

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

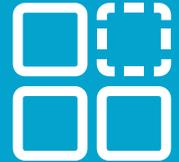


Security by Design:

personalized authentication and multi-level release management

Reduced integration costs:

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

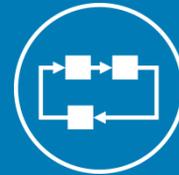


Maintenance service in real-time:

higher efficiency and quality without on-site support

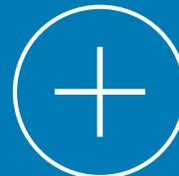
Nexeed Transparency Kit

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



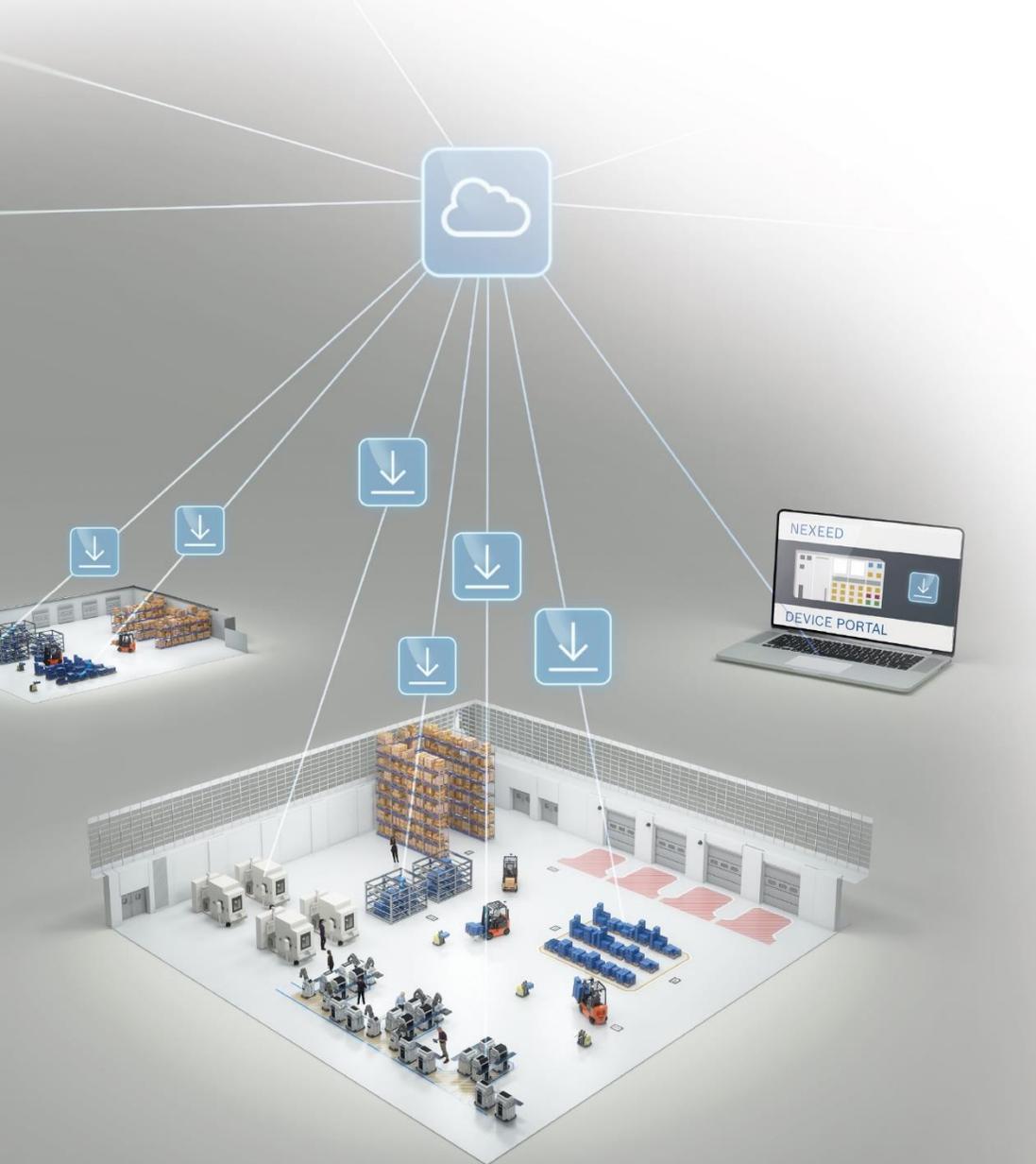
Our **Heatmap** visualizes part flow, bottlenecks and deviations at line level

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.



