

# ROBERT BOSCH ENGINEERING AND BUSINESS SOLUTIONS

## NEXEED: CONNECTED INDUSTRY PLATFORM

# Bosch Connected Industry Nexeed Portfolio

# NEXEED

Portfolio overview

## Nexeed Connected Manufacturing

## Nexeed Connected Logistics

Nexeed Manufacturing Execution System	Nexeed Transparency Kit	Nexeed Automation	Nexeed Production Performance Manager	Nexeed Remote Shopfloor Access	Nexeed Data Analytics	Nexeed Device Portal	Nexeed Energy Platform	Nexeed Track & Trace	Nexeed Intralogistics Execution
Nexeed Maintenance Support System									

## Nexeed Open Integration

Harmonization solution of different software systems and applications for production and logistics.  
Integration of Bosch Connected Industry solutions, Bosch solutions and third-party solutions.

# Nexeed Connected Manufacturing

## For connecting the entire production

### **Nexeed Manufacturing Execution System**

Far more than an MES –  
modular and scalable as needed

### **Nexeed Maintenance Support System**

Shorter repair times and higher machine  
availability through intelligent maintenance

### **Nexeed Transparency Kit**

Fast machine upgrades, increased OEE  
and efficiency – with no downtime

### **Nexeed Automation**

Rethinking automation: efficiency  
for machine manufacturers and operators

### **Nexeed Production Performance Manager**

Software for the systematic and sustainable  
optimization of production

### **Nexeed Remote Shopfloor Access**

Remote maintenance in real time –  
reduced integration costs, maximum security

### **Nexeed Data Analytics**

Discovering unexpected potential for optimized  
quality, cost and delivery performance

### **Nexeed Device Portal**

Transparency and security for IIoT devices  
through centralized management

### **Nexeed Energy Platform**

Monitoring consumption and optimizing machines

# Nexeed Connected Logistics

## Software services based on sensor-based real-time data from the supply chain

### Nexeed Track and Trace

Seamless transparency throughout the entire supply chain

### Nexeed Intralogistics Execution

Optimizing and monitoring vehicle fleets, material stock and transport routes

# NEXEED OVERVIEW

# NEXEED



Data Analytics

Manufacturing Execution System

Production Performance Manager

Automation

Intralogistics Execution

Transparency Kit

Maintenance Support System





# Nexeed Production Performance Manager

Systematic & sustainable optimization of production

Nexeed Production Performance Manager captures and reconciles production and machine data from a wide variety of shop floor sources virtually in real time. The data is visualized and forwarded to associates as defined events.

The simple control configuration allows maintenance personnel to be proactive in their maintenance tasks with as little downtime as possible. Production quality can be optimized through the general monitoring and documentation of process data.



Full transparency across machine and process data



Increased efficiency through optimized digital processes



Lower costs thanks to systematic improvements



# Nexeed Maintenance Support System

## Efficient maintenance for production

The Maintenance Support System (MSS) enables operators and maintenance engineers to **increase the speed, effectiveness and sustainability** of corrective, preventive and autonomous maintenance.

The system helps employees to respond faster and to process maintenance orders more efficiently – without the need for specialized expertise.



Mobile access



Higher machine availability



Less repair time required



# Nexeed Manufacturing Execution System

The MES from Bosch

Real-time transparency is the basis for successful production **optimization, planning** and **control**.

The modular, scalable Nexeed Manufacturing Execution System (MES) delivers precise information on machine and product data.

The goal is to continuously optimize processes, to react quickly to changes, and to increase production efficiency.



Covers the entire value chain



Increased output and productivity



Higher production transparency



# Nexeed Automation

## Rethinking automation

The Nexeed Automation platform is based on the control-independent software system “**Control plus**”. Its **modular engineering approach** enables machine manufacturers to realize their automation projects easily and cost-effectively.

The Integrated engineering gives machine operators added value in the form of **information services and apps**. They support operators in handling diagnosis and error detection throughout the machine’s lifecycle, while ensuring consistently high machine availability.



**Engineering:**  
Fast and easy modelling  
of machines



**Information service and apps:**  
Increased machine performance  
and extended lifetime



# Nexeed Remote Shopfloor Access

Highly secure, vendor-independent platform for increased security combined with minimized support and administration efforts

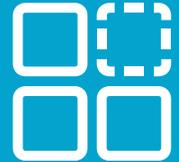


## Security by Design:

personalized authentication and multi-level release management

## Reduced integration costs:

one holistic, supplier-independent remote maintenance solution for all connected devices and machines

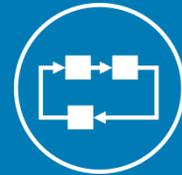


## Maintenance service in real-time:

higher efficiency and quality without on-site support

# Nexeed Transparency Kit

The Nexeed Transparency Kit helps manufacturing staff to understand production lines better, shorten reaction times, fix issues faster and increase productivity.



