

**BECKHOFF** New Automation Technology

# PC-based Control for Integrated Building Automation



# Discover the fascinating world of PC-based control technology from Beckhoff.



## One control system for all automation tasks

References from all around the world validate the high performance and reliability of PC-based control from Beckhoff. In countless industries and application areas, from industrial and machine automation to wind farm networking or energy supply through to building automation, Beckhoff control solutions are being used successfully.

The modular automation concepts from Beckhoff are based on a broad range of powerful Industrial PCs, I/O components for a large variety of signals, the high-speed EtherCAT communication system, universal TwinCAT automation



Beckhoff implements open automation systems based on PC control technology.



software, along with highly dynamic drive technology components. Selecting from this automation toolkit, a control solution can be configured to match any performance requirements in a cost-efficient way.

The scalability, modularity and reliability of the components make PC-based automation technology from Beckhoff the ideal tool for implementing all building technology applications too. Intelligent networking of all applications on one central platform is essential for ensuring optimum functionality and reducing energy consumption. This means that heating, ventilation and air conditioning, room automation, media control as well

as operation and monitoring can be connected in holistically integrated building automation.

The advantages are obvious: all system information is available to the user on one platform due to the inherent continuity and flexibility provided by PC-based control. Operation is simplified, comfort levels are increased and costs can be reduced.

#### Your benefits with PC-based control:

- Economic efficiency – from investment, to implementation, to use
- Future-proof – with technologies available today for the demands of tomorrow
- Simple networking – all information is available in one universal system
- Flexibility – to respond and adapt to individual user needs
- High availability – through broad compliance with accepted communication standards

# A universal automation platform for intelligent building control.



The universal and open control platform for the most diverse applications

Security/Surveillance



Room automation

Audio

Energy data acquisition



Remote maintenance



## Integrated building automation on one control platform

At the heart of the Beckhoff control platform, robust Industrial PCs or embedded controllers using TwinCAT as the universal automation software holistically integrate PLC, visualisation, room control and media control functions. Beckhoff I/O systems can be used to connect the whole range of sensors and actuators. This includes devices used for daylight-dependent lighting and facade control to control of heating, ventilation and air conditioning through to show lighting, sound and projection control. EtherCAT, the real-time-enabled fieldbus system, provides the nec-

essary communication speeds. Through the integration of all communications protocols typically found in the areas of building and media technology into the PC control platform, all devices from a wide range of manufacturers can be addressed. The functionality of the system can be easily extended by adding a new I/O terminal that supports the required signal, for example, or by adding new data points if the required software interface is already provided. All technical systems of the different trades and their functionalities can be programmed and configured via the uniform TwinCAT software platform. For diagnostics and configuration purposes a wide range of software function blocks and libraries is available.

## Your built-in benefits in building automation with PC-based control:

- Continuity – one control platform for all trades
- Openness – interfaces for all popular communication standards in the area of building and media technology
- Scalability – in terms of performance, design and price
- Modularity of components – for flexible control design
- Extensive connectivity – through to integration of cloud communication
- Excellent price-performance ratio

## Office Buildings and Educational Institutions

- Open-space offices
- Individual offices
- Conference/meeting rooms
- Auditoriums
- Class rooms

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# Applications

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## Hotels, Cruise Ships and Stages

- Hotel rooms/suites
- Hotel lobbies
- Spa areas
- Ship cabins
- Function rooms
- Theatres and stages

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## Industrial and Commercial Buildings

- Production buildings
- Clean rooms/ultra-clean rooms
- Warehouses/logistics
- Cold storage warehouses
- Shopping malls
- Data centres

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## Infrastructure Facilities

- Transport
- Energy supply
- Water treatment
- Rescue coordination centres
- Hospital/care facilities
- Sports/cultural facilities

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# Systems



## Heating, Ventilation, Air Conditioning

Beckhoff control components for:

- Heating
- Ventilation
- Air conditioning

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## Room Automation

Beckhoff control components for:

- Lighting
- Occupancy sensor
- Air quality
- Temperature
- Facade/blinds

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## Media Technology

Beckhoff control components for:

- Audio installations
- Video installations
- Media control
- Presentation systems
- Show lighting

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## Operating and Monitoring

Beckhoff control components for:

- Visualisation
- Power monitoring
- Condition monitoring
- Predictive maintenance
- Remote control/maintenance
- Cloud connectivity

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## Heating, Ventilation, Air Conditioning

Beckhoff control components for:

- Heating
- Ventilation
- Air conditioning

## Room Automation

Beckhoff control components for:

- Lighting
- Occupancy sensor
- Air quality
- Temperature
- Facade/blinds

## Media Technology

Beckhoff control components for:

- Audio installations
- Video installations
- Media control
- Presentation systems
- Show lighting

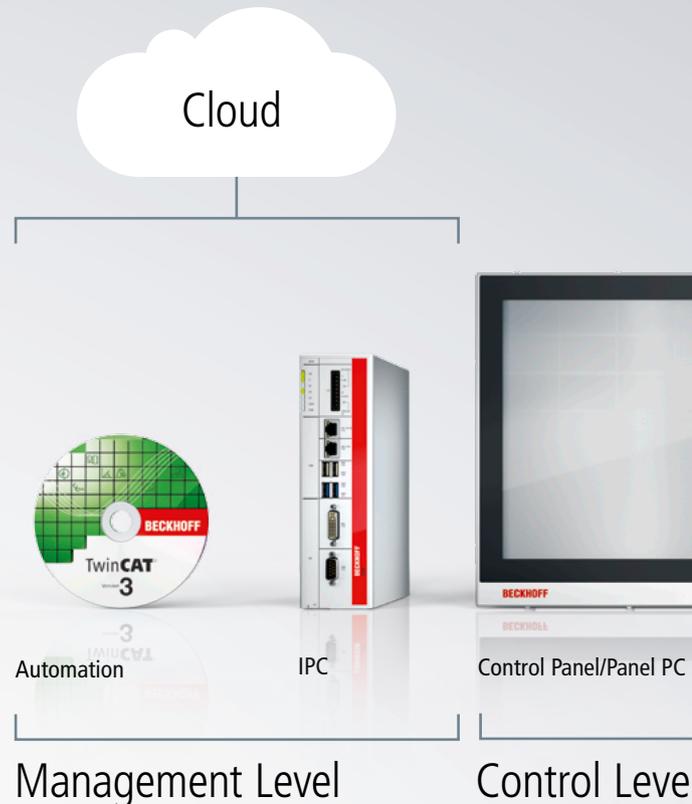
## Operating and Monitoring

Beckhoff control components for:

- Visualisation
- Power monitoring
- Condition monitoring
- Predictive maintenance
- Remote control/maintenance
- Cloud connectivity

# Integration across all systems: for diverse applications.

BACnet  
OPC UA  
DALI/DALI 2  
SMI  
EnOcean  
Modbus  
M-Bus  
MP-Bus  
LON  
EIB/KNX  
DMX  
SMPTE Timecode  
sACN  
Art-Net™  
AES70 (OCA)  
PJLink



