PREMAS® 4.0
Predictive Maintenance Solution

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

AUMUND

See what you can´t see, detect what you can´t measure

Running machinery and production are top priorities in any plant. Regular maintenance activities and routines are therefore often a challenge: Machines cannot be maintained as required, inspections are postponed and the condition of components, their wear, or even damage, are not detected.

PREMAS® 4.0 breaks the Gordian knot between operation and maintenance

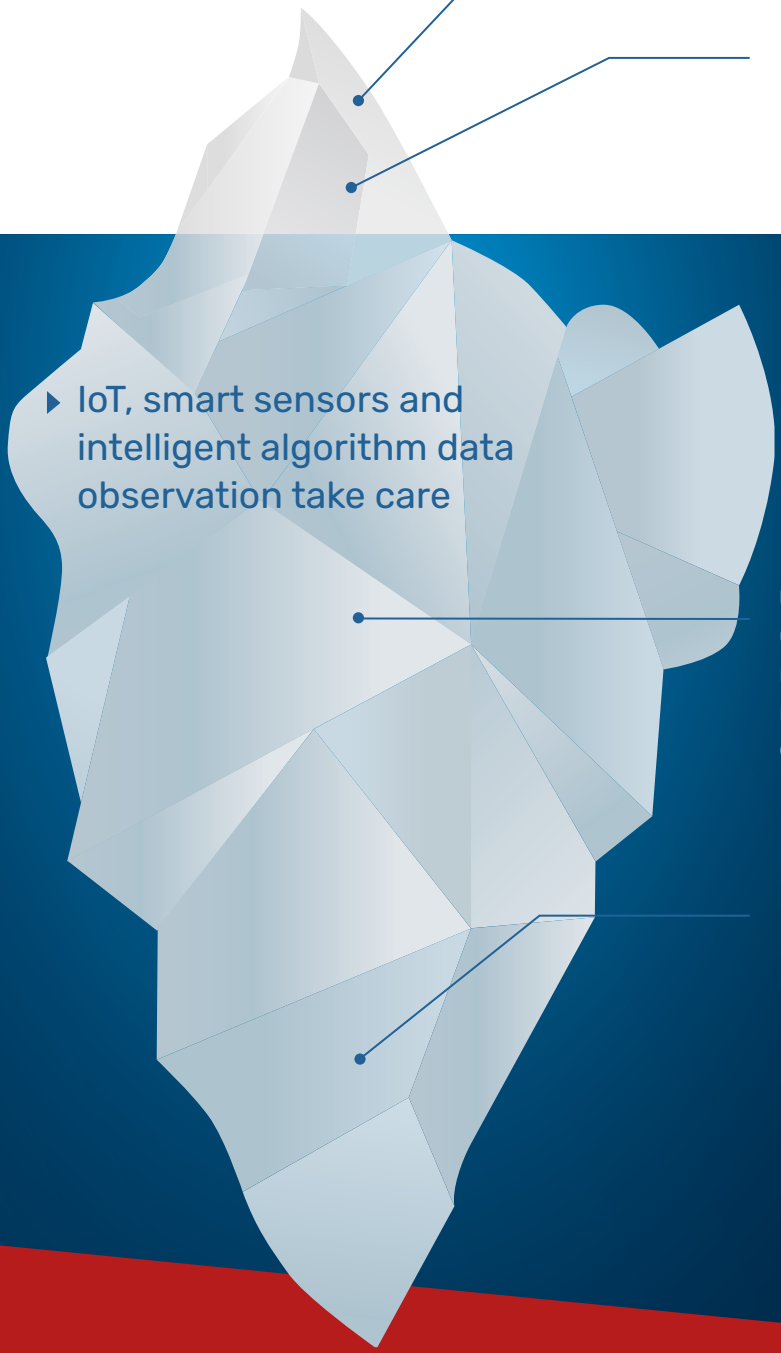
Mostly the maintenance is left to do walk-by inspections and to rely on continuous measurements and sensors, indicated in the central control room. However, many crucial observations cannot be made at a running machine, thus they remain under the water´s surface. This is a risk for the availability of the machine and the production rate of the plant. Bucket elevators, pan conveyors, or other conveying machines are often named auxiliary equipment but are as crucial in the production process as the main machines (e.g. kiln, cooler, mill). They are often a bottleneck in the production line, as they are the only transport line in front or behind the main equipment.