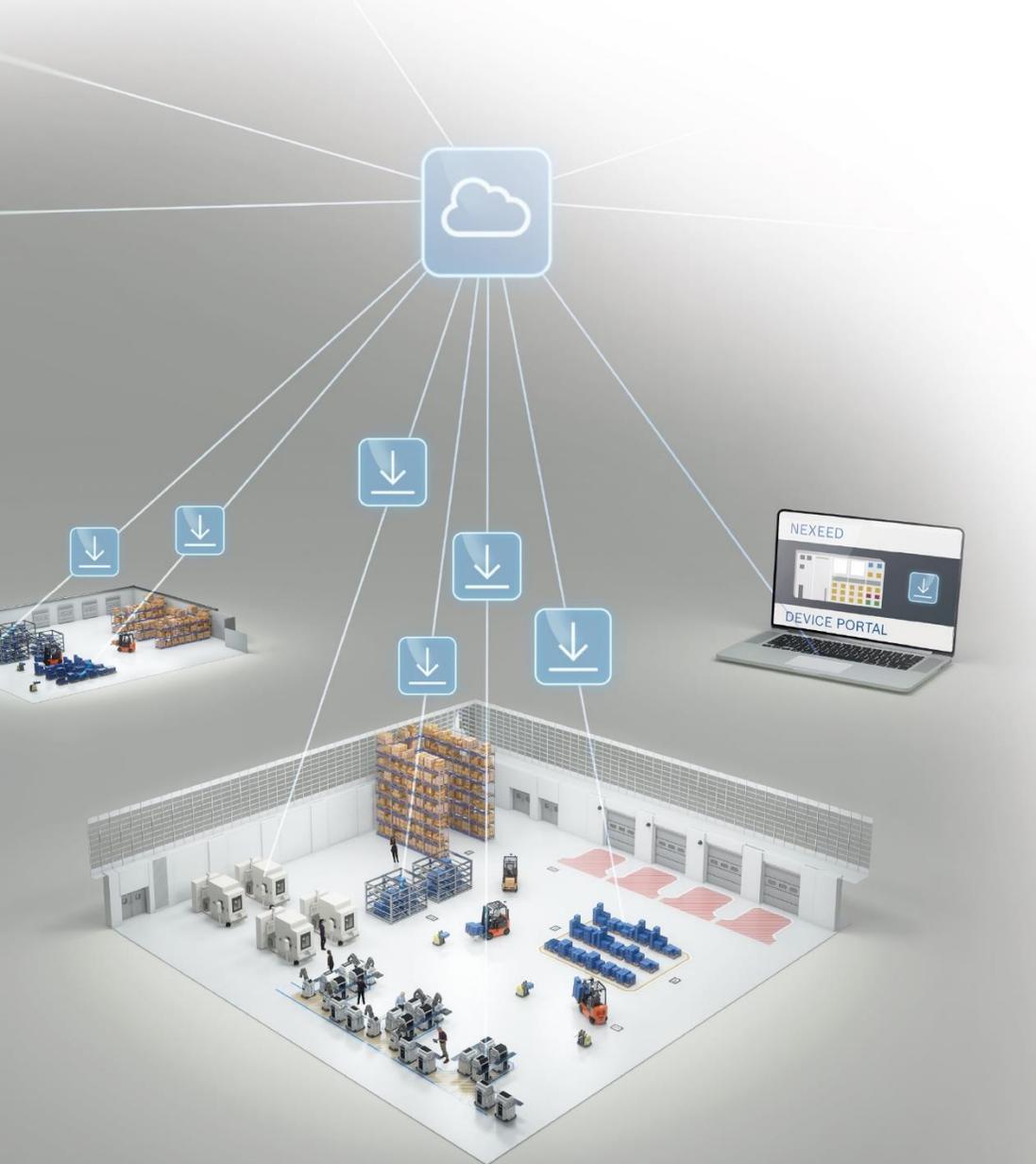
Our **Heatmap** visualizes part flow, bottlenecks and deviations at line level

Our **Condition Monitoring** identifies issues faster by monitoring machine-relevant parameters



## Benefits

- ▶ Out-of-the-box & stand-alone system
- ▶ Simple & non-intrusive
- ▶ Short installation time
- ▶ Low investment costs



# Nexeed Device Portal

All IIoT devices all over the world are **centrally managed, maintained and protected** from a distance



Remote access and transparent status overview of all IIoT devices

All IIoT devices always up-to-date



Full control of data, no access to production-related information



# Nexeed Data Analytics

From data integration to machine learning

Nexeed Data Analytics provides individualized services, from the first data analysis to comprehensive predictive analytics.

We offer a unique combination of extensive expertise in data analytics, software and manufacturing. This enables us to gather new knowledge from existing data, identifying and implementing actual improvements in quality, cost and delivery performance.



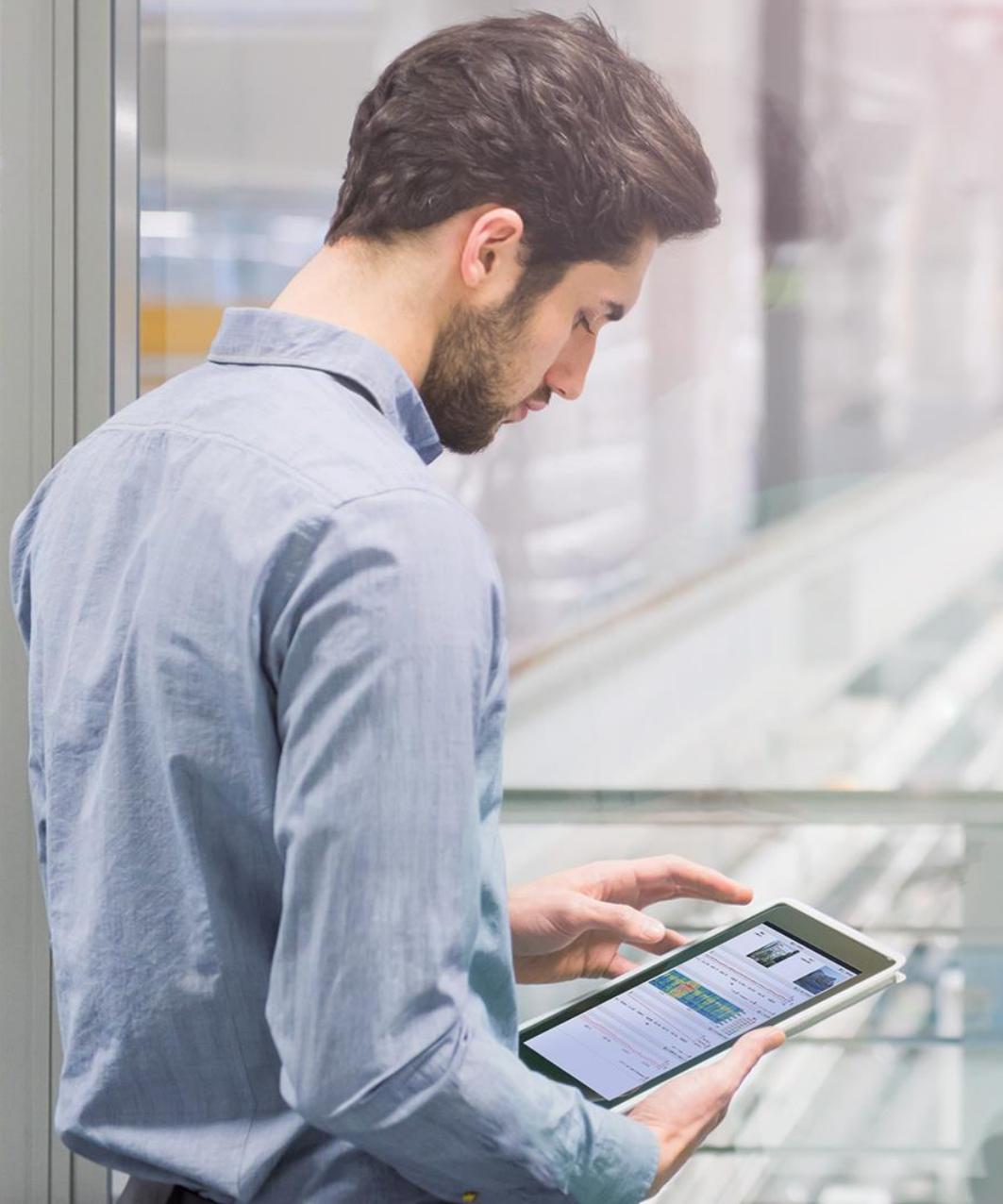
Extensive  
expertise: From  
production to data  
analysis



