OWL EYE®



THE OWL EYE® SYSTEM

By SACHTLEBEN TECHNOLOGY

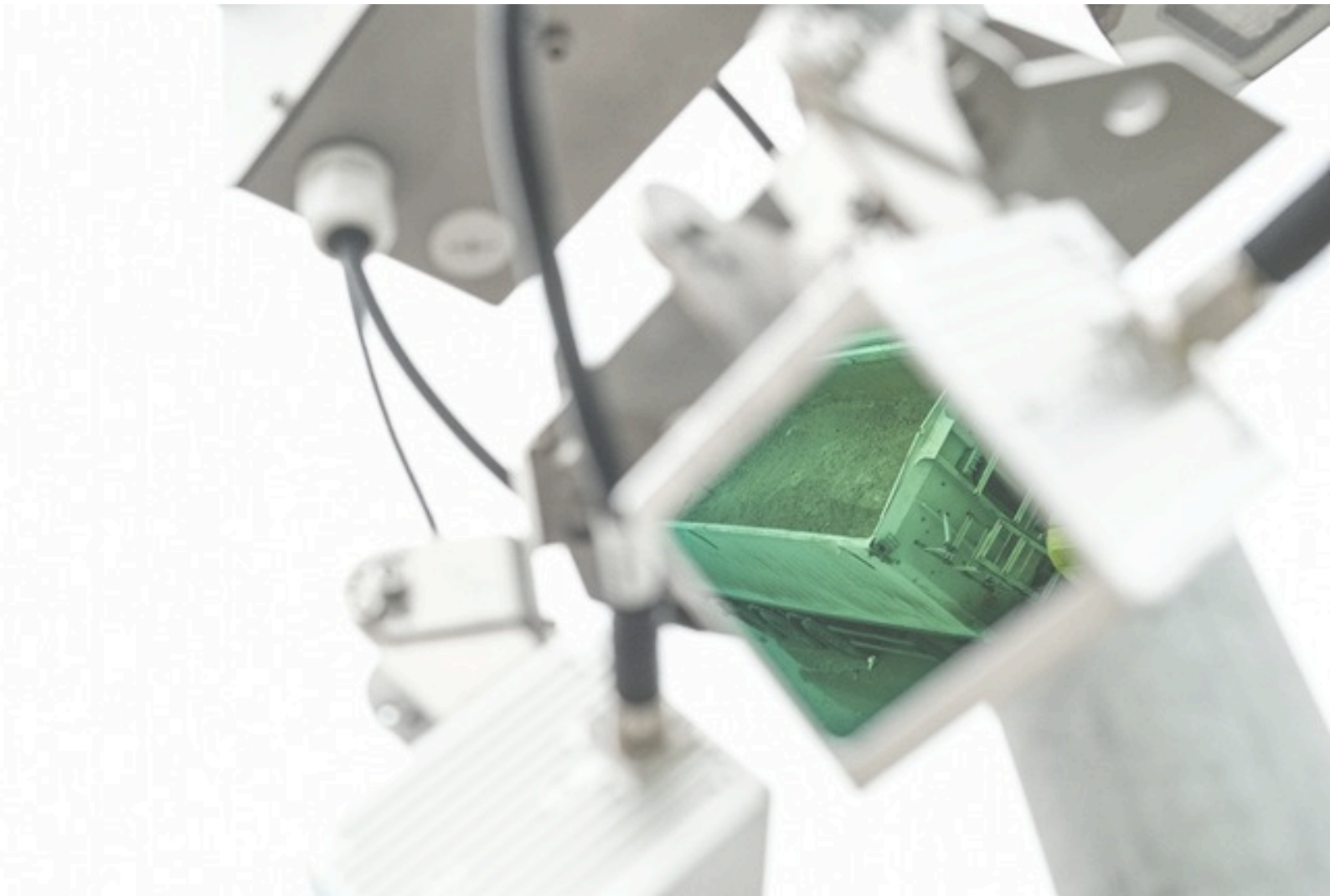
SACHTLEBEN TECHNOLOGY

What is OWL EYE®?

OWL EYE ® is a modular 3D measurement system for the digitalisation of your bulk material stocks. From the initial loading process to final logistics, OWL EYE ® provides sensor-based, precise monitoring and optimisation of industrial bulk goods processes.

Whether for the volume measurement of stockpiles, real-time monitoring of volume flows, level control in silos and process containers or fleet tracking - our solutions provide reliable data for maximum efficiency.

Thanks to robust hardware and intelligent analytics, OWL EYE® helps you to reduce material losses, optimise processes and make well-founded decisions - safely, efficiently and seamlessly integrated into your processes.



The modular OWL EYE® System

Precise volume monitoring for industrial bulk material processes



OWL EYE® Stockpile Monitoring
Real-time volume measurement for bulk material stockpiles



OWL EYE® Volume Flow
Volume flow measurement & conveyor belt health tracking



OWL EYE® Level Measurement & Monitoring
3D level measurement & container monitoring



OWL EYE® Mobile Mapping
Mobile Mapping-System



OWL EYE® Inspect
Intelligent camera monitoring for conveyor belts, screw conveyors and process containers.



OWL EYE® Dashboard
Central platform for visualising, evaluating and controlling all OWL EYE® data and processes.

OWL EYE® Stockpile Monitoring

Real-time volume measurement for bulk material stockpiles

The OWL EYE ® Monitoring System is a complete and fully automated inventory system for permanent volume measurement of your bulk goods in storage boxes, open stockpiles or warehouses according to schedule, in real time or on demand.

PRECISE VOLUME MEASUREMENT IN REAL TIME

Automatic & continuous recording of the bulk material volume without manual measurement.

INTUITIVE SYSTEMINTEGRATION

Flexible integration into your system thanks to REST API, OPC UA and SAP interfaces.

INTELLIGENT 3D BLOCK MODEL

Creation of a digital 3D model of the spoil tip with material layers that can be traced in terms of time and content.

SUITABLE FOR INDUSTRIAL USE & LOW MAINTENANCE

Robust sensor technology, IP65+ protection and minimal maintenance - ideal for dusty, harsh environments worldwide.



What is OWL EYE ® - Monitoring?

With the OWL EYE ® Monitoring System, the volume of any bulk material stockpiles in flat storage facilities can be digitally and precisely recorded.

For example, for automated stocktaking and process optimisation.

OWL EYE ® - MONITORING is a complete and fully automated inventory system for bulk material stockpiles of any size, including database connection and interfaces for third-party systems such as SAP.

Accuracy

Volume accuracy: >98%





Hardware

IP65+ range:
5m - 200m

Visualisation & data

Web interface, dashboard, REST, OPC UA





Analysis

Save digital quality and age information in the 3D model of the stockpile.

Support

Support is offered both remotely and on-site worldwide



Thinking about digitalisation holistically is a win-win situation.
Our OWL EYE ® system is your step towards a digital warehouse.

