CONVEYOR VOLUME FLOW MEASUREMENT

Volume flow scanned contactless.

±1 % VOLUME ACCURACY · 24/7 · LOW-MAINTENANCE



AT A GLANCE

Four numbers that matter.

OWL EYE® VOLUME FLOW is an industrial LiDAR system that measures bulk-material throughput on a moving conveyor belt in real time — contactless, continuous and to ±1 % volumetric accuracy.

±1 %	0.5–1.5 m	24 / 7	–40…+80 °C
VOLUME ACCURACY	MOUNTING HEIGHT	LOW-MAINTENANCE	TEMPERATURE RANGE

NON-CONTACT BELT SCALE ALTERNATIVE

Measure instead of weigh — no wear.

Instead of weighing the load through the belt structure, OWL EYE® VOLUME FLOW captures it optically: a 2D-LiDAR sensor mounted above the belt scans the belt load line by line, crosswise to the belt direction, and converts the cross-section together with the belt speed into a volume flow. Mass flow is derived from the material-specific calibrated bulk density — no load cells, nothing in the belt line.

Dust, fog or rain? Multi-echo signal processing separates airborne dust from the material profile — the LiDAR locks onto the solid bulk surface, not the dust cloud. No moving parts, minimal connectivity requirements: Wi-Fi, LTE, Ethernet or fibre optics.

> **“Your digital conveyor belt at a glance — material throughput and profile heights monitorable at any time.”**

OWL EYE® VOLUME FLOW RUNS AT **K+S**, **PROFAGUS**, **NORDZUCKER**, **VALE**, **HOLCIM** AND **GELITA**, AMONG OTHERS.

HOW IT WORKS

One sensor. One cross-scan. Every second.

Three integrated steps — from bulk material on the belt to mass flow in your control system. No belt stoppage, no manual entry.



SENSOR IN OPERATION

01 — SCAN

The 2D-LiDAR scans across the belt.

A single sensor is mounted 0.5–1.5 m above the belt. The scan line crosses the belt direction and captures the height profile line by line across the full belt width — without touching the load.

02 — COMPUTE

From profile to volume and mass flow.

Every line becomes a profile cross-section. From cross-section and belt speed, the OWL EYE® volume engine — our own development — integrates the volume flow in real time; the calibrated bulk density turns it into mass flow.

03 — DELIVER

Live data in dashboard, SCADA and ERP.

Volume in m³/h and mass in t/h, updated every second. Web dashboard, REST API, OPC UA and SAP integration — shift reports and history included.

MASS FLOW FROM VOLUME FLOW

Mass flow (t/h) = volume flow (m³/h) × bulk density (t/m³)

`Example: 250 m³/h of crushed limestone × 1.5 t/m³ = 375 t/h`

Bulk density is calibrated per material at commissioning against a reference weighing (existing belt scale, weighbridge or sample weighing) and stored as a material profile. Volume is always the primary measurement.

FEATURES

What OWL EYE® Volume Flow measures and delivers.

Not just total throughput, but the shape of the load itself: one belt scan delivers flow, belt load and belt health in the same data stream.

01

Volume & mass flow

Live throughput in m^3/h and t/h, density-calibrated per material.

02

Profile cross-section

Live belt-load profile, every line. Full cross-section profiles are recorded — for audit, quality assurance and forensics.

03

Throughput trends & history

Hour, shift, day, week — fully configurable. Every measurement is stored; shift comparisons at the click of a button.

04

Threshold alerts & over-height

Configurable limits for min/max throughput, profile height and load asymmetry, with alarm forwarding. Overloading is detected early.

05

Conveyor diagnostics

Off-centre loading, belt-edge spillage, profile-height anomalies and belt mistracking are flagged — anomaly events for preventative maintenance.

06

REST · OPC UA · SAP

Documented interfaces out of the box: REST API (JSON over HTTPS), OPC UA server and SAP IDoc connector — ready to integrate.

TECHNICAL SPECIFICATIONS

Industrial grade. Low-maintenance. Reliable.

Built for 24/7 operation in industrial environments — no moving parts, no wear.

± VOLUME ACCURACY **± 1 %**	↕ MOUNTING HEIGHT **0.5 – 1.5 m**
°C TEMPERATURE RANGE **−40 … +80 °C**	IP PROTECTION CLASS **IP65+**
≋ SENSOR TYPE **2D-LiDAR · multi-vendor**	⇄ INTERFACES **REST · OPC UA · SAP**
⌁ CONNECTIVITY **Wi-Fi · LTE · Ethernet · Fibre**	✦ AUTO CLEANING **Compressed air (optional)**