Future-oriented  
analyses: Much  
more than a  
standard solution



Everything from a single  
source: From basic  
knowledge to concrete  
implementation



# Nexeed Energy Platform

Monitoring consumption and optimizing machines.

The use of energy and resources in buildings and production facilities is a significant cost factor, which is continually growing with increasing automation.

The Nexeed Energy Platform captures the consumption (e.g. heat, power or compressed air) for the whole plant or at the individual machine level and enables the analysis of all data in clear and transparent management cockpits. This not only reduces costs but also forms a comprehensive basis for game-changing decisions in your business.



Automated  
reporting



Load  
management



Predictive  
analytics



# Nexeed Intralogistics Execution

Nexeed Intralogistics Execution provides transparency along the material supply chain in real-time – from storage to point of use in production. It also offers an application to optimize the material flow and the workload for logistical assets. The system delivers data on the material storage location, the status of vehicle fleets and transport paths. In a nutshell, Nexeed Intralogistics Execution supports logistics specialists in optimizing processes.



Process efficiency  
**+ 15 %**  
with Transport  
Management



Productivity  
increase  
**+ 7,5 %** with  
Fleet Analytics



Stock reduction  
**- 5 %**  
with Stock  
Management



# Nexeed Track and Trace

Transparency throughout the supply chain

Nexeed Track and Trace enables shipments and assets to record a “digital travel diary”: products and load carriers not only update the individual stops, but also regularly communicate their location and status to the cloud.

For instance, schedulers can view at any time where the packages are and whether they are expected to arrive on time. In addition, information about temperature, vibration and humidity can also be transmitted.



Transparent  
logistics supply  
chain



Connecting  
the real with the  
virtual world



Locating goods  
and assets in  
real-time

# Monitoring lubricants & filters of hydraulic valve production

25%

Maintenance costs reduction

+5% OEE

-20%

Complexity for manual testing

ROI <  
1,5 years

## Background

- ▶ Hydraulic valves are tested after production
- ▶ To apply the results, the oil quality needs to be improved and be compliant with the ISO cleanliness level

## Approach

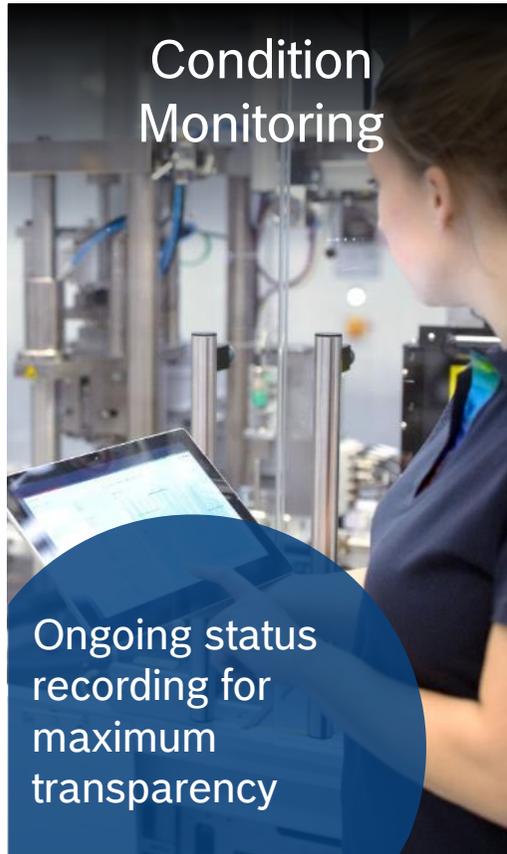
- ▶ Take the existing 30 test facility without an IT connection and retrofit it with about 20 IoT Gateways using IO-Link, Bluetooth, and USB
- ▶ Send data on lubricants and filters to the Nexeed Production Performance Manager visualization

# NEXEED PRODUCTION PERFORMANCE MANAGER

# Nexeed Production Performance Manager

## Use case overview

### Condition Monitoring



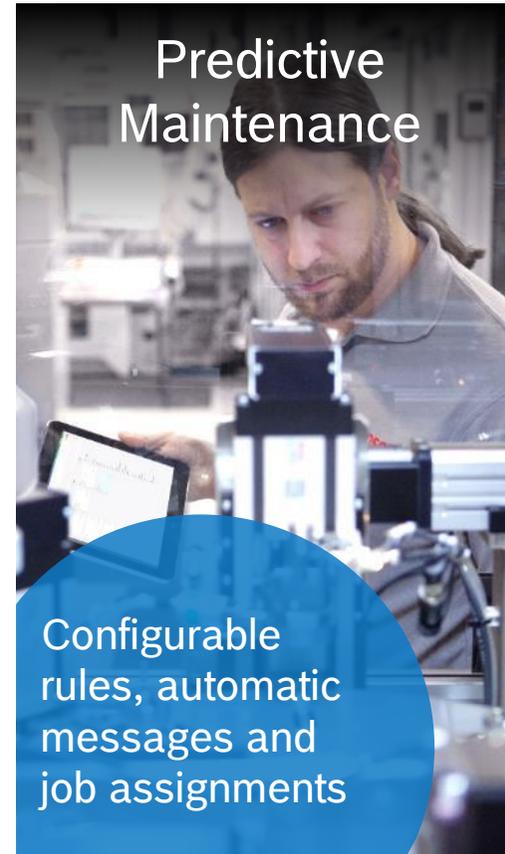
Ongoing status recording for maximum transparency

