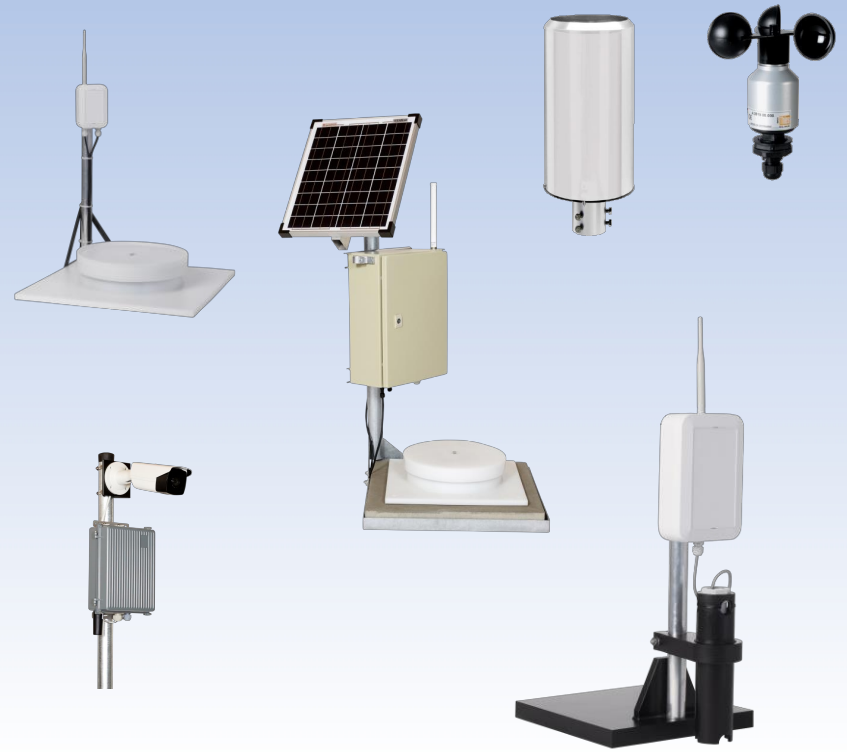
Professional monitoring of roof loads all year round

Smart Roof Monitoring System

Snow load measurement systems

Standing water detection systems

Complete solutions for flat roof monitoring



NOMINIERT INNOVATION LEBEN AWARD

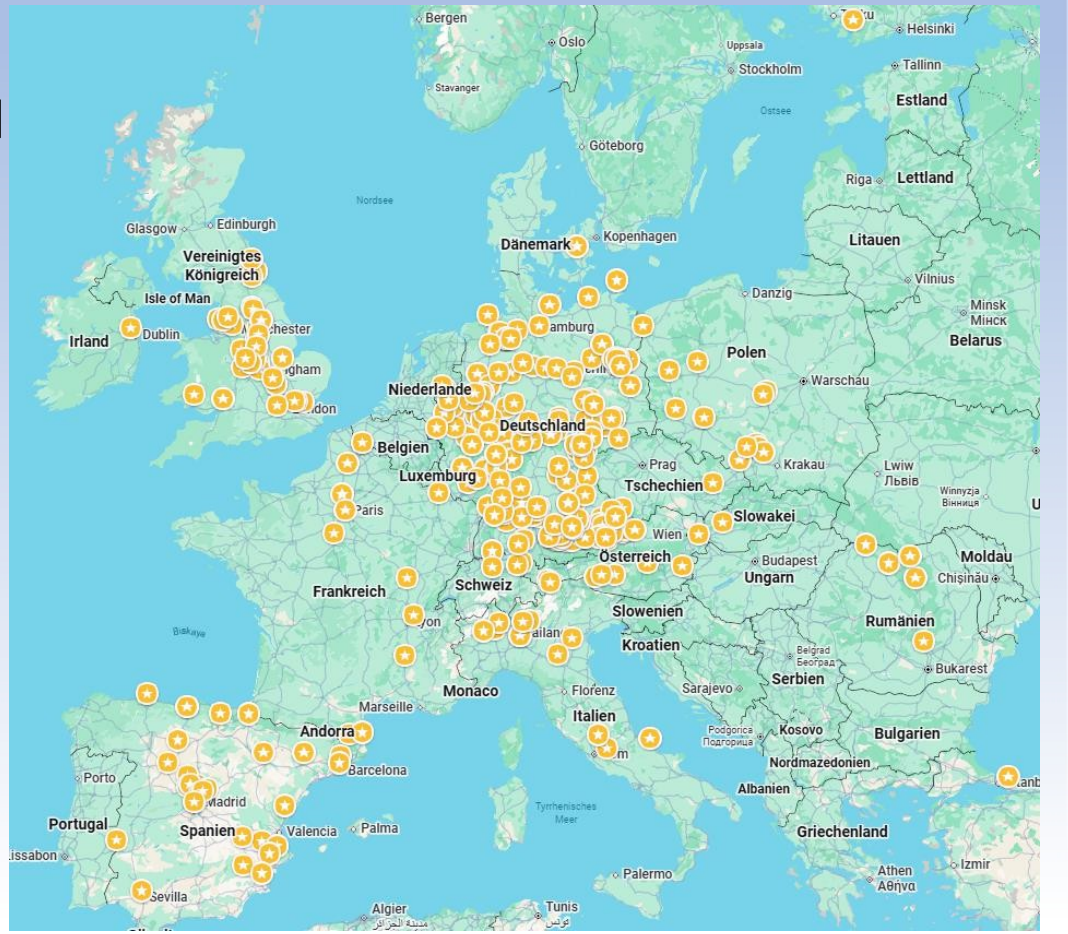
EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