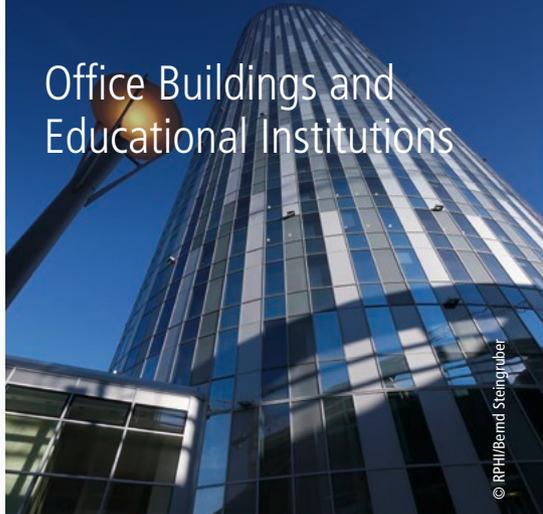
### The open communication platform from Beckhoff

The powerful PC-based automation platform handles control processes, data processing, connectivity, visualisation and remote maintenance. With open software and hardware interfaces, it is ideal for centralised as well as decentralised control of all technical systems in buildings: from heating, ventilation and air conditioning, room automation and media control through to operation and monitoring. Besides integrating all typical building technology standards, system integrators have all common interfaces at their disposal for connecting audio/video and multimedia systems. The TwinCAT FIAS server provides an interface for hotel booking systems as well, which can then be seamlessly integrated into the building automation system. The TwinCAT database server can be integrated into the configuration to enable the building automation system to connect to standard databases.



I/O

Field Level



Office Buildings and Educational Institutions

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Hotels, Cruise Ships and Stages



Industrial and Commercial Buildings



Infrastructure Facilities

# 12

From 1 to 12 cores  
on a DIN rail



BACnet  
OPC UA  
DALI/DALI 2  
SMI, EnOcean  
Modbus, M-Bus,  
MP-Bus, LON,  
EIB/KNX, DMX



Benefits that  
Beckhoff provides  
for you.

### Maximum scalability

Control solutions from Beckhoff are up to the task at hand: all product lines in the areas of Industrial PCs, I/Os, drive technology and automation software are exactly scalable to suit the application. The range of Industrial PCs thus extends from the C6015 ultra-compact IPC with dimensions of 82 x 82 x 40 mm to the many-core Embedded PCs of the CX20x2 series offering up to 12 processor cores on the DIN rail.

### Comprehensive connectivity

PC-based control speaks all networking languages: all customary communication standards and fieldbus systems – as well as all protocols typically used in media and building automation – are supported, permitting the easy integration of all systems and devices.



Secure your  
technological lead  
with Beckhoff.

### Simplified engineering: TwinCAT Building Automation

Beckhoff developed the TwinCAT Building Automation software library in order to simplify engineering and reduce the time involved. The library includes tried and tested basic functions from the areas of control, regulation and signal processing as well as room functions, mathematical functions, alarm management and general system functions.

### Take the fast way to your individual user interface: with TwinCAT HMI

Integrated in Visual Studio®, TwinCAT HMI software offers a WYSIWYG editor for HTML5 as well as straightforward configuration using drag and drop for all resolutions, operating systems and devices, including mobile.



### Available and reliable for the long term

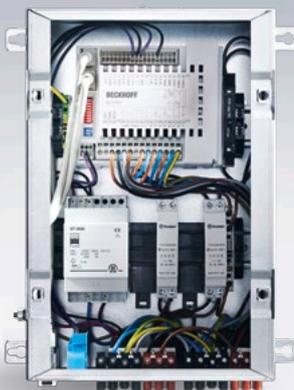
When you choose Beckhoff, you choose industry-proven, reliable and long-term available control technology – Made in Germany.

### Modular and flexible

The Beckhoff I/O portfolio includes over 400 signal types and 36 fieldbus systems, and is ideal for controlling the full range of sensors and actuators. Together with the modular TwinCAT automation software, users have optimum flexibility when configuring their application-specific controls and for extending functionality over time.

### Further benefits of the Beckhoff control solution:

- Use of standard components, programming standards and networks
- Recording of all data points in a single system
- Consistent software for all disciplines
- Shorter engineering times and lower costs
- System provider with deep industry expertise
- Simple installation of third-party software



### Individually configured and installed with ease: The eExtendable Room Box

TwinCAT Building Automation software and the eExtendable Room Box constitute an universal system, which reduces the engineering time for solutions in the field of building automation. The user is able to fully configure a box in a few mouse clicks that can be installed in a building for rapid start-up via plug-and-play technology.

### Plug and Cloud: using Beckhoff IoT products

Connection to popular cloud systems can be performed either from the controller via the IoT protocol standards AMQP, MQTT and OPC UA, or directly using the IoT Bus Coupler from Beckhoff as a gateway. This coupler enables simple and standardised integration of I/O data with cloud-based communication and data services through web-based configuration, without the need for any special control program.

### Further benefits for building automation:

- Implementation of decentralised I/Os via inexpensive Bus Couplers
- BC9191: Compact and modularly expandable room controller for individual room control
- EtherCAT: the real-time fieldbus system
- EtherCAT P: the One Cable Automation solution for the field level
- Support for multi-core CPU functionality
- Network ports available as standard on all controllers

# Intelligent building control: PC-based control in offices and educational institutions.



The universal and open control platform for the most diverse applications



Auditorium

Data centre

Heating system

Open space office

# Heating, Ventilation, Air Conditioning

Beckhoff control components for:

-  Heating
-  Ventilation
-  Air conditioning

# Room Automation

Beckhoff control components for:

-  Lighting
-  Occupancy sensor
-  Air quality
-  Temperature
-  Facade/blinds

# Media Technology

Beckhoff control components for:

-  Audio installations
-  Video installations
-  Media control

# Operating and Monitoring

Beckhoff control components for:

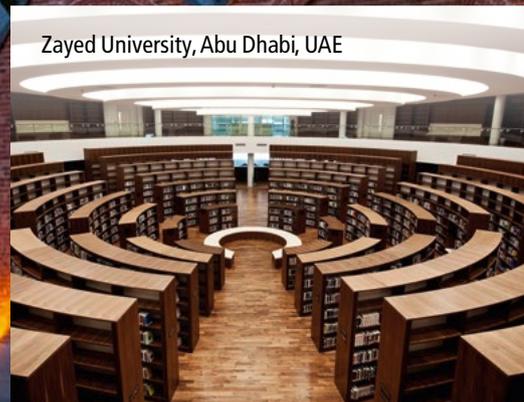
-  Visualisation
-  Power monitoring
-  Condition monitoring
-  Predictive maintenance
-  Remote control/maintenance
-  Cloud connectivity

