YASKAWA

YASKAWA Cockpit

Software Suite EUR 1.0 that brings you the advantages of Industry 4.0.

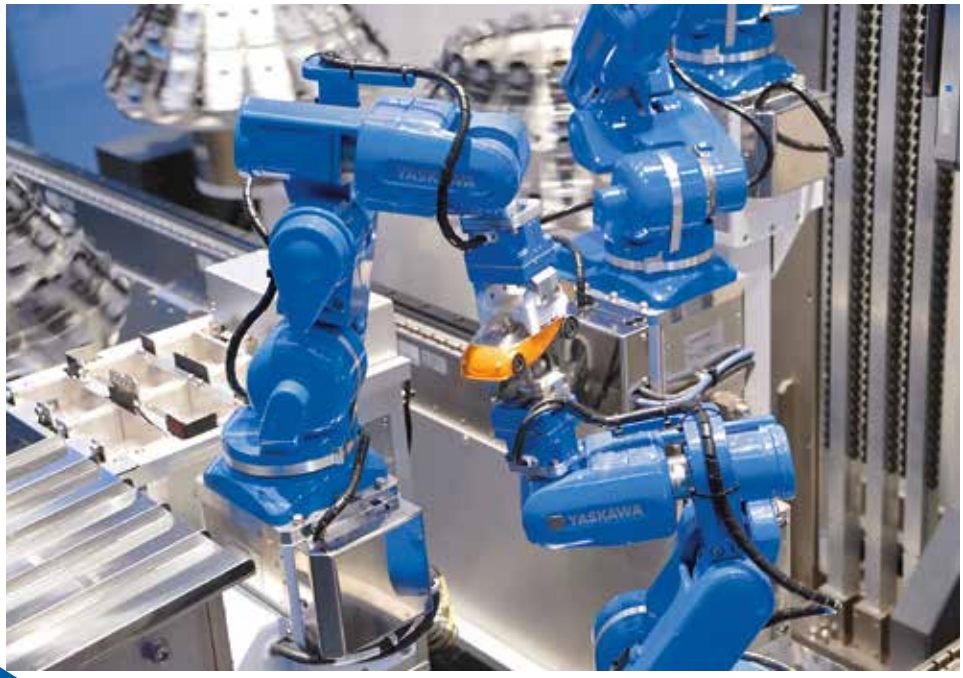
www.yaskawa.eu.com

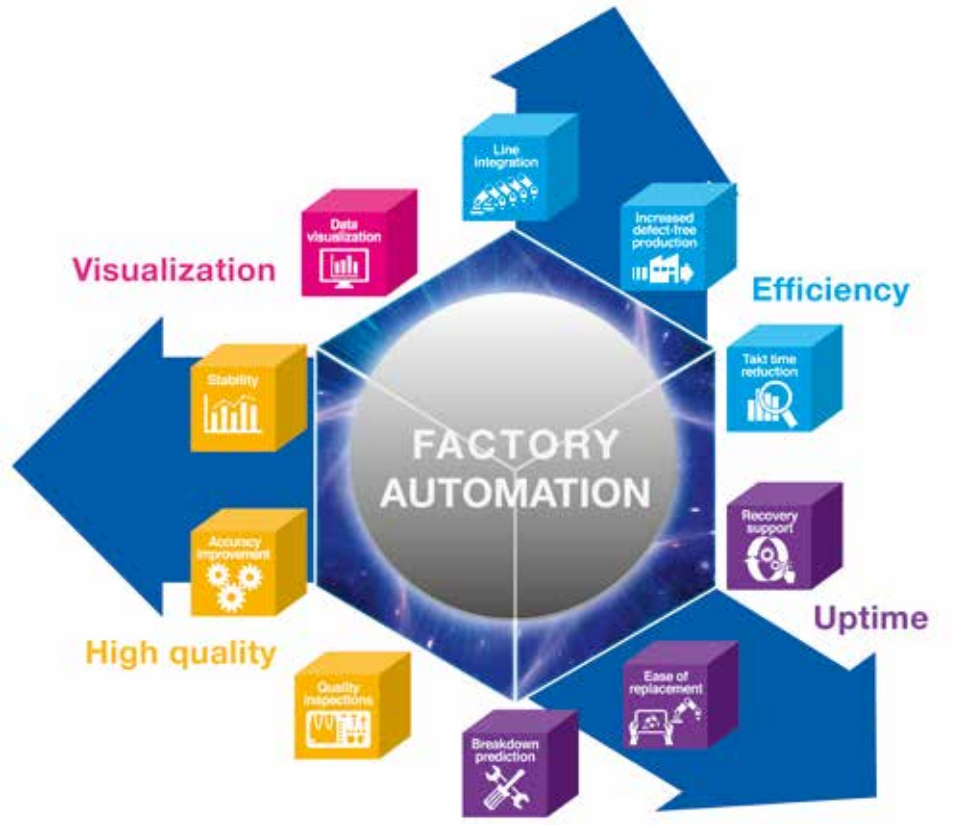
Shift to the Next Generation ...

Digitalization is laying the foundation for the development of future factory automation. Some call it Industry 4.0, some say Internet of Things, we call it i3-Mechatronics, but all these terms refer to the exciting smart factory of connected devices enhancing productivity and production flexibility.One question remains, however: when will it all be available? Our answer is …

Now!

Once in the late 60s, YASKAWA invented the term mechatronics. Now, 50 years later, let us take you into the next-generation world of i3-Mechatronics. With YASKAWA Cockpit – one major element of i3-Mechatronics – we are offering companies of any size a genuine software suite product for factory automation. It is easy to install, easy to configure and easy for anyone to use. Its modular software structure makes enables growth, reaping the benefits of Industry 4.0 digital transformation.





i³-Mechatronics

integrated

Our production environment enables customers to collect and analyze real-time data. It is open for further data analysis with specialized Big Data analysis and AI learning. Production data can be visualized by the YASKAWA Cockpit at application, machine and complete production line level.

intelligent

Big Data analysis and AI learning of collected production site data offer new ways of optimizing the production process at machine level and factory level.

innovative

Insights gained from the in-depth analysis of the production process are used to trigger improvements and create a better level of production and quality.