Conventional inventory of flat bearings

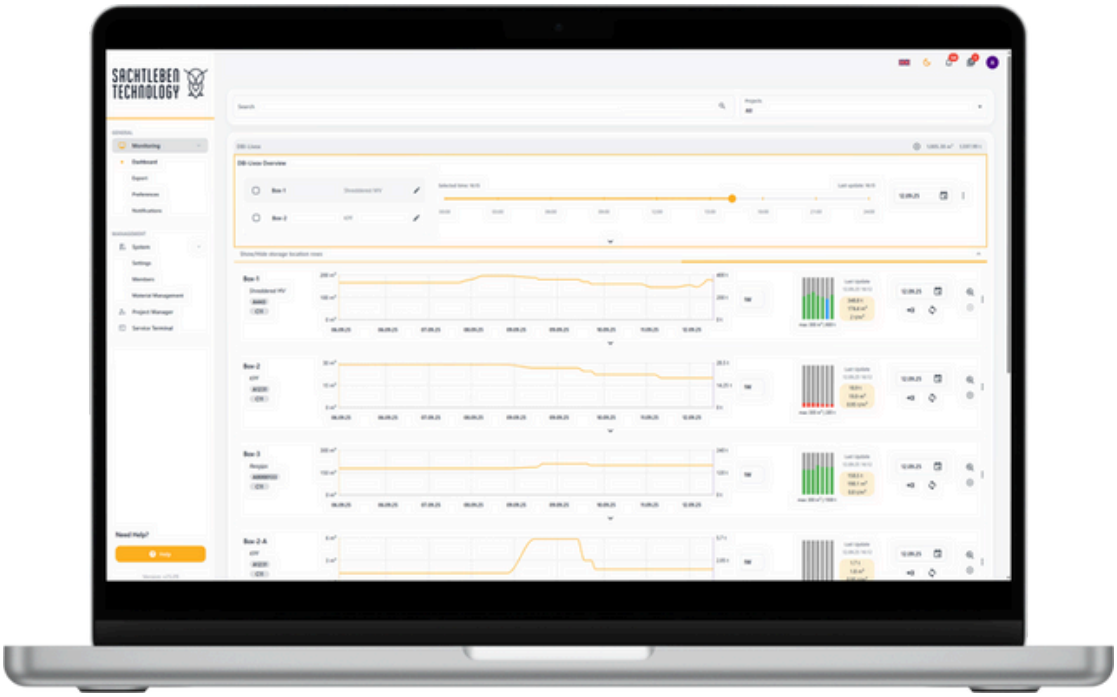
- Estimates
- Wheel loader and grapple bucket counts
- Weighings
- Input and output calculation

Problem: Book inventories quickly deviate from real inventories

> *Purchasing: There are still 300 tonnes in the warehouse. - Wheel loader driver: The bunker is empty.*

- Production plans have to be changed
- Commercial accounting must enter corrections
- Customers cannot be supplied on time

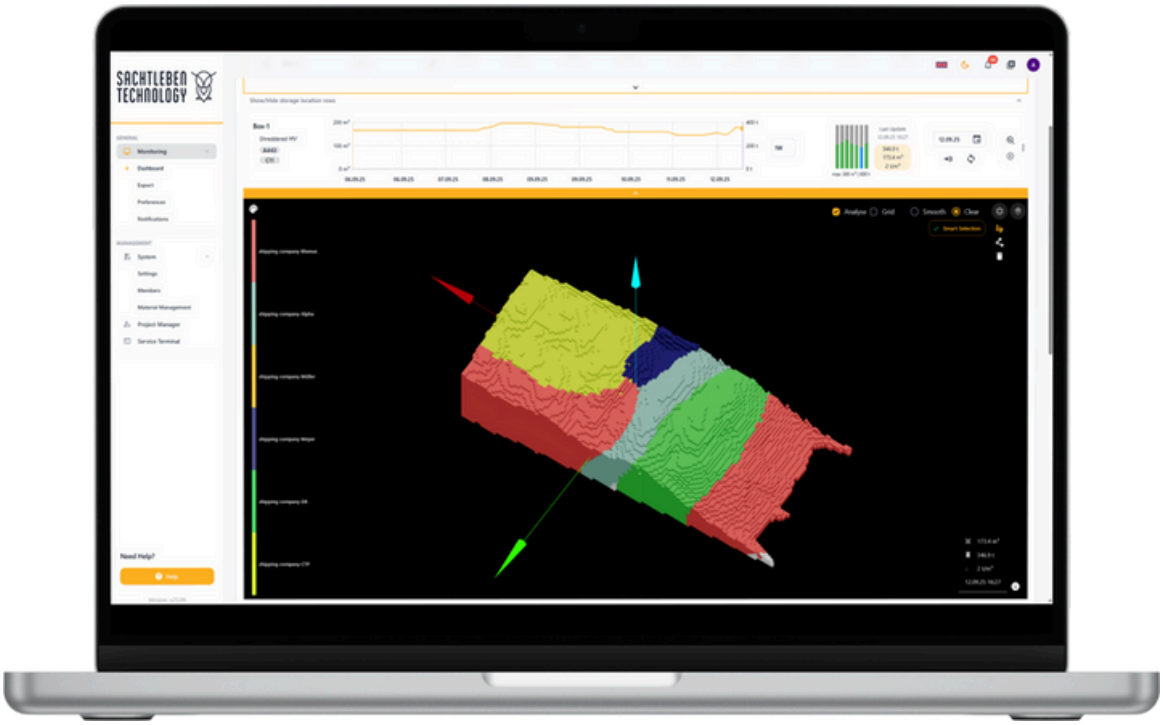
Decision-making based on facts instead of assumptions



The Stockpile Analysis Module helps you to record the composition of your stockpile. Assign any information, such as the quality class or the result of your chemical sampling, to individual areas of the stockpile. The age is recorded automatically.

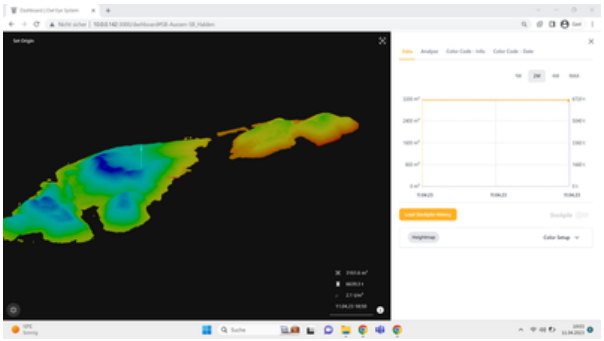
Your stockpile is divided into small cubes

- Each cube in the stockpile has a measurement date
- Assign any information to each block individually or in groups
- For example, the quality class, the chemical composition or that you have not yet taken a sample
- You can assign a colour to each piece of information. This is then visualised in the stockpile and you have a direct overview of the composition
- Colour the stockpile according to the age of the blocks - this gives you a direct overview of the individual age of the components of your stockpile
- Mark an area of the stockpile and see the composition, age and volume of the marked blocks at a glance

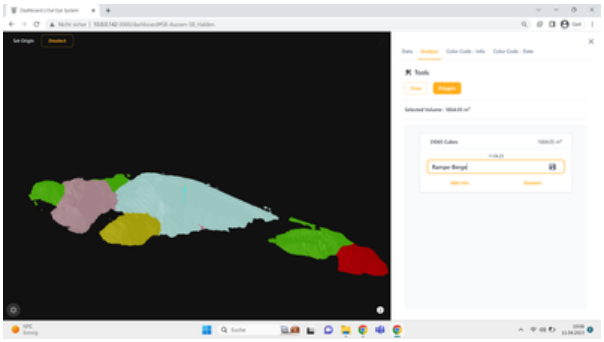


Digitisation pays off.

