First ToolCommander® equipment control for Beneq Oy

"The flexiblity of the ToolCommander® and the experienced Kontron AIS engineers were the key aspects for the success of the project. We are looking forward to continue the excellent cooperation with Kontron AIS team."

Pasi Meriläinen, Beneq Oy

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BENEQ

ToolCommander®

Beneq Oy
Espoo, Finland

Platform:
ToolCommander®

Project:
Integration of a Beckhoff PLC with ToolCommander®

Kontron AIS services:
Windows 10, TwinCAT, CC-Link

Goals

❯ Control of the ALD equipment with ToolCommander®

❯ High software quality and easy commissioning

Challenge

❯ Support of single wafer batch and batch processing

❯ Custom horizontal and vertical interface

Solution

❯ Creation of a solution for future equipments

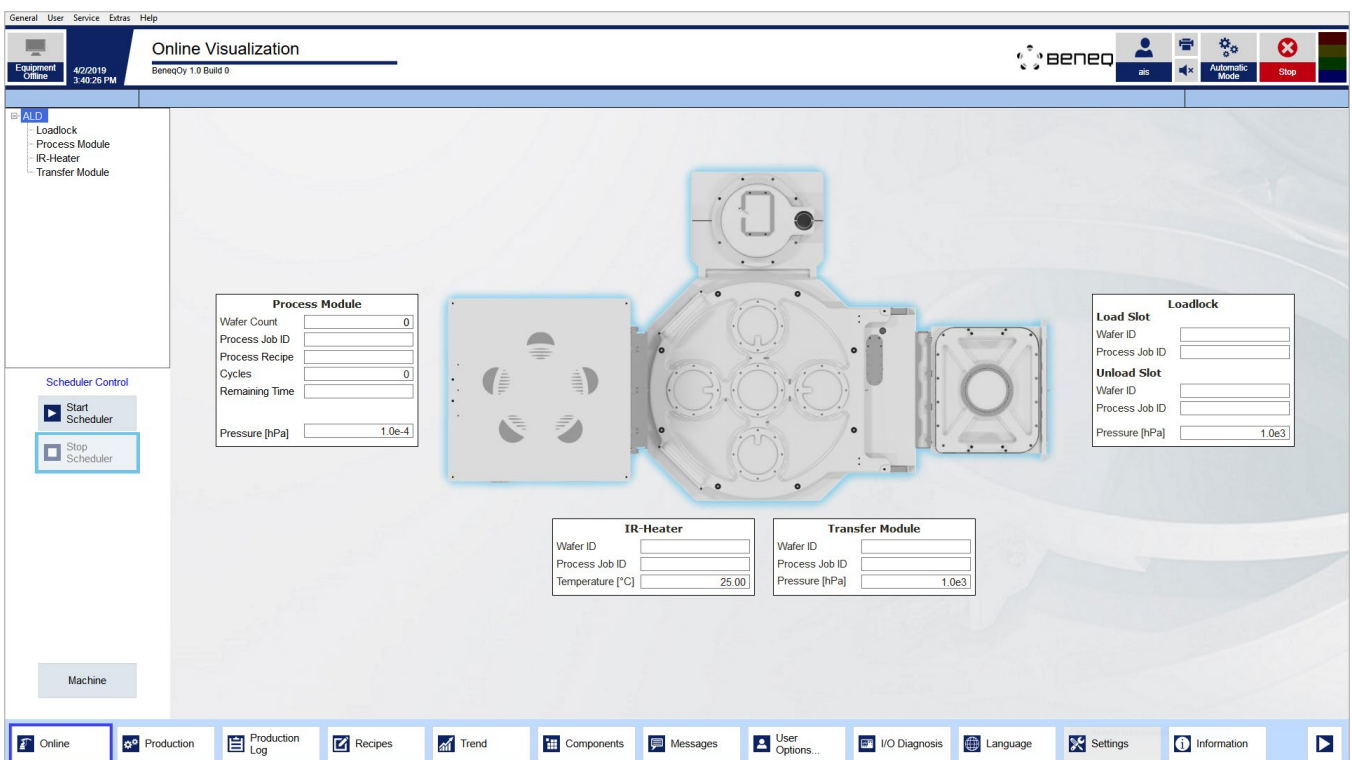❯ Delivery of the control software ToolCommander® in time and budget

