\text{C}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Mulch, soil, and rail track temperature monitoring.	Tracks environmental and infrastructure temperatures.	Prevents environmental damage and enhances efficiency.
	Compost Temperature	KOU20	Measures temperature (-40°C to $+150^{\circ}\text{C}$), IP68-rated. Battery: 7 years.	Reliable Compost and Soil temperature tracking / Fire risk detection	- Accuracy: $\pm 0.5^{\circ}\text{C}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Compost, soil, and waste management temperature monitoring.	Ensures proper composting and fire prevention.	Optimizes composting processes and prevents hazards.
	Rain Meter	SRM10	Measures rainfall ($\pm 2\%$ accuracy), IP67-rated. Battery: 10 years.	Accurate rainfall data tracking / Durable for outdoor use in agriculture	- Accuracy: $\pm 2\%$ (Rainfall) Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Rainfall monitoring for precision agriculture and water resource management.	Tracks rainfall for precision agriculture.	Improves water management and crop health.
	Food Temperature	STF40	Measures temperature (-40°C to $+380^{\circ}\text{C}$), IP68-rated. Battery: 7 years.	HACCP compliance / Fast response for cooking / Durable for kitchen environments	Accuracy: $\pm 0.5^{\circ}\text{C}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 1-3 km (indoor)	Food storage, cooking, and kitchen monitoring.	Ensures food safety and compliance with regulations.	Prevents foodborne illnesses and ensures proper storage/cooking.
	Leaf Wetness	SLW40	Measures leaf wetness percentage, IP67-rated. Battery: 7 years.	Accurate leaf wetness monitoring / Durable for outdoor agricultural environments	- Accuracy: Precise wetness percentage Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 3-10 km.	Leaf wetness detection for vineyards, orchards, and crop fields.	Tracks wetness levels to prevent crop diseases.	Reduces crop loss and improves disease forecasting.
	Indoor Air Quality	SPU10	Measures CO ₂ , TVOC, temperature, humidity, air pressure. Battery: 5-7 years.	Reliable Air quality and Occupancy monitoring / compliance with indoor health standards	- Accuracy: CO ₂ $\pm 30\text{ ppm}$, TVOC $\pm 0.5\text{ mg/m}^3$, Temperature $\pm 0.2^{\circ}\text{C}$, Humidity $\pm 1.8\%$, Air Pressure $\pm 1\text{ hPa}$ Detections/hour: $\sim 4/\text{hour}$ (90/day) Range: 1-3 km (indoor).	Indoor air quality monitoring for offices, schools, and public spaces.	Tracks air quality and occupancy for health and safety.	Improves indoor air quality and occupant health.

Have questions about an
IoT project?

Ask me.



BLAŽ KASTELIC,
PROJECT MANAGER



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The logo for 'senzemo' is centered on the page. It consists of the word 'senzemo' in a lowercase, sans-serif font. The background is split diagonally from the bottom-left to the top-right, with a light gray area on the left and a white area on the right.

senzemo

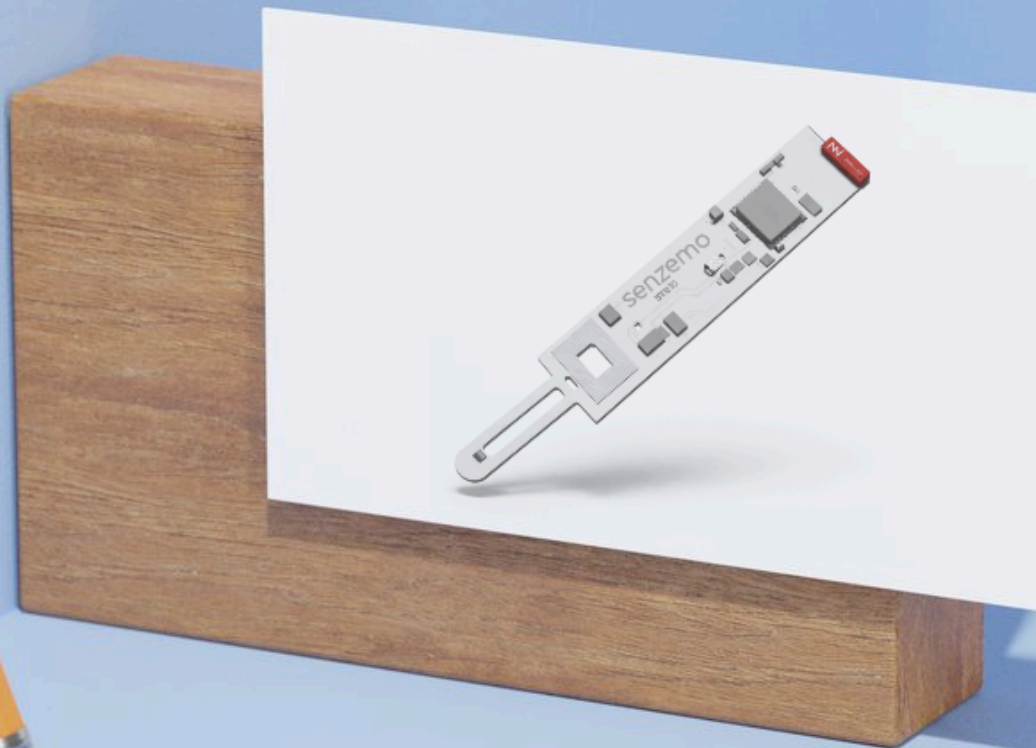
Usecases



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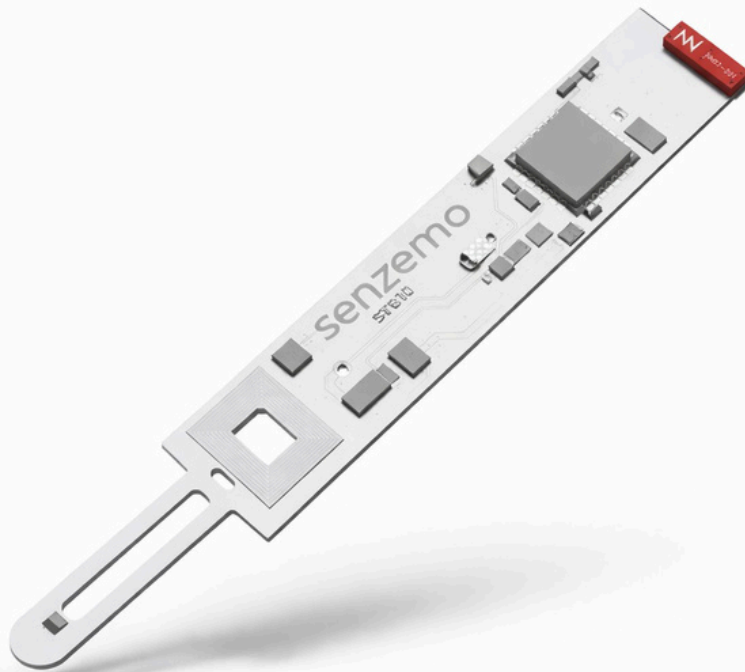
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Industrial IoT Design

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Reseller Pricing 2026

