

**AUMUND Group –
leading in conveying quality
all over the world**



Jaber Malandi
AUMUND Fördertechnik GmbH



There for you since 1922 – high quality solutions for conveying and storage of bulk materials

The AUMUND Group offers efficient solutions for conveying and storage of bulk materials. **A particular strength is the technologically mature and extremely reliable machinery for handling all kinds of bulk materials, even hot, abrasive or sticky.**

A light blue world map is centered in the background of the slide. It shows the outlines of continents and countries. Overlaid on the right side of the map are four statistics in large blue numbers, each with a corresponding text description below it.

24,000

installations worldwide

140

countries in which AUMUND Group companies are active

19

locations all over the world

80

representatives as global network

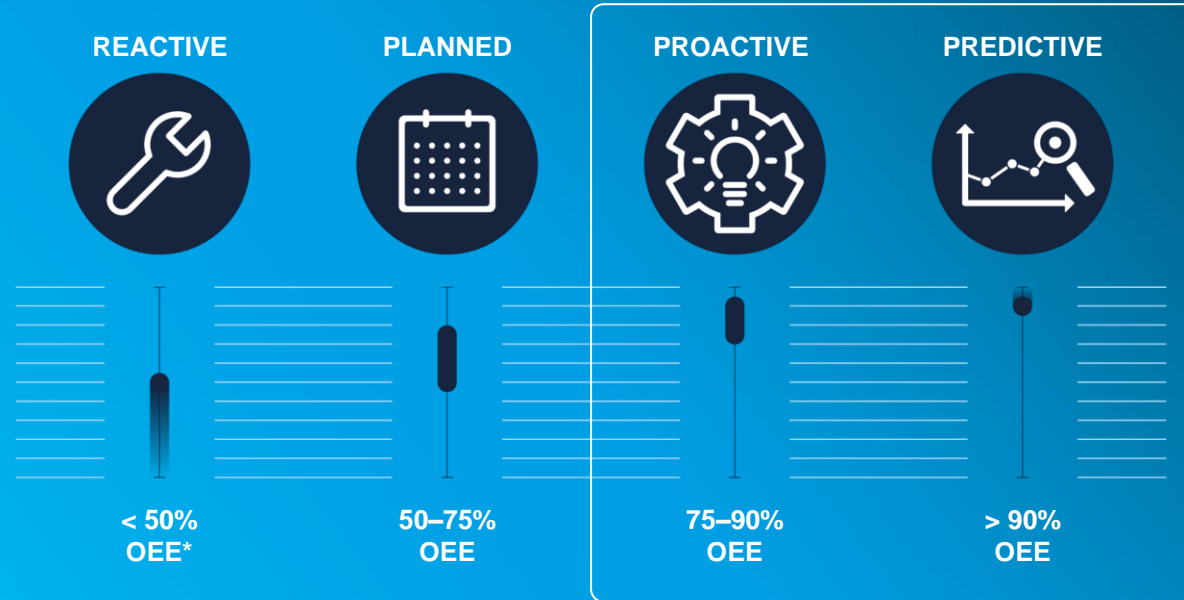


Keep on smiling!

Enjoy reliable running machines at low costs with PREMAS® Maintenance Solutions



Our mission: Support you to avoid unforeseen failures and breakdowns!



*Overall Equipment Efficiency

Source: Deloitte analysis

PREMAS® – Preventive and Predictive Maintenance Solutions for uninterrupted conveying



PREMAS® Inspection

See more, plan better and shield your business



PREMAS® 4.0

Predictive Maintenance Solution



PREMAS® 360°

Quality services in unique maintenance packages



PREMAS® Inspection

What you see is not always what you get. Shield your business with PREMAS® Inspection.



Let's tighten the safety net – with PREMAS® Inspection

Shield your people!

Safety is our top priority when we think about your employees. We want to share our knowledge and ensure that the machines they work with meet all safety standards. For us, safety means avoiding unnecessary risks, not fixing them.

Shield your business!

We know: Availability is everything for your customers. So keep your production and business running – we make sure you continue to have maximum delivery performance, no unforeseen costs for outage, downtime and low OpEx / CapEx.



Shield your machine!

Our service enables you to plan maintenance work at an early stage, so you can operate your machine as efficiently and effectively as possible. We thus minimize unforeseen breakdowns and unplanned downtime and can increase potential energy cost savings.

Shield your plant!

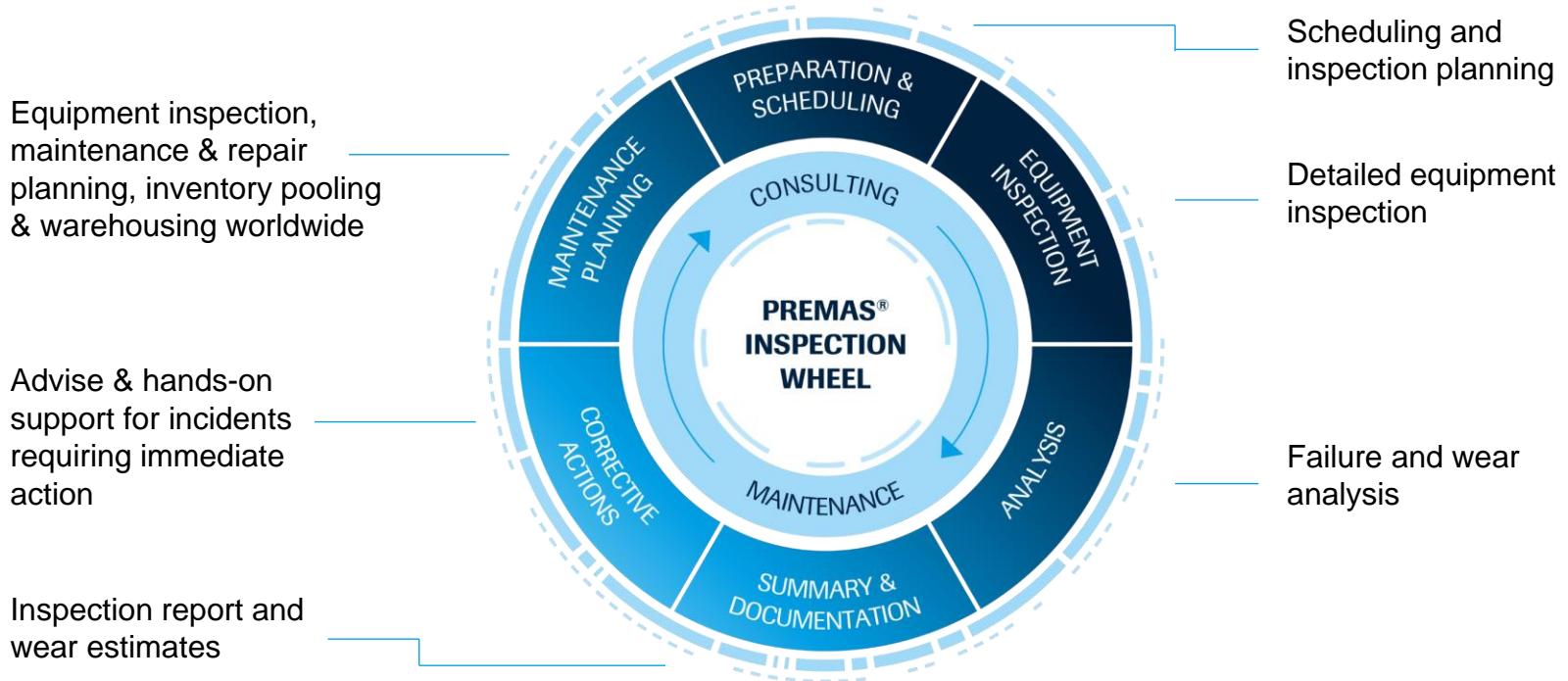
Production and maintenance needs contradict? Not with us. You continue to produce at the highest level with optimum maintenance. This saves you from unnecessary downtime.