### Live Process Data Analysis



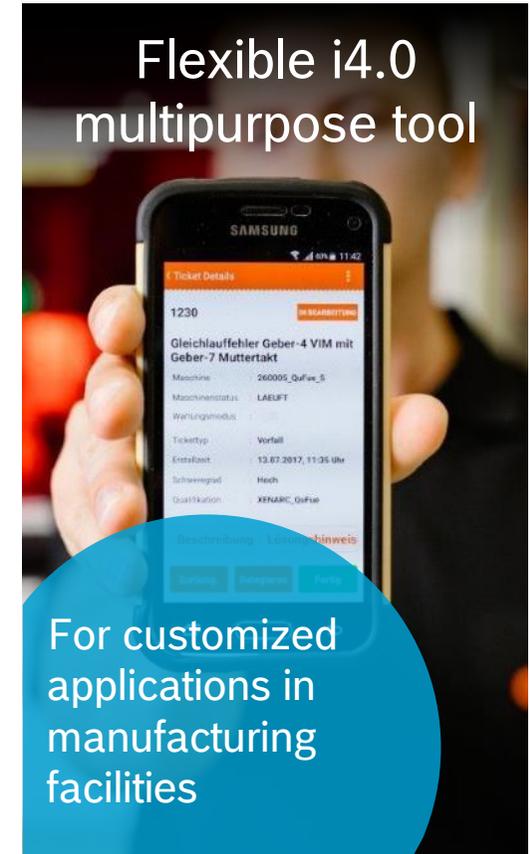
Reducing production errors and process deviations to a minimum

### Predictive Maintenance



Configurable rules, automatic messages and job assignments

### Flexible i4.0 multipurpose tool



For customized applications in manufacturing facilities

Ticket Details	
1230	IN BEARBEITUNG
Gleichlauffehler Geber-4 VIM mit Geber-7 Muttertakt	
Machine	260005_Qufax_5
Machinestatus	LAELFT
Wartungsmodus	
Tickettyp	Vorfall
Erstfallzeit	12.07.2017, 11:05 Uhr
Schweregrad	Hoch
Qualifikation	XFNARC, Oefue

# Nexeed Production Performance Manager

## Benefits at a glance

**Full transparency:** machine and process data available live at any time

**Higher efficiency, lower costs** thanks to optimized digital processes

Employees can contribute their **expertise without the need for special IT skills**

**Maximum flexibility and safety** for future applications thanks to modern software architecture, documented interfaces and open standard (PPMP)