The first ALD (Atomic Layer Deposition) equipment from Beneq Oy with the Kontron AIS software framework ToolCommander® for equipment control was put into operation at the end customer. It was pre-tested in the Beneq Headquarter, in Espoo (Finland). The coating system is now used in China in a cluster for OLED microdisplay production. The Beneq Oy system consists of a heater, loadlock, transfer module and a process module, which is controlled by Beneq.

A special feature is that single-wafer processes and batch processes can run in the system. In addition to the equipment control solution using the ToolCommander®, Kontron AIS also realized a custom host integration protocol.

Solution

The ToolCommander® software framework from Kontron AIS GmbH is an universal equipment control framework supporting the control of batch, cluster and inline systems. In this project, Kontron AIS utilized the existing functionality of the ToolCommander® as the scheduler functionality and the user interface. In a custom project, the integration of the Beneq Oy Beckhoff PLC controlling the ALD process was realized. The Beckhoff TwinCAT protocol is used for the communication between ToolComander® and the Beckhoff PLC, allowing an easy integration. In addition to the integration of the Beckhoff PLC, ToolCommander® controls several components, e.g. the load lock or the pumping system of the transfer module directly. Direct control is achieved by using a distributed I/O station and by control via TCP/IP interfaces, for example.

The end customer in China defined for the vertical host integration a custom interface protocol. The protocol is generally similar to the SECS/GEM standard, but the streams and functions are custom. Therefore, the Kontron AIS integration team developed a customized message adapter.

The horizontal integration into the main cluster was realized by CC-Link. The CC interface was also developed by Kontron AIS.

Project kick-off was at the end of the year, and the first step was a solid specification written by Kontron AIS in close collaboration with Beneq Oy. Part of this specification process was also the specification of the test scenarios. Due to the tight schedule, agreed parts of the specification were already developed by Kontron AIS before the specification was finalized. The next step was the in-house testing by the Kontron AIS test department, using the ToolCommander® simulation capabilities. After passing the in-house test, commissioning and pre-test were executed at Beneq Oy.

During this project phase, Kontron AIS was in a very close cooperation with the developers from Beneq Oy. About six months after the kick-off, the system was shipped to China and were it was finally commissioned by Beneq Oy and Kontron AIS.

About Beneq Oy

Beneq is the home of ALD, offering a wide portfolio of equipment products and development services. Today Beneq leads the market with innovative solutions for flexible high-volume manufacturing (BENEQ TransformTM), advanced R&D (TFS 200, R2), ultra-fast high precision spatial ALD coatings (C2R), roll-to-roll thin film coating of continuous webs (WCS 600), and specialized batch production for thicker film stacks (P400, P800).

Headquartered in Espoo, Finland Beneq is dedicated to making ALD technology accessible for researchers and providing the invisible advantage in emerging semiconductor applications.

For more information please visit: **www.beneq.com**

About Kontron AIS GmbH

We set the benchmark in industrial software – for more than 30 years and with an experienced team of over 200 employees. Our proven software products and customized digitalization solutions enable machine and equipment builders as well as factory operators to break new ground in automation and secure long-term competitive advantages. Together with our customers we implement worldwide cross-industry, intelligent digitalization strategies and solutions for the smart manufacturing of tomorrow.

As a subsidiary of the Kontron AG, we offer integrated, end-to-end IoT concepts consisting of hardware and software as well as worldwide project management, service, and support thanks to a global network.

For more informationen please visit: **www.kontron-ais.com**