

TOX® software with certified OPC UA communication

Standardized Data Exchange for Networked Manufacturing

TOX® has had the OPC UA interface of its software certified by the OPC Foundation as an OPC UA server. This provides independent verification that the implementation meets the underlying requirements and profiles of this internationally established communication standard. Machine, process, and quality data can be made available across systems via the interface and integrated into automation, analytics, and IT systems.

In networked production, machines and systems are increasingly required to exchange data with higher-level systems. OPC UA (Open Platform Communications Unified Architecture) provides a vendor-neutral communication standard for this purpose. It enables the secure and standardized exchange of data between machines, systems, and higher-level IT systems. TOX® software already supports OPC UA as a standard interface. Certification by the OPC Foundation has now independently confirmed its standards-compliant implementation.

The certified TOX® software is implemented as an OPC UA server. Certification was granted for OPC UA specification version 1.04 for the 2017 UA Server Profile and the Machinery 1.x Information Model. The interface enables machine, process, and quality data to be made available across systems. This allows the TOX® software to communicate, for example, with HMI, SCADA, MES, analytics, and IT systems.

Independent Verification for Users

For TOX®, certification was already part of the plan when the decision was made to support OPC UA as the standard interface. A specific customer project ultimately provided the impetus for its implementation. The reason for this is that companies sometimes define their own specifications for interfaces, which must be met before the system can be deployed in production.

“With this certification, we can provide our customers with independent proof that our OPC UA interface complies with the underlying standard,” explains Tobias Hainmüller, R&D Software Team Leader at TOX® PRESSOTECHNIK. “This means the customer does not have to perform this verification themselves. This can significantly reduce the coordination and testing effort, particularly in the case of large-scale integration projects.”

For the TOX® software, OPC UA communication is part of its middleware functionality. This means that process and quality data can not only be archived locally or on the network, but also transferred to other systems via communication protocols such as OPC UA or MQTT. OPC UA certification provides a reliable foundation for this data exchange.

Thorough Testing of the Interface

The certificate is issued by the OPC Foundation. The required testing is conducted by authorized certification bodies in accordance with the Foundation's guidelines. Throughout the process, TOX® Software Development maintains close communication with the certification body. Test results are analyzed, outstanding issues are resolved, and next steps are coordinated.

A maximum time frame of six months is allocated for the certification process. All required tests must be successfully completed within this period. To prepare, developers can use the Compliance Test Tool (CTT) to simulate tests in advance. This allows potential discrepancies to be identified and addressed even before the actual certification tests take place.

On the TOX® side, the certification was implemented by the software team. Johann Wesely is primarily responsible for developing the OPC UA interface. Christian Kieble is handling the integration with the TOX® software's quality data system.

Clearly Defining Data

A key technical challenge in OPC UA communication is clearly defining the required data and ensuring consistency across the participating systems. Even differences in terminology can complicate data mapping. If data is needed that has not yet been transferred from the controller to the TOX® software, it must first be determined whether this data can be obtained and subsequently made available to the software.

For customer-specific applications, an XML structure is developed in collaboration with the customer based on the required data scope to serve as the foundation for communication. The TOX® software, acting as an OPC UA server, provides the corresponding data and notifies the customer's client, which then reads it. In the certification process, however, a defined server structure is established. Here, the focus is, among other things, on verifying data validity, value ranges, and update intervals.

“Certification goes well beyond simply providing an interface,” says Tobias Hainmüller, R&D Software Team Leader. “During testing, it becomes very clear exactly which data and functions must be available to ensure fully standards-compliant communication. These insights are directly incorporated into our software development.”

Foundation for Further Software Development

The experience gained from the initial certification process will also be incorporated into the future development of the TOX® software. Additional data and functions required to meet the certification criteria have been integrated into the software and the underlying data exchange. This allows TOX® to build upon a foundation that has already been tested when making future changes.

The certified OPC UA communication complements the functions of the TOX® software for networked production. It supports the setup, operation, and monitoring of industrial pressing and joining processes and enables process data to be collected, evaluated, and documented in a traceable manner for quality assurance purposes.

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Image captions:



Image 1: The TOX® software is certified by the OPC Foundation as an OPC UA server. This provides independent confirmation that the interface complies with the underlying requirements and profiles.



Image 2: Through the certified OPC UA interface, the TOX® software provides machine, process, and quality data to higher-level automation, analytics, and IT systems.

Images: TOX® PRESSOTECHNIK SE & Co. KG

About the company:

TOX® is a supplier of presses, systems as well as components for sheet metal joining and assembly technology. Since its foundation in 1978, the family business has become a global player with more than 1500 employees worldwide, over 500 of which are based at the headquarters in Weingarten near Ravensburg, Germany. The success story started with one pneumohydraulic drive – the TOX® Powerpackage. The “Components” division now includes pneumohydraulic and electromechanical drives as well as controls, sensors and software for process monitoring and quality assurance. In addition to a large range of presses, the system range comprises manual, machine and robot tongs. Another mainstay are modern sheet metal joining procedures, also incorporating the TOX® Clinching Technology, which makes the company today’s market leader.

Drives, processes and systems from TOX® can be found at automotive manufacturers and their suppliers as well as at industrial businesses for household appliances, electronic components, furniture and much more. Special versions of the TOX® Drives are also approved for the food industry.

TOX® is represented worldwide: 17 subsidiaries, amongst others in the USA and South America, Europe and South Africa, India, China and the entire Pacific Region. 18 representatives in many other markets support and advise local customers.

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