**Up to 15% higher machine availability**  
thanks to predictive maintenance

**5-10% higher production performance**  
through reduced scrap

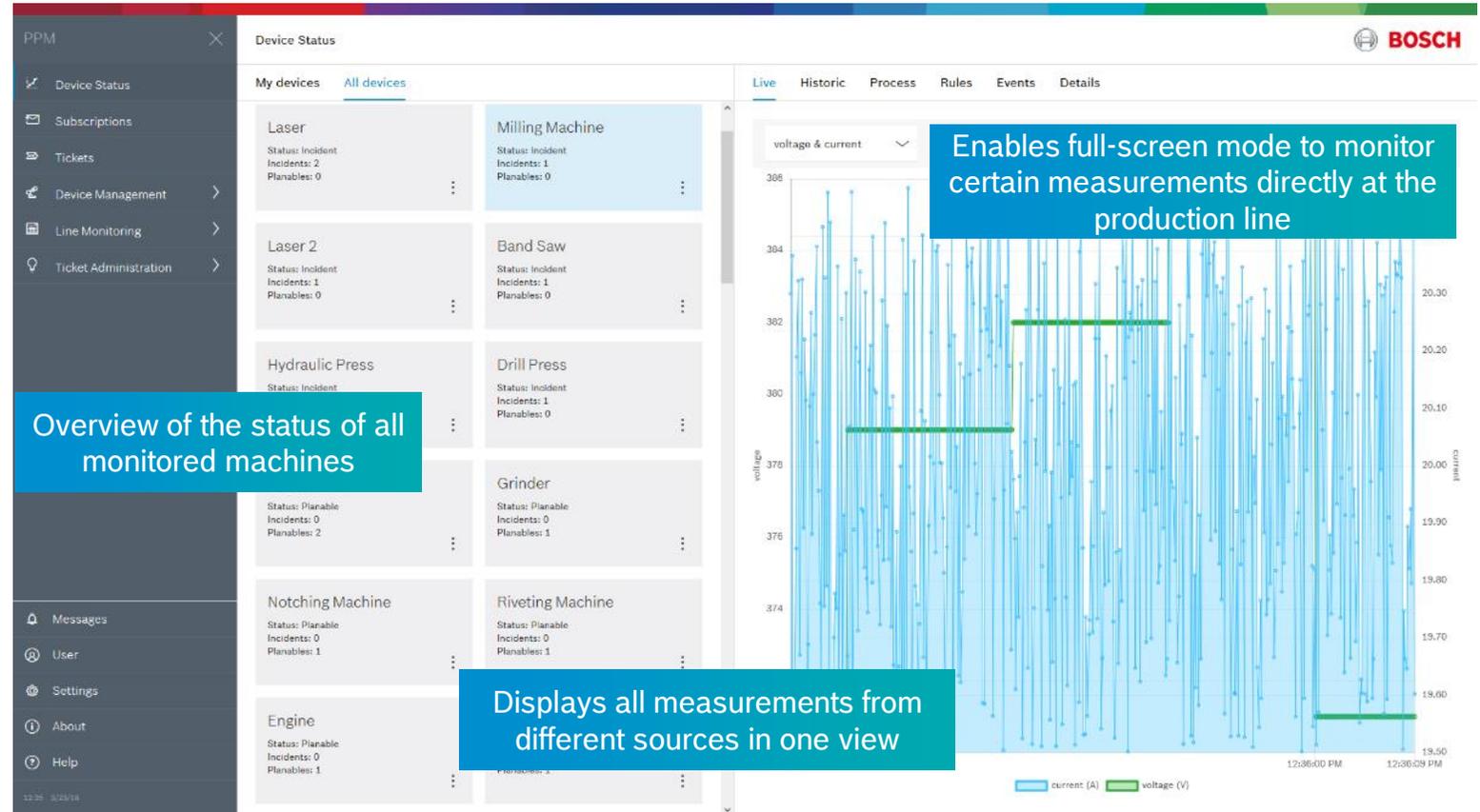
# CONDITION MONITORING

Ongoing status recording for maximum transparency

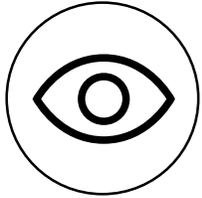
# Nexeed Production Performance Manager

## Basic functions overview

- ▶ Access machines at ONE point
- ▶ Quick feedback on machine changes due to LIVE data
- ▶ Easy and quick access to machine data from anywhere in the plant

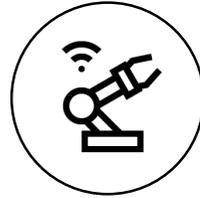


# Nexeed Production Performance Manager Condition Monitoring – Benefits at a glance



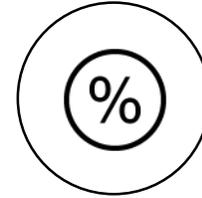
## Full transparency

Machine data and messages  
available any time and anywhere



## Less machine downtime

Rapid response to failures, analysis  
of common faults



## Reduced spending

Lower costs thanks to systematic  
production improvement

*Ongoing status recording for maximum transparency*

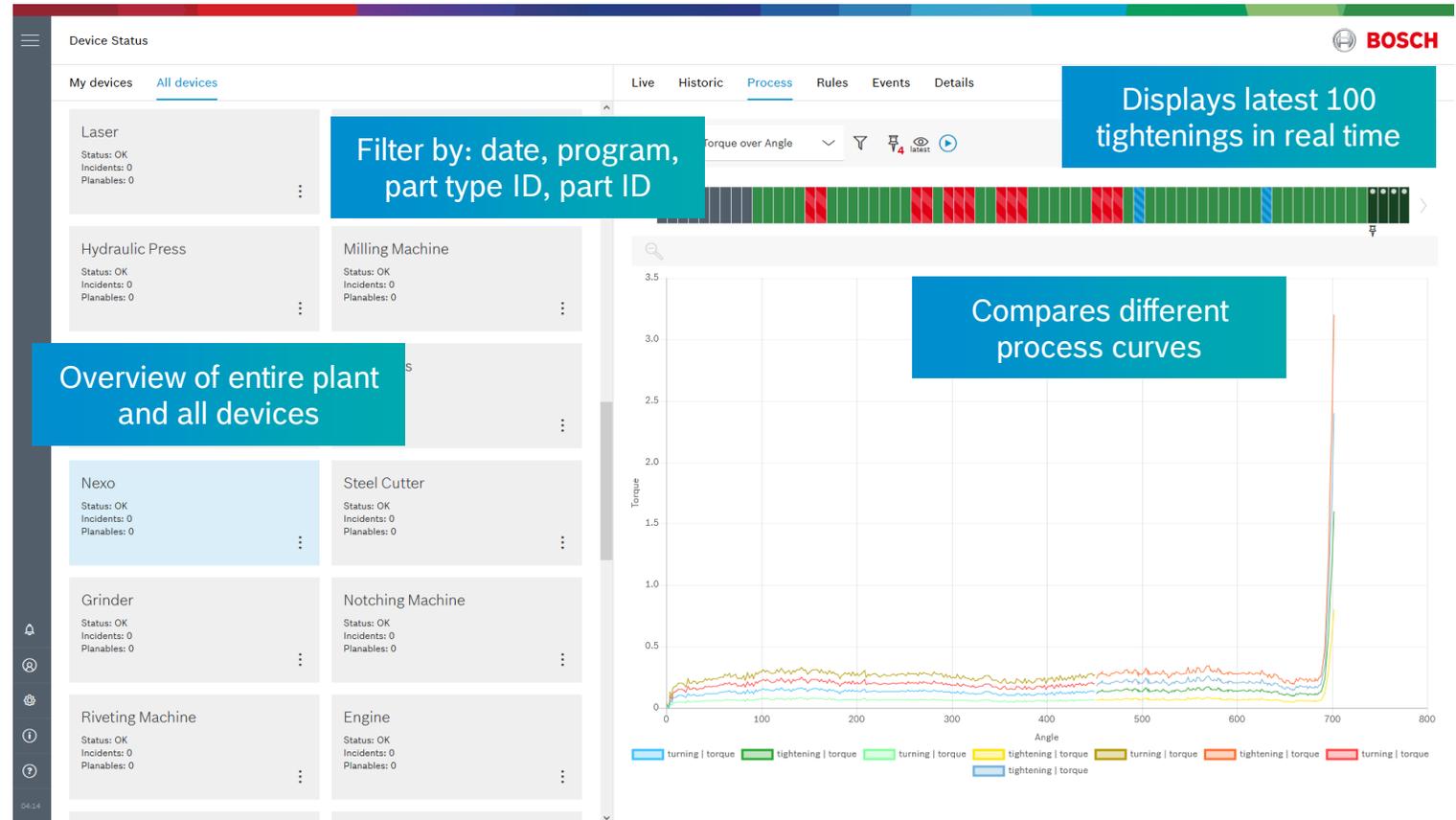
# LIVE PROCESS DATA ANALYSIS

Reducing production errors and process deviations to a minimum

# Nexeed Production Performance Manager

## Functions overview

- ▶ Overview of all process data
- ▶ View of process meta-information
- ▶ Creating favorites using “My devices”
- ▶ Rules definition and notifications