YASKAWA Cockpit

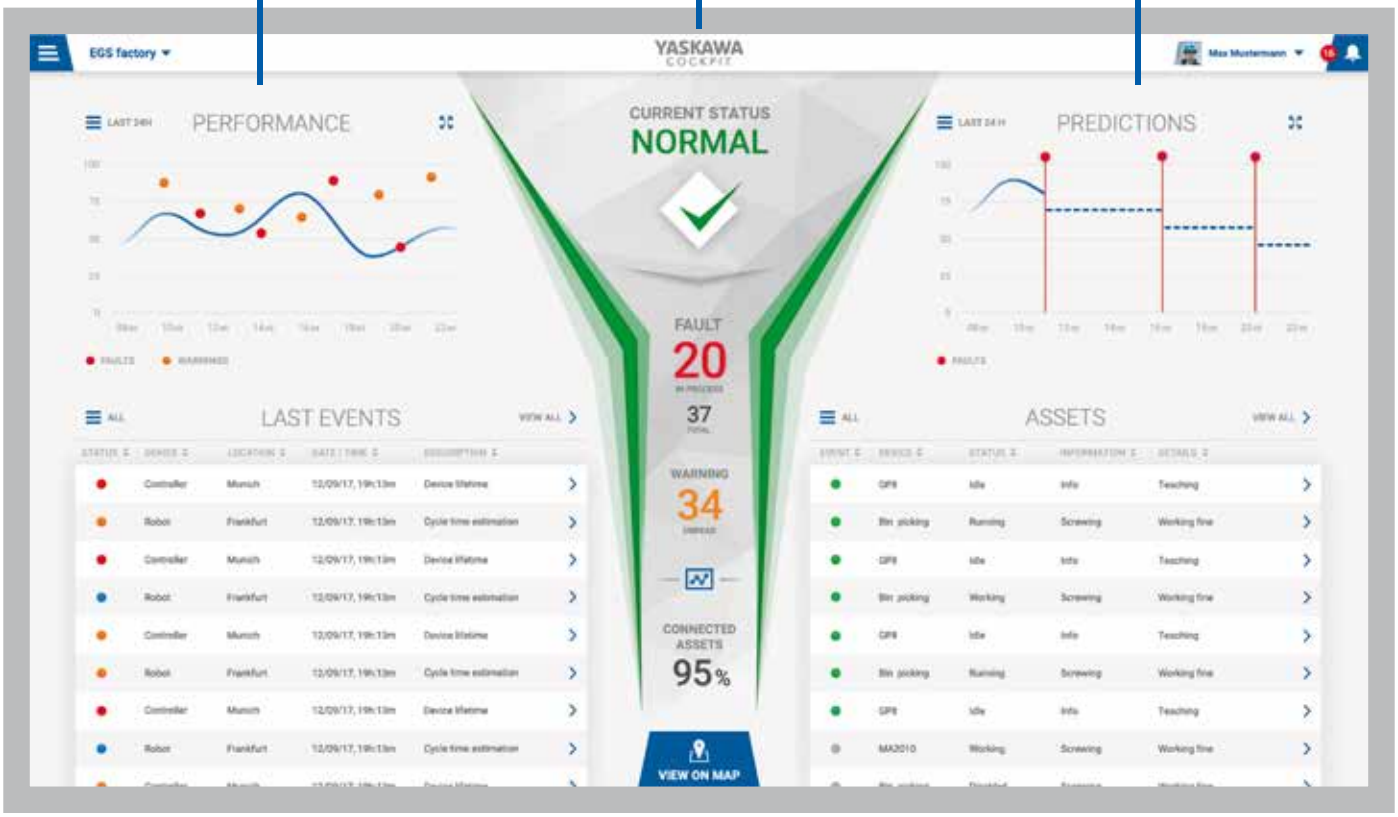
From Data to Information

YASKAWA Cockpit provides a complete management view

- asset management, live data monitoring, and collected production data for sophisticated analysis and process improvements.
- factory data available to your plant operation team and decision makers, but also to customers, business partners and suppliers, allowing users at any moment to see what is happening at any point on the value creation chain.

The information can be used to enhance productivity and to reduce the cycle times and downtime of any system.

Performance Area **Live Area** **Predictions Area**



YASKAWA Cockpit is the core element of our i3-Mechatronics concept. Captured device and system data are analyzed and actionable insights are available – all displayed in YASKAWA Cockpit.

KPI (Key Performance Indicators)

Unlike conventional machine visualizations, YASKAWA Cockpit presents you with much more powerful information (key performance indicators, KPI) about your production machinery:

- **The LIVE area:** quick and simple production status overview.
- **The PERFORMANCE area:** summary of past data to capture patterns and operational opportunities.
- **The PREDICTIONS area:** aggregated knowledge about trends, providing information that can help you to prevent production downtime and suggestions for improvement.

Levels of Control

Factory Level

Color-coded for quick assessments at a glance, and clickable for a detailed view of individual assets and events.

Performance Area

Selection of KPIs graphically visualized with marked events and trend line.

Live Area

Current status of the factory.

Predictions Area

Predicted factory KPIs in selected time periods according to upcoming events and operational plans.

Events

The most recent events in the factory for connected devices, with time stamp, type, and short description.

Map

of connected devices in the factory with their statuses.

Assets

The status of all connected devices. Selecting a device takes the user to a detailed view.

YASKAWA Cockpit provides real-time visualization from a complete factory view down to single devices.