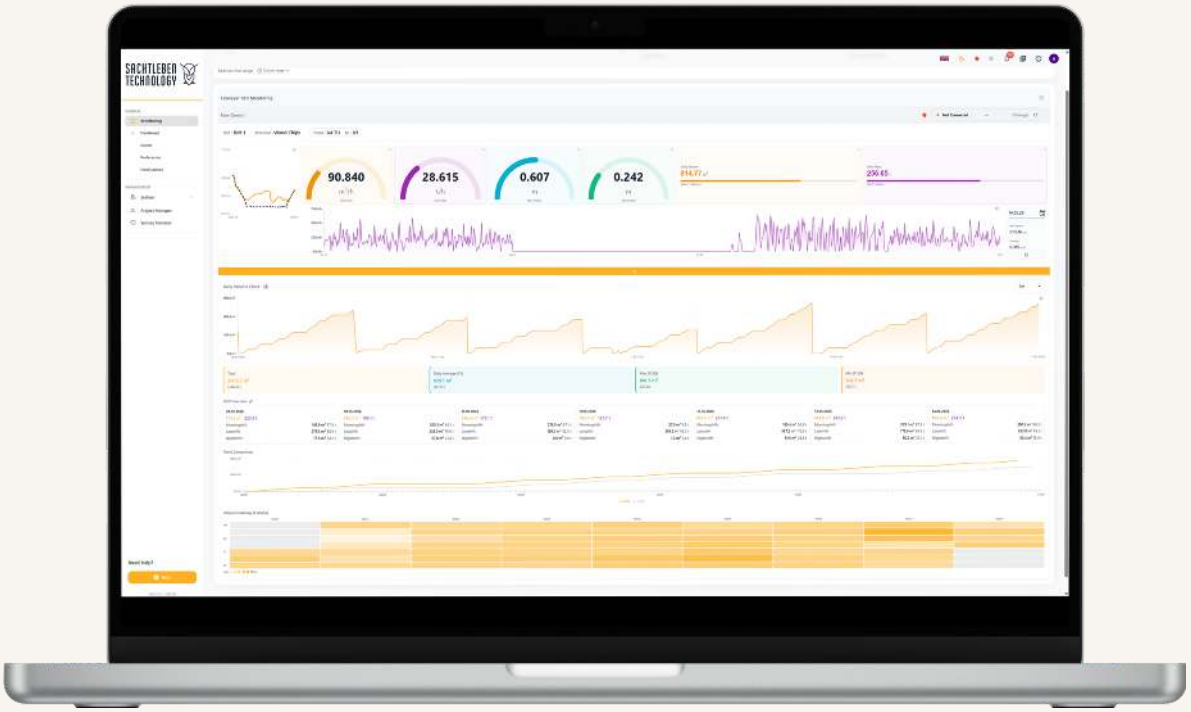
BELT TYPES	Troughed and flat belts, incl. inclined and reversible
BELT WIDTH	typically 600 – 2200 mm
BELT SPEED	typically 0.5 – 6 m/s
BULK DENSITY	approx. 200 kg/m³ (wood chips) to approx. 4000 kg/m³ (iron ore)
MASS ACCURACY	homogeneous materials typ. ±1–2 %, variable materials typ. ±3–5 %
DRIFT	below 0.2 % per year in normal operation

Volume accuracy typical on a calibrated belt. Mass accuracy depends on the stability of the bulk density. For fiscal-grade (custody-transfer) billing, the gravimetric belt scale remains the reference.

OWL EYE® SOFTWARE

Your digital conveyor belt — at a glance.

The web dashboard shows every belt, every cross-section, every trend in real time — fully configurable for your site and your materials.



DASHBOARD VIEW · DEMO DATA

- Live volume flow (m³/h) and mass flow (t/h)
- Daily volume and daily mass, daily chart
- Trend comparison and volume heatmap (8 weeks)
- Cross-section profile, max. and average height
- Shift overview (morning, late, night shift)
- Automatic shift reports (PDF, CSV)

YOUR DATA STAYS WITH YOU

The dashboard runs in your browser; the raw data lives on the OWL EYE® edge server inside your network. No cloud dependency, no outbound internet connection needed for the production loop. Container-based software, documented APIs.

APPLICATIONS

Universally applicable — for every bulk material.

Wherever bulk material moves on a belt, OWL EYE® Volume Flow measures it. Abrasive, sticky, hot or wet bulk materials are no problem — the sensor never touches the belt or the material.

- Mining ores
- Iron, copper & bauxite ores
- Cement & lime plants
- Industrial minerals
- Stones & aggregates
- Wood chips, pellets & biomass
- Coal & coke
- Sugar beet & agriculture
- Grain
- Salt & potash
- Chemicals
- Recycling

VOLUME FLOW IN PRODUCTION

Real belts. Real material.



QUARRY · CROSS-SCAN OVER BELT



INSTALLATION · HOUSING ABOVE THE BELT



WOOD CHIPS · BIOMASS CONVEYOR

LIDAR OR BELT SCALE?

When volumetric LiDAR is the right choice.

- ✓ **Abrasive, sticky, hot or wet materials** — no contact with the load, no mechanical wear parts.
- ✓ **Retrofit on an existing conveyor** — mounted on a small gantry above the belt in hours, no rebuild of the belt frame.
- ✓ **Profile data, not just total mass** — off-centre loading, belt-edge spillage and profile-height anomalies as maintenance triggers.
- ✓ **Multiple belts at one site** — all data in one OWL EYE® dashboard with one set of APIs.
- ✓ **You need the volume** — e.g. for stockpile-input reconciliation; a belt scale cannot report volume.

Stick with a **belt scale** when you need fiscal-grade weight accuracy (custody transfer at < 0.25 %). Many customers run both: the belt scale for periodic re-calibration of the LiDAR mass output, LiDAR for continuous monitoring.

TURN-KEY DELIVERY

Worldwide. Flexible. Reliable.

01

Belt survey & sensor planning

On-site survey, optimal sensor position, material-density calibration.

02

Mount & commission

Pre-fabricated bracket, no on-site welding. Power + Ethernet to the control cabinet, network and PLC integration. Commissioning typically one shift per belt.

03

Training & support

Onboarding for your team, documented interfaces, remote support.



DETAIL · SENSOR BRACKET AND CABLE GLANDS

LET'S TALK

Ready to digitalise your conveyors?

We survey your plant, plan the sensor positions and come back with a detailed proposal — within a week.

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MARK

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