**Personal. Efficient. And at your side
worldwide: get to know your
PREMAS® Inspector for AUMUND &
Non-AUMUND conveying machines.**

**“Man and machine working together, the
best team for maintenance excellence”**



All in one: Your confidant, your advisor, and your companion for all matters.



Three options, one choice: Our services at PREMAS® Inspection

Annual Inspection*



Our Annual Inspection will let you see, what you got. This reduces your downtime, makes your production consistent, and maintenance planning and inventory more strategic.

Diagnostic Visit*



Our Diagnostic Visit identifies the root cause of issues and thus eliminates potential damages. With our expert, you have additional resources to perform an in-depth root cause analysis.

Well Visit*



The Well Visit is an annual / semi-annual inspection to make sure, that the chosen solutions have been successful. So you can keep your business running worry-free – and longer than planned!

*All visits include scheduling and inspection planning. Please contact your local AUMUND office for more information.

Annual Inspection: See what you got.

Detailed equipment inspection:

- ✓ Condition monitoring
- ✓ Alignment check (Rail, chain, sprocket, etc.)
- ✓ Visual inspections
- ✓ Wear measurements (Chain, sprockets/rims, rollers, etc.)
- ✓ Shore hardness (Belts)
- ✓ Function and running tests

Inspection report and wear estimates:

- ✓ Reliability analysis
- ✓ Estimated lifetime
- ✓ Failure and data documentation:
 - Wear measures
 - Back-up photos
 - Maintenance and repair proposals
 - Detailed report

Maintenance and repair planning:

- ✓ Lubrication intervals
- ✓ Inspection schedule:
- ✓ What to inspect when
- ✓ Repair estimates:
 - Immediate
 - Within 6 months
 - Within one year
- ✓ Spare and wear part proposals
- ✓ Data log with equipment history and database

Failure and wear analysis based on:

- ✓ Function tests
- ✓ Visual checks
- ✓ Wear measures

Advise and hands-on support for incidents requiring immediate action:

- ✓ Instant repairs / adjustments
- ✓ Alignments
- ✓ Corrections

Diagnostic Visit: Find out the root cause of issues & eliminate potential damages.

Review:

- ✓ Review complete maintenance and parts history as thoroughly as possible
- ✓ Look for changes leading up to issues (Adjustments, repairs, changes in material, capacity or etc.).

Root Cause & Solutions:

- ✓ Find the Root Cause. It takes detective work to find the root of the problem.
- ✓ Fix the Root Cause, if time allows, or provide the customer with an action plan to make fixes.
- ✓ Finalize solutions

Report & Follow-up:

- ✓ Detailed Report
- ✓ Follow-up with well visit in 30/60/90 days when available to check corrections were successful.

Well Visit: Find out whether your chosen solutions have been successful.

Equipment Examination:

- ✓ Visual checks
- ✓ Function and running tests
- ✓ Alignments
- ✓ Checking wear marks
- ✓ Shore hardness (Belts) If the elevator can be shut down for check

Inspection report:

- ✓ Identification of critical functions
- ✓ Identification of critical parts
- ✓ Back up photos
- ✓ Maintenance and repair proposals
 - Immediate
 - Within a certain period of time
- ✓ Summary report

Get the best out of your machines and be safe!

Shield your people!

- ✓ Professional service from experienced
- ✓ inspectors – on-site and remote
- ✓ Continuous knowledge-building of your maintenance team and experience sharing through our inspectors
- ✓ Hands-on support whenever and wherever you need it (supplemental resources in case of lack of personnel)
- ✓ Improved safety through regularly inspected machines and learnings how to deal with risks

Shield your business!

- ✓ Optimised OpEx / CapEx
- ✓ Optimised inventory costs
- ✓ Low outage costs
- ✓ Reduced TCO (Total Costs of Ownership)
- ✓ Reliable supply readiness and improved delivery performance



Shield your machine!

- ✓ Consultancy of how to run the machine efficiently and effectively (extend part lifetime, lower energy consumption, avoid wear and tear)
- ✓ Detect weak points early and get suitable solutions to problems
- ✓ Identify and eliminate the exact cause of issues and potential bottlenecks
- ✓ Proactive anticipation of maintenance requirements and planning of spare part needs
- ✓ Less failure costs
- ✓ Improved machine reliability and OEE (Overall Equipment Efficiency)
- ✓ High quality in maintenance
- ✓ Wearing reduction

Shield your plant!

- ✓ Timely planning of repairs and spare parts
- ✓ Maximised production rate due to reduced stoppages
- ✓ Reduced unnecessary stoppages
- ✓ Increased uptime, minimized downtime
- ✓ Energy savings

Instant overview guaranteed – PREMAS® Inspection is getting digital

Of course, the digital age has also arrived here. Manually completed inspection reports are a matter of the past. Today, the new PREMAs® Inspect app is increasingly used by the inspector: Depending on the machine type, the check is carried out step by step and the recommendation for spare parts and other measures is sent to the client online.