Cell Level

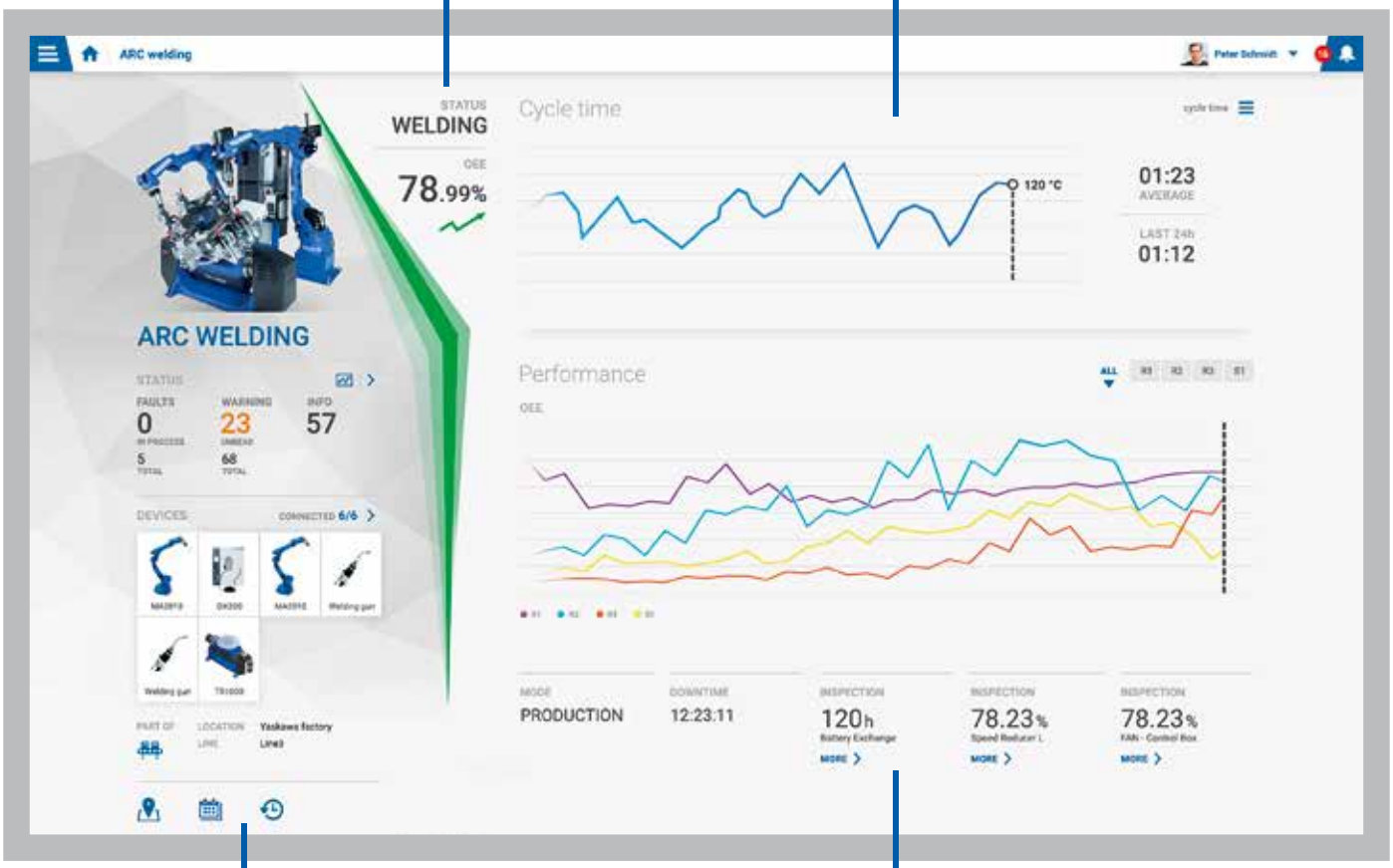
Shows the current production status on a machine-to-machine or device-to-device basis.

Key KPI

Shows the most important KPI of the cell (related to the specific application).

Cell Display Area

Standard (out-of-the-box) visualization area for your critical KPIs (here: welding fixture scheme). Customer process applications are possible.



Asset Management Area

Relating to the cell currently selected.

Live Data Display Area

Combination of aggregated and live KPI, different display options (graphs, bar, charts) available.

Device Level

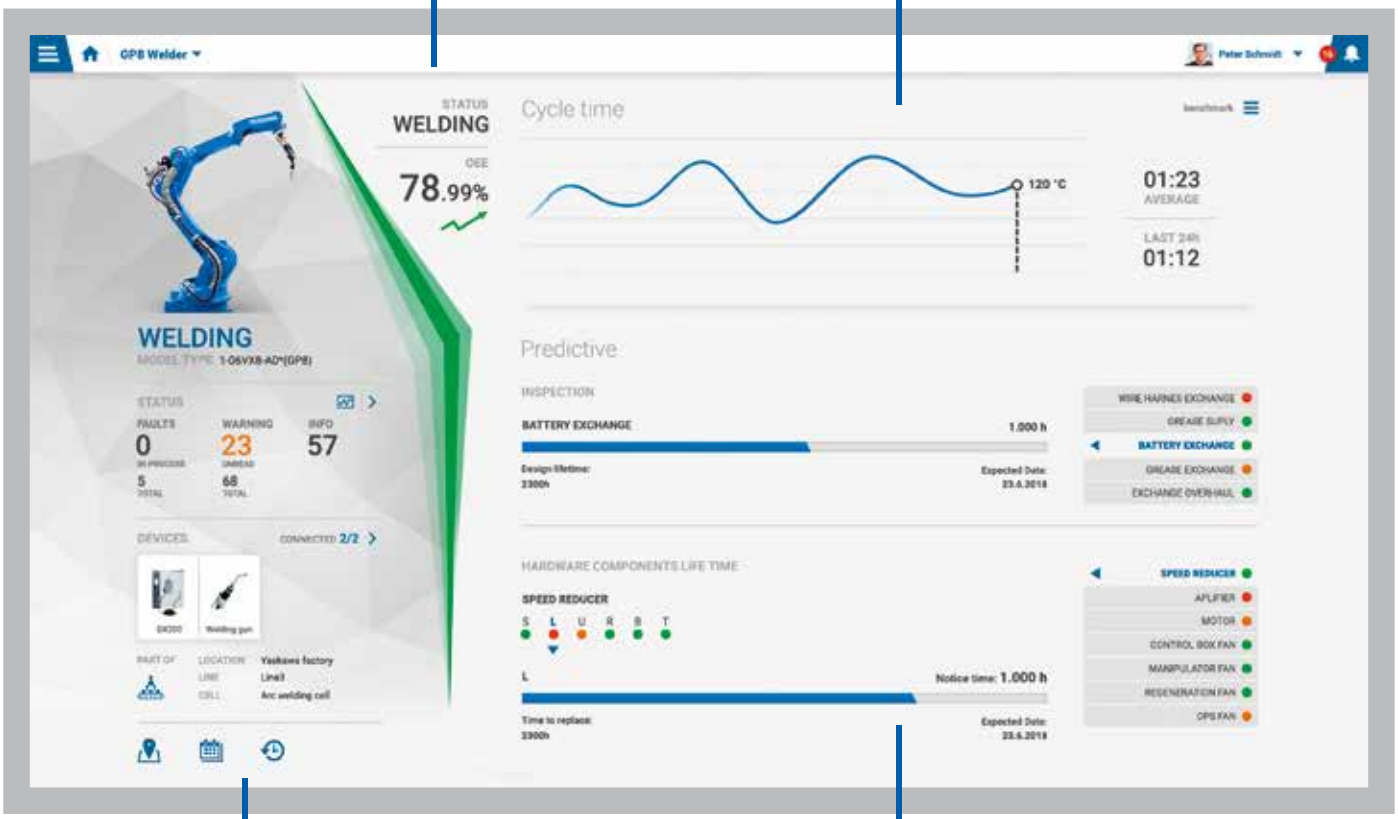
Shows the current status of devices (components).

