connecting the world of machine tools
The easier machine tools exchange and share information, the more efficient they are. umati enables machine tools and peripherals to connect to customer-specific IT ecosystems.

How umati works: several machines with OPC UA servers in umati configuration are connected to one IT system with an OPC UA client.
At METALEX 2019, umati partners show how umati as a common interface enables the connection between machine tools and software applications.

The setup follows the OPC UA client-server communication. The machines feature an OPC UA server following a specific design-freeze version of the first umati OPC UA specification. It contains data for the following use cases:

- Identify machines of different manufacturers
- Overview if production is running
- Overview of machine tool state

For reasons of stability and safe data handling within the trade show environment, the setup uses a central data hub.

Every machine connects to this data hub. Software application providers also connect to the data hub using an OPC UA client following the same specification. There, they can access the entire data pool of all machines streaming information and demonstrate how their application helps to create added value from data.

The confluence of the data can be experienced by navigating to the central umati dashboard at https://umati.app.

Every connected machine features a sticker. Scan the QR code or type the shortcut link to access the live data streaming from the machine. Get an overview of all the connected machines at https://umati.app...
setting the standard

Creating a standard with global acceptance is a challenge. umati relies on OPC UA as the global interoperability standard. The standardization work takes place in the umati OPC UA joint working group with the OPC Foundation. This guarantees maximum transparency and the support of a strong global community.

OPC UA and the OPC Foundation

• provide a framework for standardized communication (HOW to communicate)
• allow focusing on defining WHAT is to be communicated (Companion Specifications)
• include a global community for revising the standard
• assist in global outreach by publishing the standard with no license fee.

To get the work done, the umati group focuses on setting a standard for vertical integration of machine tools and production IT ecosystems. In a first version, the focus is on data requiring low update rates (approx. once per second). The following use cases for status monitoring of machine tools are being standardized:

1. Identify machines of different manufacturers
2. Overview if production is running
3. Overview of parts in a job
4. Overview of runtimes for a job
5. Overview of machine tool state
6. Overview of upcoming manual activities
7. Overview of errors and warnings
8. Providing information for KPI calculations
9. Providing data for media and energy usage statistics
10. Providing an overview of tool data

For future versions, higher update rates and further use cases are foreseen:

• Operating status
• Part/material information
• Control data management
• M2M communication (Automation systems)
• Job file management
• Lifecycle information
• Process analysis
• Wear indications

umati – universal machine tool interface

Connectivity is key for manufacturing in the 21st century. It means getting data in and out of devices and software systems – easy, secure and seamless.

For the benefit of machine tool users and the machine tool industry itself, umati tackles this issue by setting an open standard throughout the world. umati serves to exploit new potentials for manufacturing of the future by:

• Simplifying the effort for machine tool connection to customer-specific IT infrastructures and ecosystems.
• Reducing costs through faster realization of customer specific projects.

umati was created in 2018 in a joint effort by VDW, the German machine tool builders’ association, and 17 partners.

umati is still under development. It aims to provide

1. an OPC UA Companion Specification to define globally applicable semantics for machine tools
2. Communication Default Requirements for the implementation of an OPC UA environment (e.g., encryption, authentication, server settings (ports, protocols) to allow plug-and-play connectivity between machines and software
3. Quality Assurance through testing specifications and tools, certification, and serving as ombudsman for supplier-client disputes
4. Marketing and a label for visibility in the market through a global community of machine builders, component suppliers, and added value services.

Applications with OPC UA Clients are able to connect directly to machines with OPC UA Servers – if both are in umati configuration.
The demonstration served as a proof of concept that connectivity could truly be made easy, secure and seamless by using umati and OPC UA at the very special conditions of a temporary trade fair installation – and it worked perfectly! Thousands of visitors experienced live how the data flowed.

For more info an the full list of participating companies, connected machine and services, see www.umati.info/emo2019