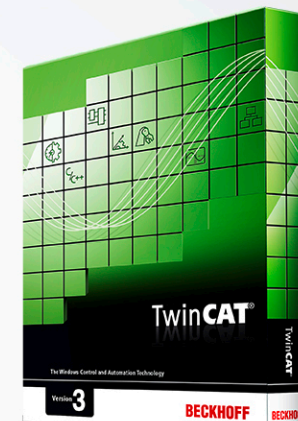
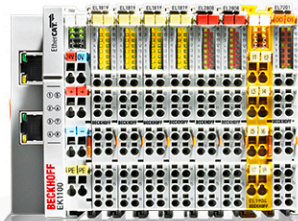


**BECKHOFF**

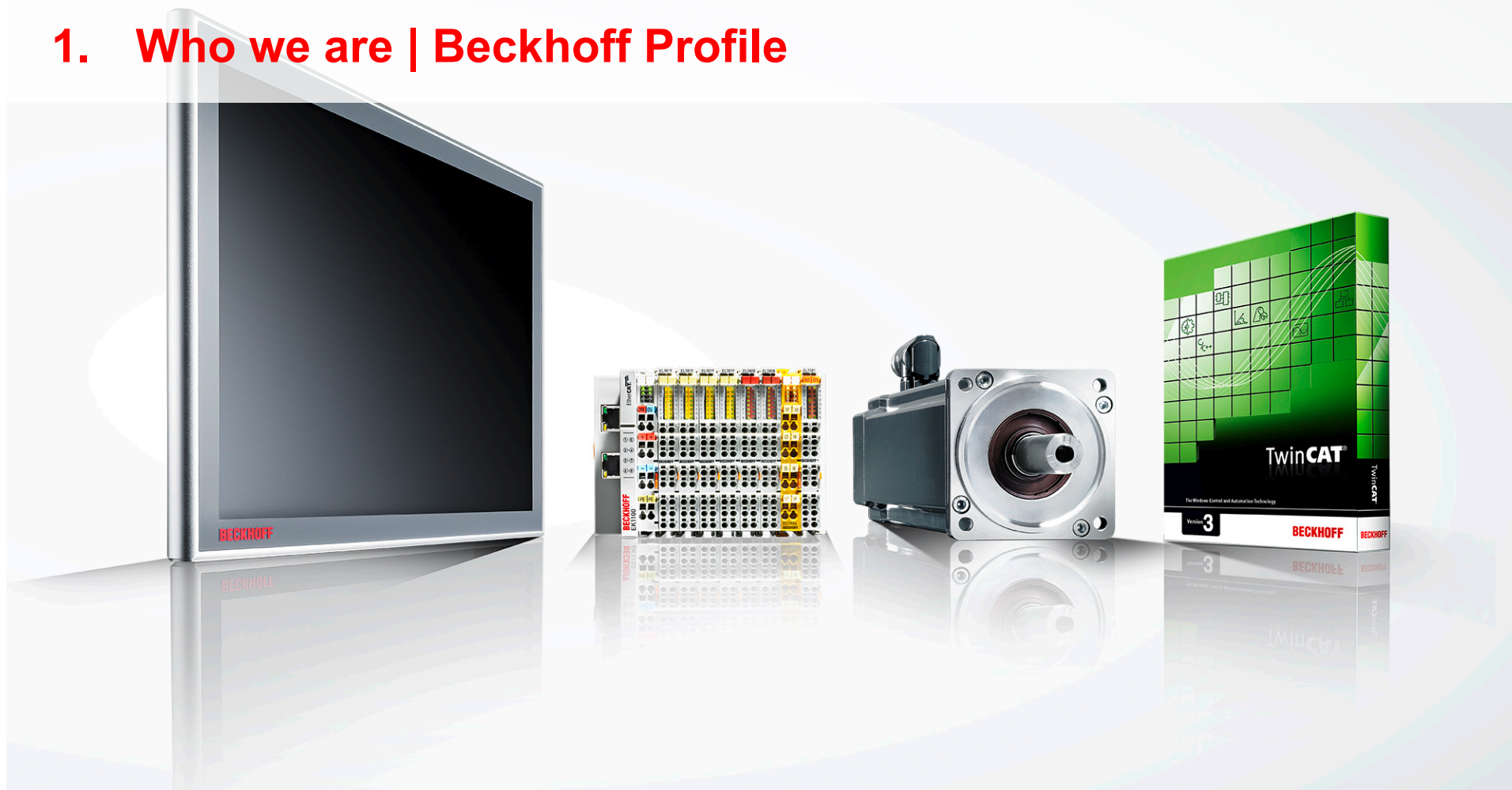
**The New Automation Technology**



1. Who we are - Beckhoff Profile
2. What we do
3. Career prospect & Opportunities
4. Questions



## 1. Who we are | Beckhoff Profile



# The results of increasing population and incomes

BECKHOFF

More people demand more consumer goods.

More people demand more energy and resources.

More people demand more infrastructure.

**How to overcome the challenges?**





## Only automation technology:

- Enables and optimises **resource-friendly and energy-efficient** manufacturing processes for the growing wealth and population
- Realises living environments and infrastructures for a growing population with higher demands... **with sustainable and efficient use of energy and resources**



**Automation technology is the only answer**

**BECKHOFF**

**Beckhoff globally provides leading-edge automation technology for ...**

- machine manufacturers
- factory automation applications
- energy suppliers
- building automation projects
- Infrastructure applications
- ... and many more





## Beckhoff technology: Allianz Arena, Germany

**BECKHOFF**

Without us, the  
lights would go out  
in Bavaria ...