Key KPI

Shows the most important KPI of the device.

KPI Display Area

Device-specific KPIs (e.g. robot uptime, temperature).

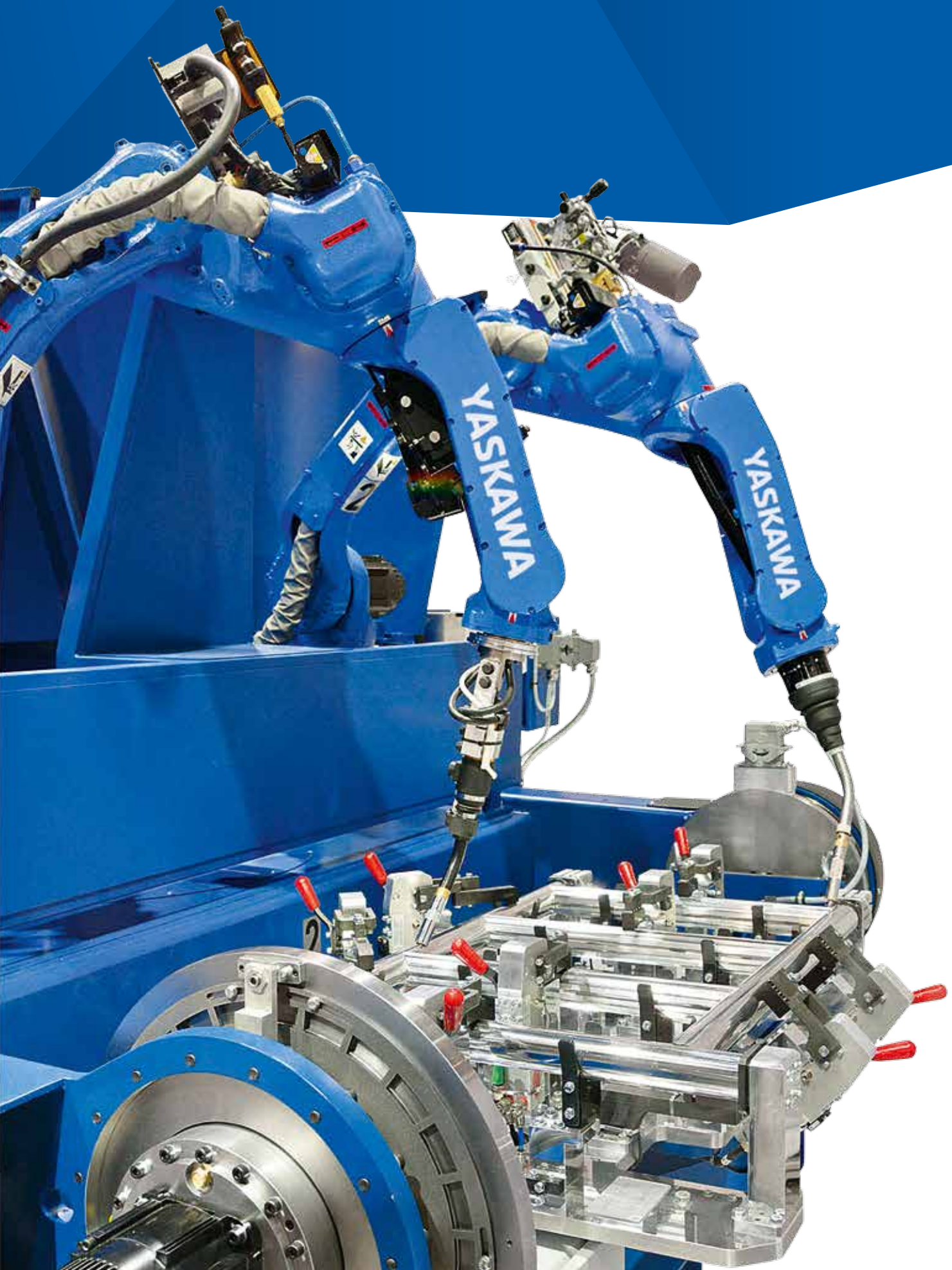


Side Information of the Device

Quick access to product and error recovery documentation, contact to internal maintenance resources or to the supplier organization of the device manufacturer.