- ✓ Clear, digital inspection reports
- ✓ Forward it easily to the right places
- ✓ Efficient inspections
- ✓ More time for the important things, namely your personal support

PREMAS® Inspection – at your side worldwide



2,069

inspected machines
worldwide in 2021

54

countries in 2021

65

qualified
AUMUND inspectors in 2021

PREMAS[®] 4.0

Predictive Maintenance Solution

Smart conveying –
Prevent downtime with PREMAS[®] 4.0
Predictive Maintenance Solution






**Break the Gordian knot
between operation and
maintenance!**

“Many crucial observations cannot be made at a running machine, so any maintenance work forces you to stop the machinery, which creates a Gordian knot between operation and maintenance.”

See what you can't see, detect what you can't measure

An iceberg diagram where the tip is above the water line and the much larger base is submerged. The tip is dark blue, and the submerged part is a lighter blue. Two callout lines originate from the tip, and two from the submerged part, pointing to text boxes.

Central control room operator, field inspector
and maintenance team take care

IoT, smart sensors and intelligent
algorithm data observation take care

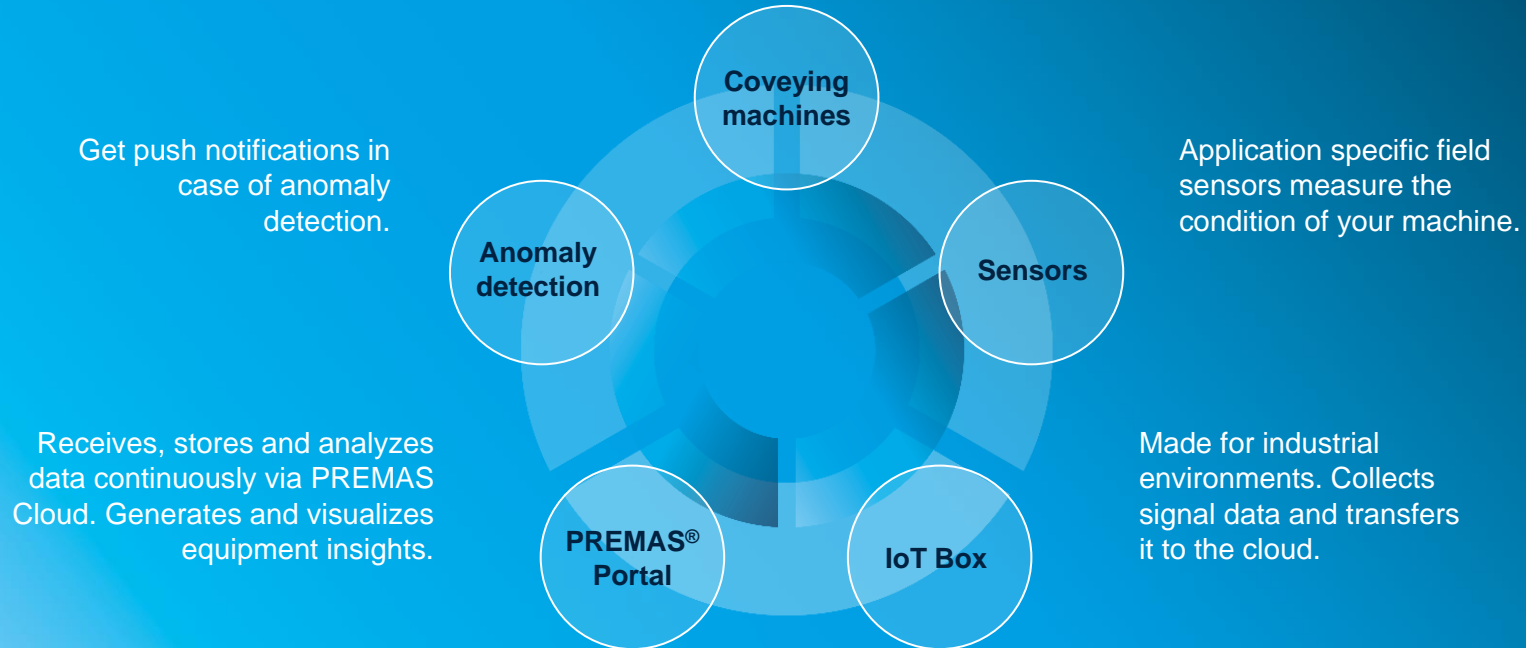
This can be avoided!

Go to maximum capacity with
additional safety & knowledge
about the condition of
your machines.

PREMAS[®] 4.0
Predictive Maintenance Solution

Made visible at the touch of a button – anytime and anywhere by **PREMAS® 4.0**

Available for AUMUND and non-AUMUND conveying machines



Specially made for AUMUND and non-AUMUND conveying machines: PREMAS® 4.0

PREMAS® 4.0 is worldwide available for Bucket Elevators, Pan Conveyors, CENTREX®, SAMSON Eco Hopper & SCHADE Reclaimers of all types of brands.