Doing no maintenance nor inspection creates unnecessary risks and is a pain point in the operation. With PREMAS® 4.0 you can break this Gordian knot between operation and maintenance. It helps you see, what you can´t see and detect, what you can´t measure.

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

Walk by inspection
Action on an observation as a result of a walk by inspection (e.g. sound of buckets touching the housing)

Alarm of a sensor in the central control room
The central control room operator calls for action triggered by an alarm of a sensor (e.g. drift switch)



- IoT, smart sensors and intelligent algorithm data observation take care

Unnoticed defects during operation
Certain measures or visual inspections require a machine stop and operation in maintenance mode (e.g. shore hardness of a bucket elevator´s belt)

Hidden failures, dynamic failures
Failures can develop silently within a component and can not be detected without disassembly (e.g. clamping connection)

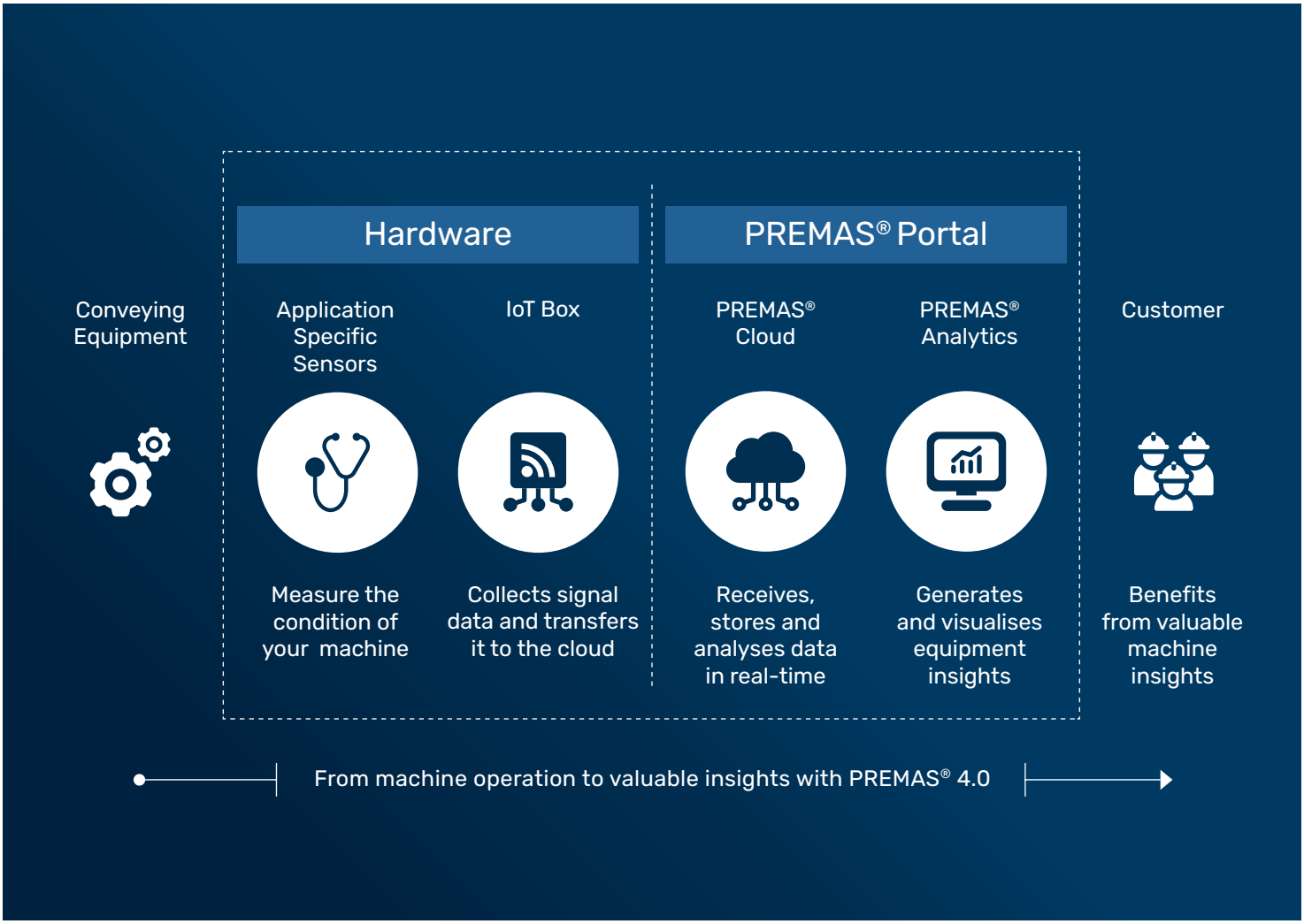
Say goodbye to unexpected downtimes, unforeseen failures and high OpEx/CapEx