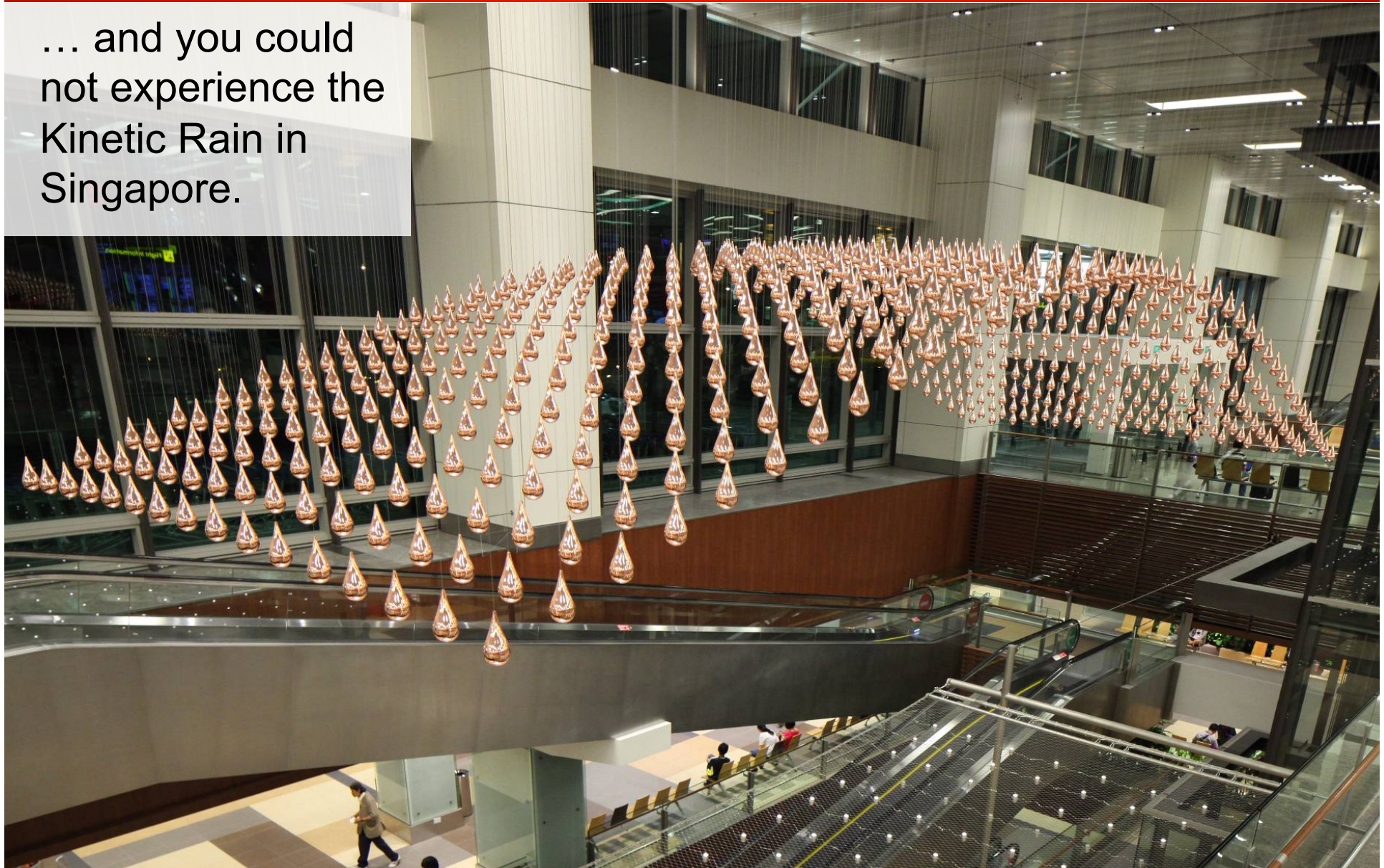




## Beckhoff technology: Changi Airport, Singapore

**BECKHOFF**

... and you could not experience the Kinetic Rain in Singapore.







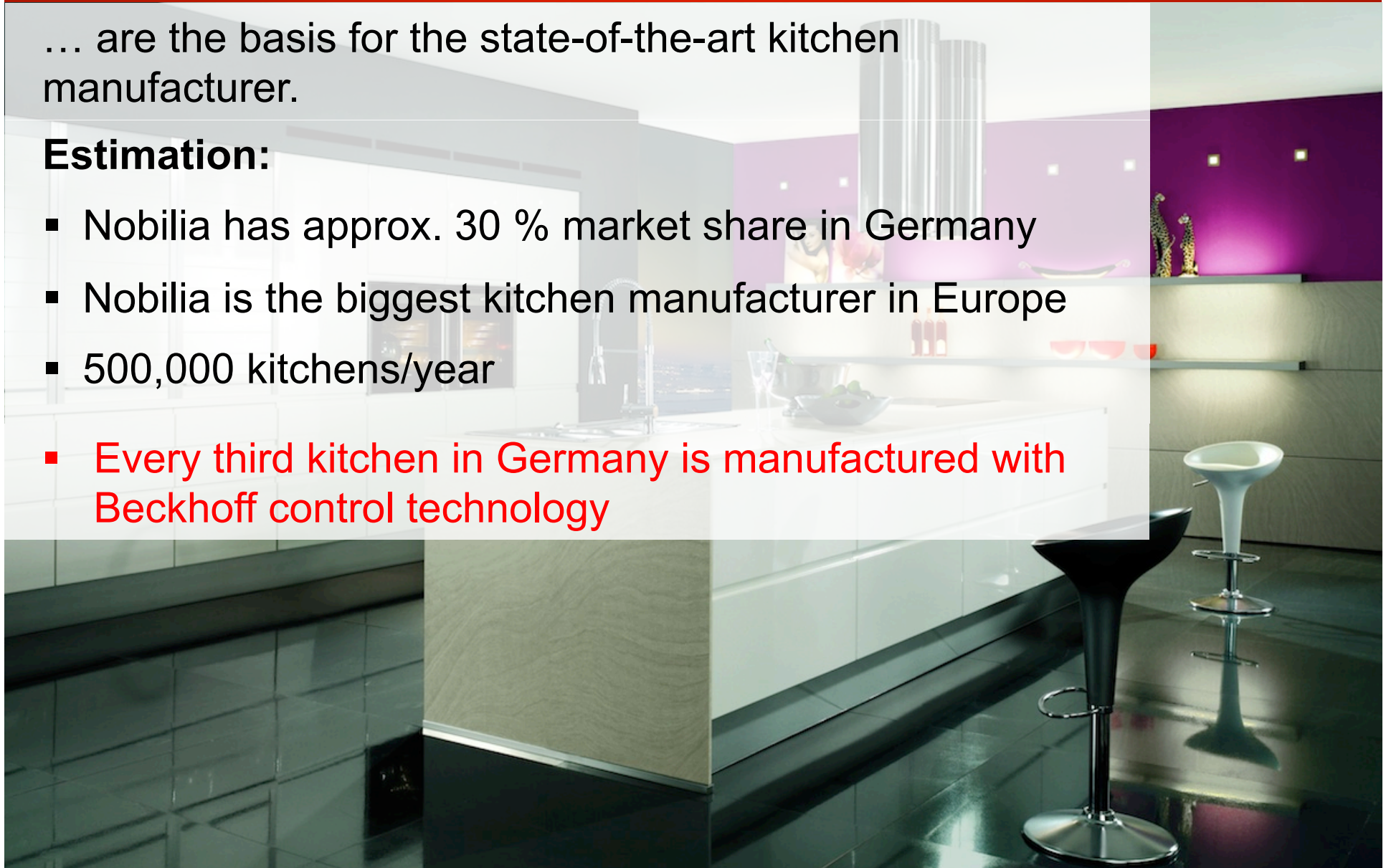
## Beckhoff technology: Nobilia, Germany