Bucket Elevators



Pan Conveyors



CENTREX®

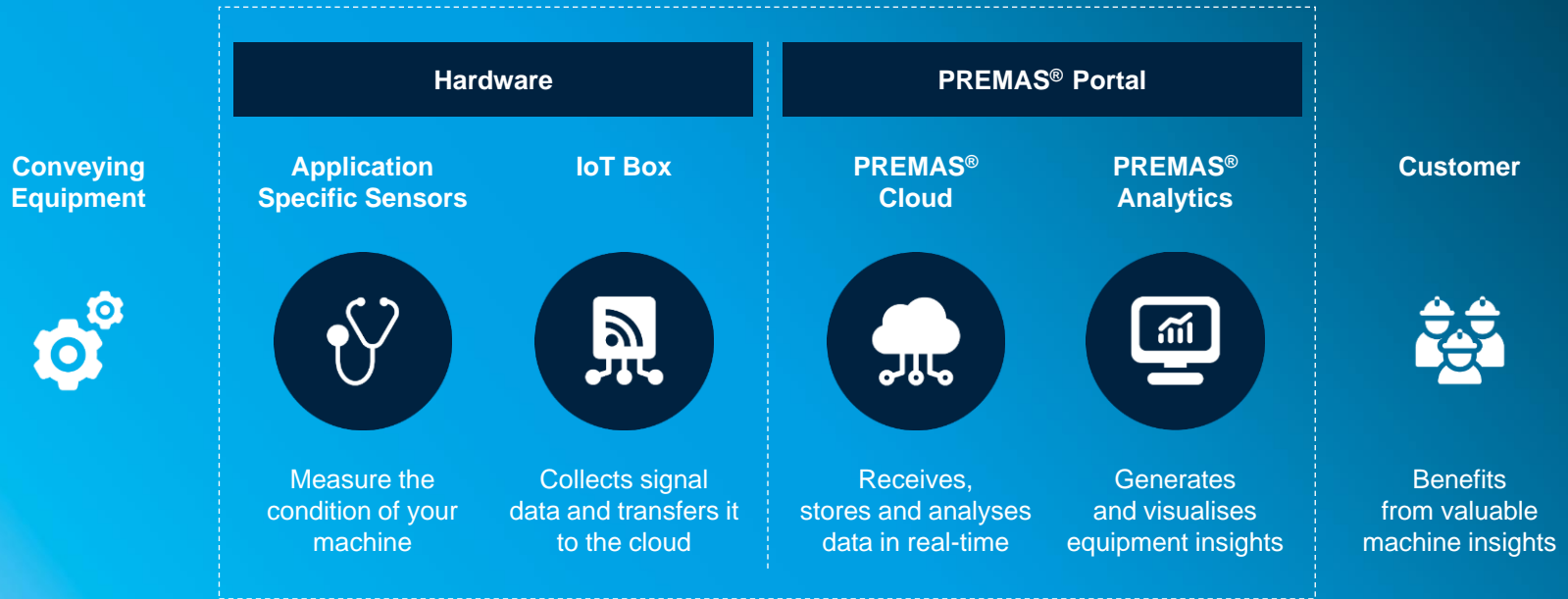


SAMSON Eco Hopper



SCHADE Reclaimers

How our predictive maintenance solution reveals machine insights to your fingertips



From machine operation to valuable insights with PREMAS® 4.0

PREMAS® 4.0 Hardware – robust, IT/OT independent, and easy to install



✓ IoT Box

✓ Antenna Kit

✓ Temperature Kit

✓ Elongation Kit

✓ Further specific Kits depending on your conveying machine

See where to act next, 24/7 on any device, anytime with PREMAS® Portal

Interface to central control room possible on request



Traffic light principle: recognise immediately where you need to act next

Machine Overview

All your machines on one dashboard.

Machine Dashboard

Detailed overview of each machine and its KPIs.

Machine Performance

Machine performance KPIs and detailed trend curves.

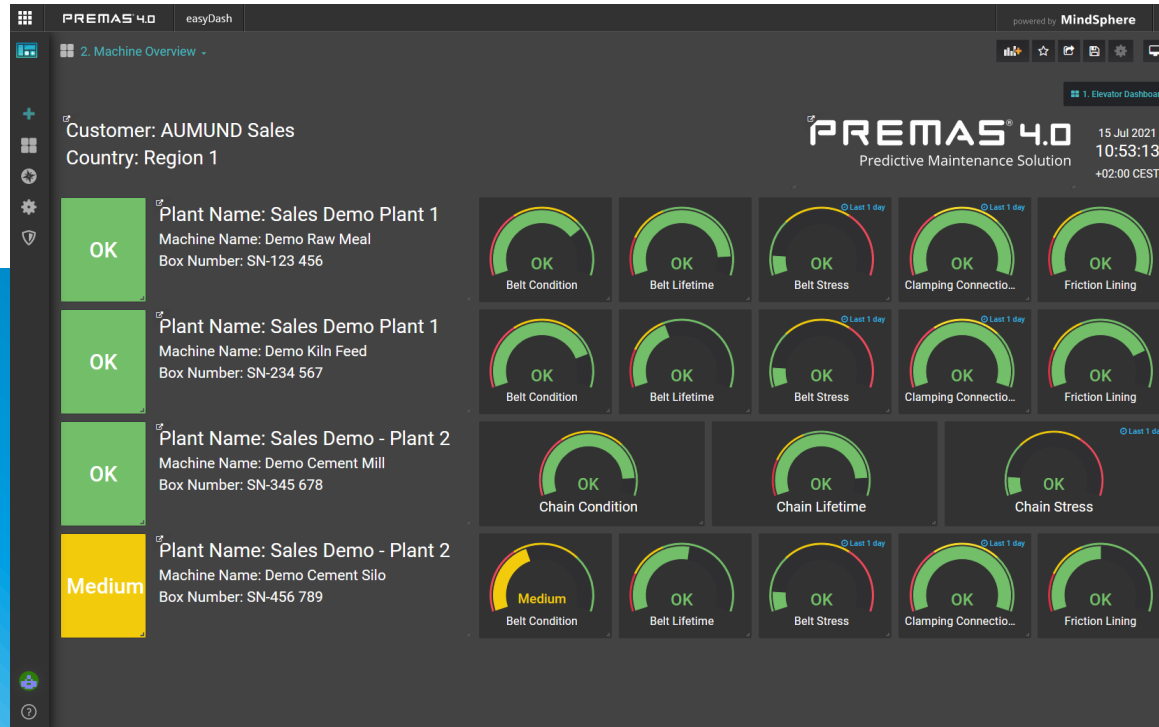
Anomaly Detection

Push notifications in case of anomaly detection.