# Offices and Educational Institutions References



Karolkowa Business Park, Warsaw, Poland

Zayed University, Abu Dhabi, UAE





Center for Virtual Engineering ZVE,  
Fraunhofer IAO, Stuttgart, Germany



Picture: Christian Richters

Miele innovation centre for electronics  
development, Gütersloh, Germany



## References for office buildings, selection

- Allianz head office, Stuttgart, Germany
- BNP Paribas Fortis, Hasselt, Belgium
- BSH Bosch und Siemens Hausgeräte GmbH at "Aviva", Munich, Germany
- Campus Dornbirn, Dornbirn, Austria
- Center for Virtual Engineering ZVE, Fraunhofer IAO, Stuttgart, Germany
- Diamant Software, Bielefeld, Germany
- Etech Center/AMS Engineering, Linz, Austria
- Euro Plaza, Vienna, Austria
- Eurotheum (European Central Bank), Frankfurt am Main, Germany
- Fifth Light Technology, Oakville, Kanada
- Internorm, Traun, Austria
- Karolkowa Business Park, Warsaw, Poland
- KölnTriangle, Cologne, Germany
- Microsoft, Cologne, Germany
- Microsoft, Munich, Germany
- Miele innovation centre for electronics development, Gütersloh, Germany
- MOE A/S, Søborg, Denmark
- Nardini, Bassano, Italy
- New Energy Research Institute, Peking, China
- Nordea Bank, Oslo, Norway
- Office building "Esplanade" Theresienhöhe, Munich, Germany
- One BKC, Mumbai, India
- Schüco Technology Center, Bielefeld, Germany
- Sky Tower, Bukarest, Romania
- Tower 185, Frankfurt am Main, Germany
- WesBank, Johannesburg, South Africa
- Westpac Headquarters, Sydney, Australia
- Widex A/S, Lyng, Denmark
- Zukunftsmeile Fürstenallee, Paderborn, Germany

## References for educational institutions

- Anton Bruckner Privatuniversität, Linz, Austria
- AUA Training Center, Schwechat, Austria
- Collegio San Giuseppe Istituto De Merode, Rome, Italy
- Kea Copenhagen School of Design and Technology, Denmark
- Leuphana University of Lüneburg, Germany
- Limtec+, Training Center, Diepenbeek, Belgium
- Lufthansa Training Center, Schwechat, Austria
- State Fire Academy Würzburg, Germany
- Stelzhamer school, Linz, Austria
- Unipark Nonntal, University of Salzburg, Austria
- University of Antwerp, Belgium
- Zayed University, Abu Dhabi, UAE

# Satisfies the highest demands: PC-based control in Hotels, Theatres, on Cruise Ships and Stages.



The universal and open control platform for the most diverse applications

# Heating, Ventilation, Air Conditioning

Beckhoff control components for:

-  Heating
-  Ventilation
-  Air conditioning

## Cruise liners



## Room Automation

Beckhoff control components for:

-  Lighting
-  Occupancy sensor
-  Air quality
-  Temperature
-  Facade/blinds

## Media Technology

Beckhoff control components for:

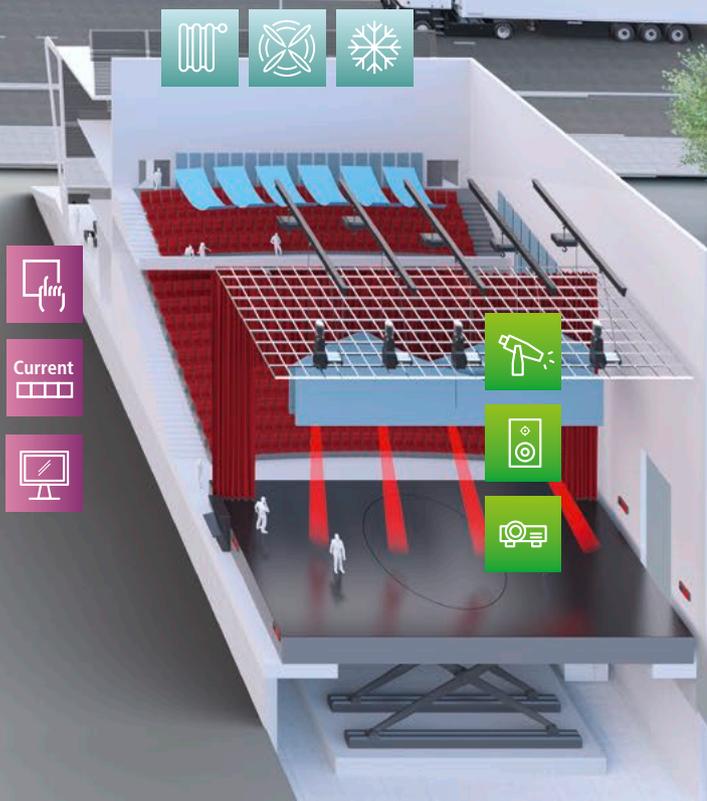
-  Audio installations
-  Video installations
-  Media control
-  Presentation systems
-  Showlight

## Operating and Monitoring

Beckhoff control components for:

-  Visualisation
-  Power monitoring
-  Condition monitoring
-  Predictive maintenance
-  Remote control/maintenance
-  Cloud connectivity

## Theatre



# Hotels, Cruise Ships and Stages References



Park Hotel Vitznau, Switzerland



Palais Hansen Kempinski,  
Austria



## References for hotels and cruise ships, selection

- Cosmopolitan Twarda, Warsaw, Poland
- Dolder Grand Hotel, Zurich, Switzerland
- Grand Tirolia, Kitzbühel, Austria
- Holiday Inn, Lodz, Poland
- Holiday Inn, Samara, Russia
- Hotel Aurelio, Lech, Austria
- Hotel Aviva, St. Stefan am Walde, Austria
- Hotel Grischa, Davos, Switzerland
- Hotel Krallerhof, Leogang, Austria
- Hotel Rasmushof, Kitzbühel, Austria
- Hotel Sonne, Mellau, Austria
- Leonardo Royal Hotel, Munich, Germany
- Palais Hansen Kempinski Vienna, Austria
- Park Hotel Vitznau, Switzerland
- Quality Pond Hotel, Sandnes, Norway
- Queen Mary II, Cunard Cruises Line, Southampton, U.K.
- Royal Spa Kitzbühel, Austria
- St. Martins Therme, Frauenkirchen, Austria
- Therme Laa, Laa at Thaya, Austria
- Tschuggen Bergoase, Arosa, Switzerland
- Vestlia Resort, Gailo, Norway
- Zirbenhütte, Fiss, Austria

## References for theatres and congress centres

- Bregenzer Festspiele, Opera on the Lake, 2015-16, Austria
- Carré Theatre, Amsterdam, Netherlands
- Design Center Linz, Austria
- Ferry Porsche Congress Center, Austria
- Helsinki City Theatre, Finland
- Helsinki Music Center, Finland
- Imatra Theatre, Finland
- Janacek Theatre, Bruno, Czech Republic
- Kuopio City Theatre, Finland
- Magical Production, Dubai, UAE
- People's Grand Theatre, Jilin City, China
- Ronacher Theatre, Vienna, Austria
- Rovaniemi Theatre, Finland
- Royal Danish Theatre, Copenhagen, Denmark
- Scala di Milano, Milan, Italy
- Schauspielhaus Nürnberg, Nuremberg, Germany
- Sibelius Hall, Lahti, Finland
- Stage Theater an der Elbe, "Das Wunder von Bern", Hamburg, Germany
- Tampere Hall, Finland