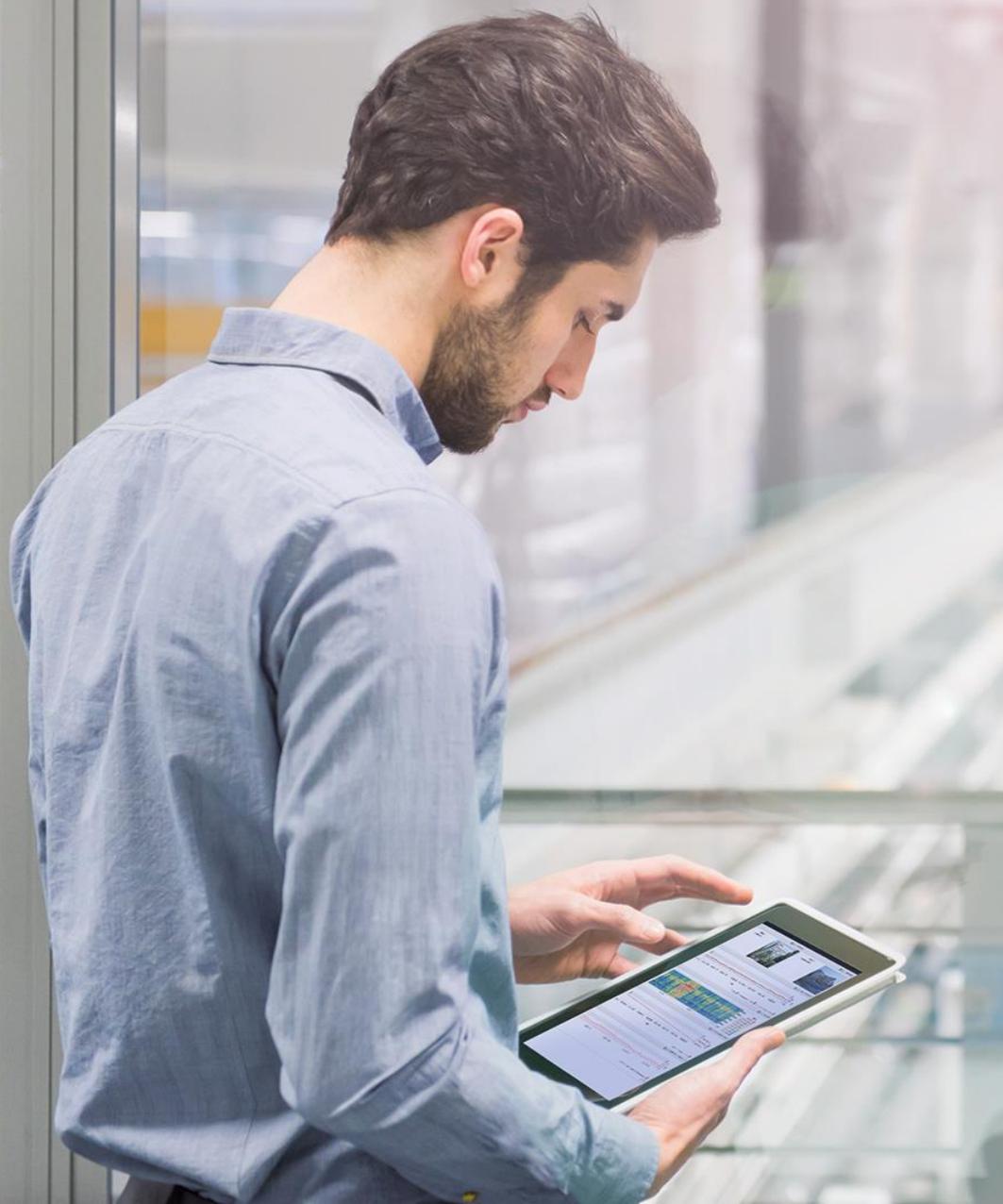
Extensive
expertise: From
production to data
analysis