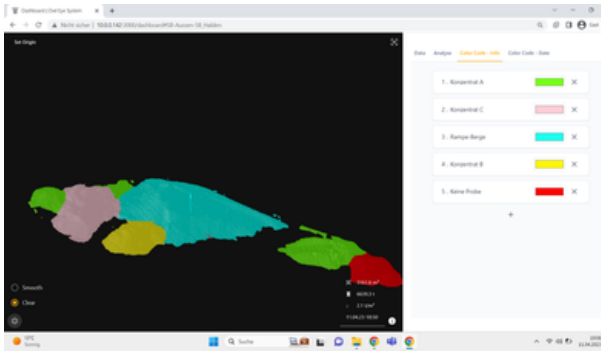
Create a digital twin of your stockyard - even a stockyard consisting of several stockpiles can be monitored



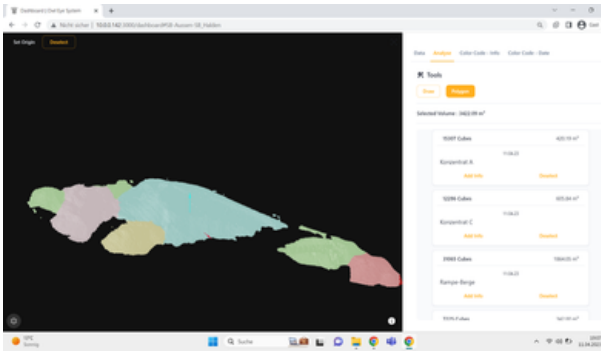
Select an area and enter information. For example, a quality class or material designation.



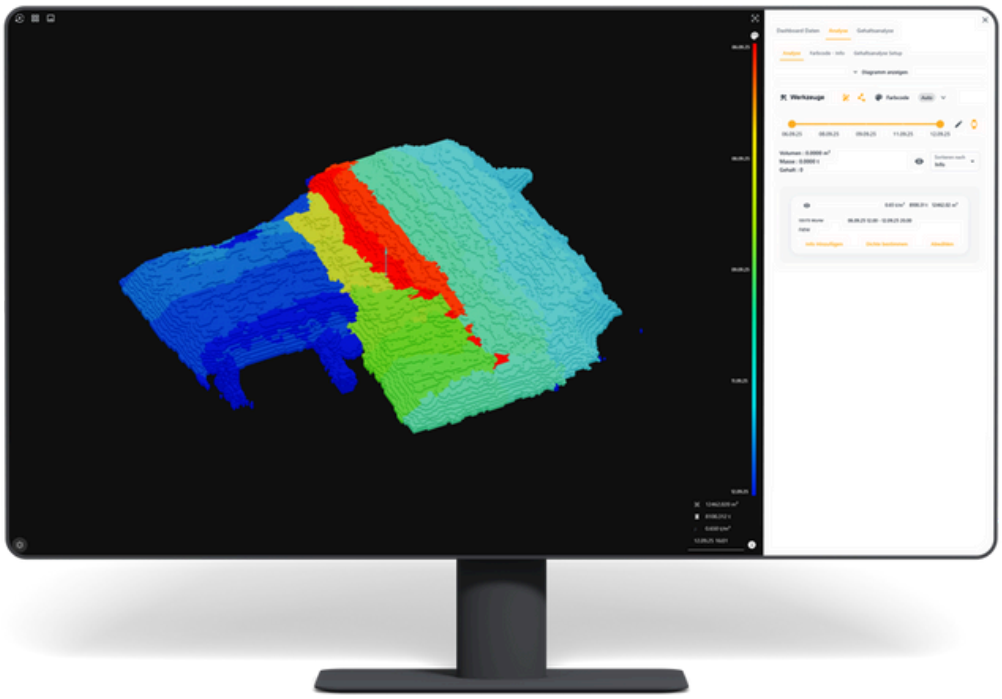
Assign a colour to each piece of information. The stockpile is coloured accordingly.



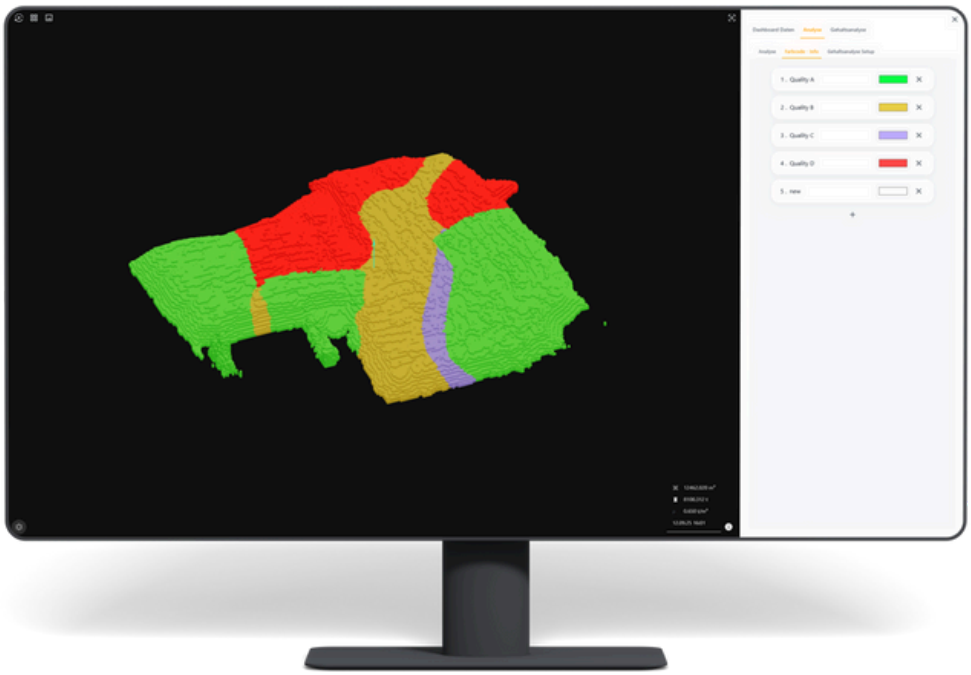
Select the entire area and display information on the quantities of the individual areas. This gives you an overview of how much material you have with the respective information.



Coloured stockpile according to time stamp:



Coloured stockpile according to stored information. In this case, the haulage company that delivered the material:



Practical example: Optimised warehouse management

Two stockpiles are built up in a warehouse around 100 metres long using a discharge conveyor belt system. The material is then removed using a scraper system.
In the past, the customer regularly faced the challenge of ordering the right amount of plaster by train. As no exact data on storage capacity was available, this often resulted in over-ordering and inefficient utilisation of the available space.

- Installation & functionality: In this project, 8 platforms were installed that permanently monitor stock levels.
- Precise capacity recording - the customer always knows how much space is actually available.
- Needs-based orders - over-ordering is a thing of the past as orders are based on real data.
- Maximum space utilisation - the system supports the optimum filling and distribution of material.
- Efficient scraper control - OWL EYE ® enables the ideal setting according to the angle of repose of the stockpiles.

The result: greater transparency, lower costs and an amortisation period of just 24 months.



Practical example: Storage box management in a fertiliser factory

The fertiliser is stored in five warehouses, each with 10-20 storage boxes (dimensions 50 m × 10 m, filling height 10 m) via a discharge conveyor belt system and then transported onwards by wheel loader.
The main challenge so far has been to maintain a constant overview of the available storage capacity, the utilisation of the individual boxes and the age of the material. Unclear stock levels regularly led to complications in sales and logistics.

- Installation & functionality: 10-20 sensor platforms were installed per hall, which are connected via network cable. Compressed air nozzles ensure automatic cleaning of the sensors. In this way, the fill levels are permanently recorded and transferred to the OWL EYE ® digital model.
- Transparency of storage capacities - always clear which boxes are free or occupied.
- Age and quantity recording - precise tracking of the material stock and its turnover time.
- Optimised logistics processes - a clear overview of where which material has been stored simplifies further processing and prevents stock shortages.