Our company history

- 2010 Initial development of a snow scale
- 2013 Development of a self-contained snow gauge “snowcontrol”
  - Funded by Bayern innovativ
  - Several awards, including a gold medal for the best innovation of 2013, the German Business Award 2021 “Best Snow Load Measurement System Europe”
- Founding of the company envitron systems GmbH
- 2020 Development of a satellite snow load measurement system
  - Funded by Bayern innovativ
  - German patent granted on 5 January 2022
  - European patent granted on 30 August 2023
  - Development of backwater sensor technology

Our company history

- Over 1,000 snow load measurement systems installed
- Installations across Europe
  - including Finland, Denmark, France and Spain
- Cooperation with partner companies
  - Bormann, snow clearance from roof surfaces



System solutions

All sensor technology for your roof from a single source

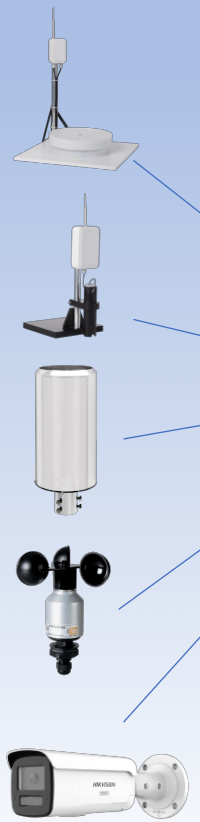
Snow Sensor

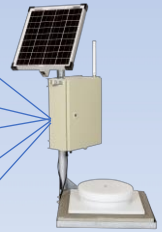
Water sensor

Rain sensor

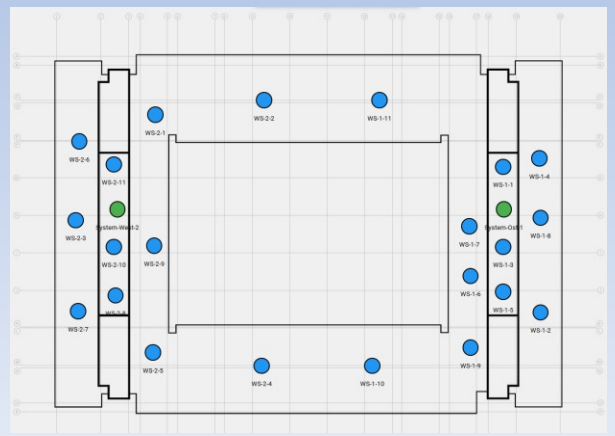
Wind sensors

Camera





Gateway



Dashboard

Alarm

Partner companies

NOMINIERT INNOVATION LEBEN AWARD

EUBusiness German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

Self-sufficient measurement system

How it works

The gateway sends data to the envitron server via the internet every hour

If the configurable thresholds are exceeded the gateway **automatically** sends **SMS messages via LTE**

Internet

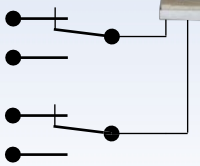
Internet

SMS
Voicemail
Email

Dashboard The user/customer has access to the server via the internet and can retrieve their data anytime, anywhere

Central 24/7 fail-safe envitron systems RAID server **Automatically sends any number of email, SMS or voicemail messages in the event of an alarm**

Connection to the BMS is via 2 potential-free contacts. Visual and audible signal transmitters can be connected



Contact 1 activates when the set lower warning limit is exceeded; Contact 2 activates when the set upper warning limit is exceeded

bayern innovativ
NOMINIERT
INNOVATION LEBEN AWARD

EUBusiness news
German Business Awards 2021.
envitron systems GmbH
Best Snow Load Measurement System - Europe

Smart Roof Monitoring System SRMS

Our **gateway or base station** is a complete and self-contained snow gauge. The system has a modular design. This means that all sensors can be combined with one another as required.

Up to 14 different sensors can be connected to a base station. An existing system can be easily expanded at any time.

The snow load and water accumulation sensors are connected to the base station via radio. The base station transmits the collected data to our own server via LTE on an hourly basis.