BECKHOFF

... are the basis for the state-of-the-art kitchen manufacturer.

### Estimation:

- Nobilia has approx. 30 % market share in Germany
- Nobilia is the biggest kitchen manufacturer in Europe
- 500,000 kitchens/year
- Every third kitchen in Germany is manufactured with Beckhoff control technology







**Beckhoff technology: Elettric80, Italy**

**BECKHOFF**





# Beckhoff technology: Teatro alla Scala, Italy - Modernization of stage equipment

**BECKHOFF**

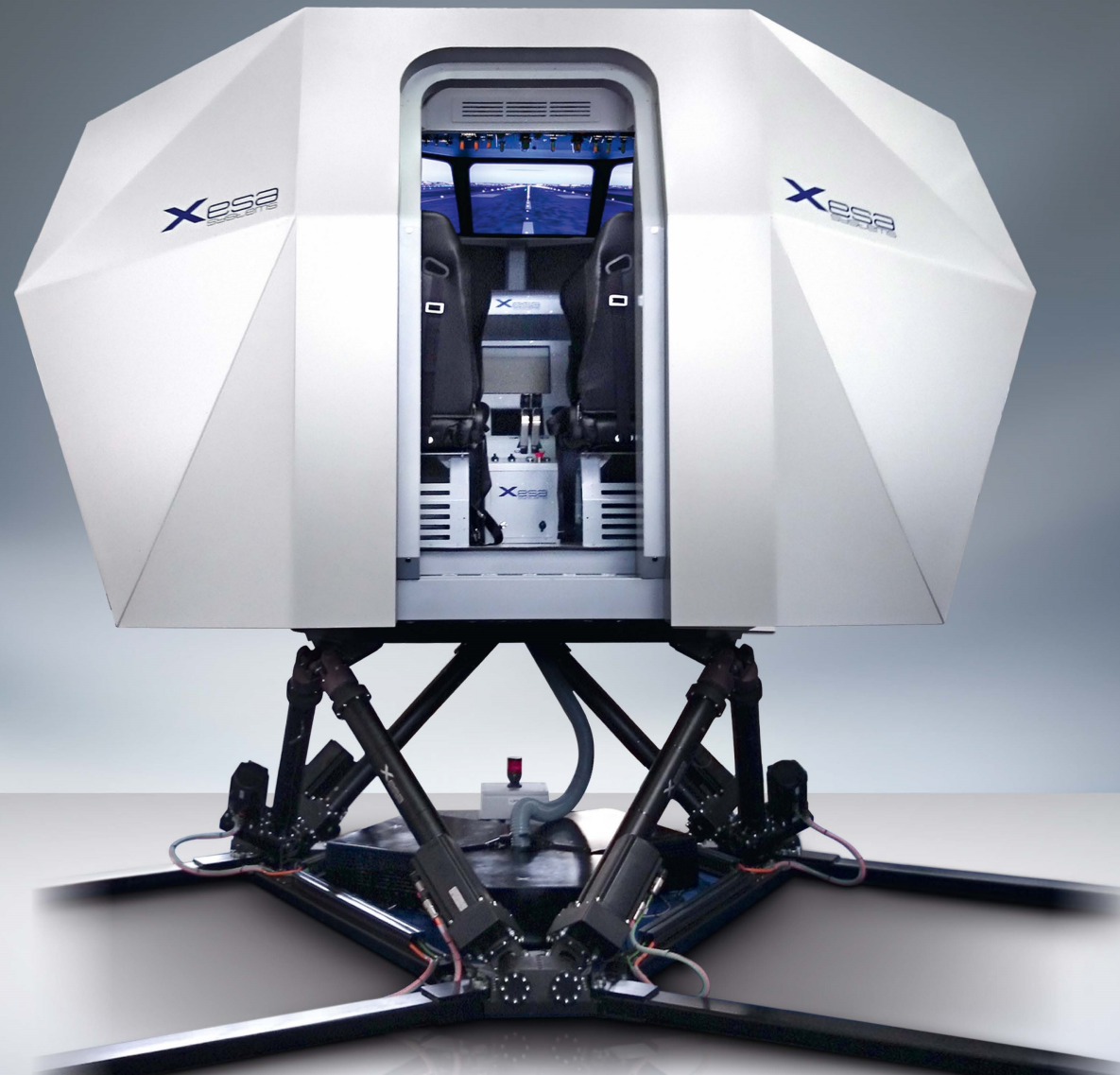




**Beckhoff technology: Xesa, Italy**  
**Full-motion simulator for ultra-realistic driving simulation**



**BECKHOFF**



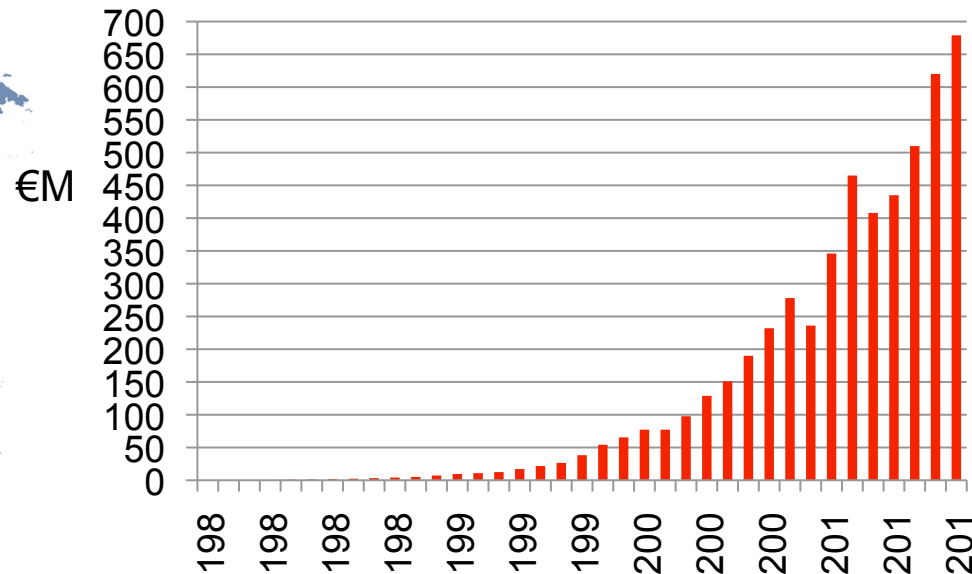