People's Grand Theatre, Jilin City, China



Vestlia Resort Hotel, Norway



# Reduces energy consumption: PC-based control in Industrial and Commercial Buildings.



Warehouses/



logistics/  
cold storage



Production buildings



The universal and open control platform for the most diverse applications



## Trade/shopping mall

## Heating, Ventilation, Air Conditioning

Beckhoff control components for:

-  Heating
-  Ventilation
-  Air conditioning

## Room Automation

Beckhoff control components for:

-  Lighting
-  Occupancy sensor
-  Air quality
-  Temperature
-  Facade/blinds

## Media Technology

Beckhoff control components for:

-  Audio installations
-  Video installations
-  Showlight

## Operating and Monitoring

Beckhoff control components for:

-  Visualisation
-  Power monitoring
-  Condition monitoring
-  Predictive maintenance
-  Remote control/maintenance
-  Cloud connectivity

# Industrial and Commercial Buildings References



AEC Pole Division, Subbiano, Italy

Tekloth GmbH, Bocholt, Germany



## References for industry and commercial buildings, selection

- AEC Pole Division, Subbiano, Italy
- Algorab, Lavis, Italy
  - Eurospin Grocery Stores, Italy
- AMAG Automotive, Buch, Switzerland
- Bank of Communication, Shanghai, China
- Broschek Tiefdruck, Hamburg, Germany
- Carheal+, Støvring, Denmark
- Cummins India Ltd., Pune, India
- Daimler, Stuttgart, Germany
- dSPACE, Paderborn, Germany
- F-eins, Vienna, Austria
- Friedrich Wenner, Versmold, Germany
- Heroal, Verl, Germany
- Holzwerke Weinzierl, Vilshofen, Germany
- Internorm, Traun, Austria
- Liebherr Werk, Nenzig, Austria
- Miele administration building, Gütersloh, Germany
- nobilia-Werke J. Stickling GmbH & Co. KG, Verl, Germany
- Pirelli Deutschland GmbH, Breuberg, Germany
- Philip Morris International, Lausanne, Switzerland
- Sensirion, Stäfa, Switzerland
- SOLON SE, Berlin, Germany
- Stahlwerke Bremen, Germany
- Tekloth GmbH, Bocholt, Germany
- ZF-Lemförder, Dielingen, Germany

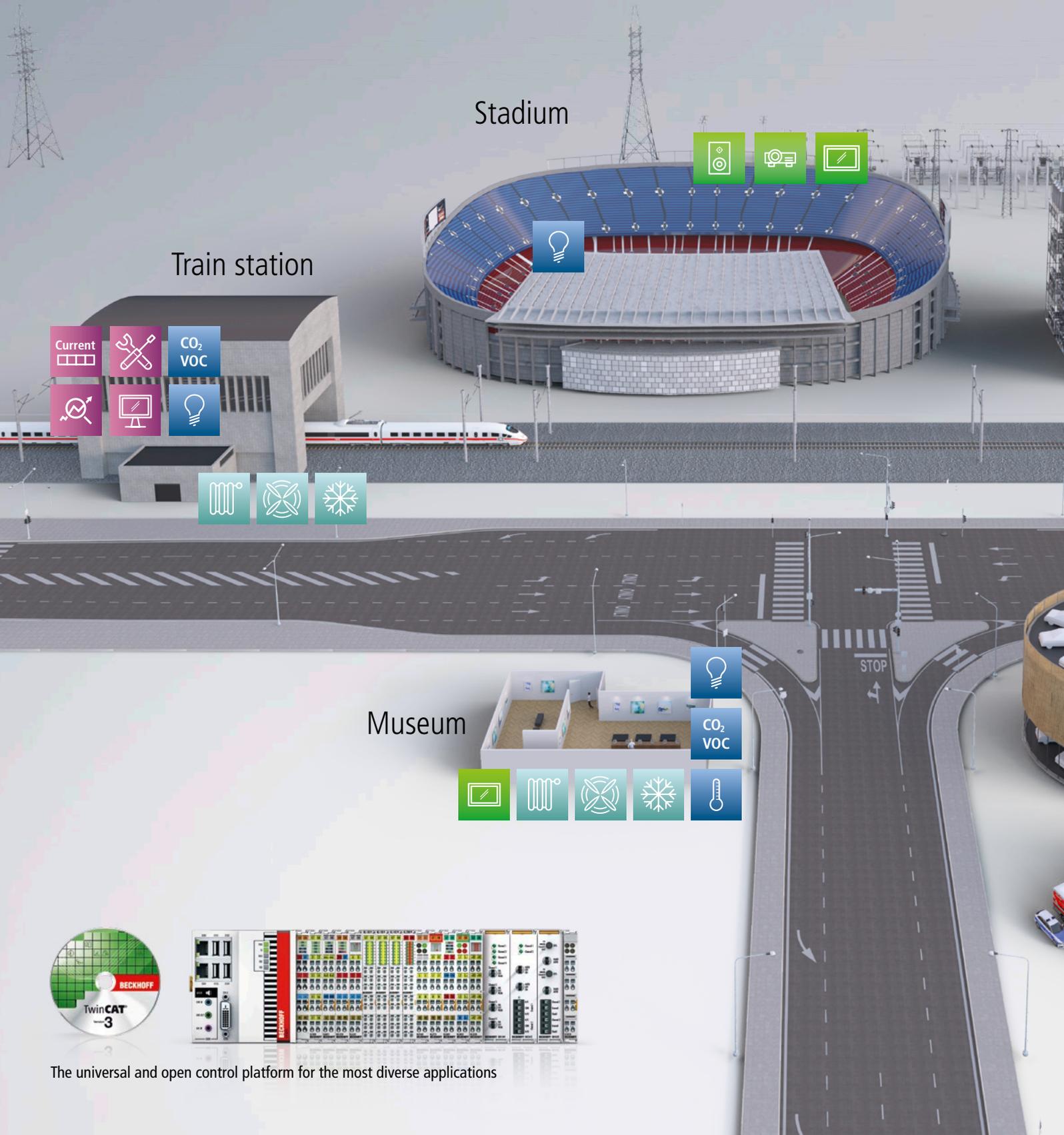
nobilia-Werke J. Stickling GmbH & Co. KG,  
Verl, Germany



Holzwerke Weinzierl,  
Vilshofen, Germany



# Reliable and efficient: PC-based control for Infrastructure Facilities.



Stadium

Train station

Museum



The universal and open control platform for the most diverse applications

# Heating, Ventilation, Air Conditioning

Beckhoff control components for:

-  Heating
-  Ventilation
-  Air conditioning

## Power supply

-  Current
- 
- 
- 
- 

## Room Automation

Beckhoff control components for:

-  Lighting
-  Occupancy sensor
-  Air quality
-  Temperature
- 

## Media Technology

Beckhoff control components for:

-  Audio installations
-  Video installations
-  Media control
- 

## Car park

- 
- 
- 

## Emergency and rescue coordination centre

- 
- 
- 
- 

## Operating and Monitoring

Beckhoff control components for:

-  Visualisation
-  Power monitoring
-  Condition monitoring
-  Predictive maintenance
-  Remote control/maintenance
-  Cloud connectivity

# Infrastructure Facilities References



Nordtangente, Basel, Switzerland



Therme Wien, Vienna, Austria



ESPRIT arena, Düsseldorf, Germany



Marmaray tunnel, Istanbul, Turkey

## References for technical infrastructure facilities, selection

- Acciona S.A., Spain
- Aparcaments i Mercats de Reus, Reus, Spain
- Envac Optibag, Stockholm, Sweden
- e2watch, Regio IT, Aachen, Germany
- Frankfurt Airport, Germany
- Gatwick Airport, London, U.K.
- Hydro-Systemtechnik, Germany
- KLIA 2 control tower, Sepang, Malaysia
- Marmaray tunnel, Istanbul, Turkey
- Metro M2, Lausanne, Switzerland
- Nordtangente, Basel, Switzerland
- Offis, Institut for Information Technology, Oldenburg, Germany
- Stadtwerke Konstanz, Germany
- Stadtwerke Lingen, Germany
- Vitrociset, Rome, Italy
  - Aqueduct automation, Maghnia, Algeria
  - Brenner motor way, Italy
  - ENAV, air traffic control, Rome, Italy
  - Italian Air Defence, remote monitoring of radar towers
  - Italian Ministry of Interior, unmanned remote control of radio site
  - SNAM, electric grid security, Milan, Italy
  - Terna, electric grid security, Rome, Italy
- Zweckverband Wasser und Abwasser Vogtland, Germany

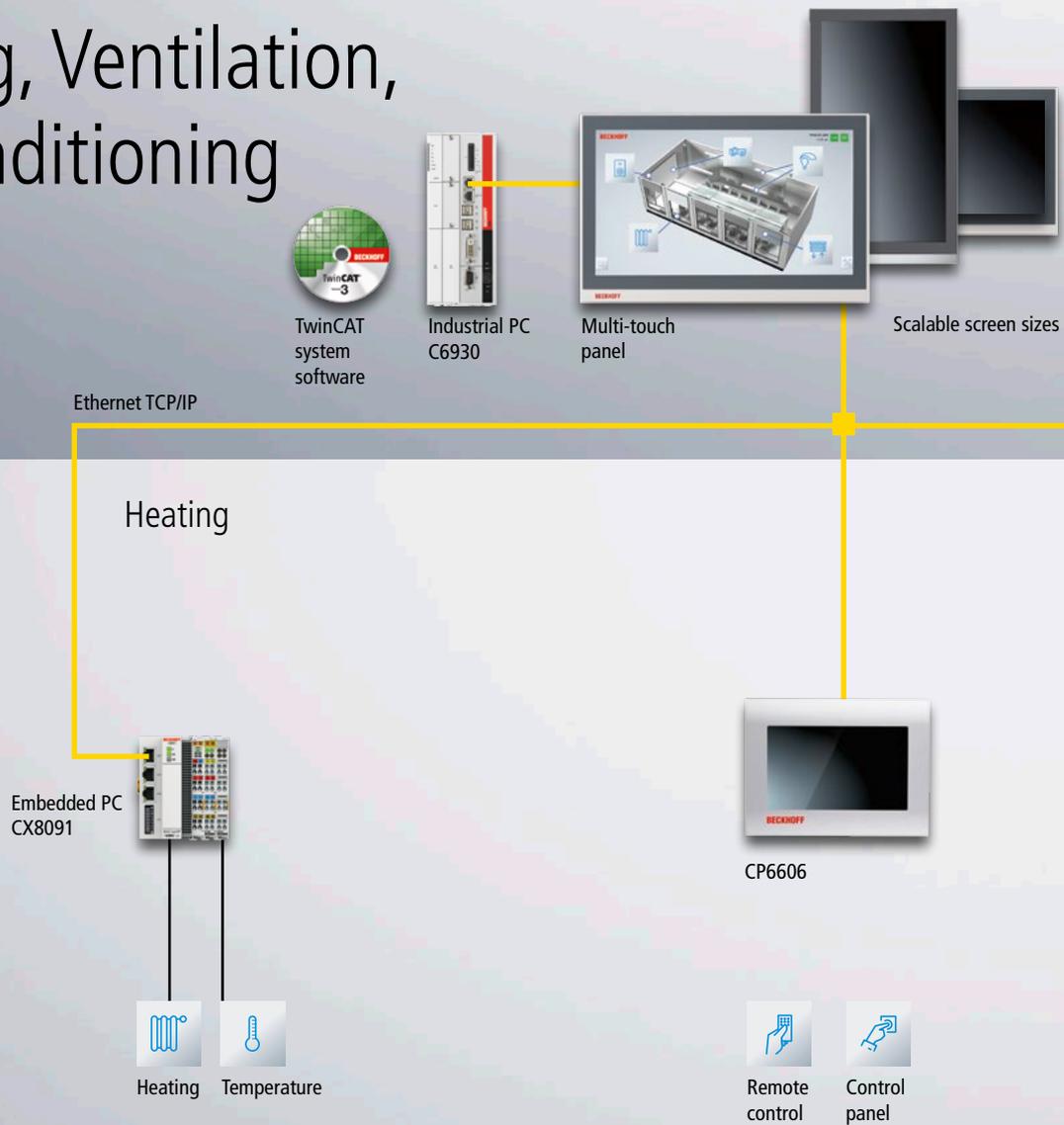
## References for social infrastructure facilities, selection

- Akrycarium, Zoo Wroclaw, Poland
- Allianz Arena, Munich, Germany
- Anima Care retirement homes, Belgium
- Armonea retirement home, Mechelen, Belgium
- Charlottenburg Palace, Berlin, Germany
- City Museum Dresden, Germany
- Deutsches Museum, Munich, Germany
- ESPRIT arena, Düsseldorf, Germany
- Gran Casino Aranjuez, Madrid, Spain
- Grundfos Kollegiet, Aarhus, Denmark
- Hagia Sophia, Istanbul, Turkey
- Messe Basel, Hall 2, Basel, Switzerland
- Nürnberg Messe, Hall 3A, Nuremberg, Germany
- Oncological Centre, Samara, Russia
- Oslo City Hall, Norway
- Ryhov Hospital, Jönköping, Sweden
- Serlachius Museum, Mänttä, Finland
- Sisi Museum, Vienna Hofburg, Vienna, Austria
- Sibeliushall, Lahti, Finland
- Staatliches Museum für Archäologie, Chemnitz, Germany
- Stadtmuseum Dresden, Germany
- Therme Wien, Vienna, Austria
- Vitrociset, Rome, Italy
  - EXPO 2015, access control system, Milan, Italy

# Heating, Ventilation, Air Conditioning

Management Level

Field/Control Level



CX-series Embedded PC controller

## Demand-driven control of heating, ventilation and air conditioning reduces energy consumption

The regulation of heating, ventilation and air conditioning systems plays a crucial role in building automation, both concerning the well-being of the user and with regard to energy consumption. An efficient room and zone control in buildings also has a positive impact on the primary systems: the heating and cooling capacity and the air quantities are regulated according to current needs.