All current readings can be accessed at any time via our dashboard using any internet-enabled device.

bayern innovativ
NOMINIERT
INNOVATION LEBEN AWARD

EUBusiness news
German Business Awards 2021.
envitron systems GmbH
Best Snow Load Measurement System - Europe

Smart Roof Monitoring System SRMS

- **Technical data**
- Unit of measurement: kg/m²
- Measurement accuracy: +/- 2 kg
- Max. measurement range: up to 500 kg/m²
- Integrated 4G/5G LTE modem
- SMS and email notification when adjustable thresholds are exceeded
- Dimensions: 50 x 50 cm, height 120 cm
- Weight: approx. 30 kg, extremely stable
- Connections: No connections required
- Open collector outputs for connection to the building management system
- Mounting: No mounting required
- Power supply: 20 W solar panel
- Integrated 24Ah AGM emergency power battery, up to 2,400 hours of backup time
- No lithium battery, therefore no fire hazard on the roof

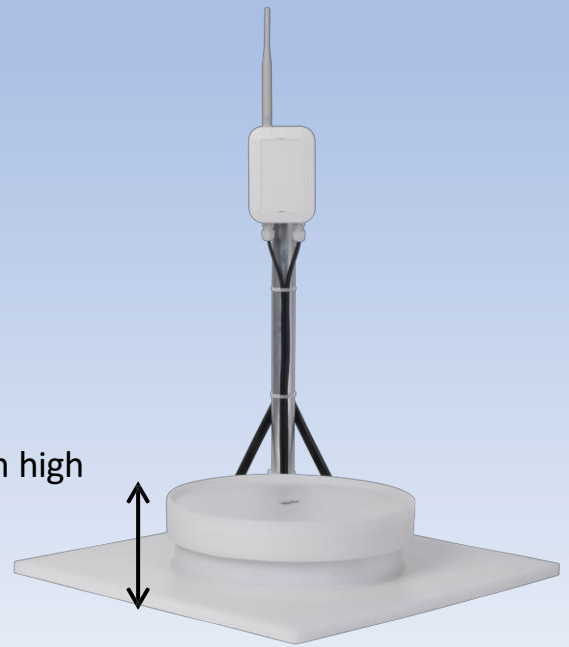
Snow load sensor

On large roof areas, the snow cover can be subject to significant fluctuations, e.g. due to snow pockets forming around roof structures, fire protection walls or photovoltaic systems. The snow load varies accordingly.

These fluctuations in snow load can only be recorded by a large number of measuring points. Our snow sensors can, for example, be installed in each photovoltaic row, thereby accurately detecting the sliding of snow masses from the photovoltaic fields.

Thanks to the large number of measuring points, the total load on the flat roof is also much depicted more realistically and accurately than with a single measurement point alone.

Thanks to the low height, measurements are taken as close as possible to the roof surface.



NOMINIERT INNOVATION LEBEN AWARD

EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

Snow Load Sensor

Technical data

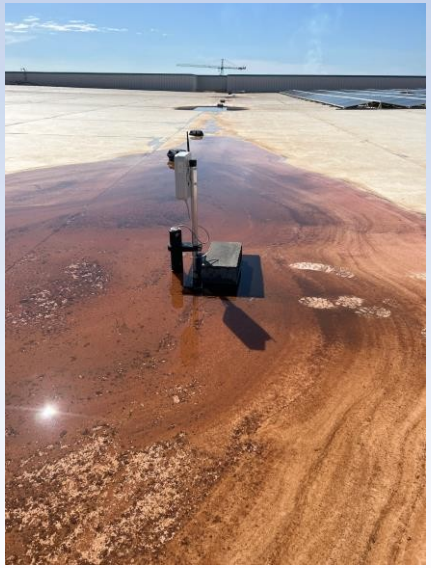
- Wireless standard: ZigBee 2.4 GHz
- Range: up to 100 m
- Dimensions: Base plate 40 x 40 cm,
- Dimensions: Weighing platform diameter 30 cm, height 10 cm
- Unit of measurement: kg/m²
- Weight: 3 kg
- Measurement accuracy: +/- 2 kg
- Max. measurement range: 250 kg/m² (higher ranges available on request)
- Material: UV-resistant PVC
- Connections: No connections required
- Mounted using paving stones
- Power supply: AGM battery (lasts more than 3 years, **no lithium**)
- Also available with solar panel

Backwater Sensor

Our backwater sensors are connected to the base station via Wi-Fi
.

The backwater sensors measure the exact height of the standing water in mm.

This allows for accurate assessments of the current surface load on the roof.



Backwater Sensor

Technical Specifications

- Wireless standard: ZigBee 2.4 GHz
- Range: up to 100 m
- Ambient temperature: -40 to +70°C
- Accuracy: +/-5 mm
- Measuring range: min. 10 mm, max. 250 mm
- Current consumption: < 1 mA
- Protection rating: IP68
- Power supply: AGM battery (lasts more than 3 years, **no lithium**)
- Also available with solar panel

Camera Monitoring System

With our camera system, you always have your roof in view. In the event of hazard alerts, you can get a quick overview without having to climb onto the roof.

The camera used has a night-vision range of 80 metres. This allows you to quickly decide, even in the dark, whether further action is required.

The images are transmitted to our own server in encrypted form every hour and displayed on our dashboard.

You can view live images at any time via a live button.