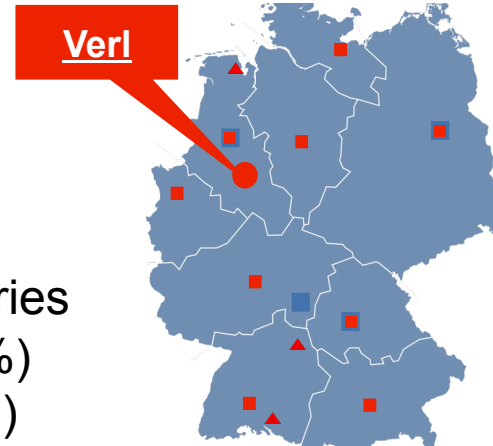




# Beckhoff Worldwide

# BECKHOFF

<b>Headquarters:</b>	Verl, Germany
<b>Employees worldwide:</b>	3.850
<b>Number of engineers:</b>	1.300
<b>Offices in Germany:</b>	21
<b>Beckhoff Offices WW:</b>	35 countries
<b>Distributors Worldwide:</b>	more than 75 countries
<b>Sales 2016:</b>	679 million € (+9,5%)
<b>Sales 2017 (Est.):</b>	800 million € (+18%)

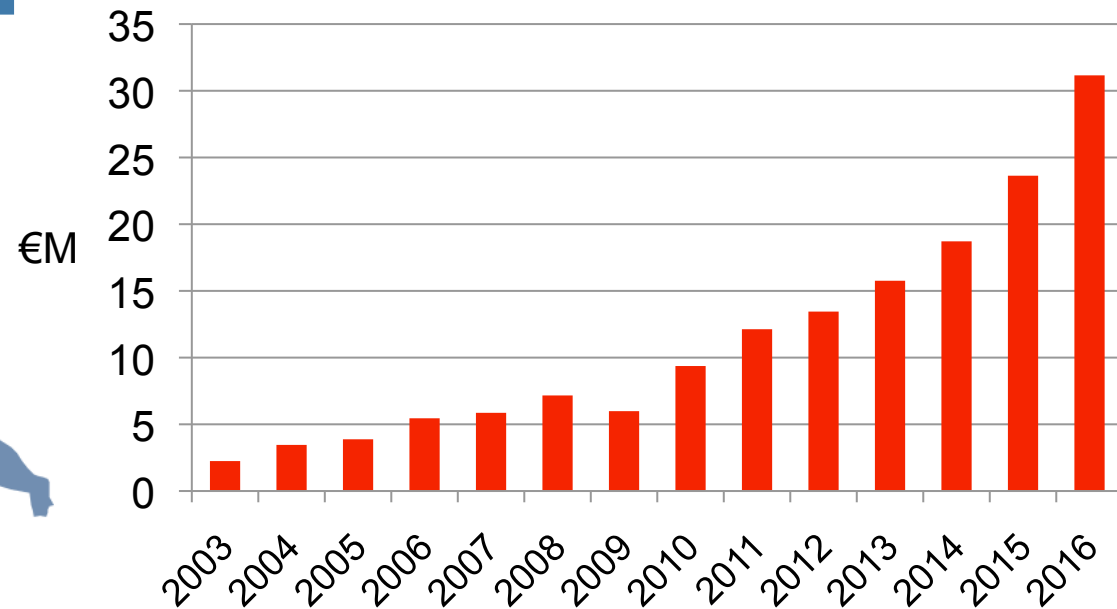




# Beckhoff Italy

**BECKHOFF**

**Head Office:** Limbiate (MB) Italy  
**Employees :** 48  
**Number of engineers:** 26  
**Beckhoff Branch Offices:** 3  
**Sales 2016:** 31 million € (+31%)  
**Sales 2017 (Est.):** 38 million € (+23%)