The result: reliable planning, efficient processes and a significant reduction in incorrect orders. The customer claims an amortisation period of just 18 months.



Practical example: Quarry and mining application

An open-cast mining customer uses OWL EYE ® to precisely measure and control a levelling stockpile in front of a crusher. The SiO_2 content is transferred directly from the LIMS system to the OWL EYE ® 3D analysis model and serves as the basis for production planning.

Areas of application and advantages:

- Installation & mode of operation: Three sensor platforms were installed around the stockpile. The sensors are positioned approx. 1 metre above the conveyor belt, permanently scan the conveyor belt profile and continuously calculate a 3D model from this. The data is reliably transmitted to the network via a radio bridge.
- Content control: Production is controlled based on the planned SiO_2 values → constant quality and higher efficiency.
- Inventory: Precise stock and quantity recording simplifies planning and logistics.
- System integration: In addition to the core system, OWL EYE® Inspect, Flow and Stacker are also in use - all connected in one software, new applications can be flexibly added per project.

Result:
Transparent processes, efficient control and an amortisation period of just 6 months.



OWL EYE® Volume Flow

Volume flow measurement & conveyor belt health tracking

The OWL EYE ® volume flow module enables the non-contact detection of volume or mass flows on conveyor belts in m³/h or t/h - combined with intelligent monitoring of the "health status" of the belt.

PRECISE VOLUME FLOW MEASUREMENT IN REAL TIME

Automatic and continuous detection of the volume flow - contactless.

HEALTHY BELT, STRONG OPERATION

Conveyor belt protection through smart detection of material centre of gravity, misalignment or large stones

EASY SYSTEM INTEGRATION

Flexible integration of OWL EYE ® into existing system landscapes thanks to REST API, OPC UA and analogue interfaces.

SUITABLE FOR INDUSTRIAL USE & LOW MAINTENANCE

Robust design for continuous operation. Minimal maintenance thanks to non-contact measuring technology.



Material flow at a glance

The browser-based software provides real-time data on material movements and stockpiles.

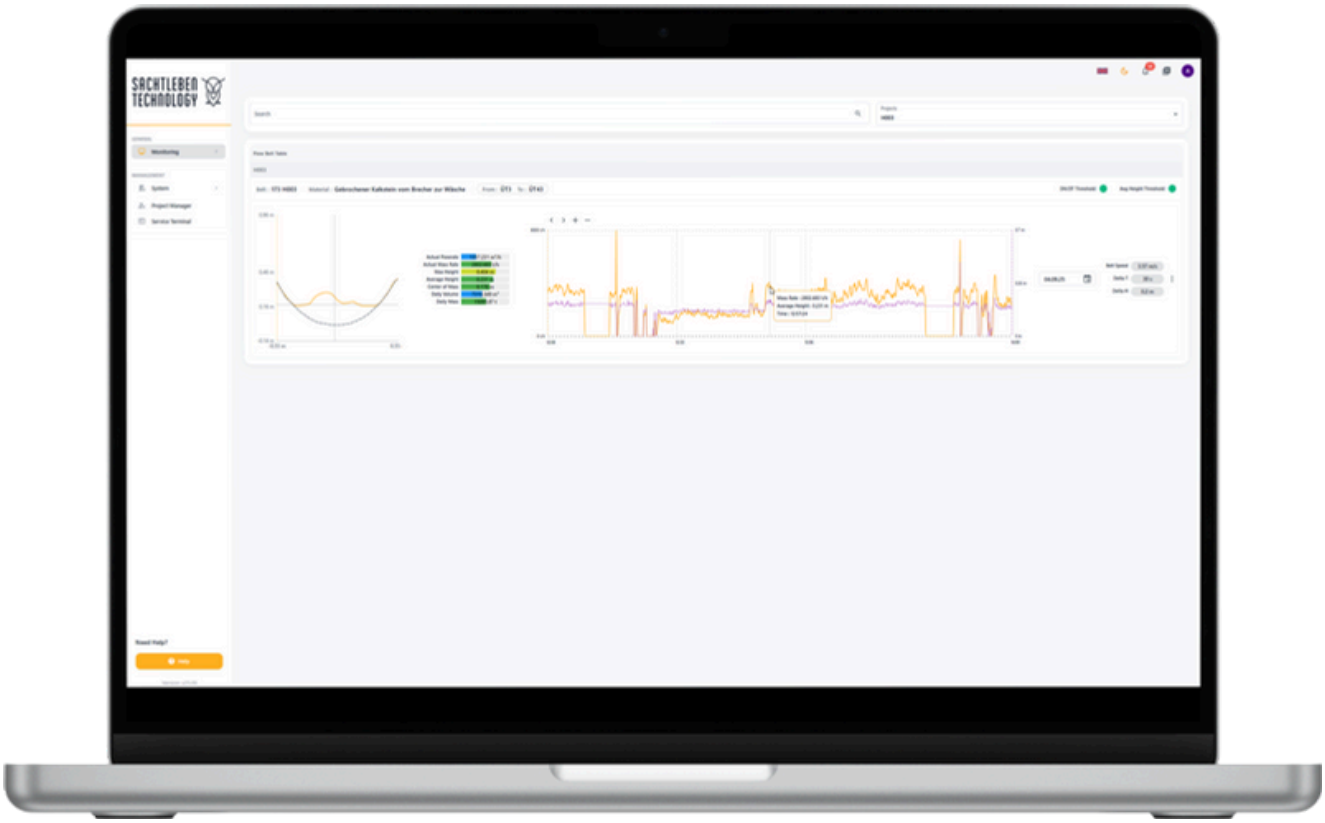
Dashboard shows, among other things:

- Material throughput (m³/h, t/h)
- Profile heights (average & maximum values)
- Large objects in the material flow

Individually configurable through:

- Measuring intervals
- Colour coding
- REST API, OPC UA, analogue signals

For well-founded decisions and efficient processes.



Technical data

Measuring accuracy
Typical measurement deviation of the volume flow measurement: ±1 %

Mounting height
From 0.3 m to 1.5 m, depending on the 3D LiDAR sensor used
Individually configurable for small halls to large outdoor warehouses.

Temperature range
Operating temperature: -40 °C to +80 °C
Suitable for indoor and outdoor use in extreme conditions.

Data transmission
Wireless via WLAN, LTE or proprietary wireless solution
Wired via network cable (Ethernet) or fibre optic
→ The system also works without an existing infrastructure on site - but offers full connectivity to existing networks.

Sensor cleaning
Optional: automatic compressed air cleaning to minimise dust deposits.



Features

Basic function: Volume flow measurement and belt health check
Automated detection of material flow, belt misalignment, centre of mass and large objects

Logging of all measured values with 2D profile
Recorded section profiles are mapped and documented in two dimensions.

Warnings when threshold values are exceeded
Automated signalling via: OPC UA, analogue signals, e-mail notification

Warning if conveyor belt height is exceeded
Direct alerting for safety-critical material heights
- also via: OPC UA, analogue signals, e-mail

Historical records of the measurement data
All measurement data is recorded historically - for seamless analyses, trend evaluations and predictive maintenance



Practical example: Quarry and mining application

A customer in an open-cast mine uses the OWL EYE ® volumetric flow measurement system as a replacement for several conveyor belt scales.

