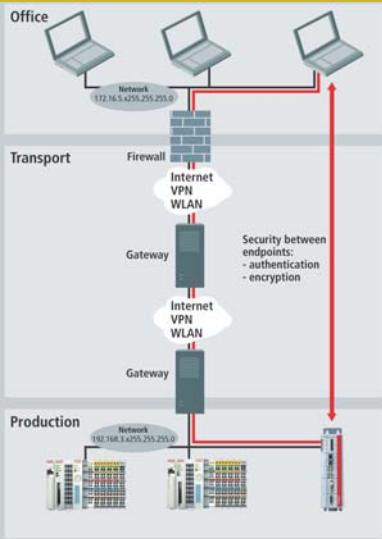


Network communication via TwinCAT OPC UA

Platform-independent and secure data exchange



The Beckhoff OPC UA solution supports secure and platform-independent data exchange.

Beckhoff implements the new OPC UA specification in its PC-based controllers. OPC is an established and recognized standard for data exchange between control and HMI in manufacturing and process automation. The new "Unified Architecture" specification creates the basis for a platform-independent communication and information technology. UA offers scalability, network capability, platform independence and security. Therefore, it can be used in a wide range of applications, including the control, MES and ERP layer. At the Hanover Fair in the "Application Park" Beckhoff demonstrated the potential of OPC UA based on production technology and robotics applications.

As an early OPC UA adopter Beckhoff had already successfully tested its products by the end of 2007, resulting in the TwinCAT OPC UA server and client for Windows XP and CE. The existing OPC technology was based on the Microsoft COM/DCOM model and was therefore limited to Microsoft-based operating systems. The new OPC UA standard is based on TCP communication and is therefore platform-independent. Integrated UA data encryption based on international security standards guarantees secure communication between client and server. The TwinCAT OPC UA components are ideally suited for large and small control platforms such as the Beckhoff Embedded PCs from the CX series running under Windows CE.



OPC UA applications at Hanover Fair

In the Application Park at Hanover Fair 2008 Beckhoff and its partners demonstrated the new OPC UA technology based on selected production and manufacturing control and robotics application examples. The Fraunhofer Institute for Manufacturing Engineering and Automation (IPA) recognized the potential of the new UA standard at an early stage and extended the control system of the mobile robot Secur-o-bot for communication with OPC UA. IPA project manager Matthias Bengel said: "OPC UA offers a high-performance transport layer based on international standards. UA communication features integrated security consisting of authentication and encryption and is ideally suited for safe and flexible communication with mobile robots." The standardized communication protocol makes integration into larger systems straightforward, and the robot can realize higher-level functions such as automatic patrol, sampling of sensor data, automatic alarm messages or remote query of individual sensor values safely and in real-time. The mobile robot is controlled by a Beckhoff Industrial PC C6920 with Windows XP Embedded. Using TwinCAT I/O it was easy to integrate the existing IPA control software with the real-time capable EtherCAT fieldbus.

Mobile Robot with OPC/UA Simplified Connection of Standard Visualisation Systems

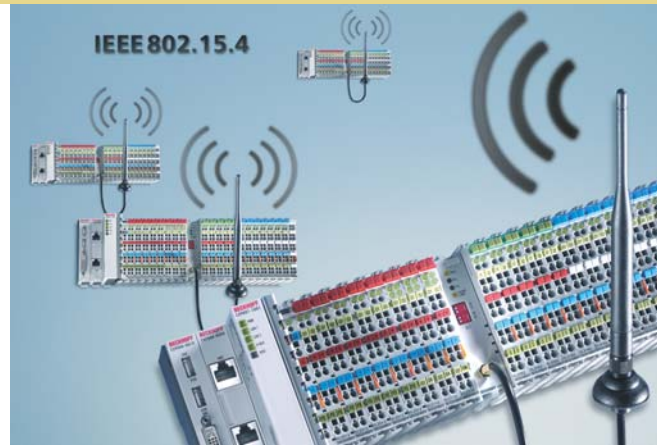


OPC UA live presentation in the Application Park at Hanover Fair in Germany: Matthias Bengel, project manager at Fraunhofer Institute IPA (Institute for Manufacturing Engineering and Automation), Thomas Burke, Executive Director OPC Foundation; Stefan Hoppe, OPC expert at Beckhoff; and the mobile robot Secur-o-bot

Wireless data transmission with Beckhoff Bus Terminals

Wireless data exchange

In addition to all common bus systems and I/O signals, the universal Beckhoff Bus Terminal system also supports data transmission via radio. The KM6551 wireless terminal enables various types of transmission, based on the IEEE 802.15.4 standard.



The application of TwinCAT OPC UA servers is straightforward, since OPC requires almost no network configuration: Direct UA-TCP communication is available as soon as a PLC is available in the network. The UA server detects the variables identified for UA access in the PLC program and makes them available in the network. In addition to standardized exchange of PLC process data, the UA solution from Beckhoff now also offers device-specific information and services. Parameters that can be read include hardware information such as platform and fan speed as well as software information such as the operating system version, the MAC-ID, available memory and screen resolution. The Beckhoff UA client supports communication with other UA servers such as controllers from other manufacturers, which are directly integrated in the data exchange with TwinCAT. Data exchange between the office/service level is routed via several transport gateways right down to the machine level.

The KM6551 wireless terminal supplements the extensive range of Bus Terminals. The compact construction with a width of only 24 mm and simple connection technology supports space-saving, fast mounting. The KM6551 exchanges data wirelessly at a gross rate of 250 kbit/s and therefore meets the requirements of industrial applications.

The Beckhoff radio technology supports bidirectional data exchange between a master and one slave (peer-to-peer), a master and up to four slaves, and unidirectional data transfer from a master to n devices (broadcasting). Radio transmission takes place with 10 bytes of user data, independent of the bus system used. A diagnostic system integrated in the KM6551 enables monitoring of the radio link.

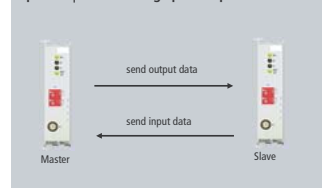
The data exchange terminal uses the 2.4 GHz ISM band, which is available worldwide. A total of 16 channels are freely selectable for several transmissions in one application. Signals from other radio services, such as DECT, UMTS or GMS, do not interfere with the system; therefore, high availability is guaranteed. With a free line of sight, data can be transmitted over distances of up to 300 m and more.

The KM6551 enables fast, highly flexible and mobile applications, which could not be achieved at all or only at great expense using cable connections. The elimination of cables and sliding contacts not only reduces wear, but also cost. Users do not need to "rethink" with regards to the operation and maintenance of the system; the process image remains identical from their point of view.

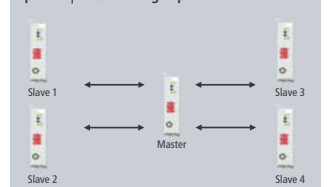
The data exchange terminal has a standard reverse SMA plug (Straight Medium Adaptor), to which various radio antennas can be connected. Directional, rod and omni-directional antennas with different directivities are offered as accessories.

Radio transmission in the Bus Terminal system: The KM6551 wireless terminal enables data transmission via radio, based on the IEEE 802.15.4 standard.

Option 1 | Data exchange peer-to-peer



Option 2 | Data exchange up to max. 4 devices



Option 3 | Broadcast up to x devices