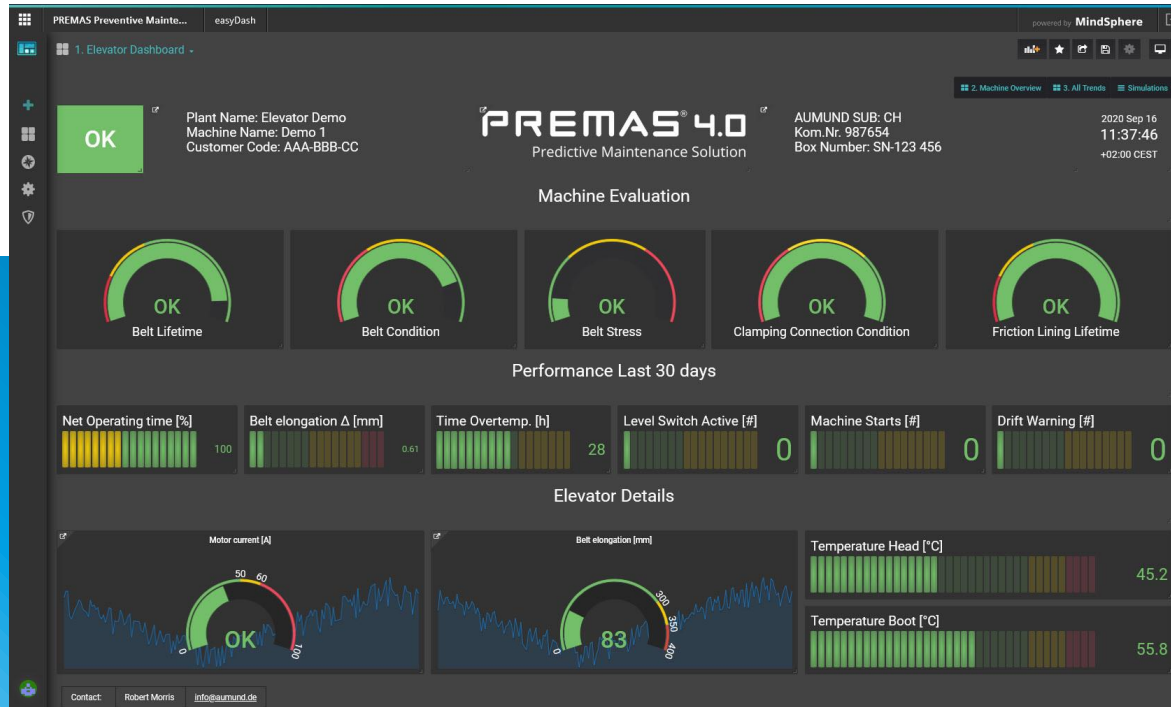
Predictive Analytics

Lifetime prediction of key machine components.

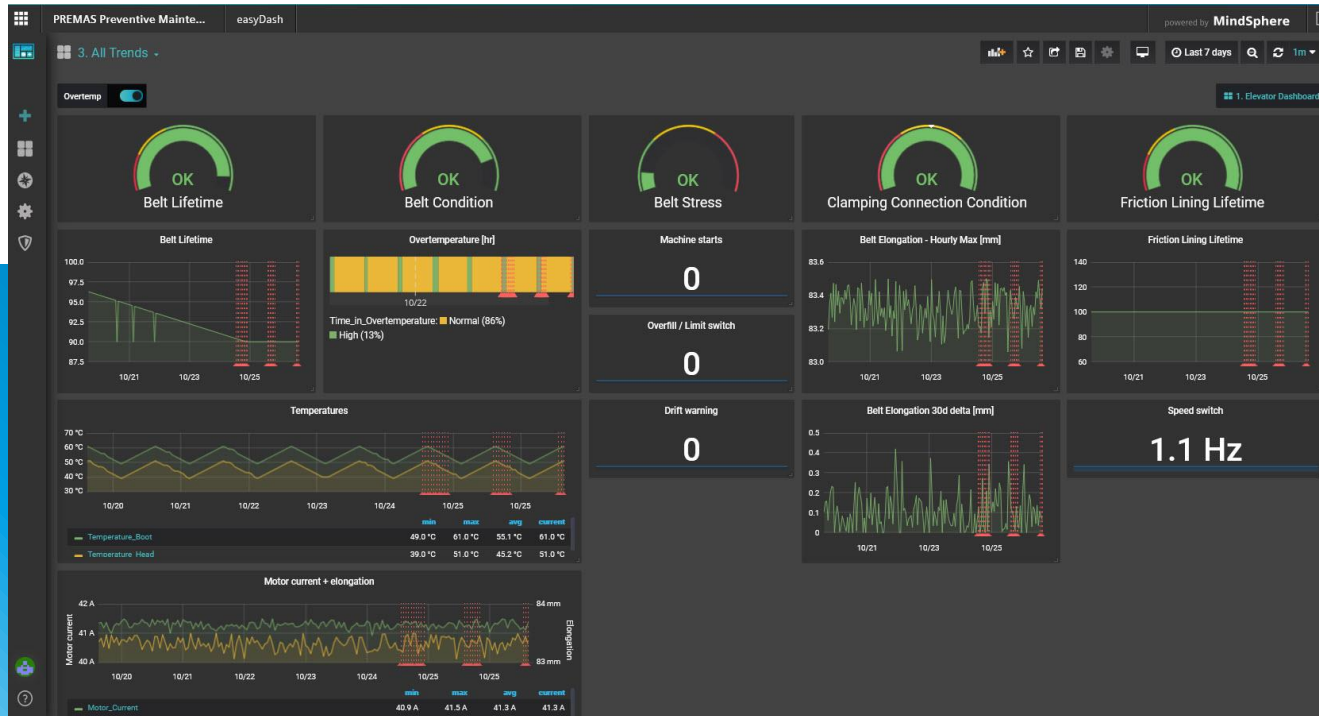
PREMAS® Portal Machine Overview – all machines with PREMAS® 4.0 at a glance



PREMAS® Portal Maschine Dashboard – detailed overview of each machine and its KPIs



PREMAS® Portal Maschine Performance – KPIs and detailed trend curves



From data to valuable insights – predictive maintenance for Belt Bucket Elevators

+ Machine Data ¹


+ Purpose-design algorithms

+ Insights from the crowd ²

+ Design knowledge ³

+ (Machine Learning) ⁴



—  Belt Lifetime, Condition, Stress

—  Clamping Connection Condition

—  Friction Lining Lifetime

1. From existing and new sensors
2. Combination of all machines of same type
3. Of many years and thousands of machines
4. Future development in the pipeline

