

# TwinCAT Cloud Engineering simplifies IoT-based automation

Connectivity is making a world of difference: In 2018, more than 7 billion Internet-of-Things devices were active worldwide, and experts are predicting that this figure could still increase threefold to 22 billion by 2025. All these devices are able to connect via a scalable infrastructure provided by the cloud. Cloud computing also presents a huge opportunity for machine builders and plant operators: By maximizing the potential of PC- and cloud-based control technology to create automation networks, they can gain and retain a competitive edge over the intermediate and longer term.



Sven Goldstein, Product Manager  
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Connecting machines and equipment – both locally and, more importantly, across multiple locations – not only breaks ground for new business models. It also boosts efficiency throughout production processes – from engineering to cloud-based operational data analysis to dependable predictive maintenance strategies for greater availability and less downtime. As a specialist in PC-based control, Beckhoff helps users implement highly efficient IoT-based automation strategies by integrating the full range of machine functionality – from PLCs and motion control, to robotics, machine vision, HMIs and machine learning – on an open, central control platform. With PC-based control technology, users can connect their machines, equipment and production lines to tap into potential efficiency gains across all their processes. Here, TwinCAT Cloud Engineering offers an ideal foundation by enabling users to create and manage instances easily in the cloud, complete with integrated analytics and HMI.

TwinCAT Cloud Engineering enables all existing TwinCAT Engineering and Runtime products from Beckhoff to be instantiated and operated directly in the cloud. With easy access via the Beckhoff website, the cloud-based solution allows registered users to perform a range of tasks, including the creation of TwinCAT Cloud Engineering instances, which can connect to physical control hardware over a secure transport channel. Access is charged for according to a fair pricing model which allows users to choose whether to continue using their instance once the trial phase expires. In any case, users benefit from all well-known advantages of the TwinCAT control architecture and tools for decentralized collaboration, such as an integrated source control repository.

## Direct access via web browser

Users can access the TwinCAT Cloud Engineering environment through the central, web-based customer portal myBeckhoff. Working in a freely configurable dashboard, they can view any instances they create and can start and stop these instances themselves as needed, which helps keep provisioning costs down. Users can initiate a web-based remote desktop connection to an instance from the dashboard. All they need to establish an HTTPS connection is a web browser. No special software installations or changes to corporate firewall settings are required. Users can simply access a project from within an instance using the familiar TwinCAT XAE toolchain and use a Git-based tool that is provided there for collaborative source code management.

Setting up a TwinCAT Cloud Engineering instance takes just a few minutes using a special, automated process. As the user interface runs in a web browser, there is no need to install and operate any other software components, and the user interface will work on any operating system or end device.

TwinCAT instances can be operated with different TwinCAT versions across a user base. It's service departments of machine builders that benefit in particular from the simple deployment of TwinCAT. Several TwinCAT instances can be set up in specific versions for a machine or machine generation and can then be employed by multiple users. Service engineers would just have to start the specific instance for the machine in question. An installation of all different engineering tool versions on the various employee PCs is no longer necessary.



TwinCAT  
Cloud Engineering



TwinCAT Cloud Engineering enables engineering PC, software instance and control system to work together efficiently.

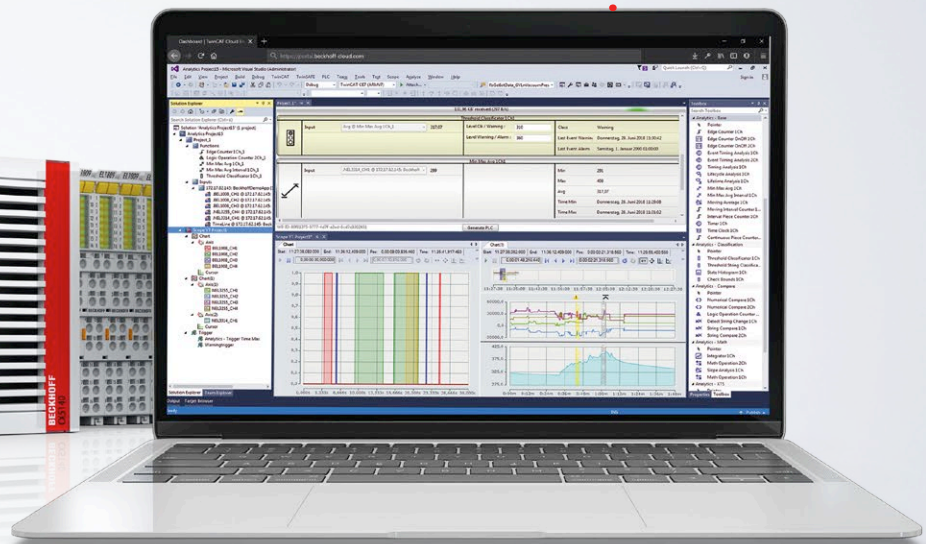
Secure ADS  
ADS-over-MQTT  
OPC UA



HTTPS



Machine controller



Engineering workstation

### Connection to physical control systems

Communication between the virtual space and the physical space with the actual control hardware can be based either on Secure ADS or on ADS over MQTT, with data connections protected by standard security mechanisms such as TLS and specific certificates. Control connections are handled in a fully transparent way for users, in the same way as they have always been. In addition, OPC UA provides another transport channel to the instance, which can be used to integrate third-party systems as well.

### Broad fields of application

Due to the generic structure of the platform and the modular control concept of TwinCAT, familiar application scenarios from the automation world can now also be operated in the cloud. However, central provision and simple integration also open up numerous new fields of application: When the Corona pandemic severely restricted travel over a long period of time, the possibilities to conduct classroom-based training, among other things, were highly limited or

non-existent. However, TwinCAT Cloud Engineering meant that the Beckhoff training courses, for example, could still take place. Here, instead of physically existing demo racks, several TwinCAT Cloud Engineering instances served as work equipment, which the training participants could operate conveniently from their computers, while trainers and participants stayed in contact via regular web conferencing tools.

More information:

[www.beckhoff.com/cloud-engineering](http://www.beckhoff.com/cloud-engineering)