

ActiveCockpit – interactive communication platform



Processing and visualization of manufacturing data in real-time

ActiveCockpit – what does it do?

Efficient production processes require continuous improvements, particularly in an ever more networked, highly-variable factory environment. For optimal fault and deviation management, it is important for users to have fast access to complete and comprehensive data. This enables them to react quickly with minimum effort – both on production lines and within the company.



In order to improve the handling of this great diversity of data, Bosch Rexroth equipped an Industry 4.0 assembly line with interactive touchscreens and the ActiveCockpit software in 2014 for the first time.

Factory of the Future

Now. Next. Beyond.

PRODUCTION AND IT ARE GROWING TOGETHER, A HUMAN OVERVIEW IS MAINTAINED

The factory of the future will be almost fully networked and entirely flexible too. In the face of the increasingly more complex, detailed processes and data quantities, the major challenge will be maintaining an overview. Intelligent dialog between humans, machines and products therefore plays an ever increasing role in the technical implementation of Industry 4.0. The merging of manufacturing and company IT, the synchronization of processes and machines that make decisions autonomously in real time enable efficient, customer-specific manufacturing processes.

As leading provider of Industry 4.0 solutions, Bosch Rexroth is drawing on its user experience in manufacturing – this also applies to the use of interactive touchscreens for the ActiveCockpit industrial software. As a future-oriented platform for manufacturing, this solution provides all relevant data directly at the production location.

MORE WORK FLOW EFFICIENCY BY CONSOLIDATING INFORMATION

A glimpse at typical manufacturing processes demonstrates how many different data sources the user has to take into account: Information regarding stock and pending orders can be retrieved from the PC in the production planning department. Condition and quality data are documented manually on various boards. Users maintain their personal calendars individually. They also have to be able to operate the user interfaces of the line control and various machines as well as start processes manually.

Via open interfaces ActiveCockpit continuously gathers, processes and filters all the manufacturing data from existing system environments and several data sources. The latest quality and manufacturing key figures are displayed in realtime on the touchscreen and can be directly analyzed on-site.

So all the staff who are involved at the factory always have the current figures available which provide the basis for enhancements and new standards. Deviations from specified production parameters are displayed in the key figures and immediately initiate the improvement process.

TRANSPARENT AND USER-FRIENDLY

The system can at all times display all the data that is relevant for manufacturing – from availabilities and production times to quantities. With the display and interaction capabilities of ActiveCockpit, all relevant information can be directly utilized at the assembly line. This not only saves time and costs, it also increases productivity and competitiveness.

ActiveCockpit is completely interactive: whiteboard, escalation, e-mail, explorer, and up-to-mobile functionalities facilitate more efficient decision-making processes. Welcome to the factory of the future.



Design Ottenwälder & Ottenwälder

In 2014 Bosch Rexroth already won the Industry 4.0 Award for the best combining of man, machine and processes – as both the provider and user of an assembly line which had ActiveCockpit as its core component.



ActiveCockpit was awarded the "German Design Award – Special Mention" for Excellent Product Design by the German Design Council in the Human-Machine-Interface category.

ActiveCockpit – optimize your production quickly and efficiently with real-time data

INDUSTRY 4.0: PRODUCTION AND IT ARE GROWING TOGETHER



- ▶ Manufacturing data are combined and visualized directly on-site at the factory
- ▶ Optimizations can be quickly discussed within the team
- ▶ The clear identification of deviations in the manufacturing process enables quick decision-making
- ▶ Standardized meeting procedures: participants, structuring of key figures, automatic reports

RECORD DEVIATIONS ON-SITE



- ▶ Process deviations are immediately visualized on-site via an intuitive interface
- ▶ The data is automatically forwarded to the responsible employees, so the improvement process starts straight away
- ▶ Malfunctions can be registered directly on-site and shared with colleagues via ActiveCockpit, e. g. a photo of defective components
- ▶ Optimizations can be implemented more quickly in order to increase productivity

CHECKS DURING OPERATION



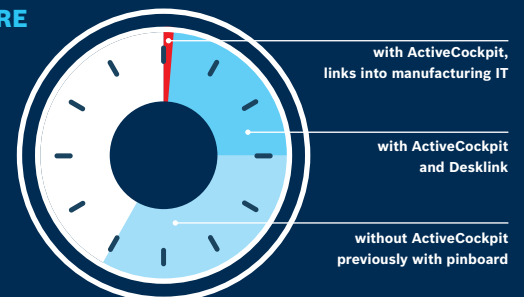
- ▶ Staff members access their order list and update the processing status directly at the assembly line
- ▶ Cancellations and prioritizations are passed on to the responsible departments with one click via the memo function or via email
- ▶ Deviations from quality and safety standards can be instantly visualized via widgets
- ▶ Fast communication within the team

CUSTOMER VALUE AND BENEFITS

The latest consistent key figures facilitate quicker and more efficient decision-making on the shop floor.