Camera Monitoring System

Technical Specifications

- 230V power supply, approx. 1A
- Resolution: 2688 × 1520
- Focal Length & FOV: horizontal FOV 78°, vertical FOV 38°, diagonal FOV 96°
- DORI: D: 115 m, O: 45 m, R: 23 m, I: 11 m
- IR night vision range: 80 m
- Integrated LTE modem
- Integrated firewall
- Attack prevention: DDoS prevention, Security policy: AWS CIS V7
- Ambient temperature: -30°C to +60°C
- Housing: IP68

bayern innovativ NOMINIERT INNOVATION LEBEN AWARD

EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

Additional sensors

Wind sensor

By constantly monitoring wind conditions on your roof, you can react in good time in the event of a hazard. The warning threshold can be set individually.

Technical data

- Measuring range: 0.5–50 m/s
- Accuracy: +/-3% of measured value or +/-0.5 m/s
- Current consumption: < 1 mA
- Ambient temperature: -40 to +70 °C
- Protection class: IP 55

Rainfall sensor

The sensor is used to accurately measure precipitation levels. The warning threshold can be set individually. This allows you to react in good time in the event of heavy rain.

Technical data

- Measuring principle: Tipping bucket
- Resolution: 0.1 mm NS
- Collection area: 200 cm²
- Speed: max. 11 mm/min.
- Ambient temperature: -25 to +60 °C (with heating)

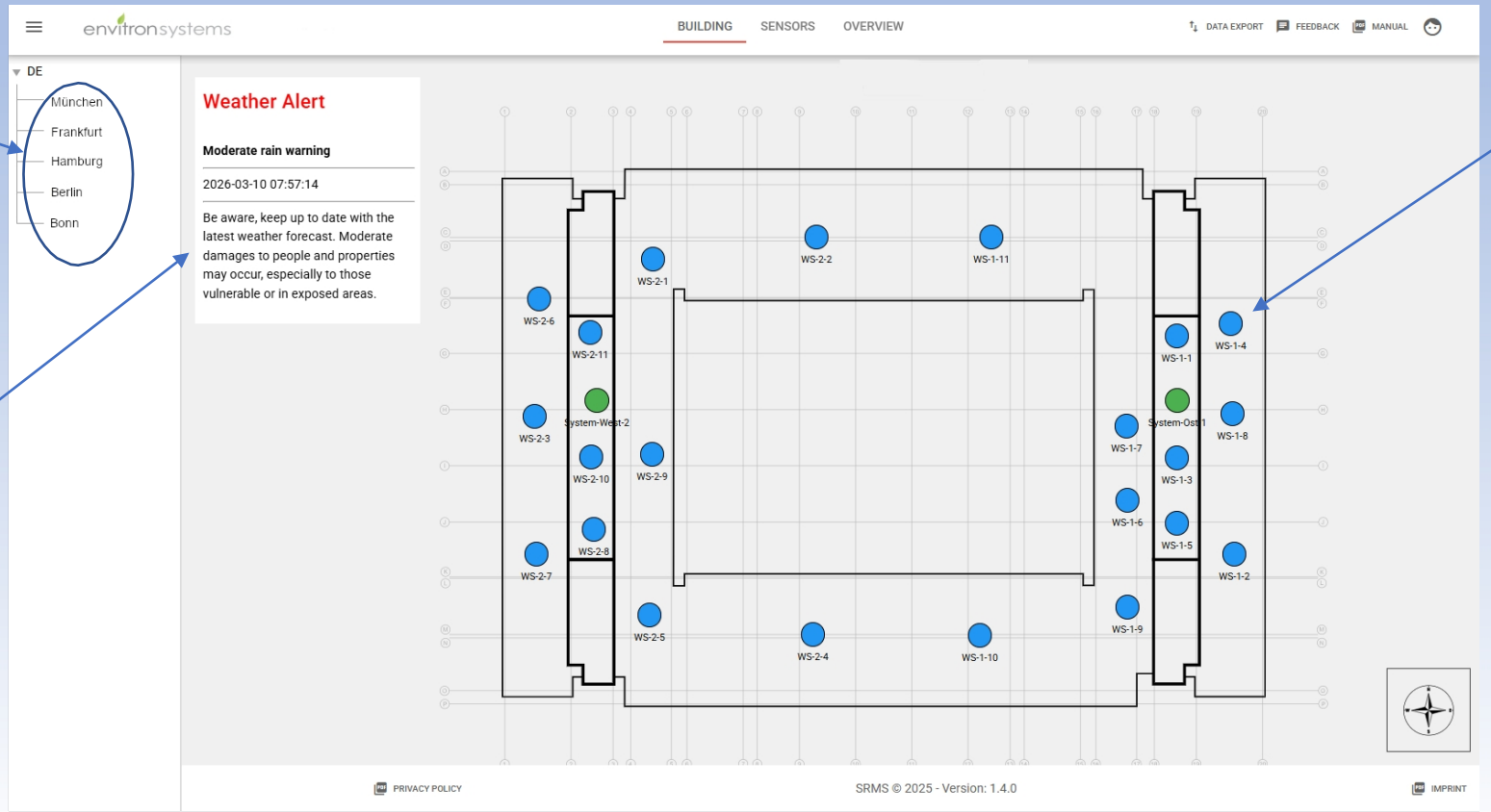
We are constantly expanding our range of sensors

Online Dashboard – Landing Page

Via our dashboard, you can access the latest data from your systems at any time from any internet-enabled device.