Alongside the standard hardware portfolio for integrating all data points, Beckhoff provides

Technical functional drawing

OPC UA  
AMQP  
MQTT



TwinCAT ADS  
Modbus/TCP  
BACnet  
Ethernet TCP/IP



Control cabinet PC C5210

## Ventilation

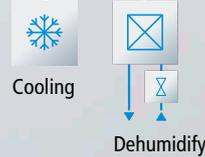
## Air Conditioning

Embedded PC CX5010



Ventilation  
Air quality

Embedded PC CX9020



Cooling  
Dehumidify

the TwinCAT Building Automation software library, which covers the entire functional scope of an intelligent building automation system. The software tool allows efficient parameterisation and commissioning and ensures consistently high system functionality. The excellent readability and expandability of the programs is a prerequisite to ensure ease of maintenance over many years and expandability of the systems. Existing templates created for systems or system modules can be reused. Training of service personnel is simplified by a clear, object-oriented program structure and comprehensive documentation of programs.

Another benefit is that a majority of the functions can be optimised within the software on a single system even during commissioning and ongoing operation. As a result, conversion or modification work does not impede operation and the time required for software adaptations remains within reasonable limits. In certain cases, many software modifications can be installed by accessing the system remotely, eliminating the need for a service technician to attend the site in person.

## Heating, Ventilation, Air Conditioning

# Room Automation

Management Level



TwinCAT system software



Industrial PC C6930



Multi-touch panel



Scalable screen sizes

Ethernet TCP/IP

Field/Control Level

## Lighting

## Facade



Embedded PC, EtherCAT Terminals, DALI, SMI, EnOcean, Bus Terminals



Embedded PC, EtherCAT Terminals, SMI, EnOcean

EtherCAT



Lighting



Constant lighting control



Emergency lighting



Presence detector



Weather forecast



Weather station



Solar position calculation



Window contacts



Lighting



Constant lighting control



Emergency lighting



Presence detector



Lighting



Constant lighting control



Emergency lighting



Presence detector



Motion detector



Outdoor lighting

EtherCAT

Technical functional drawing



The eXtensible Room Box from Beckhoff further reduces engineering requirements.

## Increased comfort and reduced energy consumption through system-spanning building automation

By supporting all communication standards for building automation – from operating and monitoring, lighting, HVAC and facade control through to energy data collection – all functions can be integrated into the automation platform from Beckhoff. The universal, coordinated control system increases comfort levels for building users. In addition, the system-integrated nature of the platform delivers energy savings and reductions in investment and operating costs. TwinCAT func-

OPC UA  
AMQP  
MQTT



TwinCAT/ADS  
Modbus/TCP  
BACnet  
Ethernet TCP/IP



Control cabinet PC C5210

## Room functions

## Local operation



Bus Terminals



Embedded PC, Bus Terminals



CP6606



Shading



Heating



Temperature



Air-conditioning



Ventilation



Mechanical ventilation



Switchable outlets



Access control



Manual operation



Remote control



Control Panel



Room controller



Room controller



Lighting



Shading



Presence detector



Window contacts



Access control



HVAC

tion blocks for building automation enable the automation of shade control, lighting, ventilation, in addition to heating and cooling according to the time of day and presence of occupants. This enables energy-saving room automation and enhanced comfort at the same time. If, for example, lighting is directly coordinated with facade control, the effective interconnection of the two disciplines is the optimal way to reduce energy consumption of lighting. The ultimate goal is to use as much natural daylight as possible while minimising glare and still providing constant light intensity.

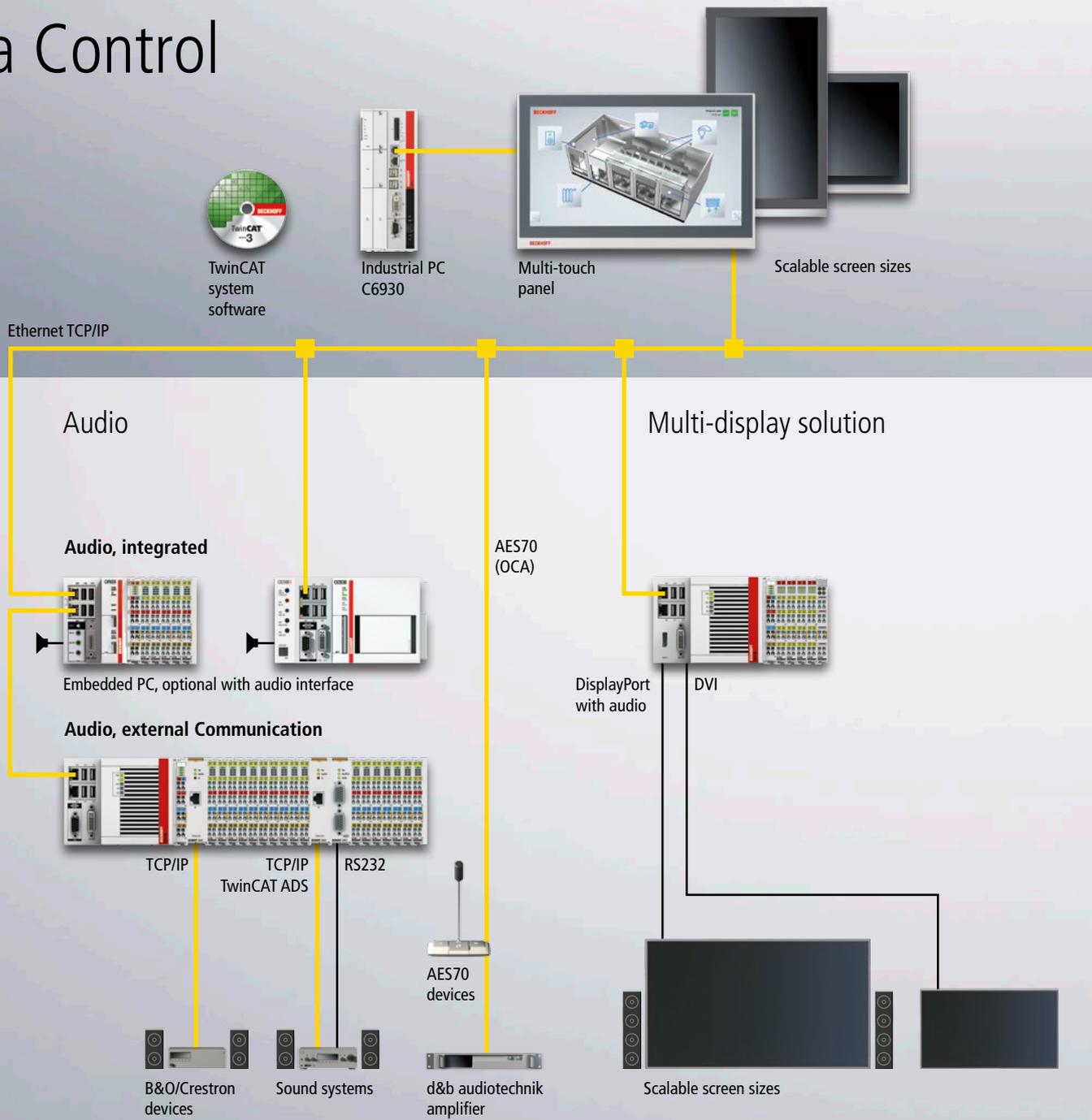
Based on integrated room automation, the building systems can be regulated in a variety of different operating modes. This above all helps reduce the energy consumption of heating and cooling system during longer periods of absence. Nevertheless, the system must be able to reach a comfortable temperature quickly during core occupancy hours and ensure good air quality at the same time – which is something PC-based control can easily ensure.