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



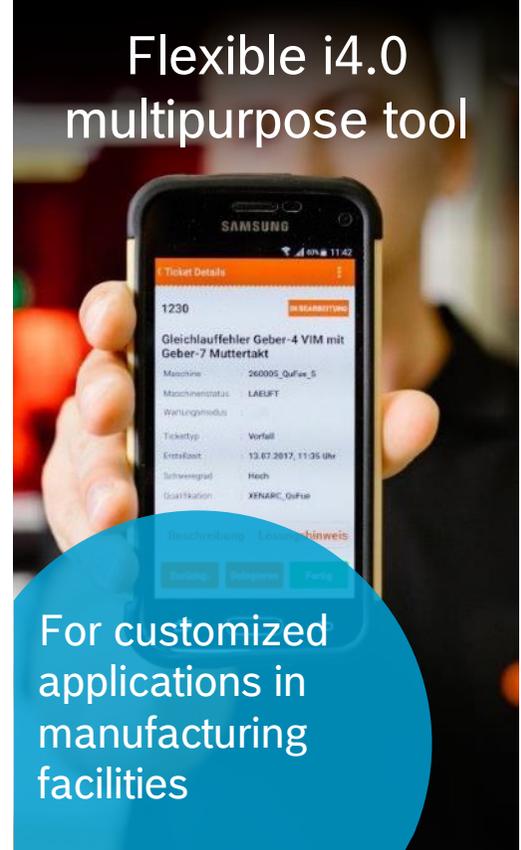
Reducing production errors and process deviations to a minimum

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
Erstfabrik	13.07.2017, 11:35 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

