Process remote control with tablet PC and Aprol on LINUX

CHT
SMART CHEMISTRY WITH CHARACTER.

CHT Germany GmbH combines the multifunctional BAR-TEC Agile X Tablet PC series with a Linux OS for the mobile visualisation and safe control of processes in the Technical Centre and in Production. Further use cases range from decentralised recording of additional process data to predictive maintenance and Industry 4.0 upgrading of underdeveloped production sites.

The globally operating CHT Group, which was founded over 60 years ago, produces around 170,000 t of special chemicals a year at 25 locations. The innovative function generators, auxiliary materials and additives improve the quality and functionality of textiles, building materials, paper, paints and coatings, cleaning agents and care products. In the course of internal IIoT projects, the group of companies with head office in Tübingen is also testing the BARTEC explosion protected Agile X Tablet PC series in combination with the process control system on a Linux OS.

The user:
- Globally operating manufacturer of chemical function generators, auxiliary materials and additives for industrial processes
- Approx. 2,200 employees, 9,000 customers and 5,000 products worldwide
- Annual production: approx. 170,000 t

The challenge:
- The mobile and safe visualisation and control of processes
- Decentralised data collection and processing for Industry 4.0 and predictive maintenance
- Direct communication with the process control system in potentially explosive atmospheres and non-hazardous areas

The solution:
- BARTEC Agile X PC series for potentially explosive atmospheres and non-hazardous areas
- Linux-based OS for direct Wi-Fi communication with the APROL process control system
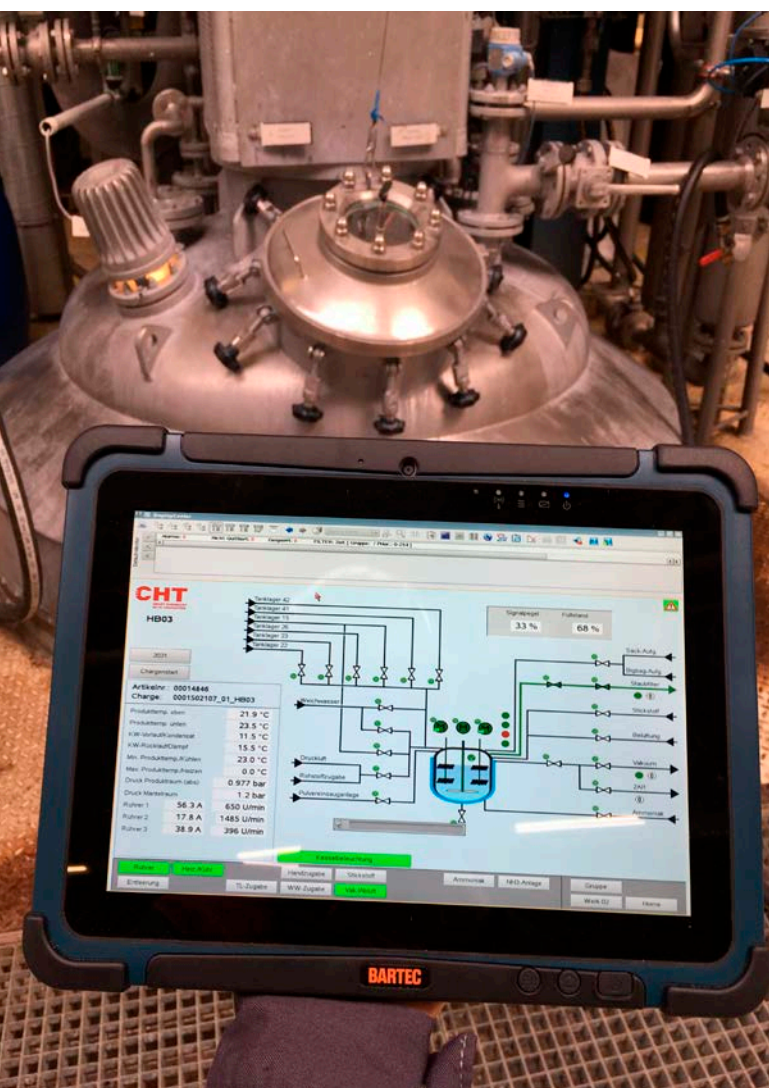- Data recording in real time via Bluetooth LE (e.g. from beacons)