## 2. What we do









Beckhoff | The Automation Company

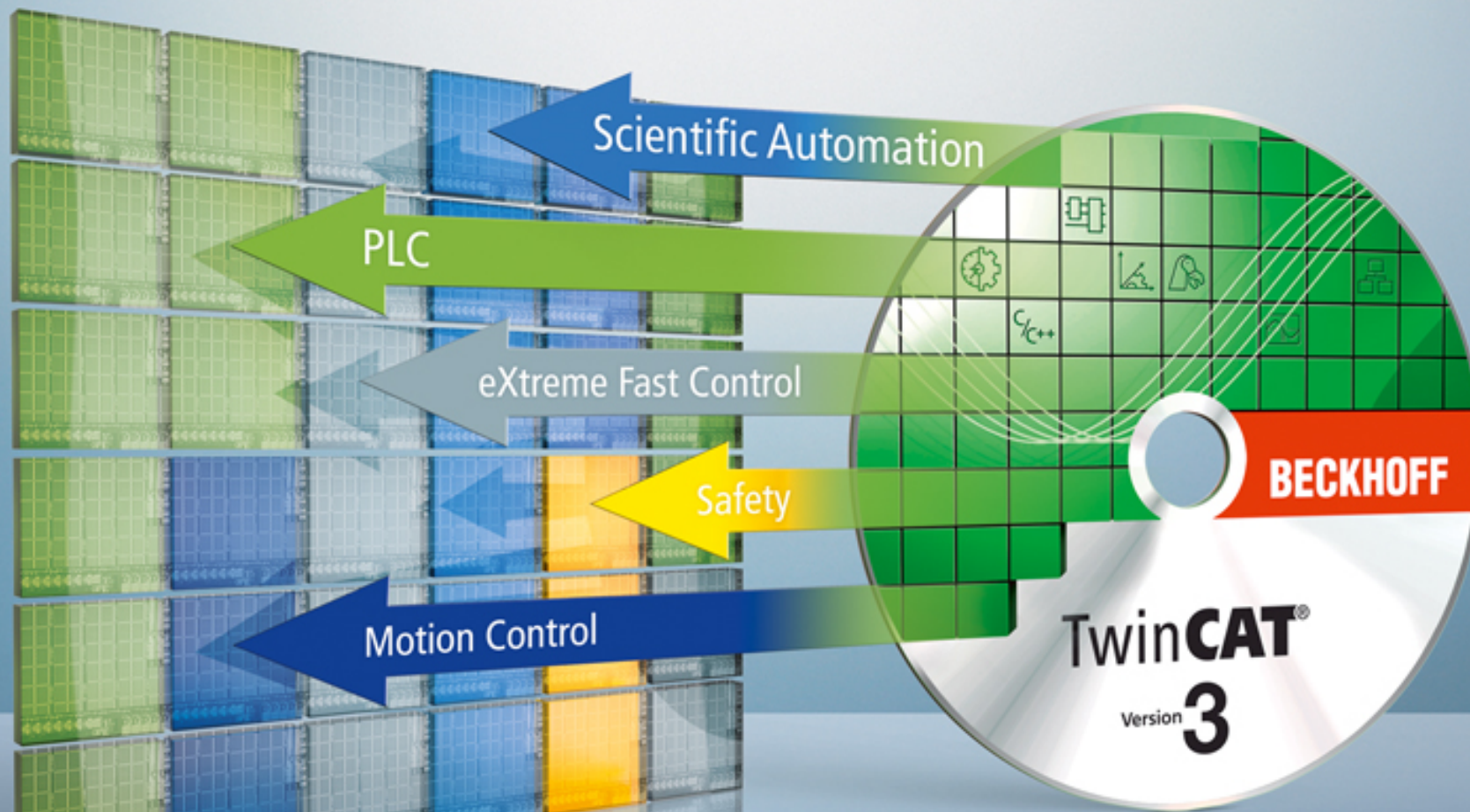
BECKHOFF





# TwinCAT 3 eXtended Automation

**BECKHOFF**





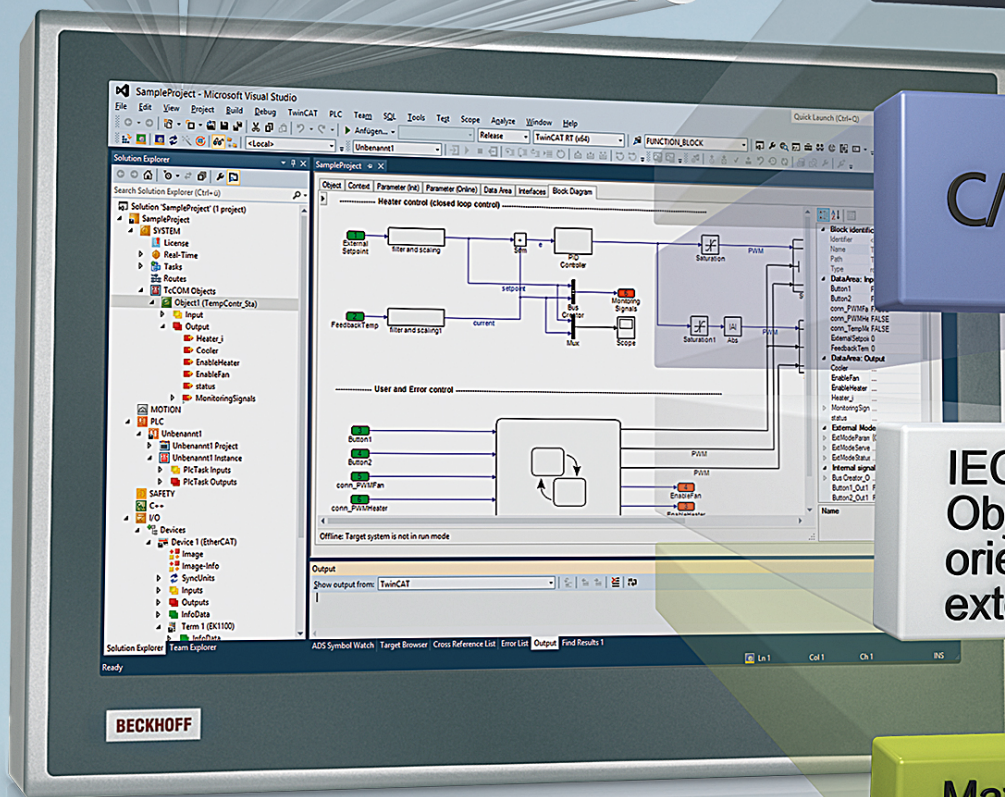
# Visual Studio®

System  
Manager

C/C++

IEC 61131-3  
Object-  
oriented  
extensions

Matlab®/  
Simulink®

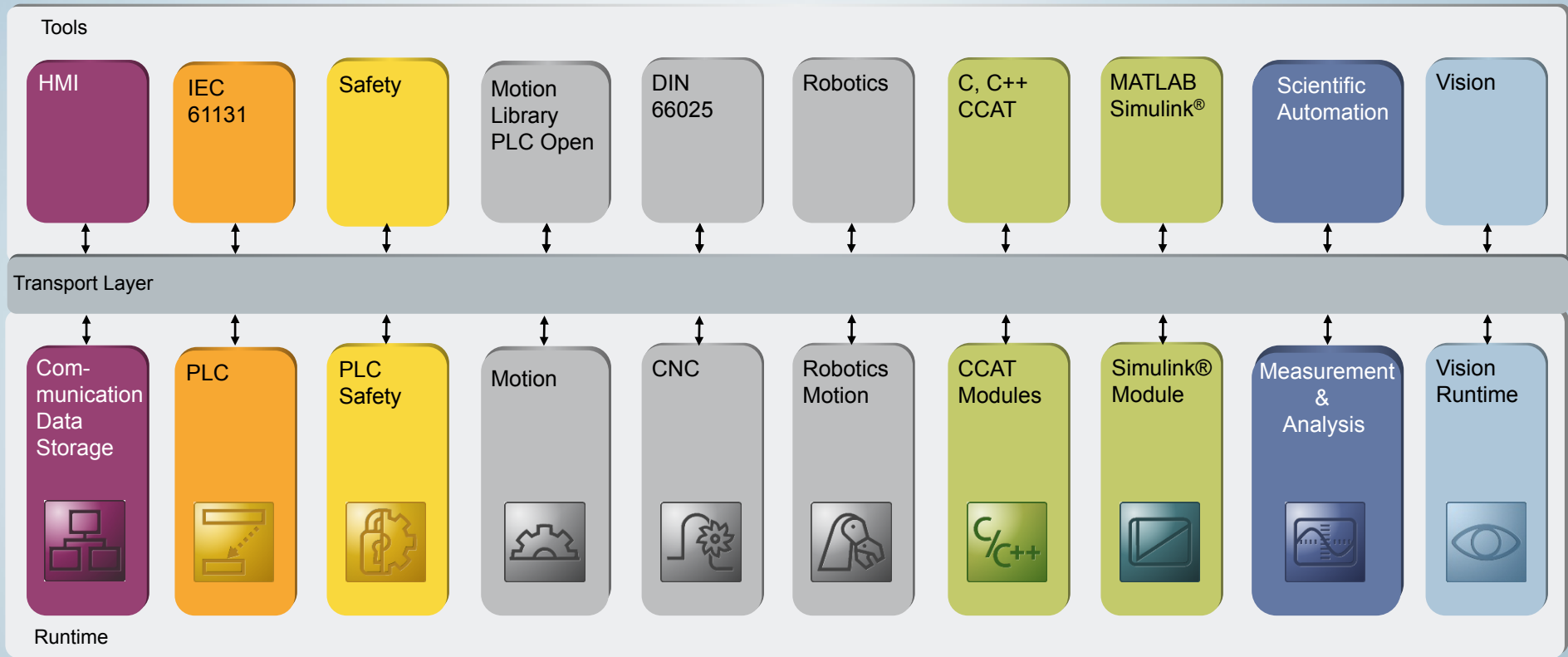