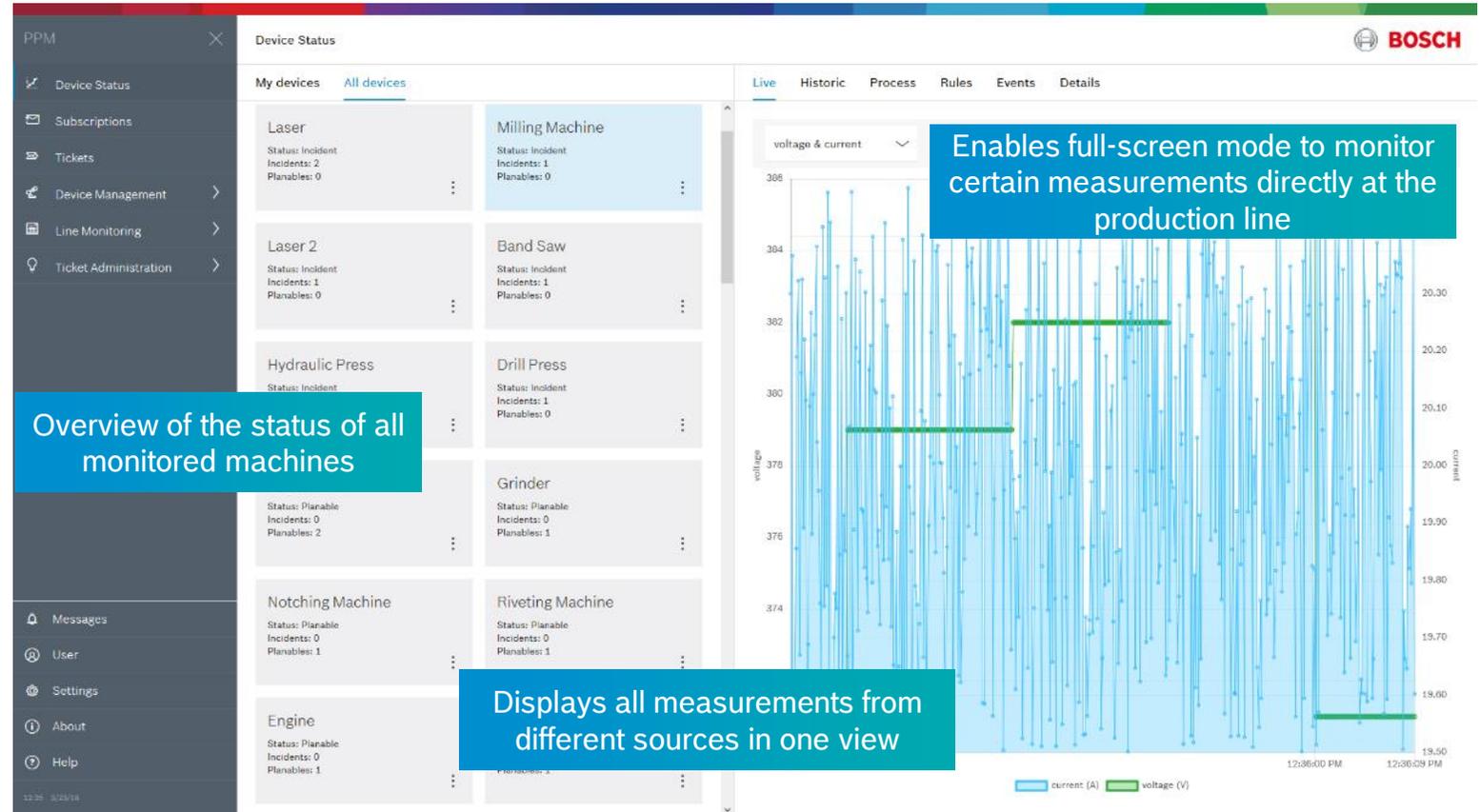
CONDITION MONITORING

Ongoing status recording for
maximum transparency

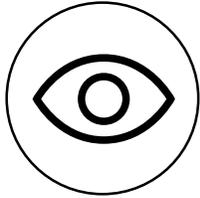
Nexeed Production Performance Manager

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

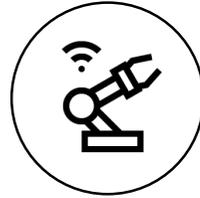


Nexeed Production Performance Manager Condition Monitoring – Benefits at a glance