The advantages:

- Installation & functionality - the sensor is installed approx. 1 metre above the conveyor belt and continuously scans the conveyor belt profile. A 3D model is continuously calculated from this data.
- No mechanical load - the measuring system works without contact and is therefore more stable and requires significantly less maintenance.
- Less calibration work - compared to mechanical systems, the need for regular adjustment and maintenance is significantly reduced.
- Extended functions - critical threshold values such as material height and increase in material height are continuously monitored and transmitted directly to the control station in real time as an analogue signal (4-20 mA).

Result:
Greater operational reliability, reduced maintenance costs and more precise process control - with a payback period of just 9 months.



OWL EYE® Container Level Measurement & Monitoring

3D level measurement & container monitoring

OWL EYE ® offers a specialised solution for monitoring closed containers such as silos, feed hoppers, crushers and other process-relevant units.

3D LEVEL MEASUREMENT IN REAL TIME

Non-contact and precise detection of complex material surfaces in dusty or irregularly filled containers.

AUTOMATIC SENSOR CLEANING & PROTECTION SYSTEMS

Clear view and reliable data collection thanks to the compressed air-controlled housing and integrated cleaning mechanism.

PROCESS-CONTROLLED EVENT TRIGGERING

Intelligent response to defined fill levels - recipe check, alarm or material logistics control.

MONITORING IN CLOSED SYSTEMS

Silos, bunkers, feed hoppers and crushers
- even under challenging environmental conditions

SEAMLESS INTEGRATION INTO EXISTING SYSTEMS

REST API, OPC UA and other standard interfaces
- for simple connection to control, SCADA or ERP systems.

Features

Level measurement of silos and closed containers
Automatic level measurement of silos, containers, closed bunkers

Logging of all measured values with 3D model
Captured 3D models are saved historically and can be retrieved at any time

Warnings when threshold values are exceeded
Automated notification via: OPC UA, analog signals, e-mail notification

Warning if fill level is exceeded
Direct alerting for safety-critical material heights - also via: OPC UA, analog signals, e-mail

Historical records of the measurement data
All measurement data is recorded historically - for seamless analyses, trend evaluations and predictive maintenance



OWL EYE® Mobile Mapping

Mobile Mapping System

With OWL EYE ® Mobile Mapping, you have full transparency of machine locations, operating statuses and material movements at all times - combined with high-precision 3D mapping for terrain, piles and work progress.

LIVE-TRACKING IN REALTIME

Track machine positions, routes and operating times on the map - maximum overview and fast reactions.

AUTOMATIC 3D MAPPING

Automatic creation of high-resolution terrain models during machine operation.

EASY SYSTEM INTEGRATION

Flexible transfer of machine and map data to ERP, construction or BIM systems thanks to REST API, OPC UA or CSV.

VISUAL PROGRESS DOCUMENTATION

Target/actual status comparison based on 3D data - keep an eye on project progress at all times!

FUTURE-PROOF SENSOR PLATFORM

Modular system with open interfaces.

Only those who measure things can manage them.

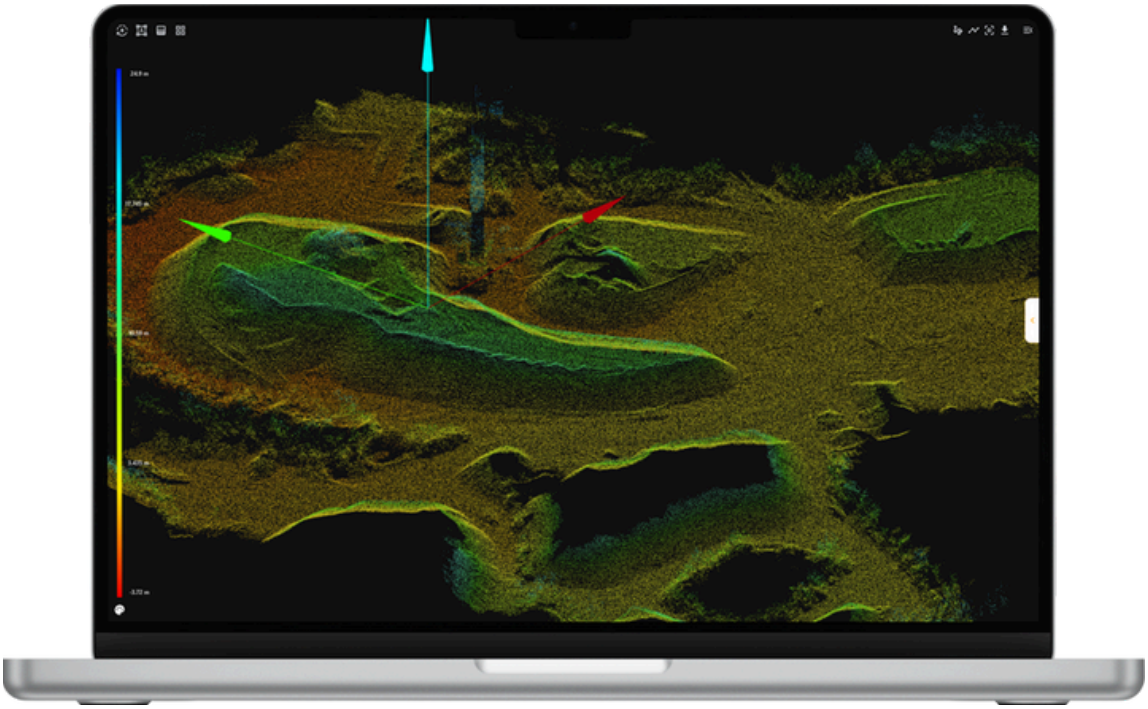
System technology:

- GPS with RTK - accuracy in the single-digit centimetre range
- LiDAR: 3D sensor technology for precise, georeferenced environment mapping
- Alignment & position always in view - a fully defined system
- Camera: Intelligent image sensor technology for computer vision, object recognition & neural networks

Make double use of your journeys - collect data & manage based on facts!

Features:

- Vehicle tracking, route recording for route optimization
- 3D mapping and recording of special events
- Direct connection to the OWL EYE ® Dashboard
- Software overlay: open street map, orthophoto, point clouds
- Uncomplicated connection to third-party systems



Recording driving data with OWL EYE® offers numerous advantages:

- Optimize routes & efficiency - Analyze routes to avoid unnecessary journeys and reduce fuel costs
- Documentation & tracking - Keep track of routes travelled and operating times for billing or analysis
- Safety & traceability - Detect risky driving behavior, improve driving style and protect yourself in case of disputes
- Analysis of operational areas - Determine where and how your vehicles are used to improve work processes
- Data for digital mapping - Combine lanes with LiDAR and camera footage to create detailed 3D maps of your environment

The data collected therefore helps you to make better decisions, save costs and optimize processes!



The system tracks the age of the stockpile. Colour the 3D stockpile model by storage date and optimize your production!

In the OWL EYE ® Dashboard, you can keep an eye on stockpile key figures such as volume and mass. The 3D models are displayed as block models in variable resolution - each block can be individually assigned a density or content.