The choice of the maintenance strategy has a crucial impact on whether you achieve high machine reliability and maximum production – or not. Reactive maintenance leads to unplanned stops, high costs and reduced production. This can be avoided – with PREMAS® 4.0. Developed for AUMUND and non-AUMUND conveying machines, it supports you in planning regular maintenance activities, detecting machine weaknesses early and acting proactively before your operation is affected.

More insights for increased machine reliability

PREMAS® 4.0 feels the pulse of your machine, keeps an eye on it and informs you when your action is required. It keeps you informed about the condition of the machine in real-time, sends push notifications in case of anomaly detection, and provides a prediction of the estimated service life of critical machine components.

Thus, it enables you to plan your maintenance, act in time, and prevent possible problems before your operation is affected. However, it does not replace your experts. PREMAS® 4.0 is your best buddy enabling you to set priorities in maintenance, decide what to do next and act!



Made visible at the touch of a button – anytime and anywhere

Our Predictive Maintenance Solution is specifically designed for conveyors in the heavy industry. The latest sensor technologies are combined with data collection and analysis to provide online information about the condition of your conveyors – wherever you are, whenever you want to make the invisible visible.

Each machine receives a hardware package. Existing field sensors and some existing signals from the plant control system are connected to the IoT Box. The collected data on, for example, the motor current, level switch, speed switch or drift warning, reaches the PREMAS® Cloud via mobile connectivity. There, the data is analysed based on the latest predictive analytics technologies. The PREMAS® Portal thus visualises and provides all relevant data for complete online condition monitoring, which is securely accessible to authorised users 24/7 and via any mobile or desktop device.

PREMAS® 4.0

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

The PREMAS® 4.0 hardware fulfils industrial requirements and is currently CE, UL and EAC certified. Specified on the type of conveying machine, you get your all-in-one kit such as:

- IoT Box
- Antenna Kit
- Temperature Kit
- Elongation Kit
- further specific kits depending on your conveying machines