# Unified Universal Platform for Control Technology

**BECKHOFF**

PC-based control technology from Beckhoff sets new standards in automation.

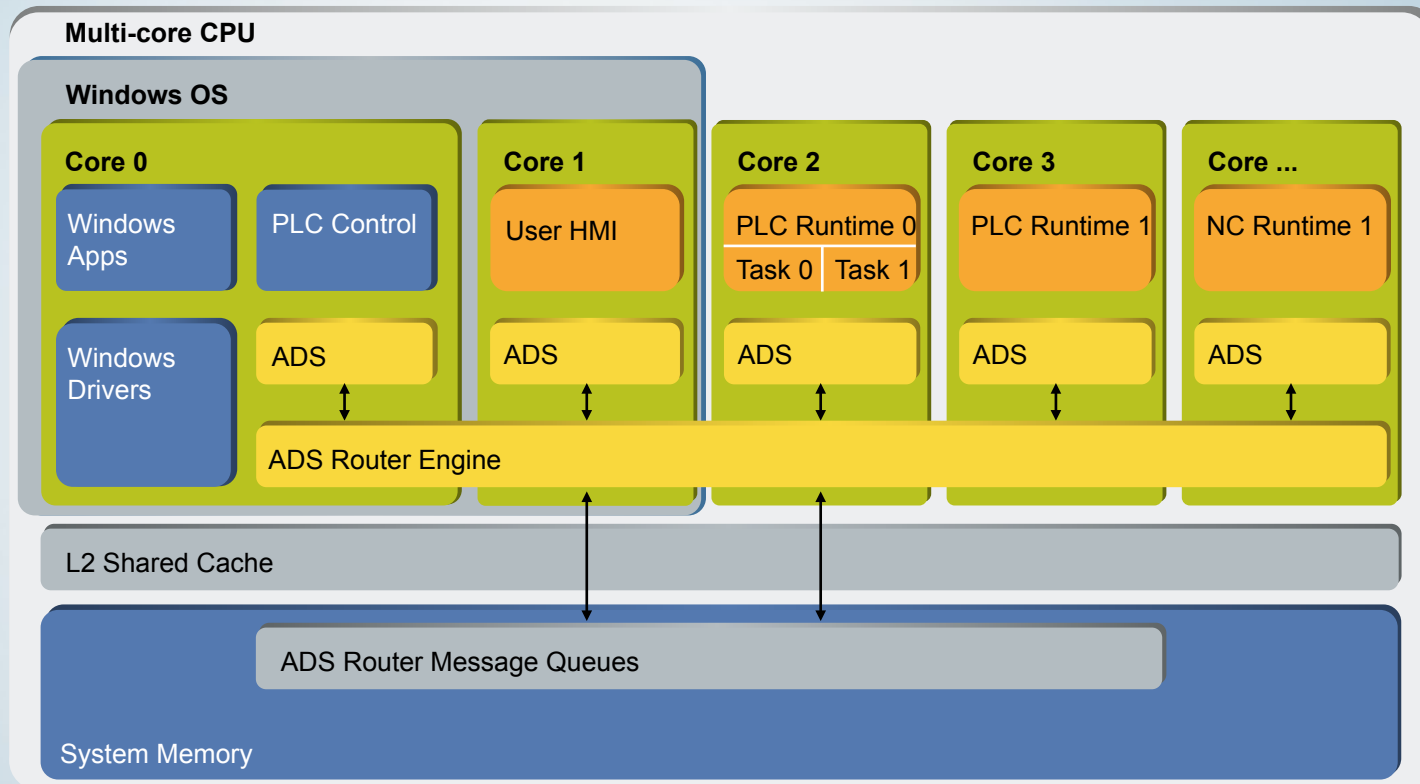






# Support for multi-core systems

- distribution of modules to individual cores (e.g. PLC, Motion control and HMI run on different cores)
- scalable base time for each core
- scalable CPU usage for each core



