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Dashboard for a buffer and distribution system

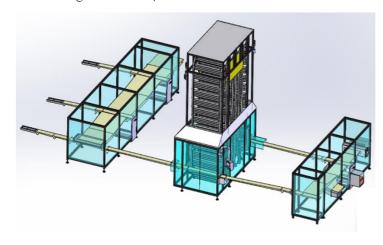
Customer profile

Together with our sister company ICS Mechanical Eng. AG we supply buffer, handling and conveying systems for the food and non-food industry worldwide.

Starting position

For a chocolate manufacturer in Switzerland, we had the privilege of jointly supplying a complete distribution system, from the transfer from the molding plant to the distribution to three packaging machines.

Thanks to the centrally located gondola buffer, the production can be decoupled from packaging, thus increasing the overall performance.



Focus on maintenance

The large number of servo drives, actuators and sensors poses a major challenge for the customer's operational maintenance. To support maintenance, a dashboard application was developed that records the most important drive data, displays it graphically, evaluates it further and calculates the key indicators relevant for the customer.

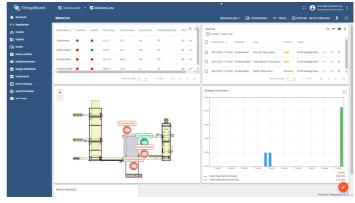
With the help of a dashboard, the maintenance team can check the system at any time and view the data relevant to them from anywhere.

Customer benefits

In addition to maintenance, individual dashboards can also be combined and designed for other user groups. Via control chains, data can also be combined and evaluated, which enables a user-specific reporting system. Thus, for example, information about faults or conditions can be sent to defined users or forwarded to third-party systems such as maintenance tools, where they are finally further appropriate evaluated with software (predictive maintenance).

In parallel with the display and processing of relevant production and operational data, the focus is on flexibility, ease of use and individuality. In order to gain a benefit, the customer himself chooses which tools he needs and where:

- Visualization of the recorded values
- Evaluation of drive data
- Power and energy measurement
- Alarm and message system
- Freely definable control chains
- Freely definable dashboard interfaces
- Data supplier for maintenance tool
- Device-independent access to the plant
- Tools for maintenance and production
- Support during operation





Production and machine data everywhere and at any time

Concept / solution

A motion controller from Schneider (PacDrive) was used to control the logic and drive part of the system. This controller combines classic motion applications with proven PLC functionalities and offers a wide range of interfaces.

In this project, the desired drive and production data are sent via OPC UA to the dashboard application, which is based on "ThingsBoard.io".

ThingsBoard.io is an open-source tool, available free of charge in its basic version and still providing all required functionalities. A paid version was deliberately omitted, as it offers extras that are rather unimportant for us, such as free design of frame, logo and graphics.

Flexible, customized & expandable

Special value was placed on the independent expandability. The goal was to develop a tool that can be set up independently by the customer and configured user-specifically.

To achieve this, an application based on ThingsBoard.io was implemented, which can be operated device-independently in a docker installation.

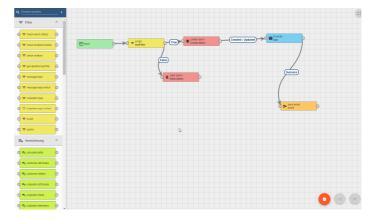


From the IT point of view, this solution combines relevant advantages such as:

- Open Source
- Customized
- Completely web based
- Device independent (OnPremise / Cloud)
- Connectors for various technologies (OPC, MQTT, BACnet, ODBC, Http, etc.)
- Operation in microservice infrastructure

For the customer, the enormous flexibility results in advantages such as:

- Independent compilation of the desired dashboards and charts
- Large selection of widgets and other freely available components
- Creation and editing of control chains
- Definition of message classes
- Definition of users & authorizations
- Configuration of alerting rules
- Creation of additional trend curves
- Data exchange via MSG command



The main **challenges** were:

- Cost-effective yet expandable solution
- Device independent operation
- Capture of high data volumes
- Scalability
- Clearly structured but freely configurable
- Configurable even without IT know-how