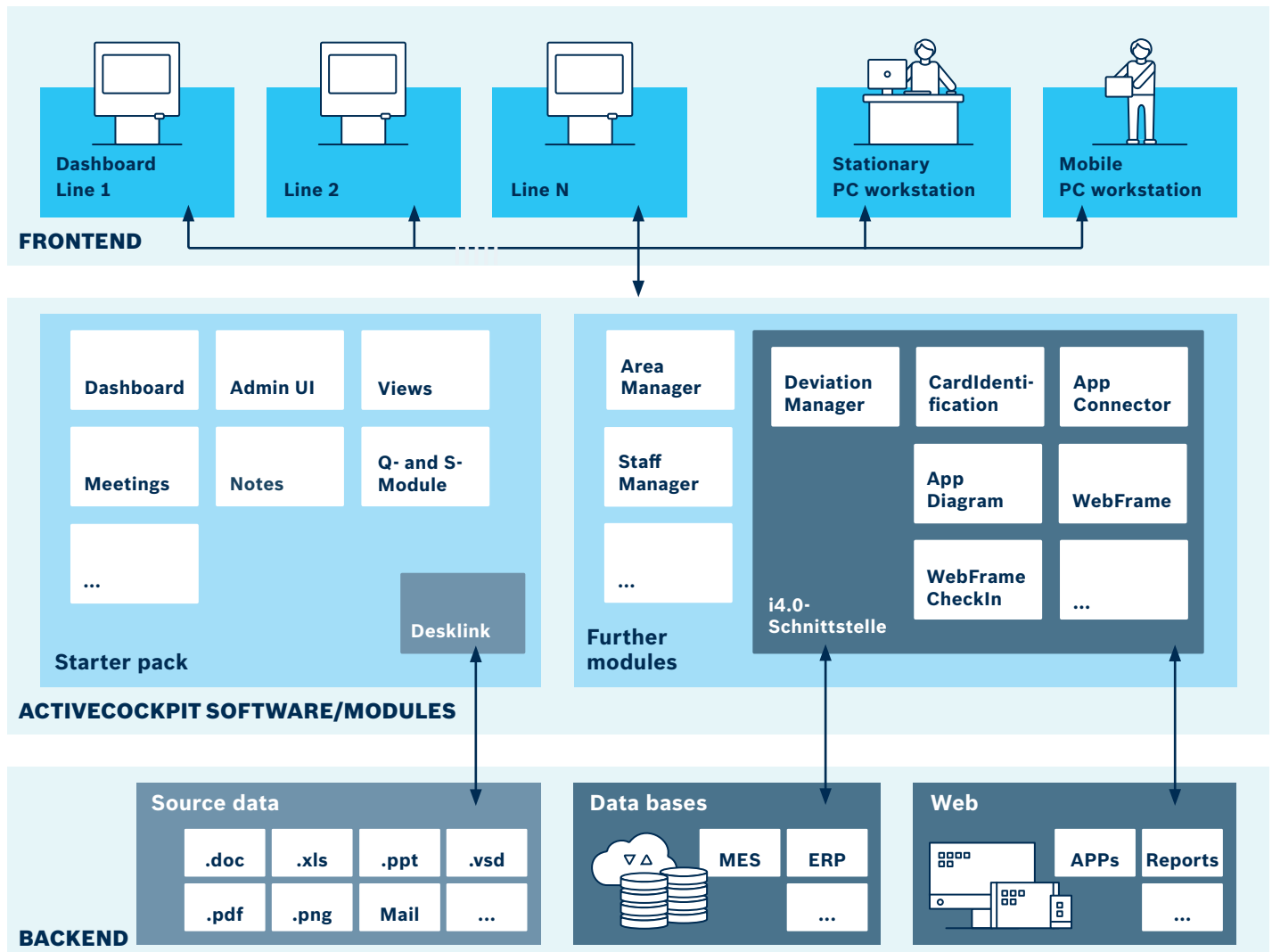
- ▶ Direct linking to back-end systems (ERP, MES) saves time and helps to avoid malfunctions
- ▶ Customer-specific web applications can be integrated as widgets
- ▶ Communication and information tool for all levels of staff
- ▶ Structured and documented team discussions
- ▶ Simple configuration thanks to intuitive web application
- ▶ Automatic report functionality helps to save time
- ▶ Compact design