3D overview in real time

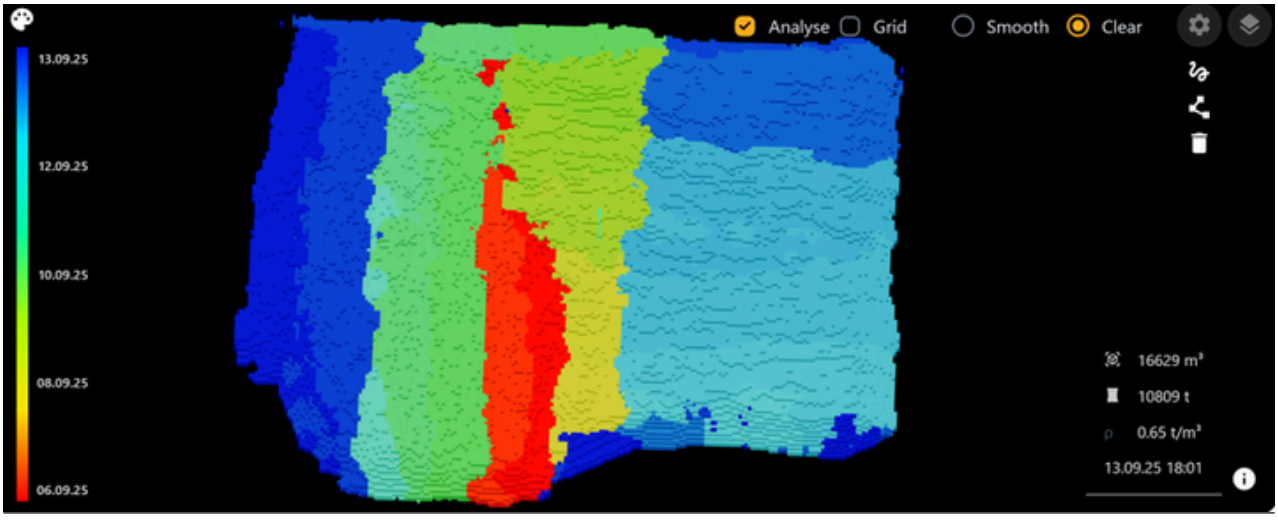
- The stockpile is digitally divided into small "cubes". Each cube is given an individual measurement date after being recorded.
- All areas can be colored by date, in the 3D model - so you can immediately see which batches were stored and when.

Reliable range measurement

- Thanks to a practical lasso tool, you can easily mark out and delimit separate areas of the stockpile.
- Determine how much material is stored in a specific section at the touch of a button and plan its removal more efficiently.

Free spaces in view

- Measure the available storage space in square meters in no time at all.
- You can immediately see how much space is still available - and can plan ahead



Practical example: Quarry and mining application

A customer uses wheel loaders in his business to move materials flexibly - both when loading them onto trucks and when filling stockpiles with stacker systems. The vehicles were equipped with the mobile OWL EYE ® Mapping System.
This allows the wheel loader to record its surroundings in real time: everything the driver sees is transferred to a digital model by the sensors. This means that inventory data can be recorded precisely. Previously, time-consuming inventories or inaccurate manual estimates had to be carried out.

Structure of the system:

- Two LiDAR sensors (front & rear)
- Three GPS sensors for precise positioning
- An edge box on the vehicle roof for real-time data processing

Result:

- Significantly simplified and accelerated inventory management
- Elimination of manual estimates and inventories
- Flexible and precise recording directly during operation
- Amortization period: only 12 months



Practical example: Clay pit

A customer uses the mobile OWL EYE ® Mapping System on a mining excavator to georeference and monitor the excavation progress of his mining operation. The generated point clouds are saved and enable complete documentation: it now becomes possible to trace which area was mined and when at any time.

- Support for surveying & planning: The surveying department benefits from precise, always up-to-date data.
- Digital mine: The entire mining process is mapped digitally - transparency from planning to execution.
- Increased efficiency: Manual measurements are largely eliminated, allowing the process to be planned more quickly and flexibly.
- Up-to-date database: Digital information on the current status of the mine is available at all times.

Structure of the system:

- Two LiDAR sensors on the excavator
- Three GPS sensors for precise positioning
- An edge box for processing the data in real time

Result:
More transparency, less manual effort and a flexible, digitally controlled dismantling process - with a payback period of 24 months.



OWL EYE® Inspect

Camera control system with an OWL Intelligence (OI) model

The OWL EYE ® Inspect System is a camera-based surveillance system that enables advanced image recognition using an OWL neural intelligence network. In contrast to conventional artificial intelligence, the OWL intelligence model, similar to an owl, focuses specifically on very local data. The software is individually trained for each customer environment, ensuring optimal adaptation and high technical stability. The system reliably detects foreign objects, different types of rock, grain sizes, contamination, moisture and much more. It is directly connected to the process control system via an interface and continues to optimize itself through continuous self-training.

APPLICATION AREAS

Developed for use on screening systems, conveyor belts, containers, feed hoppers, chutes, buckets and much more.

PROCESS INTEGRATION

Direct connection to the process control system via standardized interfaces.

RECOGNITION FUNCTIONS

Reliably detects foreign objects such as helmets, large stones, metal parts, but also different types of rock, grain sizes, dirt and moisture.

SELF-LEARNING AI

The system trains itself independently and continuously optimizes detection.

LIDAR-INTEGRATION

Optional use of a LiDAR sensor for precise quantity and volume measurement.

DATA INTEGRATION

Use and integration of inventory data from third-party systems to improve training and analysis.

Technology

Camera
The OWL EYE ® camera is installed above the conveyor belt, container or screen

Edge processing
The data is processed and trained locally in an edge box

Interfaces
Results can be flexibly forwarded to the system controller via OPC UA, analog signals (4-20 mA) or switching outputs



Anything that a human can classify visually can be taught to the Owl Intelligence System.

Through repeated training, the system reliably recognizes patterns, differences and deviations. After a sufficiently long learning phase, it is able to precisely classify material conditions, contamination or objects on screening systems, conveyor belts or in containers.

OWL Intelligence
Automated detection & classification

Functions and options
Intelligent control, monitoring and assistance solutions for the control center

Detection of soiling
e.g. mud, dust, adhesions

Detection of anomalies
In the area of material flows or processes

Detection of foreign objects
e.g. wheel loader tines, helmets or tools

Differentiation between different materials
e.g. sand, gravel, glass, wood, wood pellets and much more