Predictive Data Area

Based on aggregated data, the system makes projections into the future by combining aggregated data with given lifetime design data of the device, e.g. MTBF or maintenance schedule.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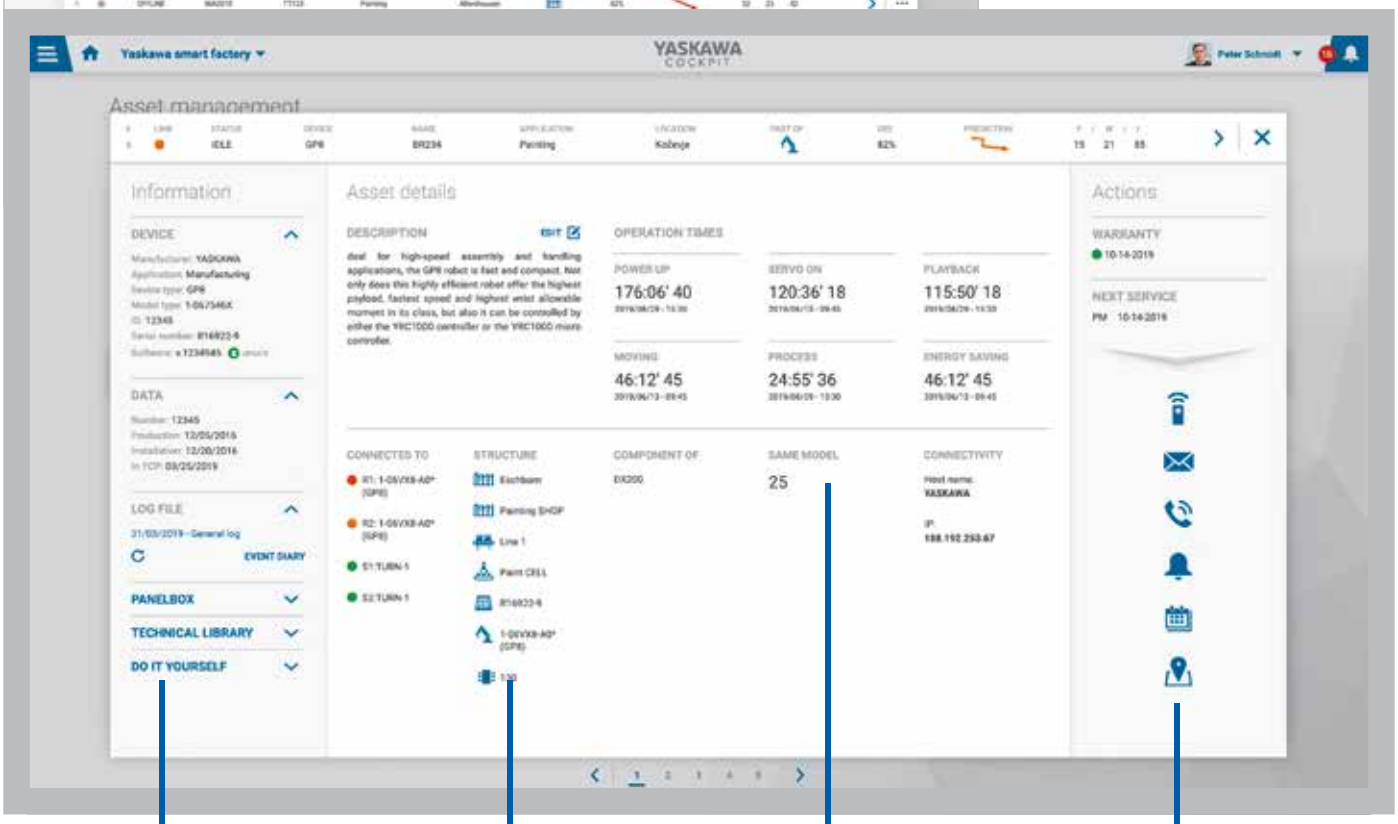
Asset Management

Much of the interesting information about your production line is related to assets – the devices and components in your installation. YASKAWA Cockpit allows you to monitor and manage your assets in one place. Connected devices and components are enriched by KPIs, aggregated operational data, activity schedules, knowledge base of documents with do-it-yourself notes, and backup functionalities, all with the objective of identifying potential improvements based on data.

Asset Table

List of all connected devices and their status.

Detailed View



Device information

General device information, including device data, technical library and custom notes.

Structure

Number and type of connected devices and position of each device in the factory structure.

Operational times

Time of operation, moving, playback, and so on for the device.

Action items

Action services to assist you with the product – such as: remote access to device, e-mail, phone support, task schedule, device location on the map.