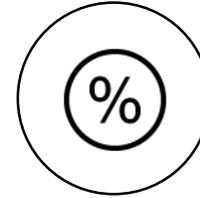
Full transparency

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

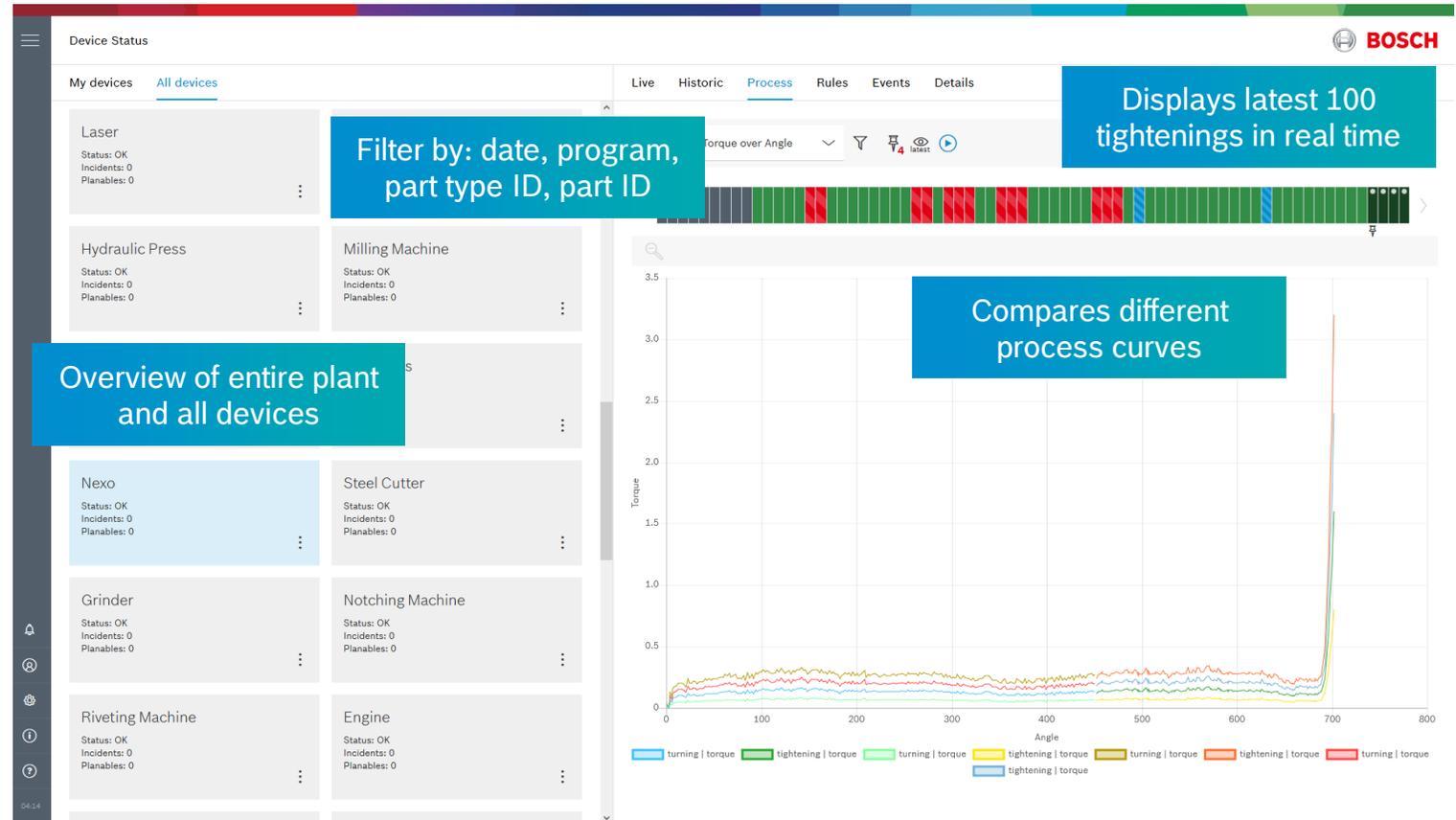
LIVE PROCESS DATA ANALYSIS

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