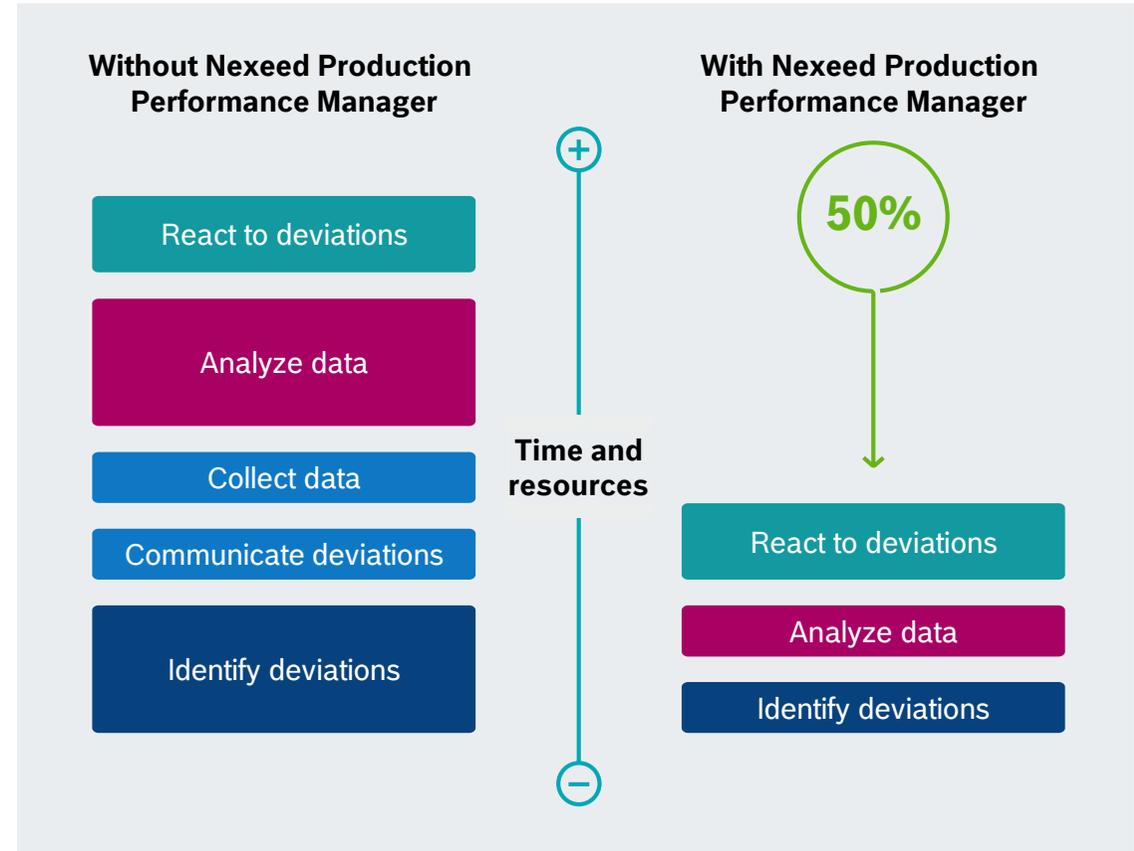


# Nexeed Production Performance Manager

## Realizing savings

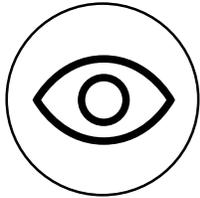
Realizing savings by using the Nexeed Production Performance Manager for process data analysis:

the time needed to respond to an identified deviation can be cut in half.



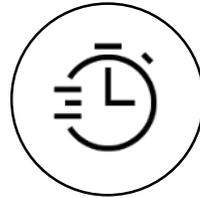
# Nexeed Production Performance Manager

## Live Process Data Analysis – Benefits at a glance



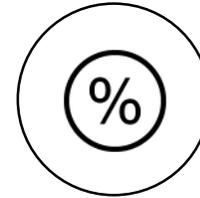
### Continuous process transparency

Greater transparency through user-friendly provision of all process data



### Increase in efficiency

Easy access to the required data on all terminals – with no legwork or delays



### Fewer rejects

Cost savings thanks to consistently high product quality with a minimal error rate

*Reduce production faults and process deviations to a minimum –  
for error-free and highly efficient production*

# PREDICTIVE MAINTENANCE

Predictive maintenance through configurable rules, automatic notification and task assignment

# Nexeed Production Performance Manager

## Functions overview – Data Processing Module

- ▶ Easy-to-operate tool for customized evaluation of measured values and machine feedback
- ▶ Monitors compliance with the parameters specified for production processes
- ▶ Includes a suite of implemented rules and functions (e.g. trend recognition and hit of events)