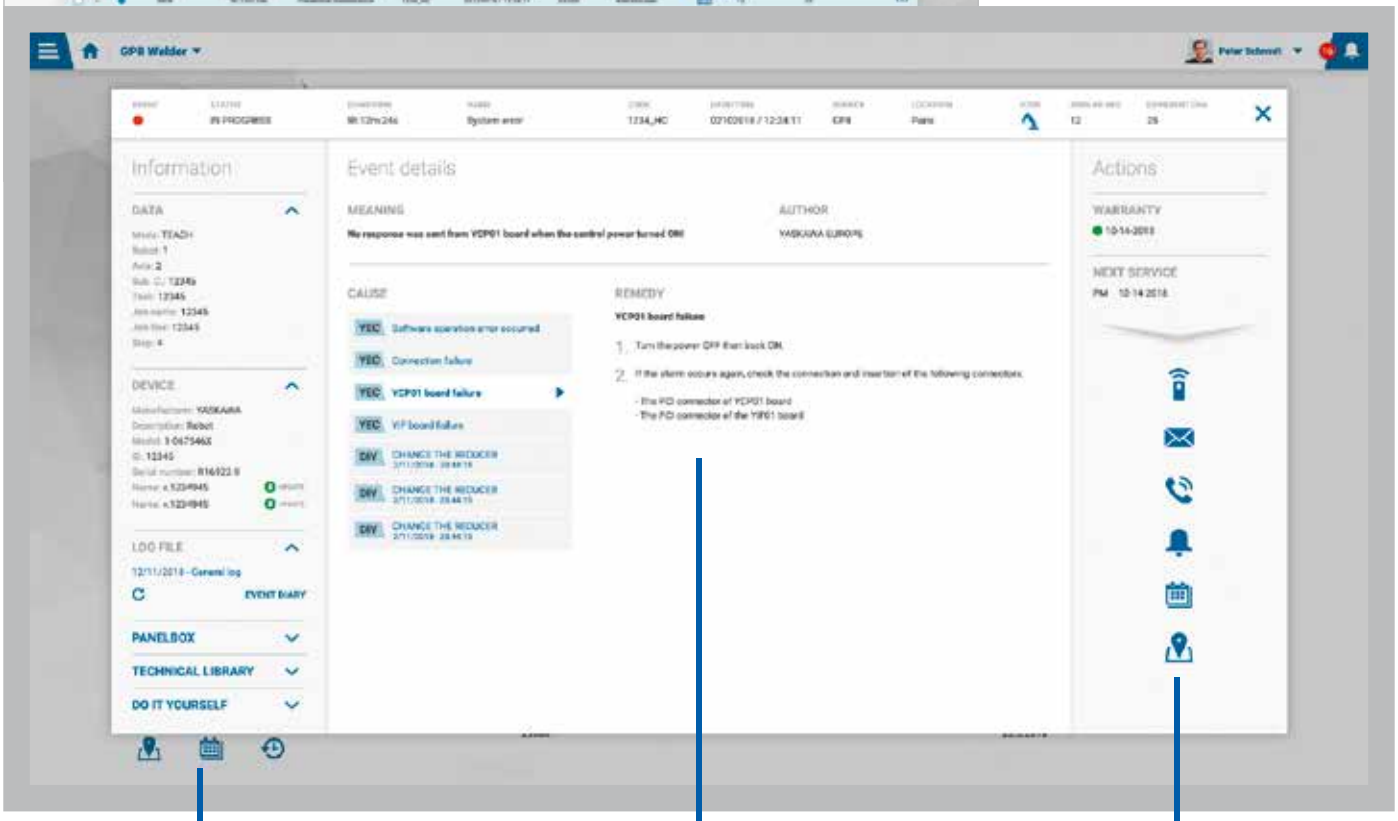
Event Management

Events are any changes in the operational status of your installed devices.
At device level, events usually come through standard communication protocol, mostly using standard protocols like OPC-UA. Examples might include error codes, operating hours, etc. At cell level, on the other hand, they depend on the specific setup and might include part counters, busy/idle signals or process-related quality or performance indicators. YASKAWA Cockpit allows you to transform the signals into meaningful business information which is delivered to you via event notifications.

Table

List of all events, their status and device information.

Detailed View



Technical information

Number and type of device along with log files, backup functionality, technical library of manuals and documentation.

Event details

Meaning and cause of the event, along with all possible remedies for it, as prescribed by YASKAWA or custom entered by the customer.

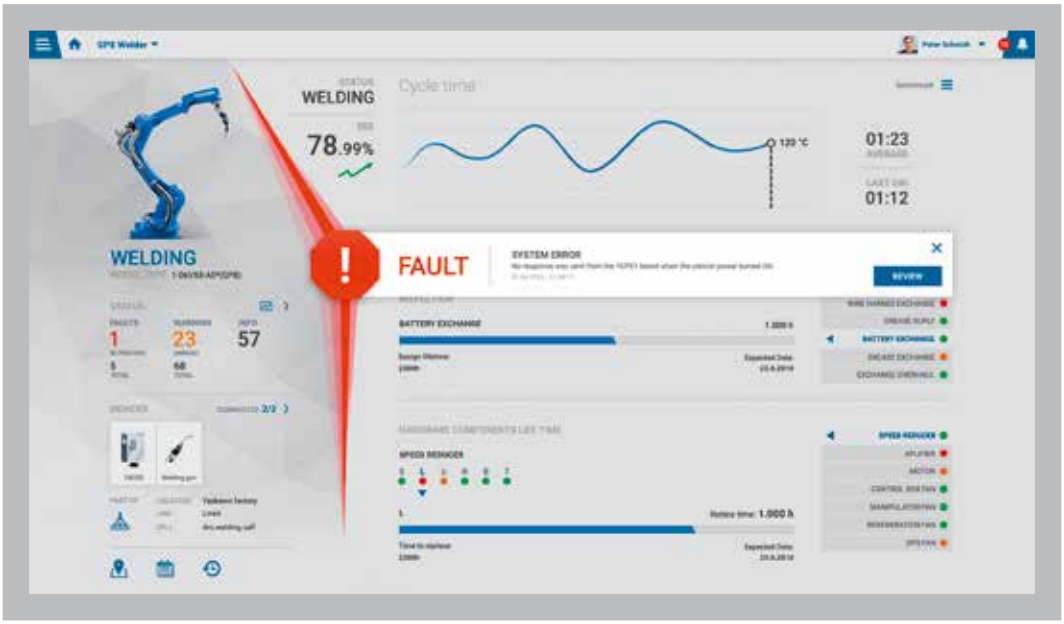
Action items

Action services to assist you with the product – such as: remote access to device, e-mail, phone support, task schedule, device location on the map.