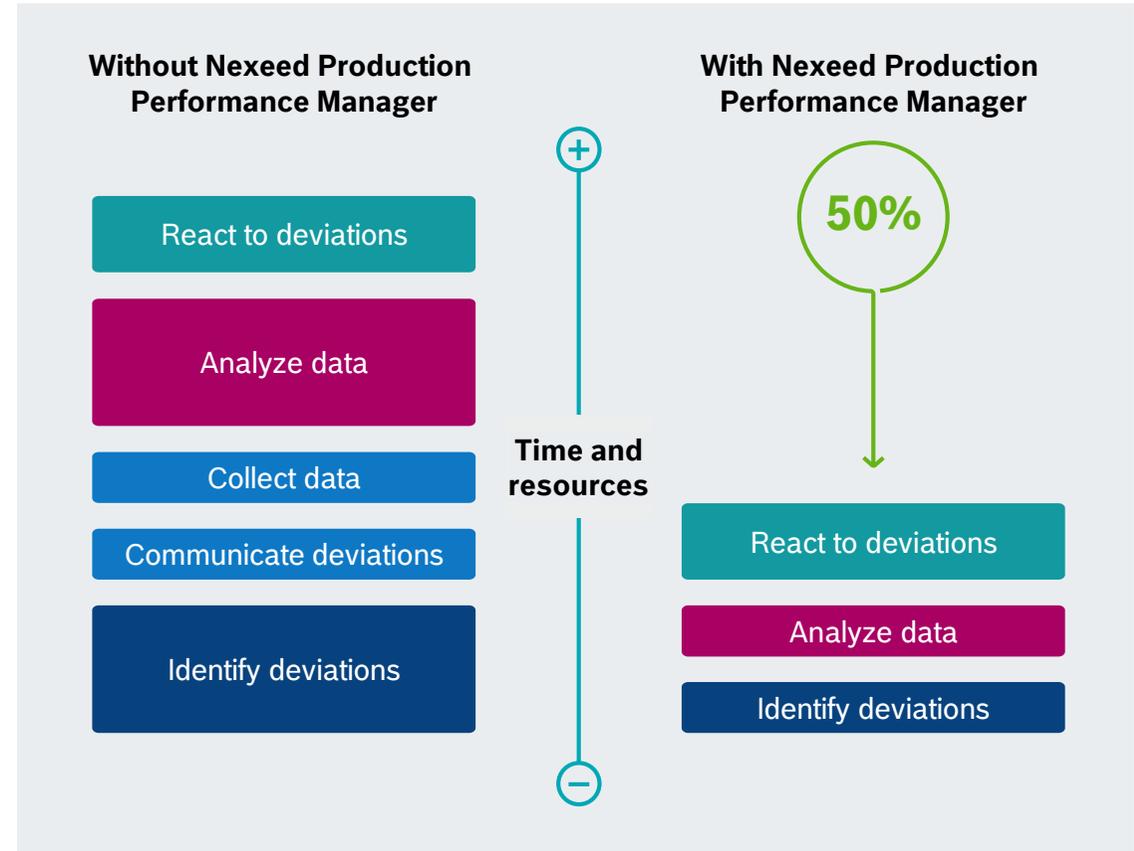


Nexeed Production Performance Manager

Realizing savings

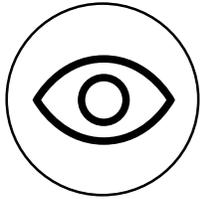
Realizing savings by using the Nexeed Production Performance Manager for process data analysis:

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



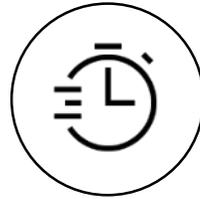
Nexeed Production Performance Manager

Live Process Data Analysis – Benefits at a glance



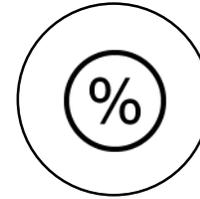
Continuous process transparency

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

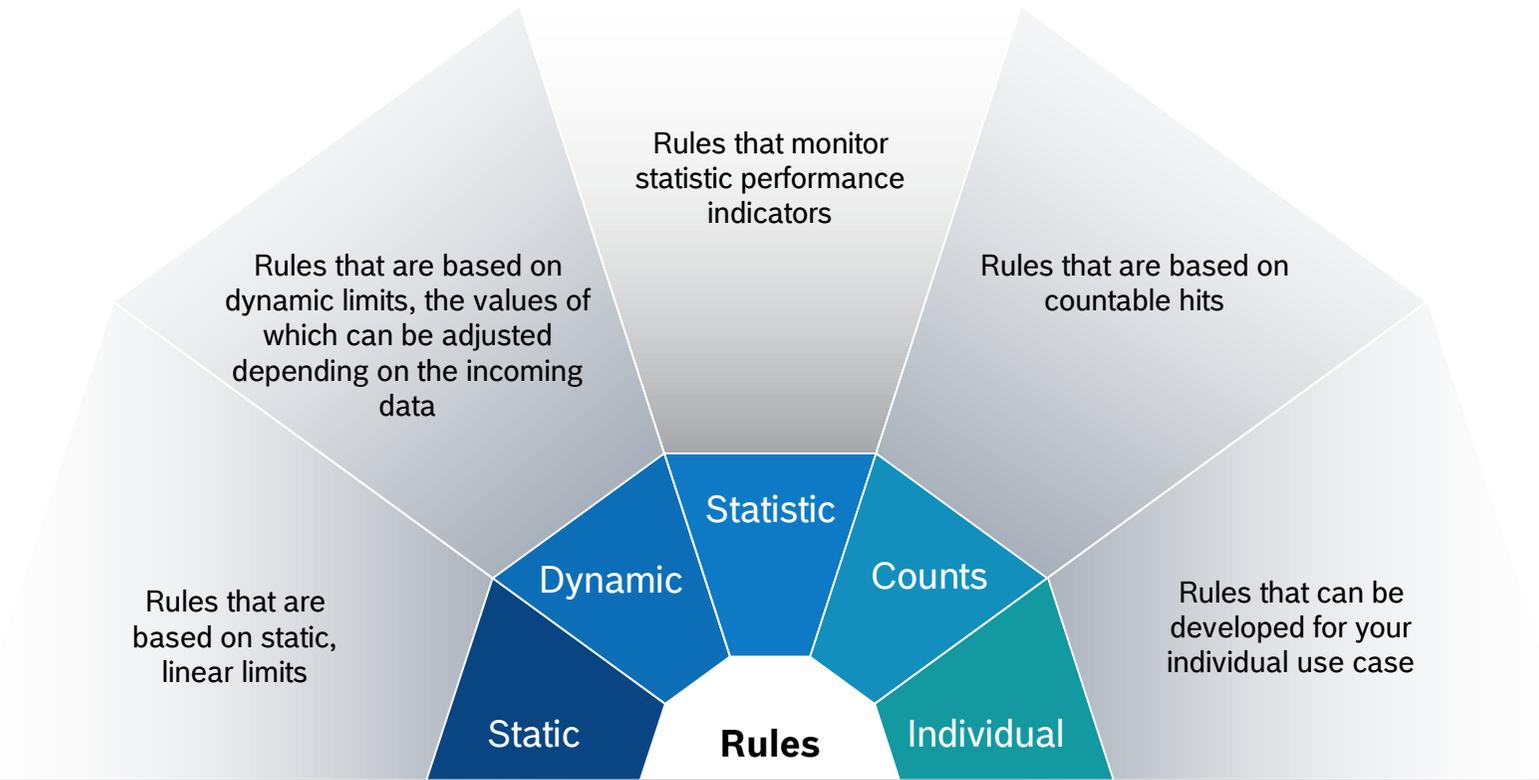
Save Cancel

Allows the user to quickly and easily set and modify parameters

Generates messages that can be configured

Nexeed Production Performance Manager

Overview of rules



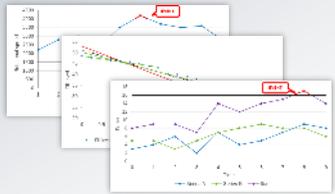
Nexeed Production Performance Manager

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

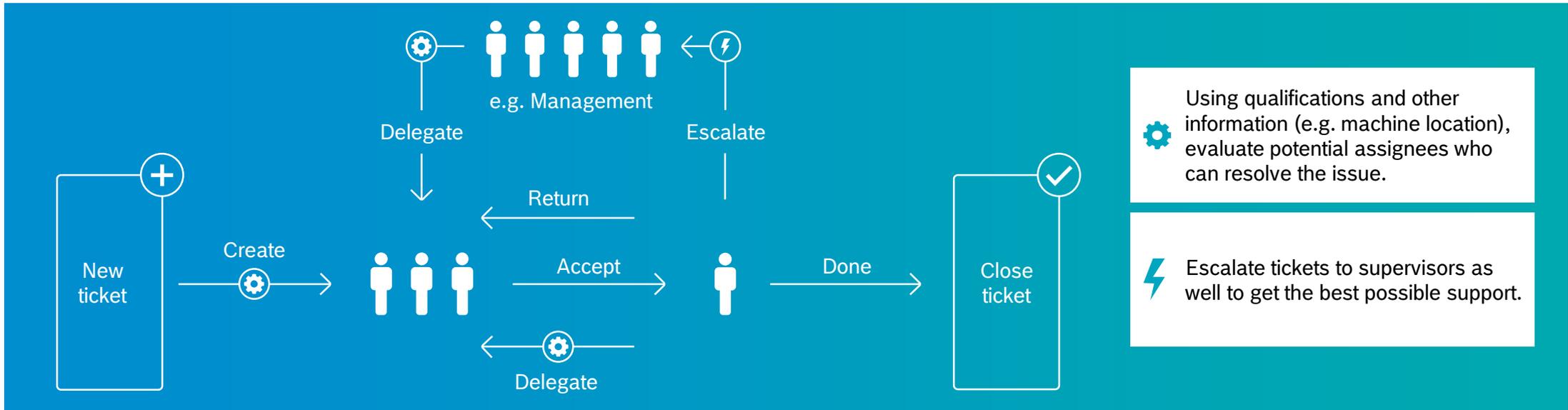
Automatically assigns ticket (delegation, escalation, etc.)