# TwinCAT PLC Control

BECKHOFF

The screenshot displays the Microsoft Visual Studio IDE with the TwinCAT project 'TC3\_IEC-LanguagesSample' open. The interface is divided into several panes:

- Solution Explorer:** Shows the project structure, including 'TC3\_IEC-LanguagesSample', 'SYSTEM - Configuration', 'NC - Configuration', 'PLC - Configuration', and 'Application'. Under 'Application', there are folders for 'DUTs', 'E\_Operation', 'GVLs', 'Global\_Variables', 'Variable\_Configuration', and 'POUs'. The 'POUs' folder is expanded, showing various function blocks like 'CHECKBOUNDS (ST)', 'FB\_CFC\_SamplePOU (CFC)', 'FB\_FBD\_SamplePOU (FBD)', 'FB\_IL\_SamplePOU (FBD)', 'FB\_LD\_SamplePOU (FBD)', 'FB\_SFC\_SamplePou (SFC)', and several state transition (ST) blocks.
- MAIN\_FBD (FBD) Code Editor:** Contains the following ladder logic program:

```
1 PROGRAM MAIN_FBD
2 VAR
3     Timer      : TON;
4     fbFBD_SamplePOU : FB_FBD_SamplePOU;
5
6     eOperation  : E_Operation := eOp_Add;
7     eOperationPrev : E_Operation := eOp_Add;
8     iResultC    : DINT;
9     bZero       : BOOL;
10    bPos         : BOOL;
11    bNeg         : BOOL;
```
- Ladder Logic Diagram:** Shows a network with two parallel branches. The top branch consists of an AND gate with inputs 'bZero' and 'bPos', followed by an OR gate, another AND gate, and a final OR gate leading to output 'bTest'. The bottom branch consists of an XOR gate with inputs 'bPos' and 'bNeg', followed by a GT (Greater Than) timer block.
- Toolbox:** Lists function blocks and math operators. Under 'Function blocks', there are Pointer, R\_TRIG, F\_TRIG, RS, SR, TON, and TOF. Under 'Math operators', there are Pointer, ADD (2 Inputs), ADD (3 Inputs), SUB, MUL, DIV, EQ, NE, LT, LE, GT, and GE.
- Error List:** Shows 0 Errors, 0 Warnings, and 0 Messages.
- Properties:** Shows the properties of the selected element.