Result and advantages:
- Multifunctional tool for all requirements plus mobile office and integrated functions, e.g. 2D scanner
- Industry 4.0 upgrading of international production sites with little server infrastructure thanks to decentralised real time data access (with corresponding sensor technology and wireless infrastructure)
- Extensive Ex certification: ATEX, IECEx etc.
- Extended connectivity through GSM module (optional)

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Efficiently and safely to batch size 1

With its IIoT projects, the CHT Group is facing growing requirements concerning process reliability, documentation and safety when handling hazardous chemicals. The current ratio of some 5,000 different products to 9,000 customers points to the direction of batch size 1 and required comprehensive modernisation. An automation concept was developed and implemented with special focus on process visualisation, condition monitoring with valid database and greater mobility in the field.

BARTEC Agile X with Linux OS

With an evolutionary Industry 4.0 strategy, CHT is transferring current developments in factory automation to the process industry. As a pilot project for the mobile visualisation and control of processes, CHT is trialling the BARTEC Agile X Tablet PC series that is available throughout potentially explo-

sive atmospheres and non-hazardous areas in the Technical Centre and Production at the Dusslingen site. Grounds for selecting the hardware platform were the good system performance, ergonomics and connectivity. In order to be able to communicate directly and in compliance with the customised APROL process control system from B&R, CHT equipped the mobile device with the Linux OS SUSE Enterprise.

Mobile control of processes in real time

The BARTEC Agile X is connected via Wi-Fi hotspots to the process control system and reflects the status of systems in real time on the handy 10.1 inch touchscreen. This allows staff to see directly in the potentially explosive area on the reactor how changes are affecting the process without the need to switch back and forth between the system and the terminal in the non-hazardous area or to deploy a second member of staff. Control loops and valves, for example, can be adjusted much more efficiently in this way.

Predictive Maintenance and itinerant sensor technology

Following the successful implementation of the process control function based on Linux, the Agile X Tablet PC series will now also be used as a rugged multifunctional device for predictive maintenance and detecting itinerant sensor technology. Günther Schätzle and his team understand itinerant sensor technology to mean measuring equipment with autonomous energy supply and radio data transmission that is integrated for short periods in manufacturing processes in chemicals production. In this way data such as temperature, pressure, flow rates, fill levels, vibrations etc. recorded by special sensors and beacons can be made directly visible on the system and transmitted automatically by radio transfer to the Aprol process control system for documentation and evaluation. The mobile system permits rapid changes and adjustments to the measuring task in the field and significantly reduces investment costs in process-related measurement technology and installation. With this concept, manufacturing processes can be observed and optimised in greater detail and the effects of wear can be systematically detected in line with predictive maintenance. Using the Agile X Tablet PC, in the present project phase functionalities are being tested with various manufacturers of measuring equipment and the system safety validated.

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Finding the right data for big data

Approx. 0.8 TB of process-related data are recorded annually at the Dusslingen site. The data must be evaluated within a system context to obtain meaningful analyses of processes and enable information for predictive maintenance to be derived from these. "During a ramp-up, for example, the combination of tablet PC and itinerant sensor technology helps us determine really relevant data", explains Günther Schätzle, Head of Technology at CHT. The powerful analysis tools run in the background in our Aprol process control system, which we can access at any time using the mobile tablet from Bartec.

With this mobile topology, we see a genuine opportunity in future to upgrade and network our global sites for Industry 4.0 applications directly and cost-efficiently with less server infrastructure using the IT."

Result / outlook

Günther Schätzle believes that the predictive maintenance with mobile terminals will make a lasting improvement to working and process reliability and will facilitate cost savings. He sees greater potential still in the "itinerant sensor technology" deployed by his team. Processes can temporarily be very intensively monitored and systematically optimised with minimum installation effort. "For fast implementation we want to get all partners round the table. With its well-conceived Enterprise Mobility solutions, BARTEC is well-placed for this."

„The BARTEC Agile X Tablet PC series makes everyday work in the field easier and safer. It supports the cost-effective introduction of predictive maintenance and simplifies the use of itinerant sensor technology for the fast optimisation of processes."

Günther Schätzle,
Head of Plant Engineering,
Dusslingen site, CHT Germany.

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