Displays information (in regional language) for ticket processing

Contains link to data that initiated the ticket

Nexeed Production Performance Manager

Ticket processing

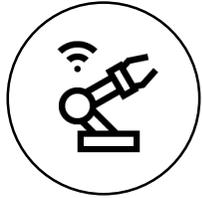


Situation-based assignments:

- ▶ 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



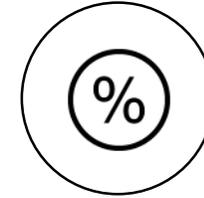
Easy monitoring of machines

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

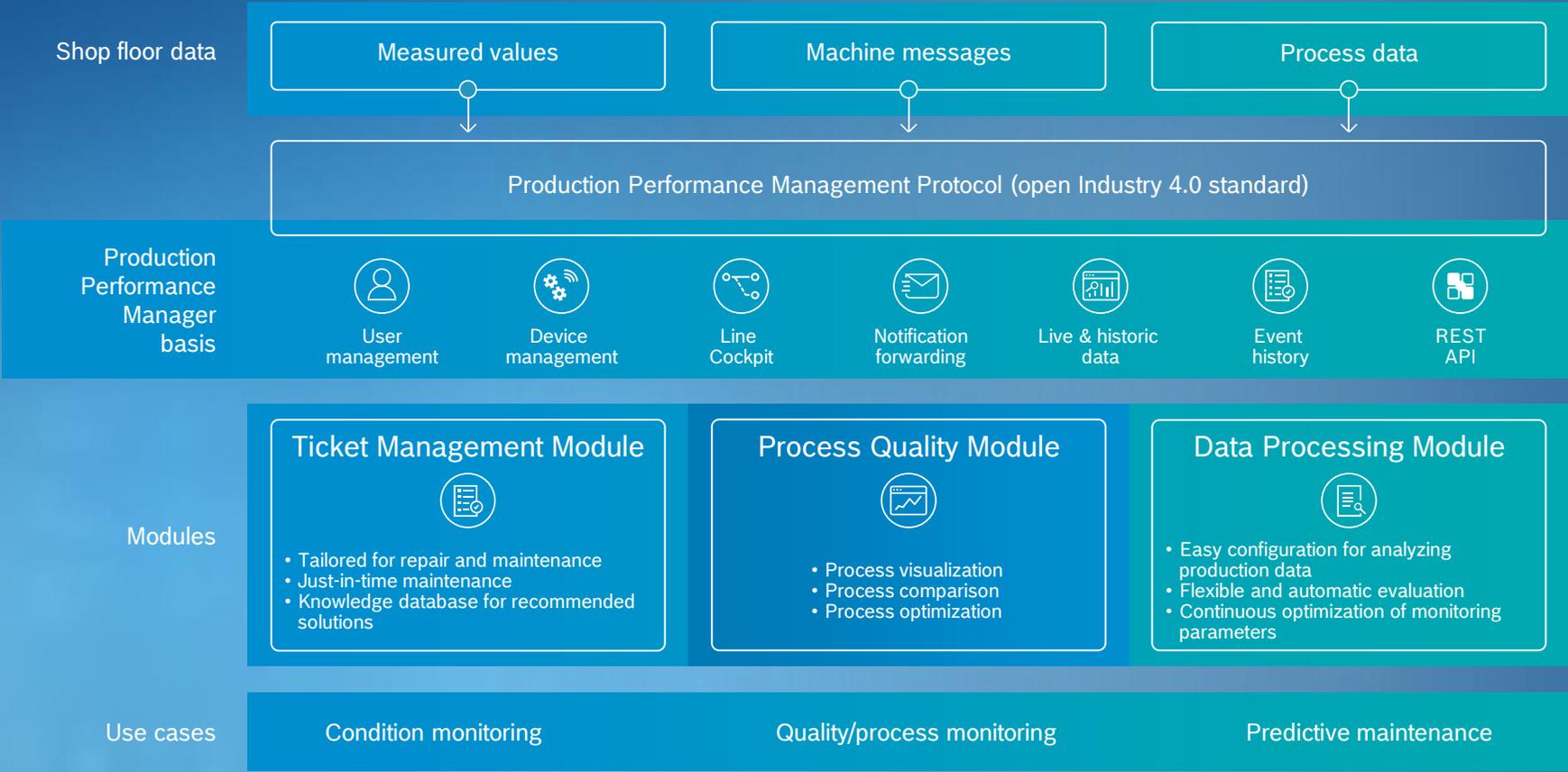
Customer benefits

- ▶ 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