Your properties

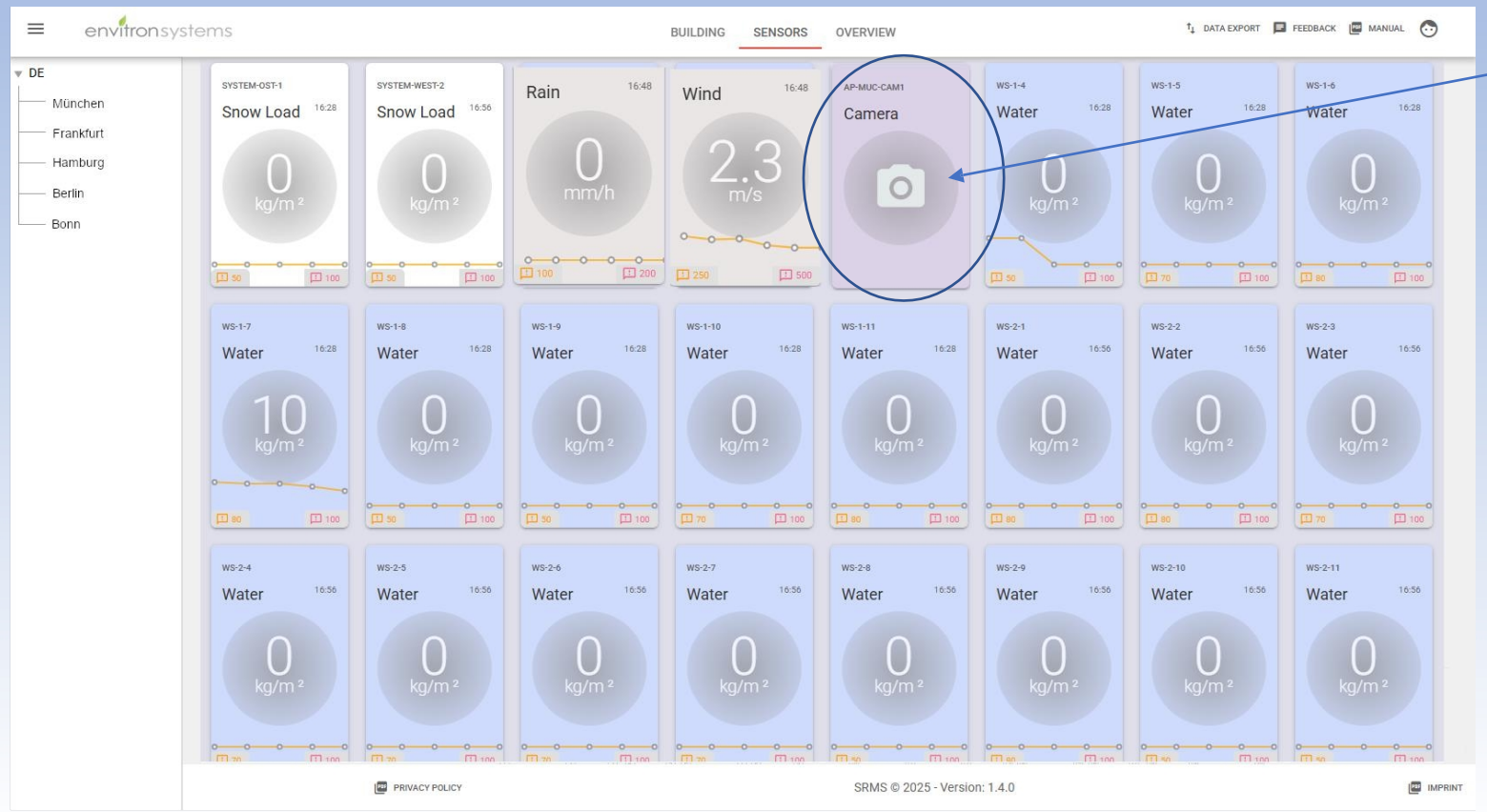
Current weather warnings



Exact positions of the sensors on the roof

Online Dashboard – Sensors tab

Clear overview of all installed sensors

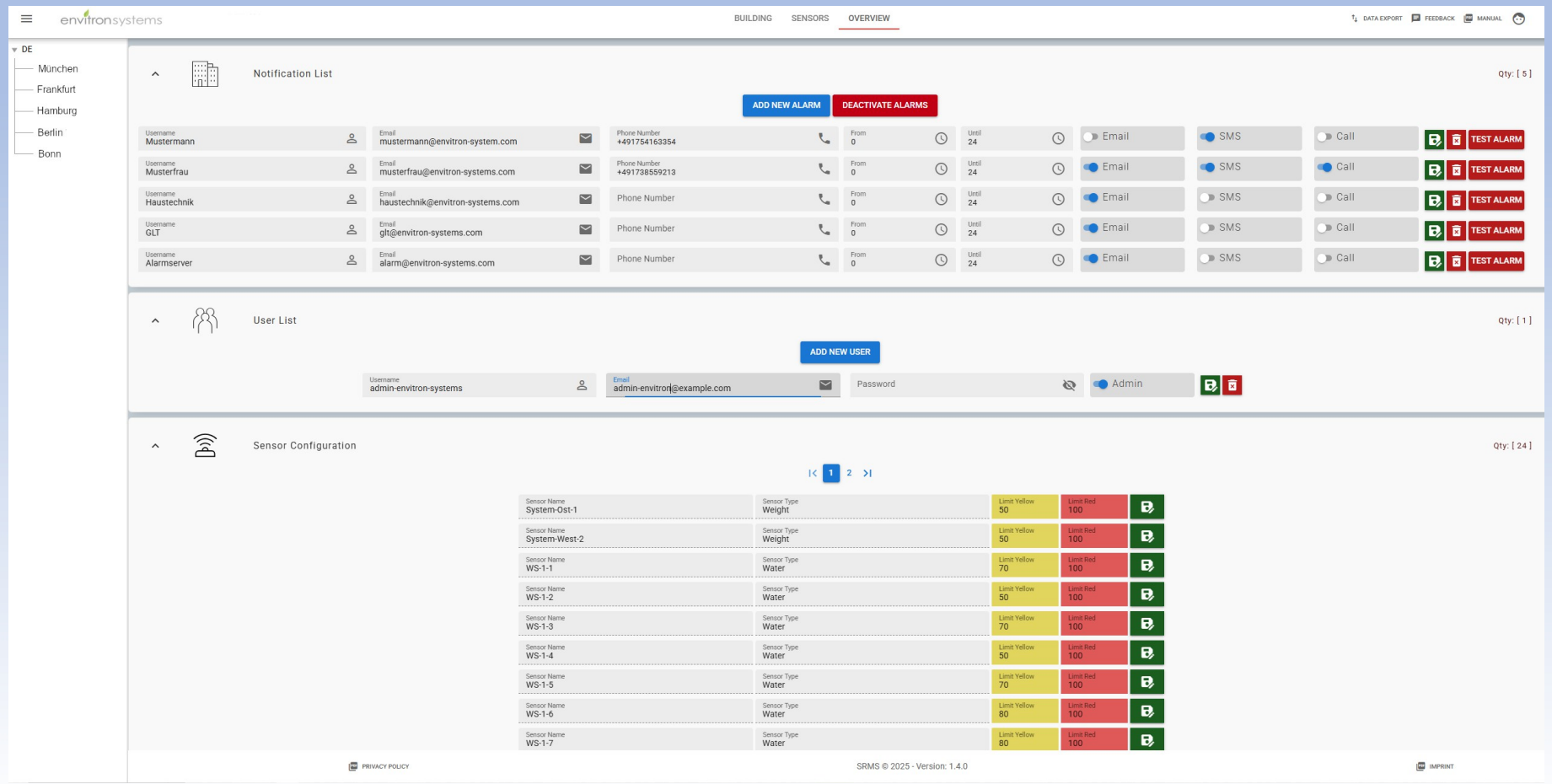


NOMINIERT INNOVATION LEBEN AWARD

EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

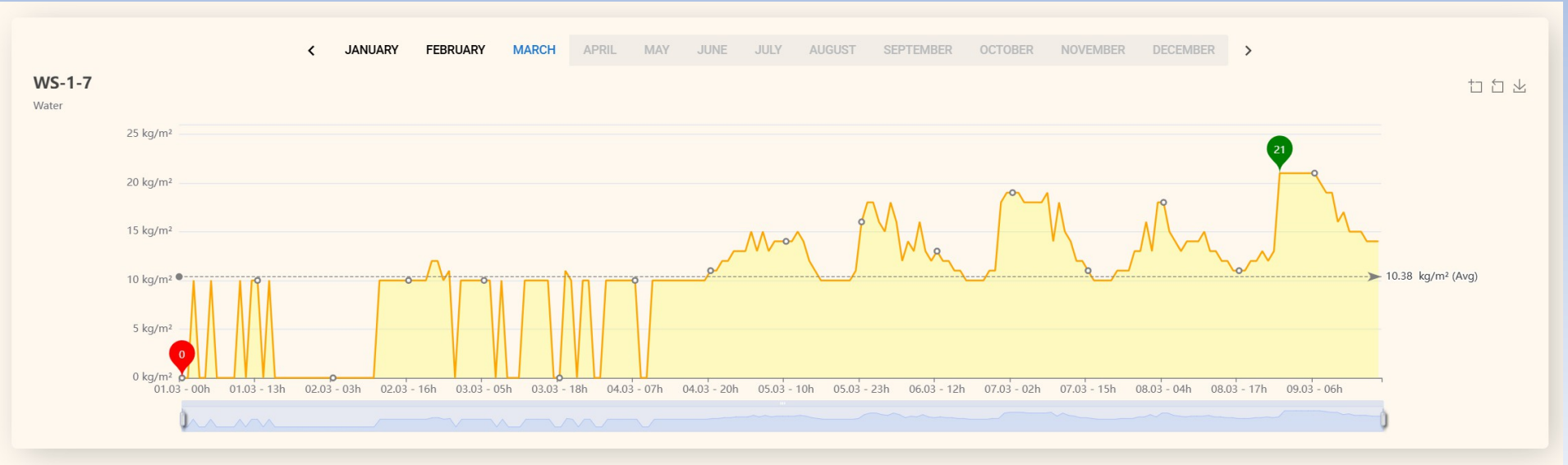
Online Dashboard - Overview Tab

All settings can be conveniently configured



Online Dashboard

Statistics function for every sensor



Additional services

- On-site maintenance
  - **System cleaning**
  - **Calibration and testing of the systems**
  - **Updates**
  - **including material costs (battery, charge controller, solar panel, weighing electronics)**
- Snow clearance
  - **Together with our partner company Bormann, we also offer you a snow clearance solution**