1. Set Context

Device Type  
 BINSA

Device  
 Blinsa

2. Set Conditions or Time Trigger

Trend (Method of least squares, normalized) > 2

Device Property\*  
cycletime

Type\*  
 Sample based  
 Time based

Number of Measurements\*  
30

Find Csv Sequence

Message Codes\*  
BRE-001

Type\*  
 Sample based  
 Time based

Number of Events\*  
30

+ Add Condition

+ Add time trigger

3. Event Configuration

Title\*  
Cycletime too high

Code\*  
KPlhigh

Severity\*  
High

Description  
Trend predicts cycletime will be too high soon

Hint  
Optional message for the rule

4. Additional Steps

add Ticket Mapping

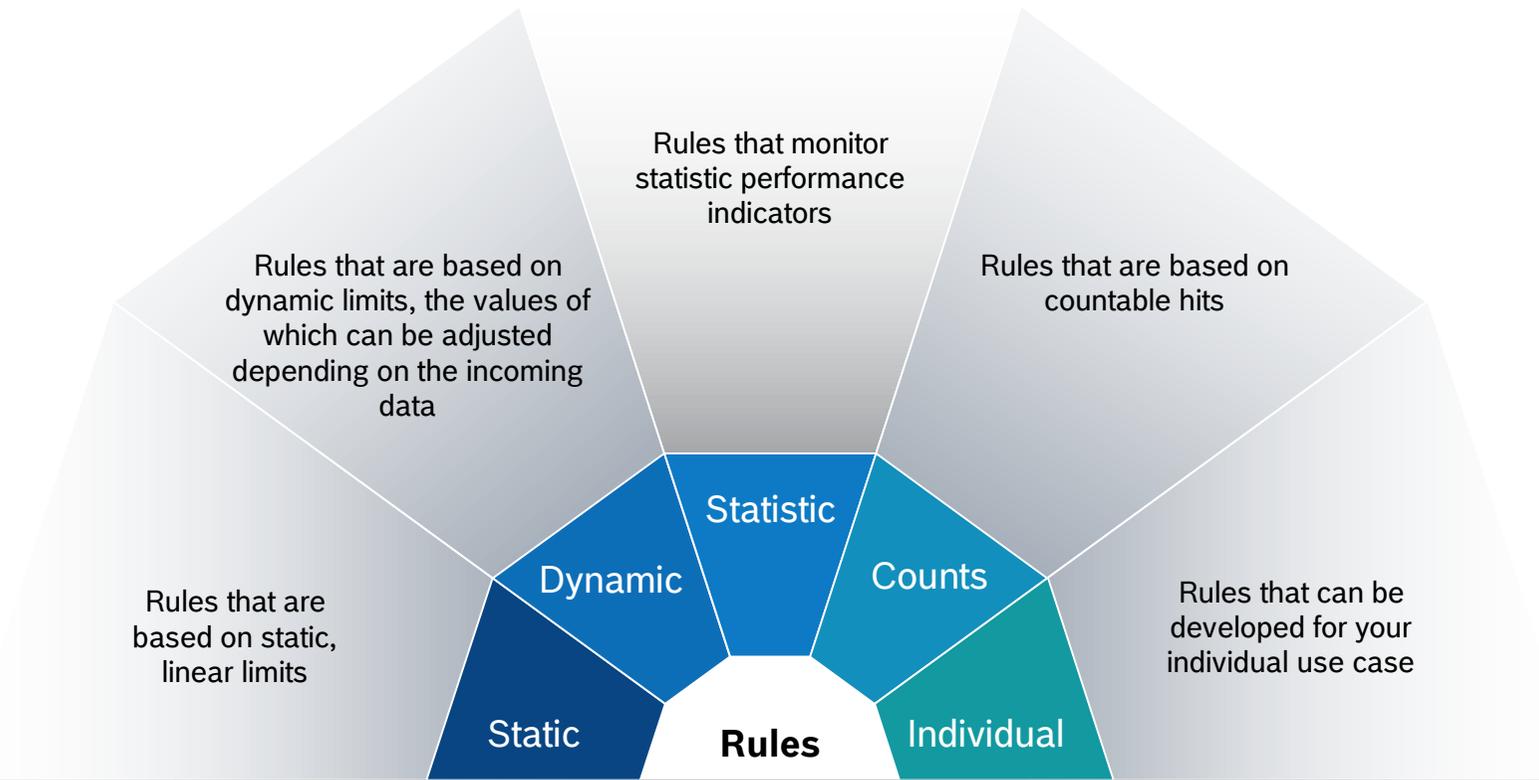
Devices affected: 1

\* required

Save Cancel

# Nexeed Production Performance Manager

## Overview of rules



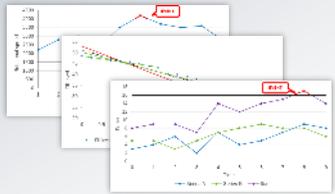
# Nexeed Production Performance Manager

## Overview of rules II

### Static

Rules that are based on static, linear limits

- ▶ Upper/lower limits
- ◆ Trend recognition
- ◆ Sum of two measurements
- ↑ Static target with tolerance
- ↑ Range



### Dynamic

Rules that are based on dynamic limits, adjusted depending on the incoming data

- ◆ Dynamic limits
- ◆ Reference series as limit
- ↑ Jump detection



### Statistic

Rules that monitor statistical performance indicators

- ◆ Process capability index
- ◆ Normal distribution
- ↑ Nelson rules



### Counts

Rules that are based on machine messages

- ◆ Hit of events
- ◆ Hit of process results
- ↑ Event sequence detection



### Individual

Rules that can be developed for your individual use case. We offer a guided approach to find the solution you need!

- Workshop & customized rule development (separate quotation)



▶ Included in Production Performance Manager    ◆ Included in Data Processing Module    ↑ Soon to be included in Data Processing Module

# Nexeed Production Performance Manager

## Functions overview – Ticket Management Module

- ▶ Optimized service processes
- ▶ Maintenance of knowledge database
- ▶ Service process history as basis for optimization
- ▶ Standardized reports to quickly see long-term benefits

Ticket list is specific to user/role

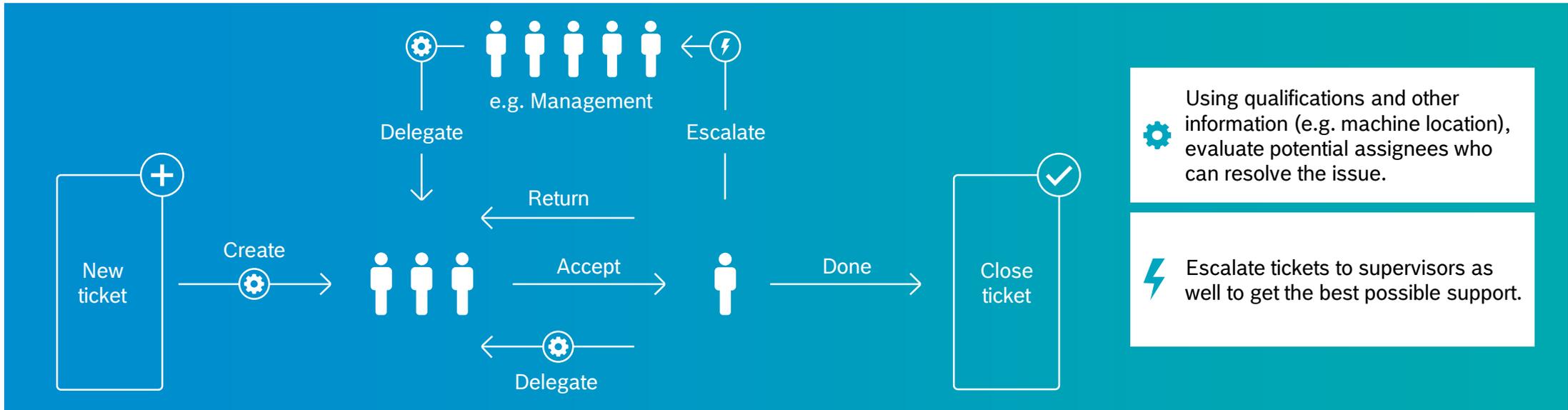
Automatically assigns ticket (delegation, escalation, etc.)