Analysis of the grain sizes
Rough classification possible

Practical example: OWL EYE ® Inspect - camera-based solution

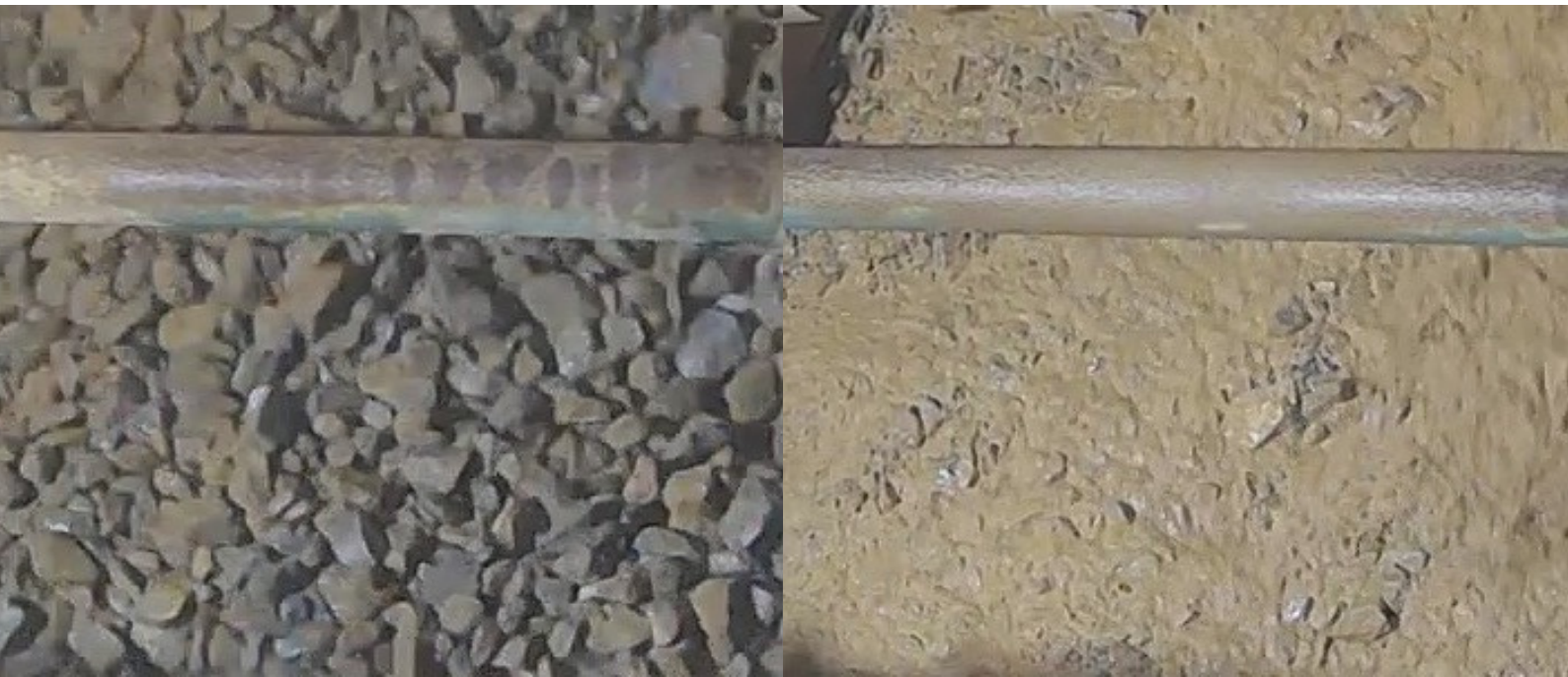
In a mining operation, OWL EYE ® Inspect is used above a screening plant to monitor the degree of silting of the stones. Excessive silting otherwise causes material to slip on the conveyor belt, blocking drives and causing downtime that can only be rectified manually.

Solution & functionality:

- Industrial camera records the material above the screening system
- Edge box in the control cabinet evaluates the data with neural networks
- Results are transferred to the control station via 4-20 mA signal and switching contacts
- Exceeding threshold values → Automatic slowdown, belt stops if sludge continues to build up

Result:

- Avoid cost-intensive downtimes
- Less manual intervention
- Greater process reliability and efficiency
- Amortization: the investment is already covered with the first prevented slippage





OWL EYE® - Moduls

Advantages of the OWL EYE ® software as a modular system

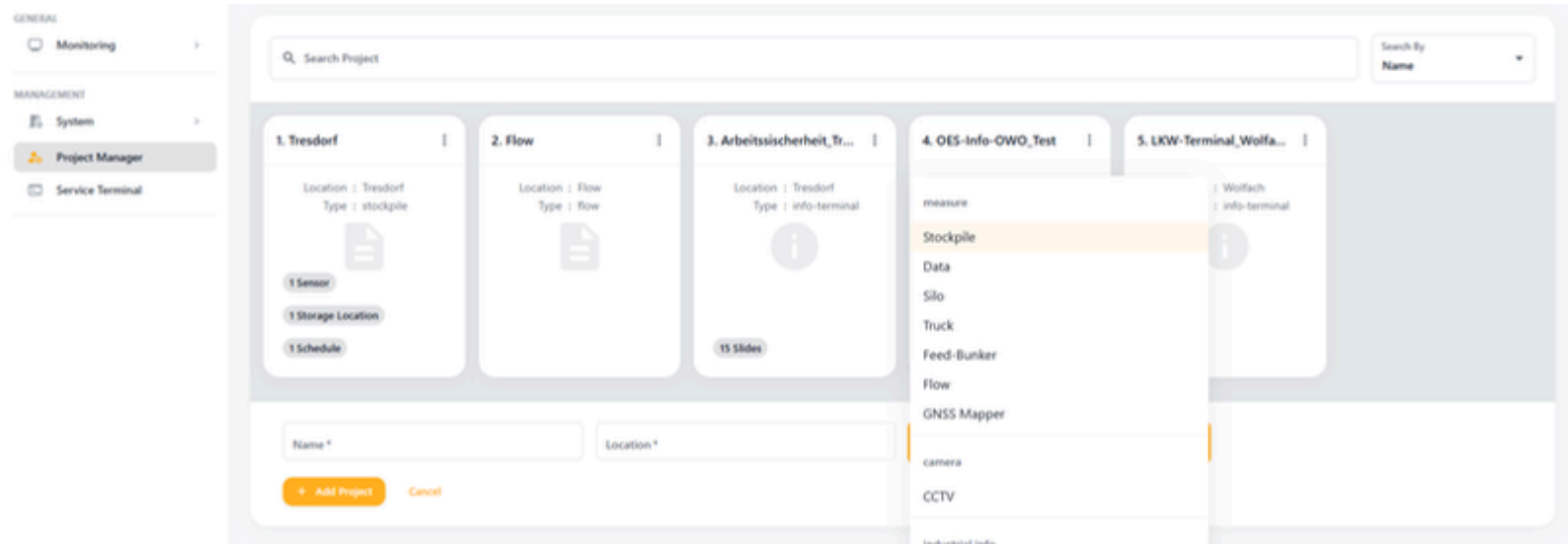
The OWL EYE ® software is designed from the ground up as a modular system. All measurement applications from the portfolio are already integrated into the platform and are available immediately after installation.

Simple commissioning:
After installation using the installer and the basic IT configuration (network, VLAN, firewall), the system is ready for operation.

Flexible expandability:
New applications can be easily added at any time - simply via the "Add project" screen in the web application. This means that all measurement solutions from the OWL EYE ® portfolio can be seamlessly integrated into the existing environment.

Your advantages:

- Future-proof: Investment in a system that grows with your requirements at all times.
- Standardized platform: All measurement applications run on the same software basis - no patchwork of individual solutions.
- High flexibility: Extensions can be implemented quickly and without complex new installations.
- Simple operation: Intuitive project management via the web interface.