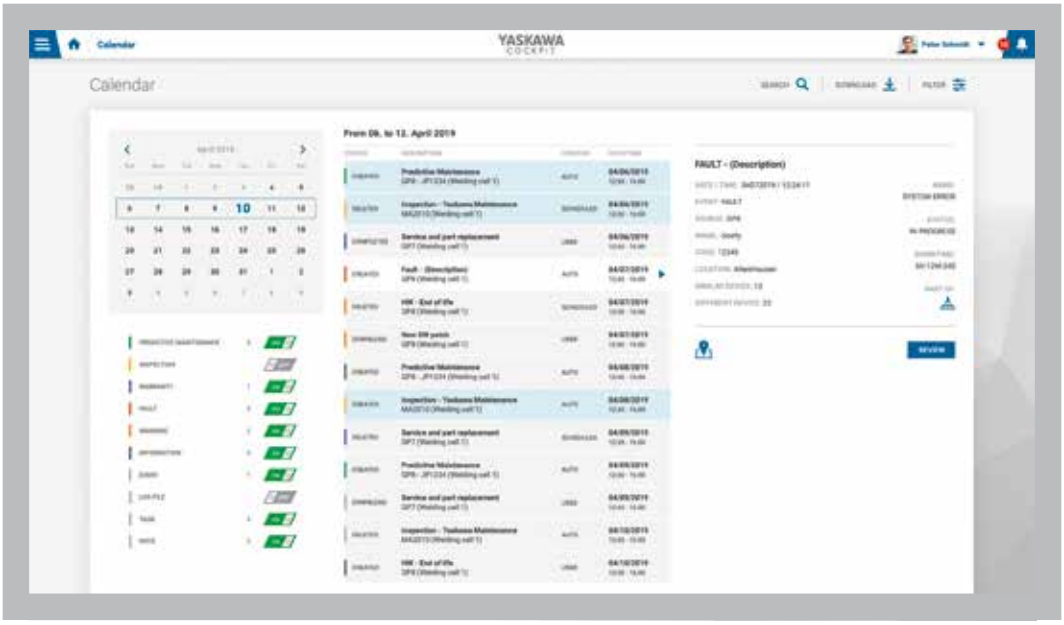
Interventions

In the case of severe problems or even production stops, every second counts. Immediate and efficient interventions save a huge amount of money. YASKAWA Cockpit provides you with all valuable, relevant and concentrated information, precisely where you need it, to speed up error localization and quickly recover from critical situations.
In the case of less urgent interventions which can be scheduled, such as preventive maintenance interventions, YASKAWA Cockpit provides a calendar to help you plan interventions early enough, making sure that resources and information are all prepared to ensure smooth workflows.

Urgent Interventions



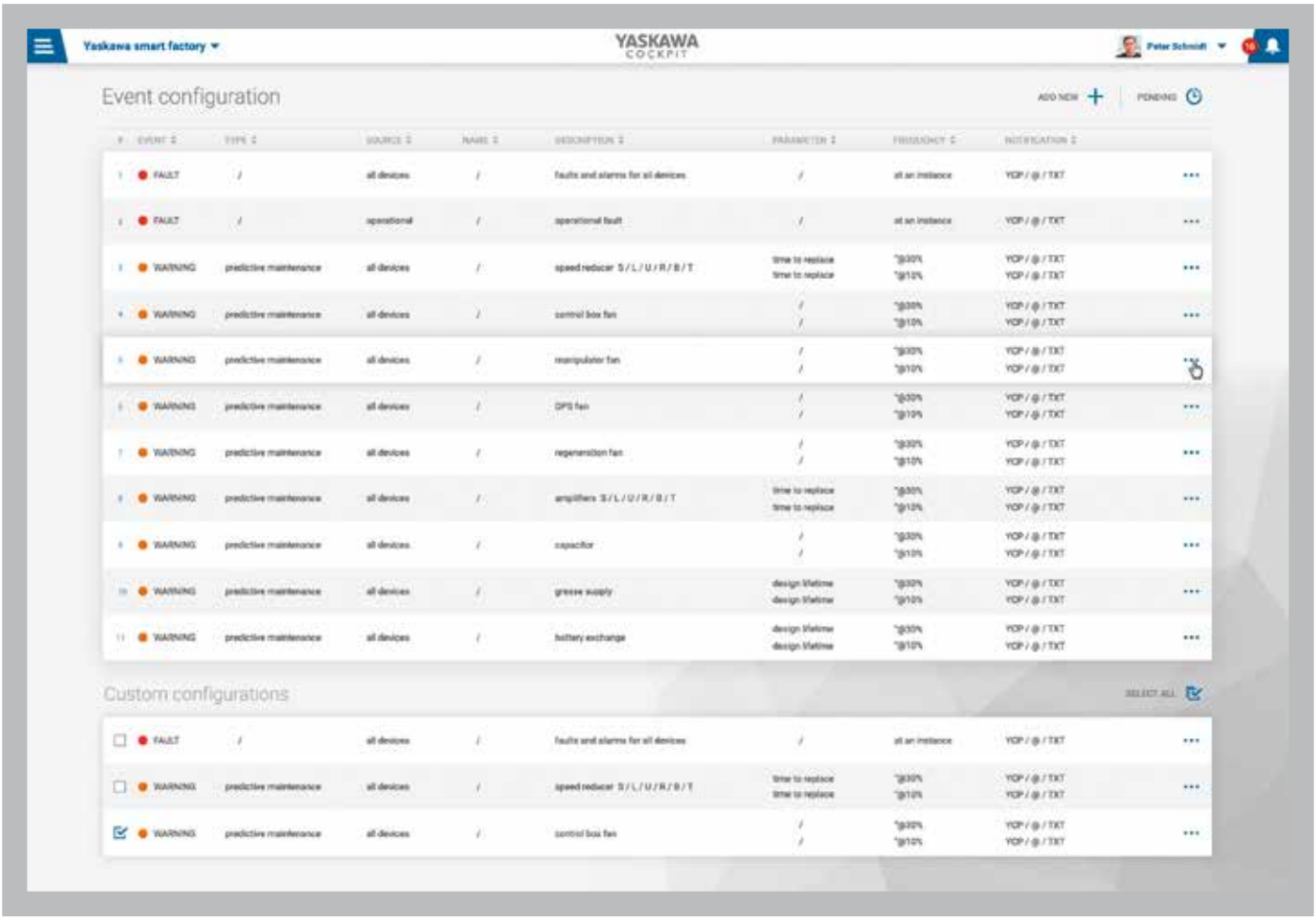
Scheduled Interventions (Calendar)



Customization SDK

The implementation of YASKAWA Cockpit is easier than you think. We supply a Customization Software Development Kit (SDK), which makes customized implementation easier and prevents you from running into a major, customized IT project for your company. The well-structured HMI, data connector tables, diagram type selections, document up-/download functionality and user management tables help you to do most of the implementation either by yourself, or to reduce our individual implementation support efforts drastically. We believe that not only your production system, but also your software needs a reasonable return on investment.

Event Configuration



Events can be displayed or sent as notification e-mails or text messages. Some faults, warnings and notifications are pre-defined, but the customer can also add events and connect them to graphical representations on the screens or notifications.

Toolkit Limitations

The Configuration Toolkit comes with a basic set of graphs, diagrams, tables and icon upload/download features. If you find those boring, or if you need more ambitious, sophisticated, animated, or customized design toolkits – come and talk to us.

Software Modules

Projects and customers are different in terms of production assets, devices and implementation skills. Our product portfolio addresses these different needs with product and support bundles.