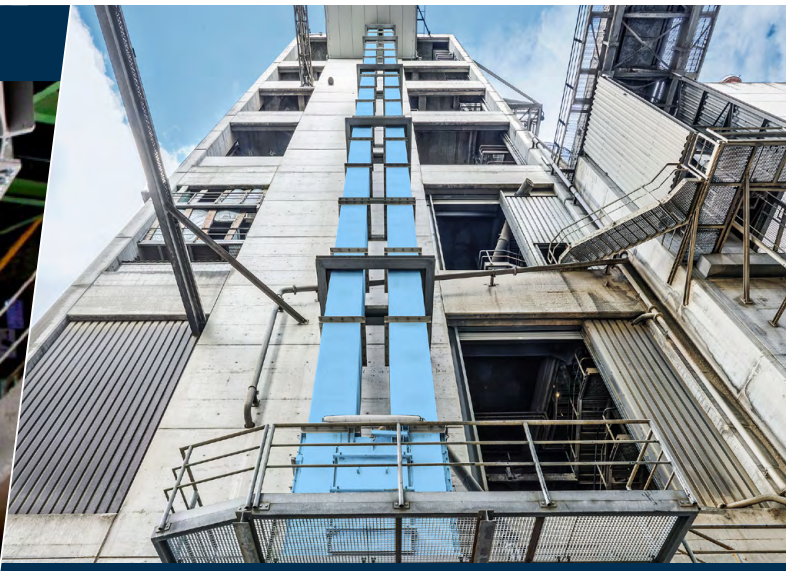
PREMAS® Portal – always one step ahead, 24 / 7 and on any device

PREMAS® Portal is your secure gateway to all your machine data: It visualises the status of your machine in real-time and presents the results and calculations based on the collected data. It includes:

- Machine Overview: all machines with PREMAS® 4.0 at a glance
- Machine Dashboard: detailed overview of each machine and its KPIs
- Machine Performance: KPIs and detailed trend curves
- Anomaly detection: Push notifications in case of anomaly detection via E-Mail or SMS
- Predictive Analytics: Lifetime prediction of key machine components
- Traffic light principle: recognise immediately where you need to act next Interface to central control room: possible on request

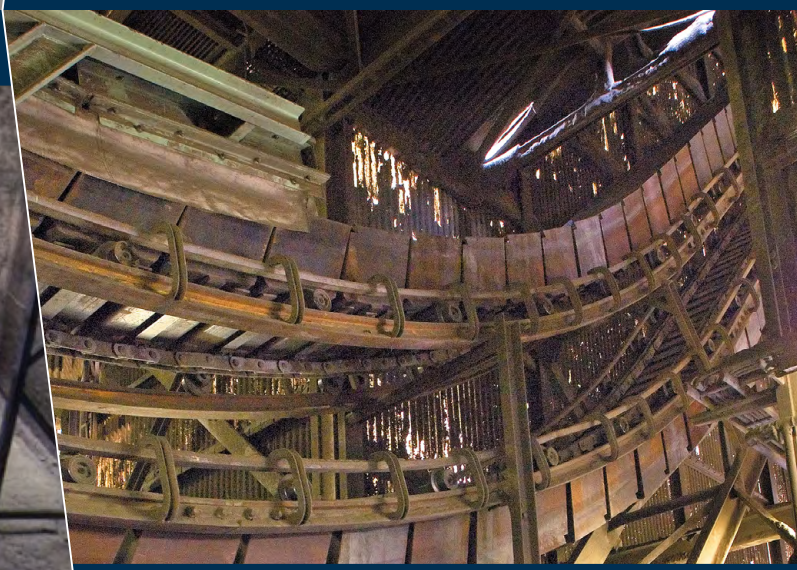
Specially made for AUMUND and non-AUMUND Conveying Machines: **PREMAS® 4.0**