## Room Automation

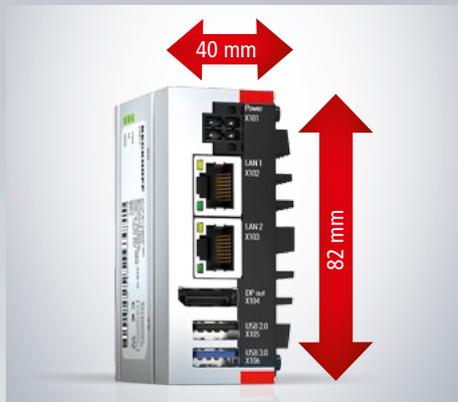
# Media Control

Management Level

Field/Control Level



Technical functional drawing



With its ultra-compact design, the C6015 IPC opens up entirely new application areas.

**A universal platform for all audio and video equipment, IP networks and cloud services**

In addition to Ethernet TCP/IP, serial protocols and OPC UA, the Beckhoff control platform supports all relevant protocols in the area of media technology. This includes Open Control Architecture (AES70 standard), PJLink, SMPTE Timecode, Crestron, Bang & Olufsen, Art-Net™ and Streaming ACN (sACN), among others. Vendor-independent control of the widest range of media technology equipment enables the seamless control of audio and video systems, display devices, multimedia servers and



19" slide-in Industrial PC C5240

## Video



Embedded PC

PoE



Camera

SMPTE Time-code

RS232



SMPTE Timecode master

Projector



Ethernet TCP/IP



Projection systems



Smart TV



IP Phone

## Multimedia



Industrial PC C6930

USB

Kinect



EtherCAT Terminals



Wearables



streaming services can be operated in one network and on the same platform. The advantage for users is clear: they are not restricted in their choice of media technology equipment and are free from manufacturer-specific protocol considerations. The Beckhoff platform serves as a "multi-language protocol gateway", ensuring flexible communication among devices, as well as optimum usability.

Through the scalability and modularity of the software and hardware components from Beckhoff, users can tailor their control system precisely to the scope of the control application at hand and the available installation space, while being able

to achieve significant performance improvements and cost reductions. The CX2000 Embedded PC, for example, represents an extremely powerful and modular control solution based on multi-core processors from Intel®, helping to combine audio, PoE, DisplayPort and DVI on one universal platform.

## Media Control

# Operating and Monitoring

Management Level



TwinCAT system software



Industrial PC C6930



Multi-touch panel



Scalable screen sizes

Ethernet TCP/IP

Field/Control Level

Energy Monitoring



Embedded PC CX9020

Point of Information



C6015



CP2224

EtherCAT



Energy data acquisition



Heat/cold detection



Outdoor temperature



Compressed air monitoring

From 7 to 24 inches

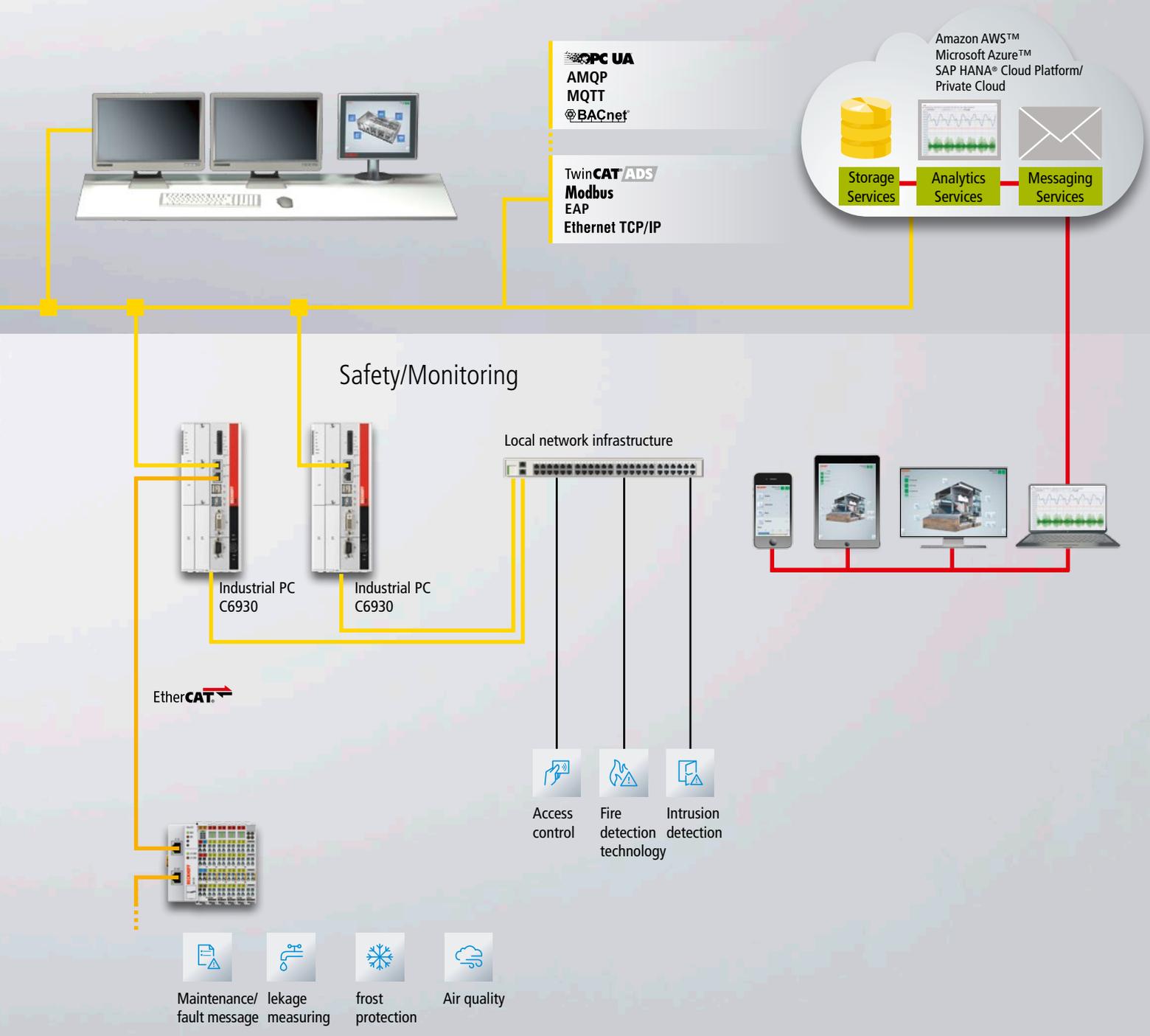


CP2907

CP2924

The Beckhoff Control Panel series with multi-touch displays in industrial strength offer a suitable solution for any application.