Displays information (in regional language) for ticket processing

Contains link to data that initiated the ticket

# Nexeed Production Performance Manager

## Ticket processing

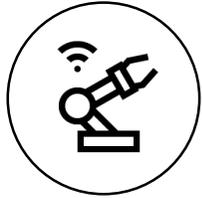


### Situation-based assignments:

- ▶ User-/Role-specific ticket list (My tickets, department, all tickets)
- ▶ Grouped ticket summary by status: Open / In progress / Resolved
- ▶ Ticket history and resolution tips in order to build a specific knowledge database
- ▶ Delegation/escalation for automatically determining assignee

# Nexeed Production Performance Manager

## Predictive Maintenance – Benefits at a glance



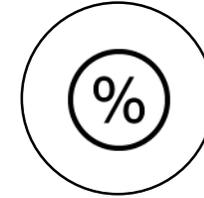
### Easy monitoring of machines

Configure rule and action  
recommendations quickly & easily



### Maintenance as needed

Non interval-controlled, flexible  
maintenance and servicing.



### Reduced downtime

Reduced machine downtime for an  
efficient production.

*Predictive Maintenance through configurable rules,  
automatic notification and task assignment*

# FLEXIBLE INDUSTRY 4.0 MULTIPURPOSE TOOL

For customized applications  
in manufacturing facilities



# The OSRAM Ticket Manager: An Industry 4.0 app for employees

## Approach

- ▶ A smart central system to replace personal handling of individual machines
- ▶ A nuanced assessment of the condition of all machines
- ▶ Recognition of correlations in machine feedback
- ▶ A way to specifically assign maintenance & repair tasks

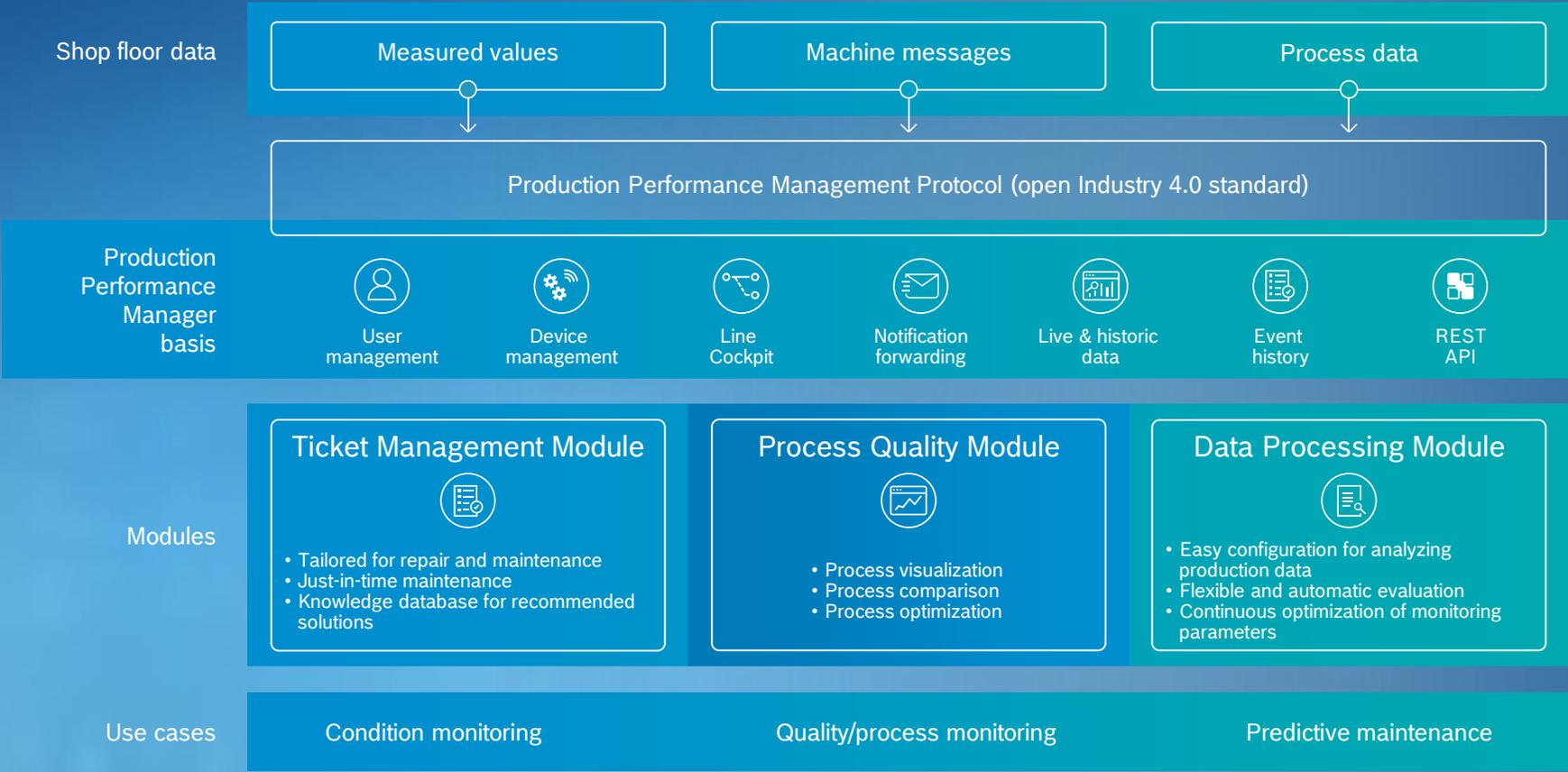
## Customer benefits

- ▶ Transparent and consistent troubleshooting
- ▶ Reduction in the cost of failures (machines and non-optimized planning)
- ▶ Open standards (Integrating more than 80 different kinds of machines)



# Nexeed Production Performance Manager

## Technical overview



THANK  
YOU