TIME EXPOSURE



ActiveCockpit – technical architecture and functionalities

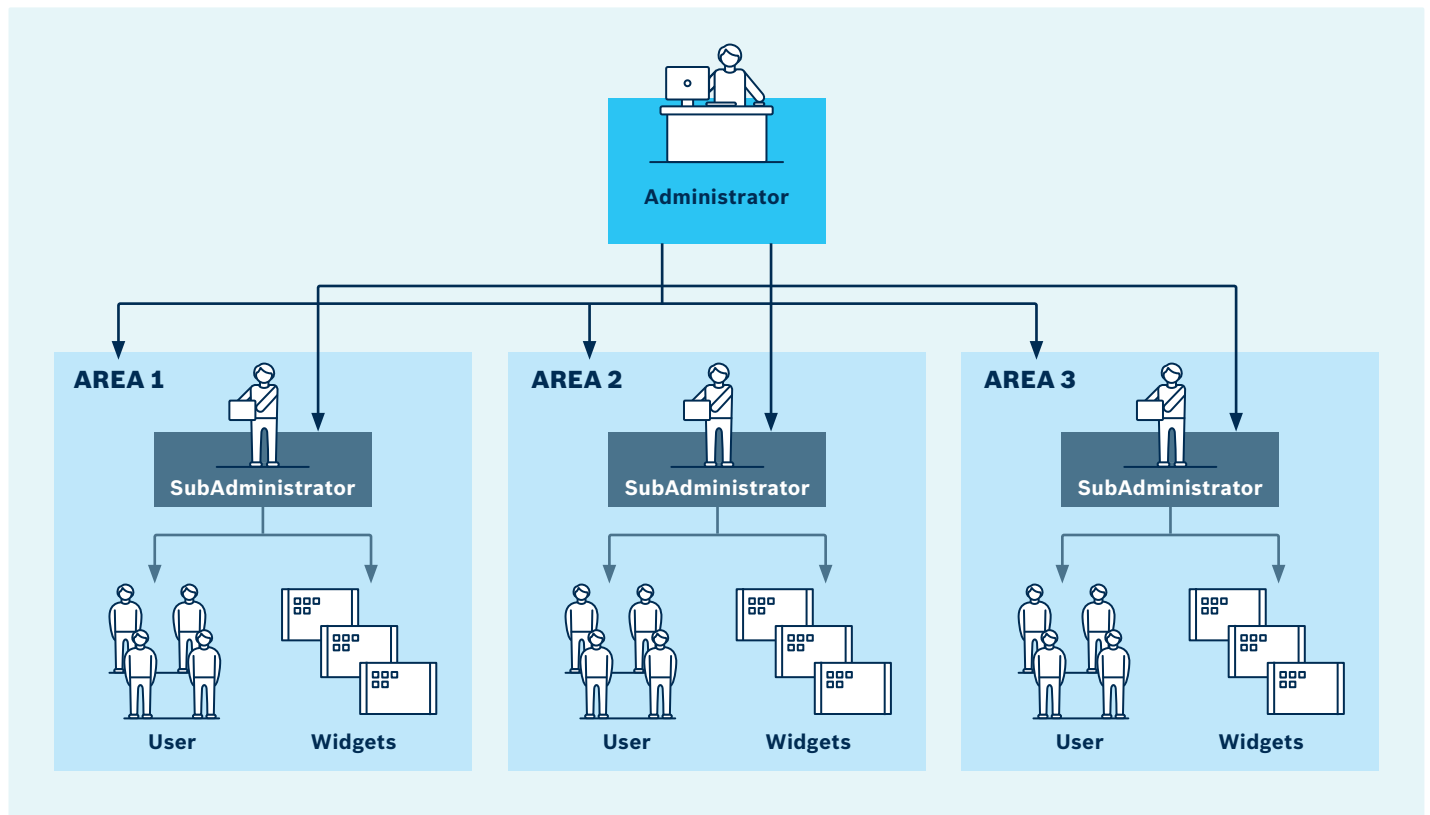
Full transparency, simple standards: ActiveCockpit is consistently designed with simplicity and rapidity in mind. Installation takes no time at all as this is done on the customer server without any changes to the IT infrastructure. As a web application, ActiveCockpit can be scaled simply by means of user licenses. Databases, MES etc. are connected via connectors, upgrades can be realized quickly via additional modules and due to the open networking, users have direct access right up to the data in the backend. All this means it's easy-to-use all round, so to speak.