Snow logistics concepts

We work with experienced structural engineers and can create bespoke snow logistics concepts for you

These snow logistics concepts include, amongst other things

- Identification of site-specific hazards and derivation of **risk assessments**
- Development of **concepts for safety and clearance strategies**
  => see also **DGUV I 212-002 “Snow clearance on roof surfaces”** and **DFV technical recommendation “Snow load measurement and snow clearance”**
- Key component:
  - **Combination** of **clearance and safety strategy**

Interesting facts about snow and water on the roof

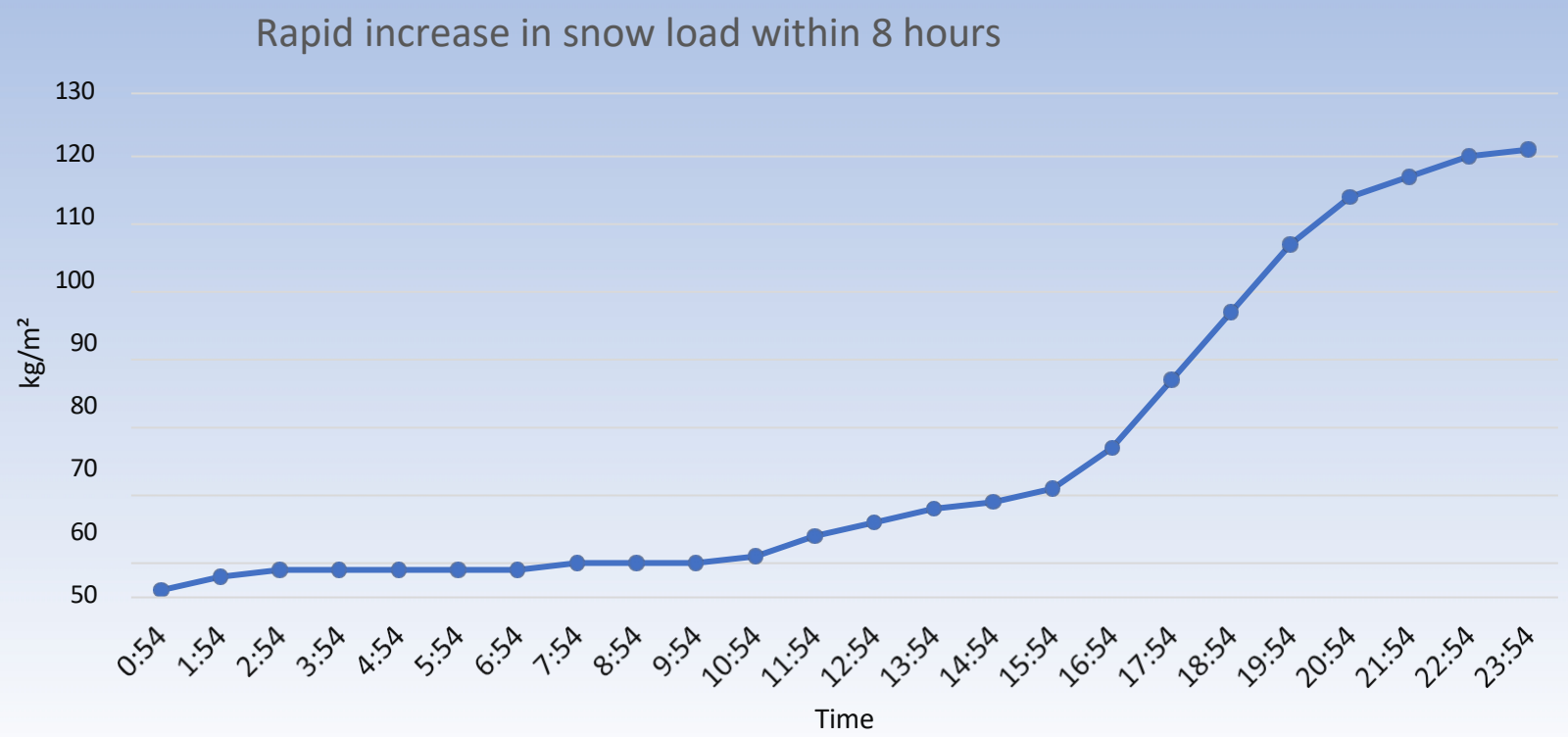
Weight of snow

In recent years, changing climatic conditions have led to exceptionally heavy snowfall. Although the expected snow depths were taken into account in the design of roofs and snow clearance was therefore not usually necessary, existing buildings are now often undersized for such loads. Furthermore, in recent years, the load-bearing capacity for snow loads has been reduced by the installation of superstructures (e.g. photovoltaic systems).