Licensed Software Packs (Functions)*

BASIC	ADVANCED	PREMIUM
Data Security	Data Security	Data Security
Cyber Security	Cyber Security	Cyber Security
Management View (dashboard)	Management View (dashboard)	Management View (dashboard)
Panel Box	Panel Box	Panel Box
Asset Table	Asset Table	Asset Table
Event Table	Event Table	Event Table
Performance KPI	Performance KPI	Performance KPI
Device View	Device View	Device View
Cell View	Cell View	Cell View
Documentation (upload files)	Documentation (upload files)	Documentation (upload files)
Calendar/Diary View	Calendar/Diary View	Calendar/Diary View
	Notifications (@SMS)	Notifications (@SMS)
	Scheduling	Scheduling
	Prediction KPI	Prediction KPI
	Export Data	Export Data
	User Management	User Management
		Factory Map
		Predictive Maintenance
		Event Configuration

Options

Software/Hardware

Public or Exclusive Device Drivers **

Configuration Software Kit
(incl. API for developers)

PC Hardware Package
(for on-premise/on-site installation)

OPC-UA Server

One Time Installation Support

Consulting / Blue Print

Analysis of infrastructure, implementation consulting, to-do list for customer for connection of all devices.

* including software version maintenance.
** asset from our existing public driver portfolio and based on a supported communication protocol, e.g. OPC-UA.

Technical Specifications

Below is a sample of hardware specifications for a single cell setup, with up to 10 devices connected to YASKAWA Cockpit.

Single cell server hardware requirements:

- 64 GB RAM (ECC recommended)
- 2 TB SSD storage (enterprise storage recommended)
- 1 x Intel Xeon family 6-core with hyperthreading
- minimum two ethernet ports

Server operating system:

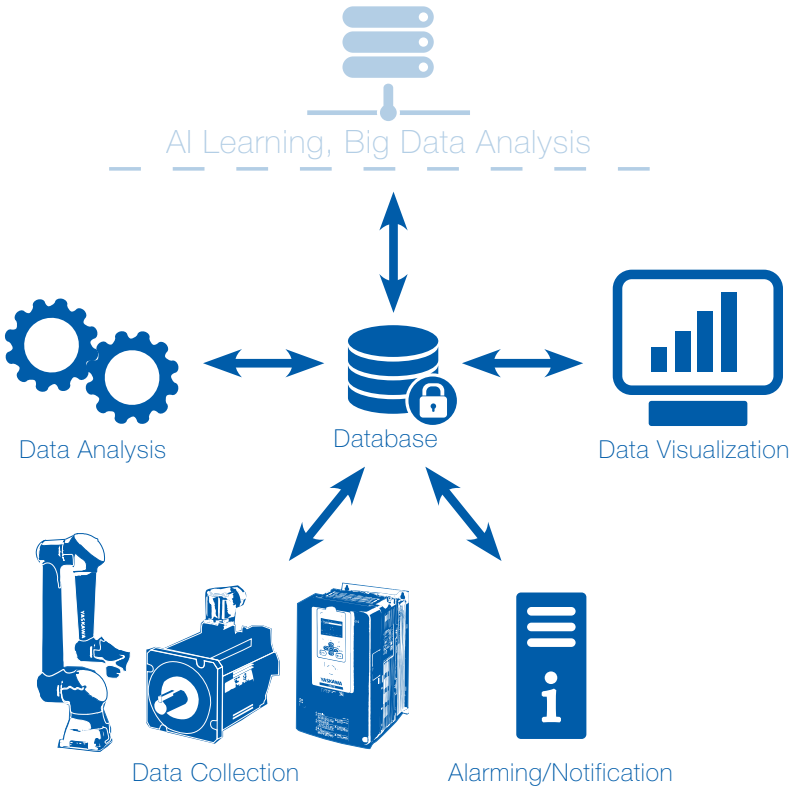
- Linux (Ubuntu 16.04 or newer, RHEL latest version)
- Docker-enabled system

Cloud based system requirements:

- Docker-enabled cloud service
- Processing and storage dimensioned according to factory system size

Client based requirements:

- PC, tablet or smartphone with browser supporting JAVA Script (Chrome, Firefox)



Use Cases – Robotics

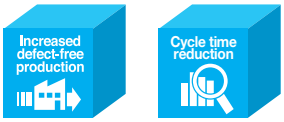
Collaborative Robots Assembly Line

In this example, we have connected several 3rd-party componets to demonstrate the possiblities of the YASKAWA Cockpit. User safety is guaranteed by the integration of PILZ safety mat and allows the robot to switch from collaborative to industrial working mode. The visualization of screwdriver status and gripping forces together with the condition monitoring of the robots and display of working status allows a full overview of the assembly line.

Here is a collection of YASKAWA Cockpit use cases.
With every installation we learn more from you, and we make sure that this new experience flows into future software releases.

Vision-Guided Robot with AI Learning

A vision-guided robot can autonomously pick random items of any shape out of a set of boxes with high accuracy and hit rate without the need to teach it beforehand. Production, vision system and robot data are displayed in the YASKAWA Cockpit.



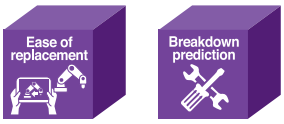
Arc Cell with Error Recovery

Even more complicated components, such as the welding equipment in this cell, can be tracked with the YASKAWA Cockpit.
In this way, you can keep an eye on all welding parameters or consumables at any time.

Use Cases – Drives & Motion

Predictive Maintenance for Servo Drive Components

The remaining life time of the product, based on cycles, capacitor information, surge prevention circuit and dynamic brake circuit, is tracked and analyzed. The system recommends planned maintenance dates.
This is applicable from single motors to the six motors of an articulated robot.



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AC Drive Controls and Minimizes Machine Vibrations

An integrated torque monitor detects vibrations in a compressor.
The AC Drive applies reverse phase torque to compensate incurred vibrations. This results in automatic noise reduction, minimized machine vibrations, less material stress and higher reliability.

Failure Prediction for Fan Applications with AC Drives

The AC Drive acts as an intelligent sensor, enabling failure prediction and predictive maintenance planning with real-time data monitoring. This saves time and money for the maintenance of units and production lines. Automatic detection of clogged filters and service before the problem appears (either cleaning or replacement).
This is visualized by measuring the electric current in the motor and displaying it in the YASKAWA Cockpit.

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