CENTREX®



Bucket Elevators

Pan Conveyors

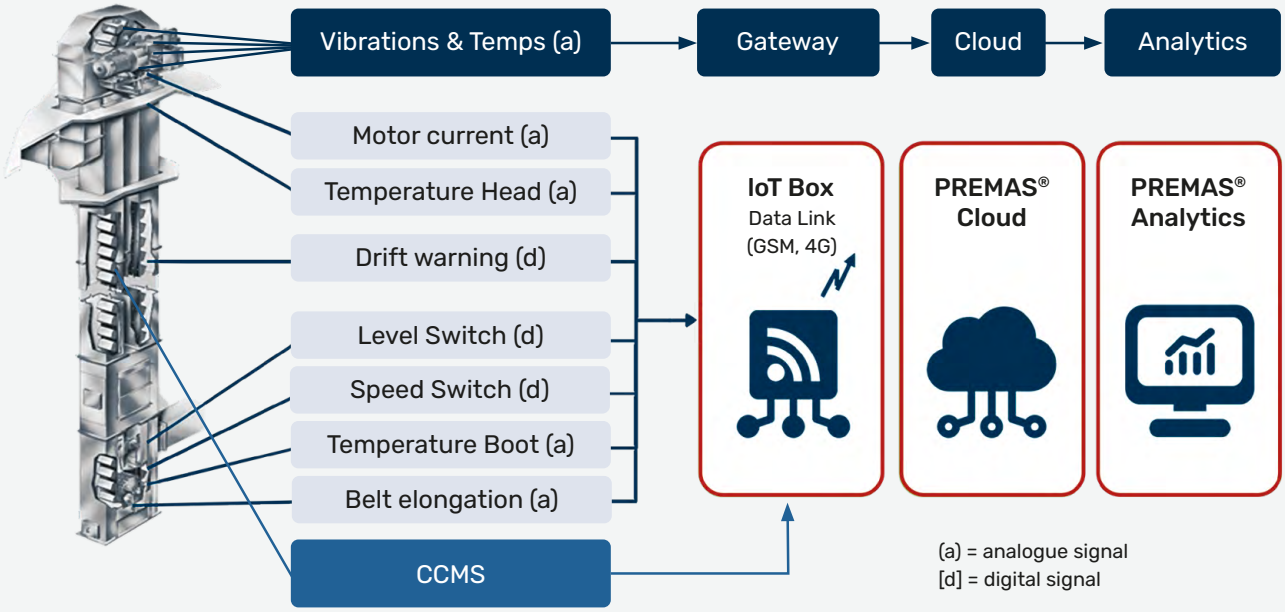


Bucket Apron Conveyor

SAMSON Eco Hopper

SCHADE Reclaimers

PREMAS® Sensors overview 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 (CCMS)
- Friction Lining Lifetime
- Power Train Condition

1. From existing and new sensors
2. Combination of all machines of the 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

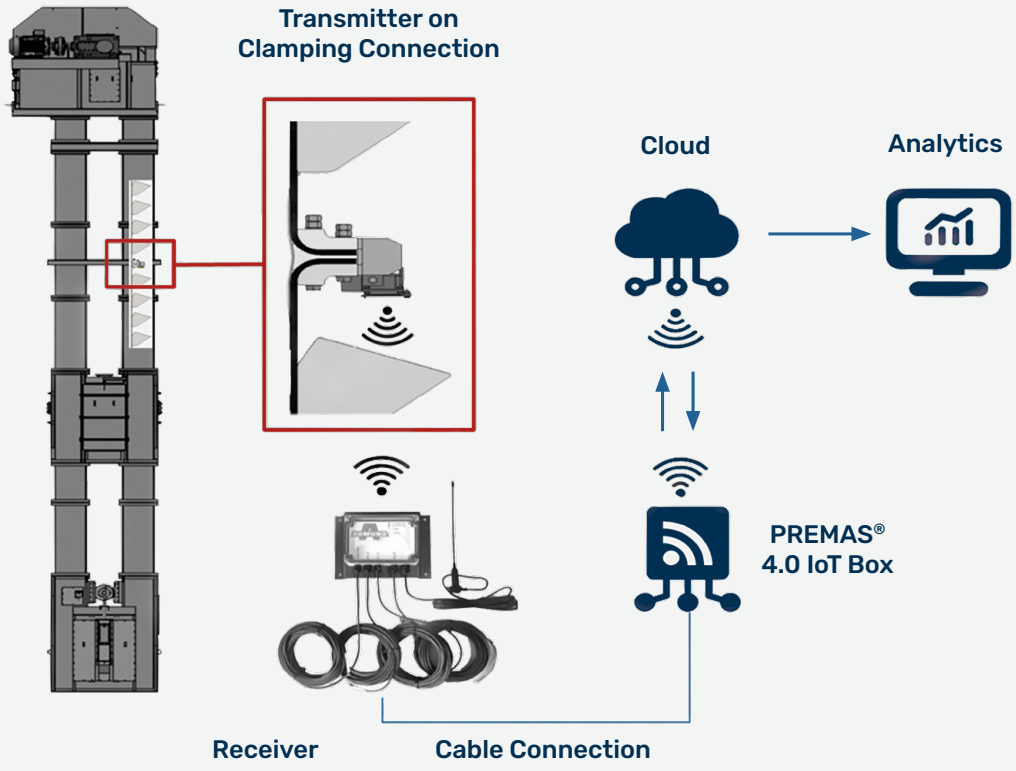
Data acquisition and analysis to provide reliable online condition monitoring