OWL EYE® Dashboard

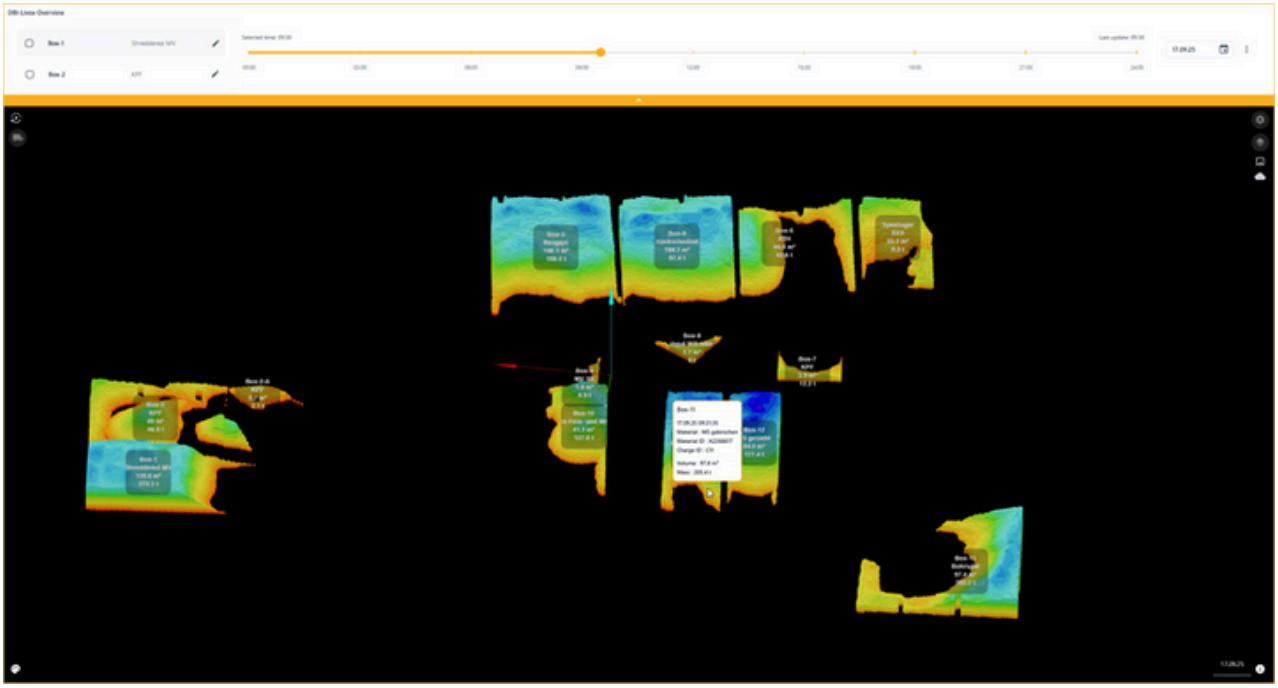
Project overview

All stockpiles at a glance - as an interactive 3D model

The OWL EYE ® Dashboard transforms your material stocks into a digital twin that can be explored interactively at any time. Each stockpile is displayed as a precise 3D model - clear, detailed and directly accessible in the browser. This gives you a complete overview of your material at a glance.

In addition to the visual representation, comprehensive material information is also available: Material designation, batch, material number, density, mass and volume can be called up directly in the 3D model. This combines visualization and data transparency to create a powerful tool for planning, controlling and optimizing your processes.

Whether for day-to-day business, reports or strategic decisions - with the 3D environment, you have access to all relevant information at all times and can act faster, more informed and more efficiently.

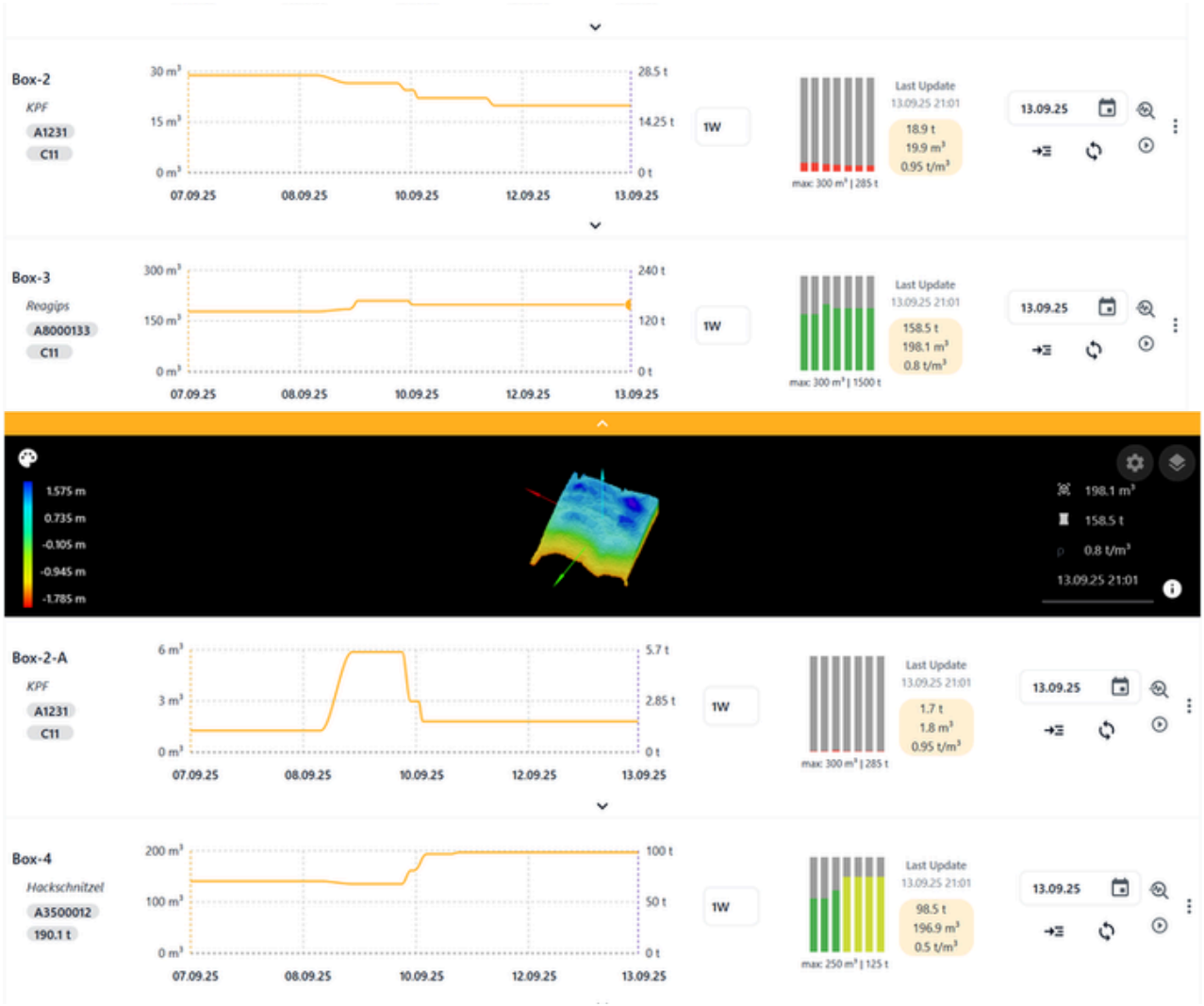


All data. Anytime. Everywhere.

With the OWL EYE ® Dashboard, you always have an overview of your production. All measurement data is not only visualized live, but also recorded historically - retrievable at any time, traceable at any time.

3D models for each individual measurement can be opened directly in the browser-based software and viewed interactively. This turns pure data into a clear picture.

Whether by shift or by day - the dashboard shows precise material movements and reliably calculates what has been added or removed. Maximum transparency for your processes.



Our Services

Worldwide, reliable and from a single source

Support:
We offer worldwide support - both remotely and on-site. Thanks to our partner network as well as our own technicians and service engineers, we ensure that your OWL EYE ® system runs smoothly at all times.

Installation
Our experts take care of the complete installation of the hardware, including electrical and network cables, compressed air or fibre optic connections and the installation of network cabinets. Everything from a single source, professionally and efficiently implemented.

Commissioning
We carry out commissioning worldwide and hand over your OWL EYE® system as a turnkey solution - for seamless integration into your operations and maximum operational reliability.

Your added value
With our service, you not only receive technology, but an all-round carefree package. You gain reliability, security and sustainability for your processes - supported by a global service network that is always at your side.





SACHTLEBEN TECHNOLOGY

We are your partner for the digitalisation of your company. With our modular OWL EYE ® System and the expertise of our team, you can take the recording and calculation of your material flow to a new level: modern, digital, accurate.



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