AREA MANAGER

ActiveCockpit enables rapid roll-out across several areas or even plants or beyond:

- ▶ Increasing the degree of standardization
- ▶ Creating maximum transparency across various areas
- ▶ Improvements are set up quickly and safely
- ▶ Hierarchical user and content management
- ▶ Organizational separation promotes clarity and better delineates responsibilities
- ▶ Releasing widgets between areas facilitates cross-hierarchical working
- ▶ Separate dashboards for every area can be configured individually



ActiveCockpit – far more than the basic configuration

ACTIVE COCKPIT STARTER PACK

Dashboard

- ▶ All relevant data available on-site in digital form
- ▶ Display of information in many different data formats (e.g. Excel, PowerPoint, video)
- ▶ Accessible for all staff members

Views

- ▶ Quick preparation of data and documents, e.g. for improvement meetings
- ▶ Individual assignment of user permissions, e.g. read, edit, delete
- ▶ Information can be displayed and used on an interdepartmental basis, documents are updated via Desklinc
- ▶ Relevant information can be filtered and displayed without modifying the original file

Meetings

- ▶ The operator can assign individual names to factories
- ▶ Documentation of meetings with freely selectable elements and individually definable structure
- ▶ Automatic creation of reports with all relevant information and appendices dealing with the discussed topics

Notepad, whiteboard functionalities

- ▶ Memo function for communication with colleagues or escalation meetings
- ▶ Annotation functionalities via touchscreen (highlighting), comments directly within the ActiveCockpit environment
- ▶ Display and transmit relevant information (e.g. by taking photos of malfunctions with a tablet and transmitting them to ActiveCockpit for processing)



Lean production made easy: The ActiveCockpit starter pack offers a wide range of tools to permanently improve manufacturing processes and increase their efficiency. Easy to understand presentations of relevant data are transparently edited for maximum user-friendliness – so you can enjoy the benefits of basic implementation right away!

FURTHER MODULES

Q- and S-Module

- ▶ Record and manage quality and safety deviations
- ▶ Display of current condition by means of a capital Q (quality) and/or S (safety)
- ▶ Annual overview of quality and safety conditions covering all months of the year
- ▶ Values can be transmitted back to ERP and MES systems via the Industry 4.0 interface

Desklink

- ▶ Fast digitization of data in various file formats, e.g. Excel, Word, PowerPoint
- ▶ Data is automatically updated
- ▶ Interactive status change for widgets

Webframe

- ▶ Quick integration of third party apps

StaffManager

- ▶ Fast coordination and sharing of personnel capacities
- ▶ Export of data showing external personnel capacity requirements, for processing in external systems as required

DeviationManager

- ▶ For assigning and tracking deviations
- ▶ Data import from MES via web service for simple processing
- ▶ Clear display of assigned deviations (status, priority, follow-ups) for the staff members



With up-to-date and consistent key figures, decisions can be made quickly and efficiently on the shop floor.

Further information on ActiveCockpit software and modules can be found at the Bosch Rexroth Website:
www.boschrexroth.com/activecockpit

ActiveCockpit – additional functions according to customers' requests

The comprehensive digitization of processes is opening the way to networked architectures in line with Industry 4.0 standards. An open interconnected architecture means that ActiveCockpit from Bosch Rexroth can offer possibilities for implementation of embedded apps or integration with those of third parties.

INDUSTRY 4.0 INTERFACE

- ▶ Real-time interconnection of ERP and MES back-end systems with your existing configuration via standardized interface
- ▶ All relevant data and integration options are customized for easy and safe networking

MODULES FOR FUTURE-PROOF SOLUTIONS

Numerous additional functions via apps – e.g.

- ▶ **Connector** for integrating self-developed applications into ActiveCockpit
- ▶ **Diagram** for real-time integration of data from back-end systems through to the clear and intuitive displaying of key figures
- ▶ **Process Quality Manager** for instant identification of deviations and errors in the production process

USER IDENTIFICATION

- ▶ Simple system login using employee ID card

CUSTOMER-SPECIFIC SERVICES

- ▶ Bosch Rexroth offers project-specific services for users which go far beyond regular engineering services, such as the development of a value stream design module

FAST INSTALLATION

- ▶ ActiveCockpit can be installed within 24 hours





DATA SECURITY

- ▶ All data including e-mails are encrypted and transmitted via SSL
- ▶ The application uses "defensive coding" methods – all inputs are checked beforehand
- ▶ A defined roles and permissions concept controls access to the system and prevents data input errors
- ▶ All passwords are encrypted. All user inputs are checked for correctness and malicious code
- ▶ Indirect data base enquiries prevent potential attacks ("SQL injections")

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