Fast deployment and plug-and-play approach

CCMS (Clamping Connection Monitoring System)

Empower your maintenance with surveillance you were dreaming off!

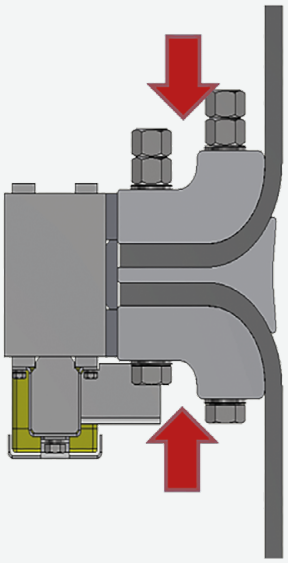
- **Avoid costly shutdowns** of your bucket elevator by online monitoring of blind spots
- **Increase production hours** without violating inspection schedules for the clamping connection
- **Reduce maintenance cost** by acting when indicated and not when scheduled
- **Use your resources in a targeted manner:** the system tells you when you must act.
- **24/7 knowledge about the condition** of your clamping connection based on constant monitoring and etection of possible weaknesses.



CCMS (Clamping Connection Monitoring System)

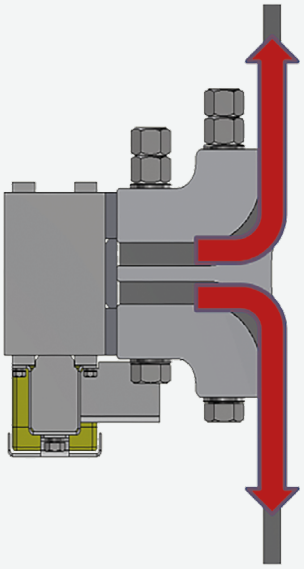
- Simple installation
  e.g. in combination with a new belt
- Online condition monitoring of belt clamping connection (belt bucket elevator)
- Measurement & analytics results to the user via PREMAS® Portal
- Detection of anomalies during operation & push notifications

Recognizes loose screws



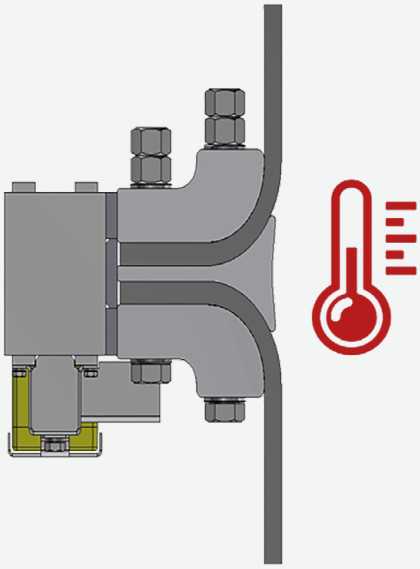
Pressure
inside the clamping connection

Notifies a source for possible belt damages



Belt Movement
within the clamping connection

Predicts belt lifetime



Temperature
inside the clamping connection

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
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INTERESTED?

Contact us and request a free demo-session on PREMAS® 4.0.

Visit our website and find out more information about PREMAS® 4.0:
aumund.com/en/premas-maintenance-solutions/premas-4-0/

WE CONVEY **QUALITY**