Early detection of wear and aging of important machine components

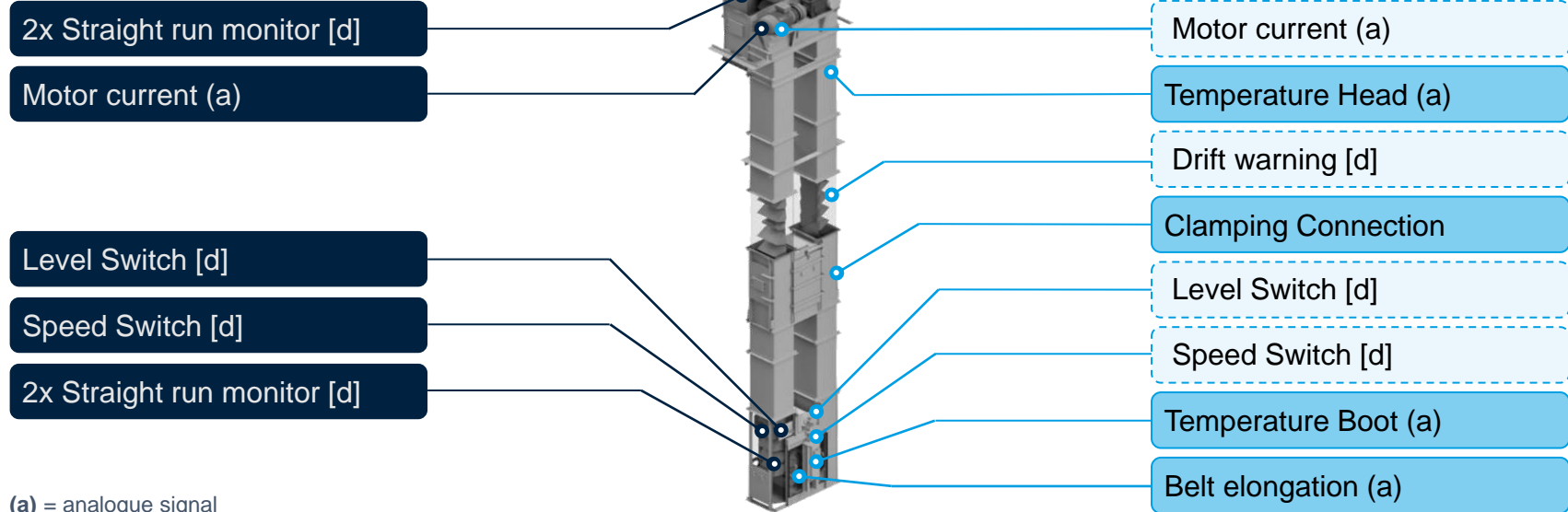
Data acquisition and analysis to provide reliable online condition monitoring

Fast deployment and plug-and-play approach

Sensor overview Belt Bucket Elevators

Connected to plant control system

Connected to PREMAS® 4.0



(a) = analogue signal
[d] = digital signal

Existing sensor New sensor Signal transfer of existing sensor

Note: sensors may be added as required to increase the condition monitoring.

All-in-one: The plug & play hardware package for Belt Bucket Elevators



- ✓ Easy to install
- ✓ Independent from local IT / OT Infrastructure
- ✓ Proven sensor technology
- ✓ Crucial measurement of critical machine components

- 1 Temperature Kit
- 2 Elongation Kit
- 3 IoT Box
- 4 Antenna Kit

From data to valuable insights – predictive maintenance for Chain Bucket Elevators

+ Machine Data ¹

+ Purpose-design algorithms

+ Insights from the crowd ²

+ Design knowledge ³

+ (Machine Learning) ⁴



— Chain Lifetime, Condition, Stress

— Chain length supervision

— Chain breakage

1. From existing and new sensors
2. Combination of all machines of same type
3. Of many years and thousands of machines
4. Future development in the pipeline

Early detection of wear and aging of important machine components

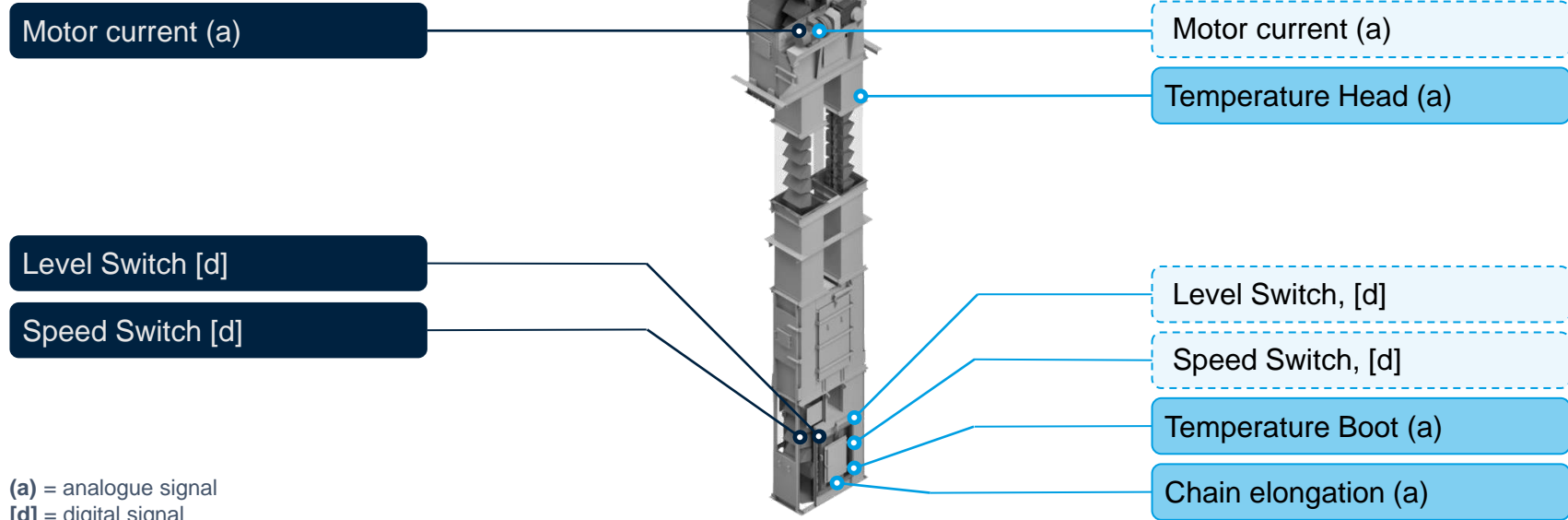
Data acquisition and analysis to provide reliable online condition monitoring

Fast deployment and plug-and-play approach

Sensor overview Chain Bucket Elevators

Connected to plant control system

Connected to PREMAS® 4.0



(a) = analogue signal
[d] = digital signal

Existing sensor New sensor Signal transfer of existing sensor

Note: sensors may be added as required to increase the condition monitoring.