Weight of different types of snow

Examples of increasing snow load

For example, on 2 January 2021, the snow load on roofs rose in some cases to over 120 kg/m² within 8 hours.

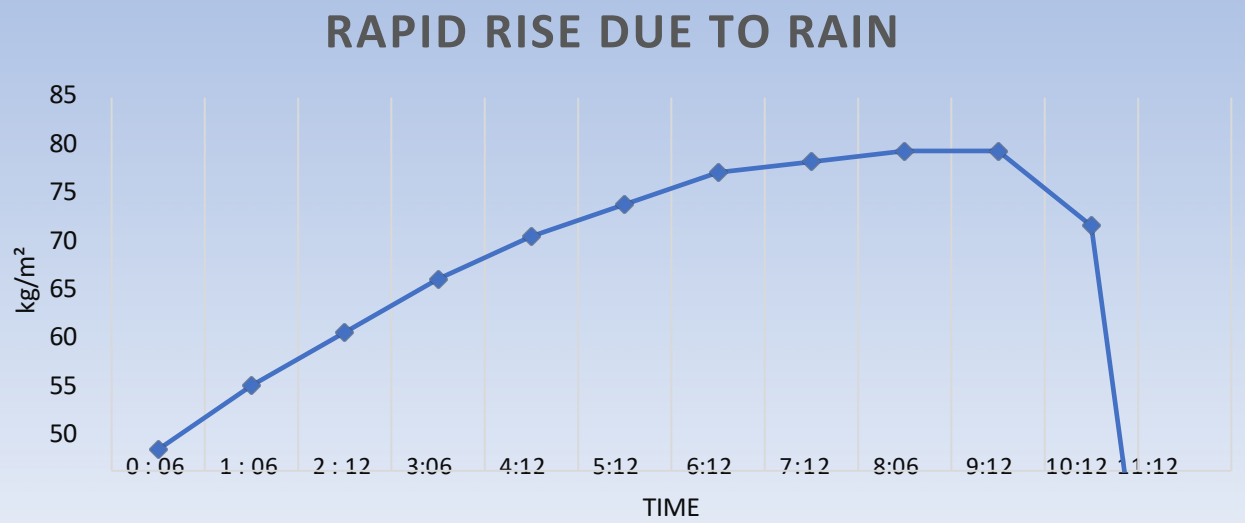


NOMINIERT INNOVATION LEBEN AWARD

EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

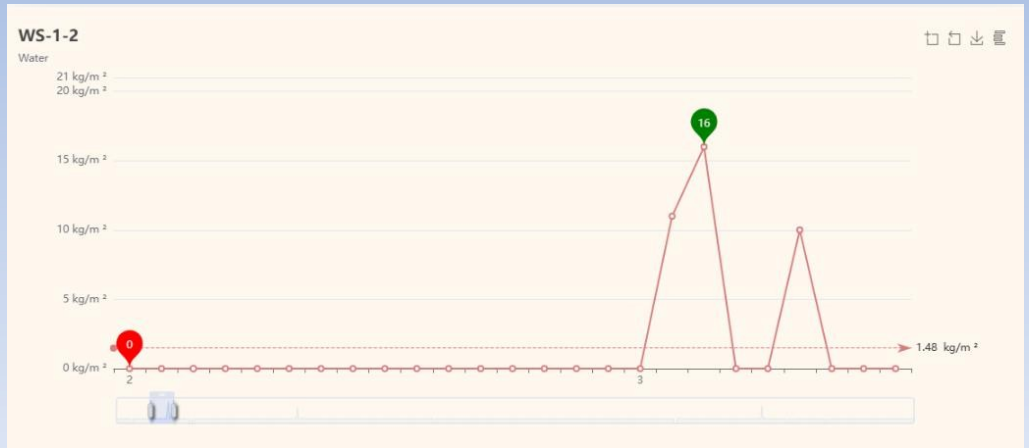
Examples of increase due to additional water

Additional rain can also quickly increase the roof load. In this example, rain fell on an existing snow cover and the roof load increased by 30 kg/m² within 9 hours



Examples of standing water

Unmonitored and blocked roof drains can quickly lead to an increase in roof load.



References

Selection of our references

envitronsystems

Berlin Neukölln District Office

Düsseldorf Airport DUS

SUMA Center

BAADER Food Processing Machinery

Eurofoam

VORWERK

FIEGE The World of Logistics

bayern innovativ NOMINIERT INNOVATION LEBEN AWARD

EUBusiness. German Business Awards 2021. envitron systems GmbH Best Snow Load Measurement System - Europe

Contact

Take a look at our Bavarian Innovation Award-winning system in action and see our systems in use
Link: snowcontrol systems at work

Your contact:

Managing Director Dipl. Ing. Reiner Reisch (FH) Managing Director Dipl. Ing. Ralf Hediger

Lochhamerstr. 13
82152 Planegg, Martinsried Tel: +49 (0)89 716 75 106
Mobile: +49 (0)1523 410 22 56
Email: vertrieb@envitron-systems.com
Website: https://www.envitron-systems.com