Technical functional drawing



### Control, operation and monitoring on one multitasking platform

The ability to monitor the status of equipment and to access control systems – anytime and anywhere in the world if desired – is becoming more important in facility management with each passing day. In this way, operators or service engineers in a control room can check anytime whether devices installed in the field are operating properly.

The support for standard interfaces as well as all vendor-specific protocols of relevance for a specific industry makes the Beckhoff control system an open platform that offers users maximum flexibility to configure their applications. A single

platform can be used to centrally monitor the status of various third-party systems, such as for example, an array of monitors or various different physical parameters. This includes acquisition of all data points and the convenient management of maintenance and alarm messages. The Beckhoff control system can be flexibly expanded because of its inherent modularity: If the functional scope is to be extended, this can be achieved by simply adding the appropriate I/O terminal to the network, and at best with a mere software update.

For operating and monitoring, Beckhoff offers a wide variety of elegantly designed multi-touch Control Panels and Panel PCs in display sizes ranging from 7 to 24 inches.

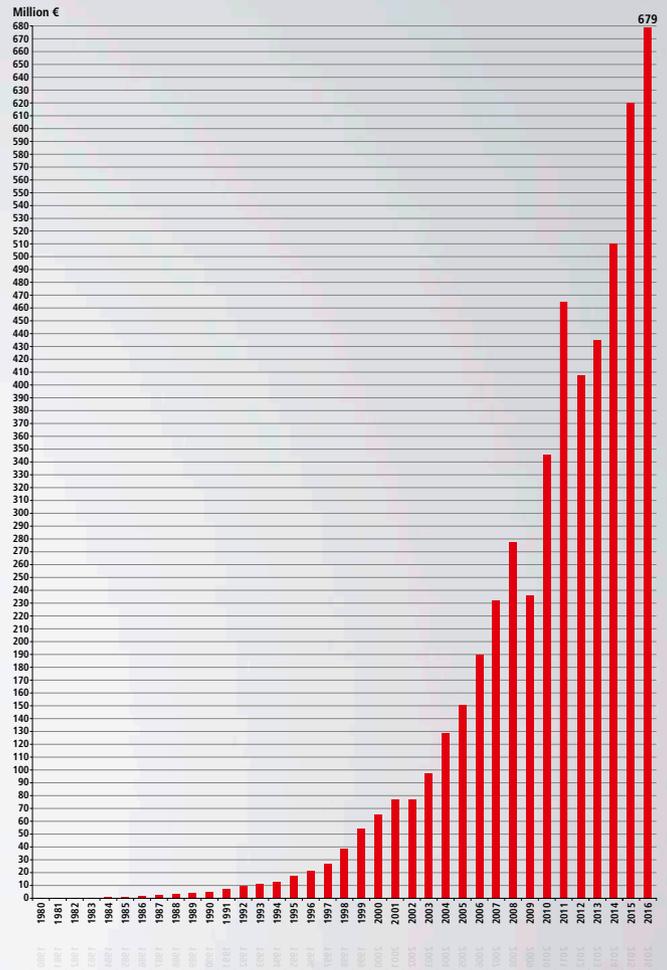
## Operating and Monitoring

# Globally available: the Beckhoff automation expertise.



- Headquarters
- Subsidiary
- Headquarters distributor
- Subsidiary distributor

**Beckhoff – New Automation Technology**  
Beckhoff implements open automation systems based on PC Control technology for more than 35 years. The product range covers Industrial PCs, I/O and Fieldbus Components, Drive Technology and automation software. For all areas of application, product series are available that can be used as separate components or integrated into a complete and seamless control system.



Sales development

The Beckhoff "New Automation Technology" philosophy represents innovative control and automation solutions that are used worldwide in a wide variety of different applications and industries, ranging from CNC-controlled machine tools and wind turbines to intelligent building automation.

### Worldwide presence on all continents

The worldwide presence of Beckhoff in more than 75 countries ensures fast service and support for globally operating customers in their local language. Moreover, geographical proximity helps us develop an in-depth understanding of the technical challenges our customers are faced with around the world.

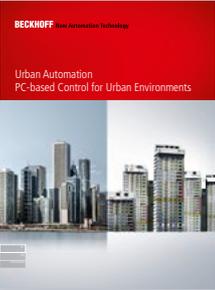
### Beckhoff at a glance

- Headquarters Verl, Germany
- Sales 2016: 679 Mio. € (+9,5 %)
- Staff worldwide: over 3,850
- Sales/Technical Offices Germany: 20
- Subsidiaries/Branch Offices worldwide: 34
- Distributors worldwide: in more than 75 countries

(as of 11/2017)

▶ [www.beckhoff.com](http://www.beckhoff.com)

# All in-depth information at a glance.



**Print media online**

The Beckhoff catalogs and flyers are available for download on the Internet. Printed copies are available on request. Please use our online order form to specify your requirements.

► [www.beckhoff.com/media](http://www.beckhoff.com/media)

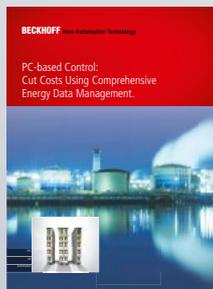
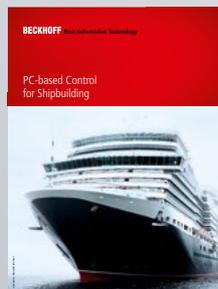
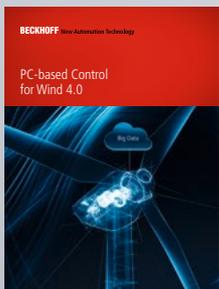
## General information

- Website
- Main Catalog: Volume 1 and 2
- Product Overview
- News Catalog



## Specific information

- PC-based control for Media technology
- PC-based Control for Stage and Show
- Integrated Building Automation for Technicians
- Building Automation for
  - System Integrators
  - Specialist Engineers
  - Architects
  - Operators
  - Investors



## Additional information

- PC-based Control for
  - Urban Environments
  - Wind 4.0
  - Shipbuilding
  - Energy Data Management



## Company magazine

- PC Control Magazine
- Stage Technology Compendium
- Building Automation Compendium

Contact us

► [www.beckhoff.com/building](http://www.beckhoff.com/building)

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