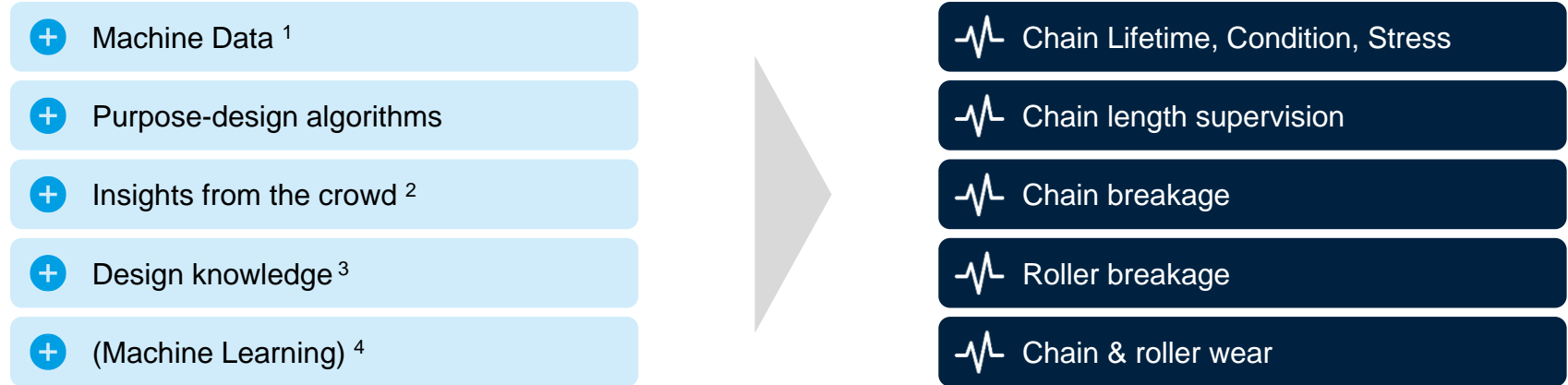
All-in-one: The plug & play hardware package for Chain Bucket Elevators



- ✓ Easy to install
- ✓ Independent from local IT / OT Infrastructure
- ✓ Proven sensor technology
- ✓ Crucial measurement of critical machine components

- 1 Temperature Kit
- 2 Elongation Kit
- 3 IoT Box
- 4 Antenna Kit

From data to valuable insights – predictive maintenance for Pan Conveyors



1. From existing and new sensors
2. Combination of all machines of same type
3. Of many years and thousands of machines
4. Future development in the pipeline

Early detection of wear and aging of important machine components

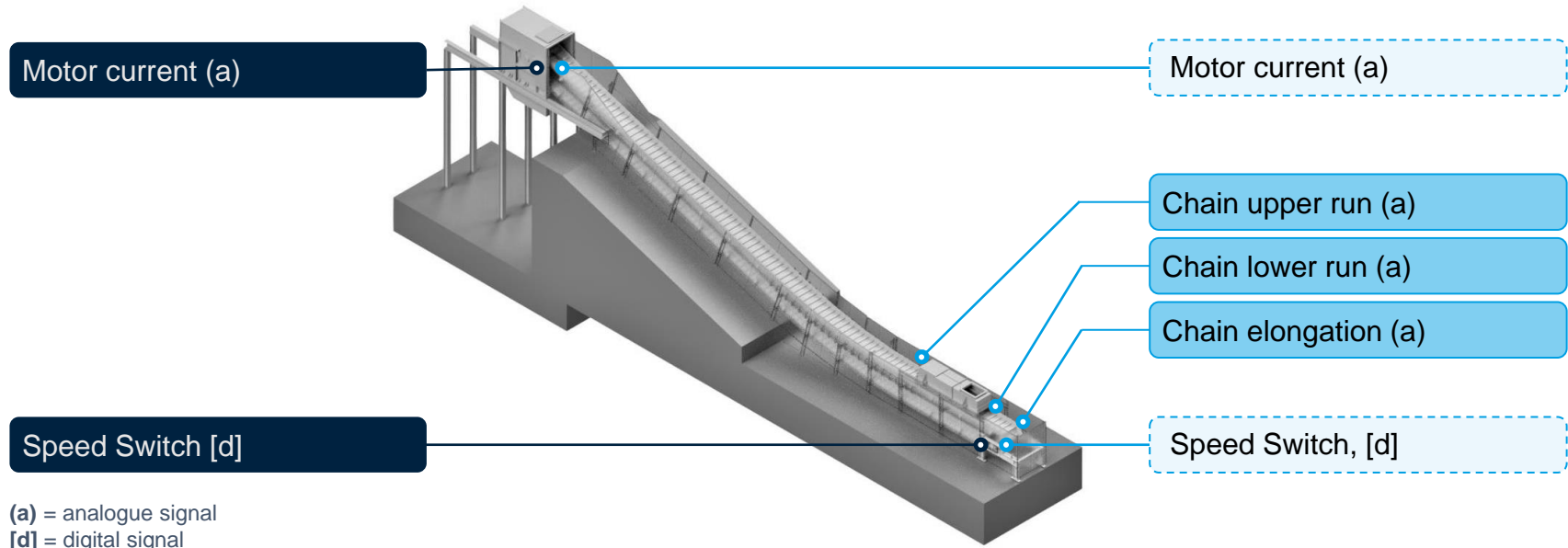
Data acquisition and analysis to provide reliable online condition monitoring

Fast deployment and plug-and-play approach

Sensor overview Pan Conveyors

Connected to plant
control system

Connected to
PREMAS® 4.0



Existing sensor

New sensor

Signal transfer of existing sensor

Note: sensors may be added as required to increase the condition monitoring.

Say goodbye to unexpected downtimes, unforeseen failures, and high Opex/Capex with PREMAS® 4.0!

Plan



Optimise your maintenance & inspections planning based on **machine insights and lifetime prediction**. Plan your spare parts on time and reduce useless storage at site.

Know



Know the truth: Learn more about machines and components behavior to make better decisions based on **insights & data history**.

Detect



Detect machine weaknesses without physical inspection 24/7 online with **PREMAS® Portal**. Share your data with your OEM & get improved remote support.

Recognise



Recognize maintenance needs early with **anomaly push-notifications**.

Prevent



Act on time to **prevent critical failures** and its massive consequences. Secure a smooth, reliable operation anytime.

Improve



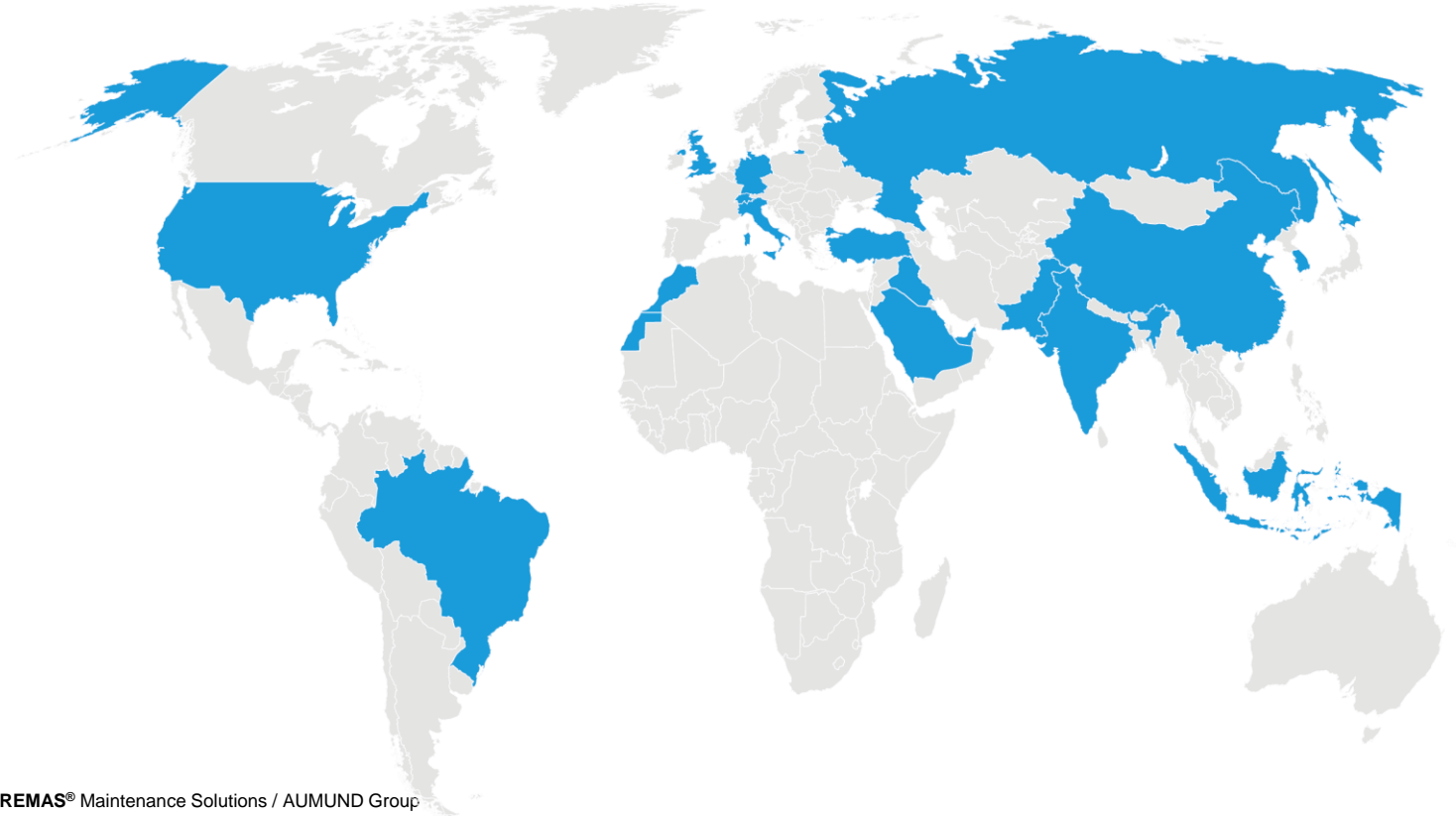
Save OPEX/CAPEX, optimise your resources, increase machine reliability at a high level of production and avoid unnecessary stoppages.



“We are convinced that predictive maintenance has a future. With PREMAS® 4.0, we can plan spare parts and maintenance better, which has a positive effect on resources and costs. It enables us to immediately recognise where action is needed, regardless of time and place.”

Customer Statement of Ramona Keller
Maintenance Manager
Jura-Cement-Fabriken AG

PREMAS® 4.0 growing number of installations worldwide



PREMAS® 360°

Achieve operational excellence
with PREMAs® 360° Maintenance
Packages





**Get fast, reliable,
and highly professional
services at one price!**

“Budgets are as limited
as expected downtimes, and
resources to secure
maximum production and highly
reliable machines.”

Quality services in unique packages for AUMUND and non-AUMUND conveying machines

BASIC Maintenance Package*



- ✓ Inventory Consulting
- ✓ OEM Spare Parts
- ✓ PREMAS® Inspections included
- ✓ Training / AUMUND Days
- ✓ Optional: Predictive Maintenance Solution, PREMAS® 4.0

ADVANCED Maintenance Package*



- ✓ Inventory Consulting
- ✓ OEM Spare Parts
- ✓ Extended warranty on full machine + 1 year (only for AUMUND machines)
- ✓ PREMAS® Inspections included
- ✓ Training / AUMUND Days
- ✓ Predictive Maintenance at your hands with PREMAS® 4.0

PREMIUM Maintenance Package*



- ✓ Inventory Consulting
- ✓ OEM spare parts pooling
- ✓ Shared maintenance planning assistance
- ✓ Extended warranty on full machine + 2 years (only for AUMUND machines)
- ✓ PREMAS® Inspections included
- ✓ Training / AUMUND Days
- ✓ Predictive Maintenance at your hands with PREMAS® 4.0
- ✓ Remote Support, 24/7 Support

*Please contact your local AUMUND office

From A to Z – define your individual all-around maintenance package based on your needs.



Extended warranty
on full AUMUND machine



Inventory Consulting



OEM Spare Parts Pooling



PREMAS® Inspection



PREMAS® 4.0
Predictive Maintenance



Remote Support, 24/7 Support



Shared Maintenance Planning
Assistance



Training

Secure high machine reliability, achieve operational excellence – with PREMAS® 360° Packages

- ✓ Plan: **Keep your budget** - benefit from fast, reliable, and highly professional **products and services at one price**
- ✓ Recognise: **Avoid unforeseen failures** with physical inspections and predictive maintenance.
- ✓ Detect: Get **quick and easy emergency support** when things take a turn for the worse.
- ✓ Know: Benefit from **24/7 support**, whenever and wherever you need it. Rely on **physical and remote expert support**.
- ✓ Prevent: **Optimize inventory costs** with professional inventory planning and **just-in-time-delivery**.
- ✓ Improve: **Secure high machine reliability** and save time, money, and resources with **AUMUND expert support**.

PREMAS® – Preventive and Predictive Maintenance Solutions for uninterrupted conveying



PREMAS® Inspection

See more, plan better and shield your business



PREMAS® 4.0

Predictive Maintenance Solution



PREMAS® 360°

Quality services in unique maintenance packages

Contact us.
We're here for you.

AUMUND Fördertechnik GmbH
Saalhofer Str. 17
47495 Rheinberg, Germany
PREMAS@aumund.de / +49 2843 72-777