# C/C++ Programming Languages

**BECKHOFF**

- C/C++ code integration

→ Method *CycleUpdate*: – is called cyclically from a task

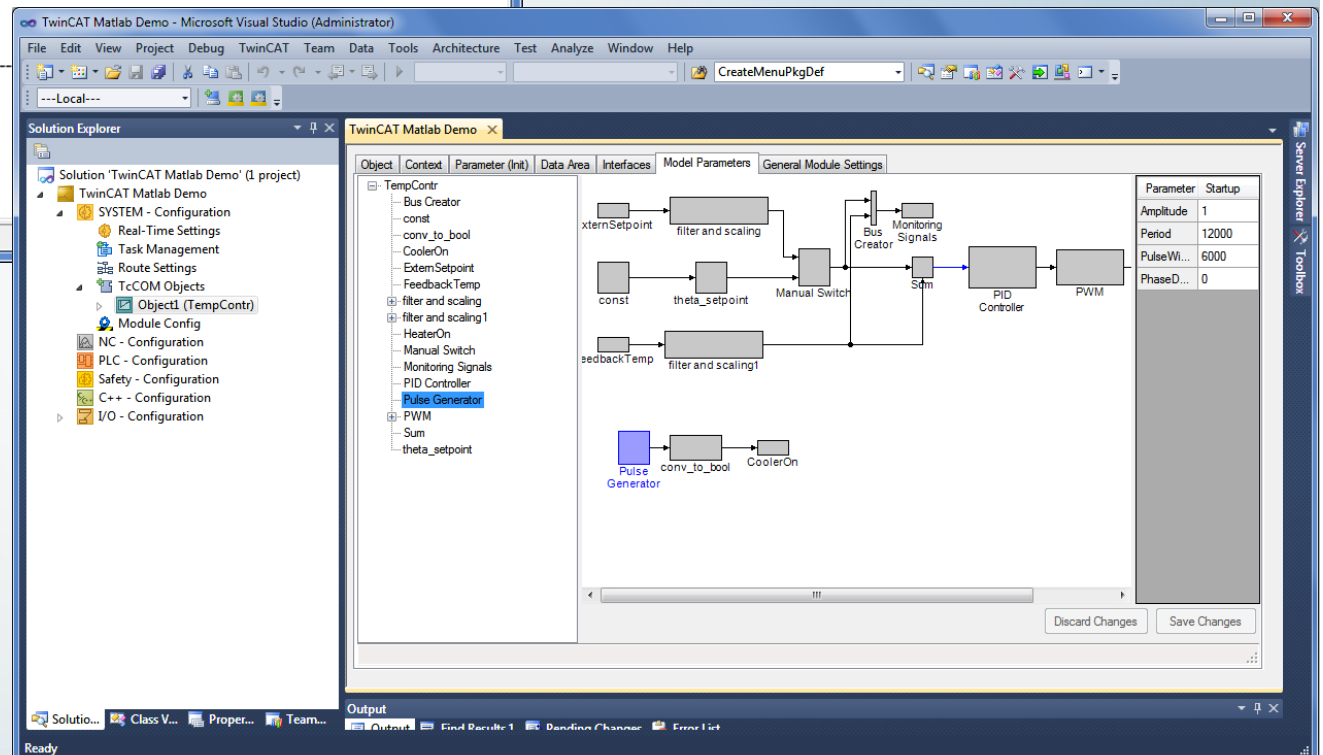
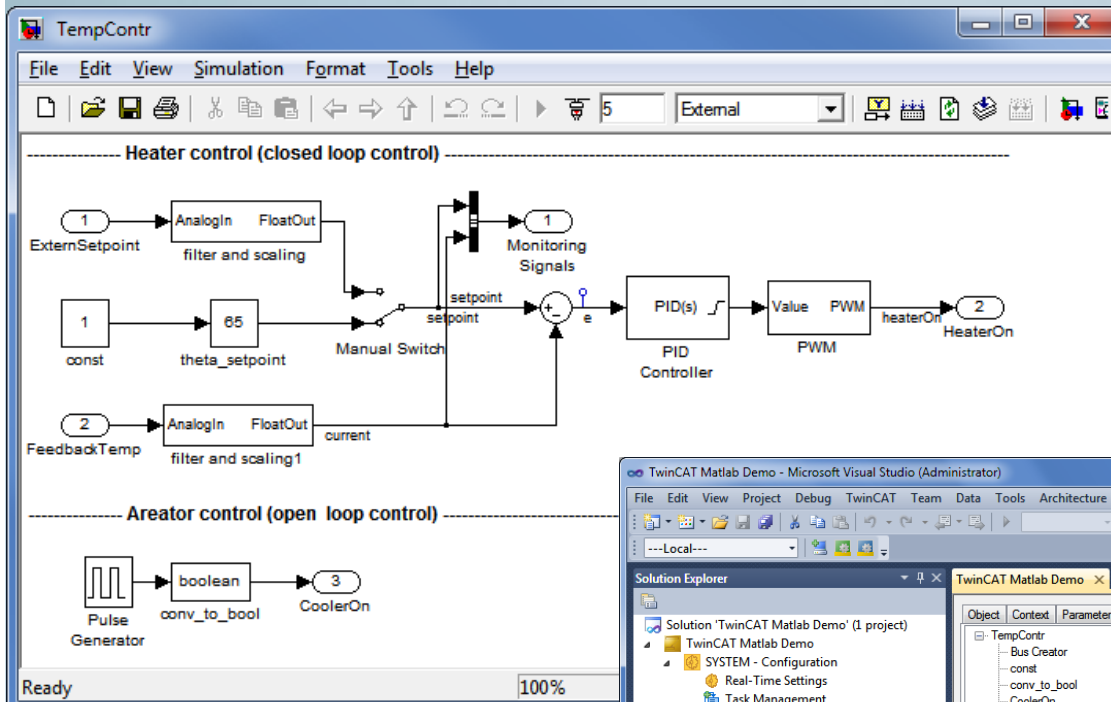
The screenshot displays the Visual Studio IDE interface. On the left, the Solution Explorer shows a project named 'TwinCAT Project11' with a sub-project 'TC\_Proj\_1' under the 'C++' category. The main editor window shows the source code for 'Module1.cpp'. The code includes a method 'SetObjStateSP()' and a cyclically called method 'CycleUpdate()'. The 'CycleUpdate' method signature is circled in red, and a red arrow points from the text above to it. The code for 'CycleUpdate' is as follows:

```
///<AutoGeneratedContent id="ImplementationOf_ITcCyclic">
HRESULT CModule1::CycleUpdate(ITcTask* ipTask, ITcUnknown* ipCaller, ULONG_PTR context)
{
    HRESULT hr = S_OK;

    // TODO: Replace the sample with your cyclic code
    m_counter+=m_Inputs.Value;
    m_Outputs.Value=m_counter;

    return hr;
}
///</AutoGeneratedContent>
```

# Matlab®/Simulink® Integration







# TwinCAT Motion – from PTP to Robotic Control

**BECKHOFF**



NC PTP

## Point-to-point movement

- gearing
- camming
- superposition
- flying saw



NC I

## Interpolated motion with 3 axes and 5 additional axes

- programming according to DIN 66025
- technological features
- straightforward utilisation through function blocks from the PLC



CNC

## Complete CNC functionality

- interpolated movement for up to 32 axes per channel
- various transformations



Robotics

## Interpolated motion for robotic control

- support for a wide range of kinematic systems
- optional torque pre-control

# TwinSAFE: the integrated safety solution

**BECKHOFF**

The screenshot shows the TwinCAT software interface for a safety project. The main window displays a ladder logic network with several function blocks:

- safeAND (FBAnd1):** A function block with inputs AndIn1 through AndIn8 and output AndOut. State: 0x01.
- safeOr (FBO1):** A function block with inputs OrIn1 through OrIn8 and output OrOut. State: 0x01.
- safeStop (FBStop1):** A function block with a Restart input and outputs EStopOut and EStopDelOut. Delay Time (ms) is set to 100. State: 0x01.
- safeIs (FBI1):** A function block with a Set input and output FoOut. State: 0x09.

The left sidebar shows the project tree with 'SafetyProject' and 'TwinSafeGroup1'. The bottom section contains a 'Variable Mapping' table and a 'Safety Project Online View' table.

Function Name	Instance Name	Port Name	Direction	Assigned Variable	Data Type	Alias Port
safeAND	FBAnd1	AndIn1	input	in1_in	Bool	StandardInput.Channel 1
safeAND	FBAnd1	AndIn2	input	input_button_1	safeBool	SafeInputs.Channel 1
safeAND	FBAnd1	AndIn3	input	input_button_2	safeBool	SafeInputs.Channel 2
safeOr	FBO1	OrIn1	input	input_button_3	safeBool	SafeInputs.Channel 1
safeOr	FBO1	OrIn2	input	input_button_4	safeBool	SafeInputs.Channel 4
safeStop	FBStop1	Restart	input	restart	Bool	EStopRestart.Channel 1
safeStop	FBStop1	EStopOut	output	output_1	safeBool	SafeOutputs.Channel 1
safeIs	FBI1	FoOut	output	output_2	safeBool	SafeOutputs.Channel 2

Name	Value
TwinSafeGroup1	
State	State: RUN (0/3 connections not running, 0/5 fun
Inputs	
RUN	1
Error Acknowledgement	0
Outputs	
FBEn	0
ComErr	0
OutErr	0
Alias Devices	
Function Blocks	
FBAnd1 (safeAND)	
FBO1 (safeOr)	

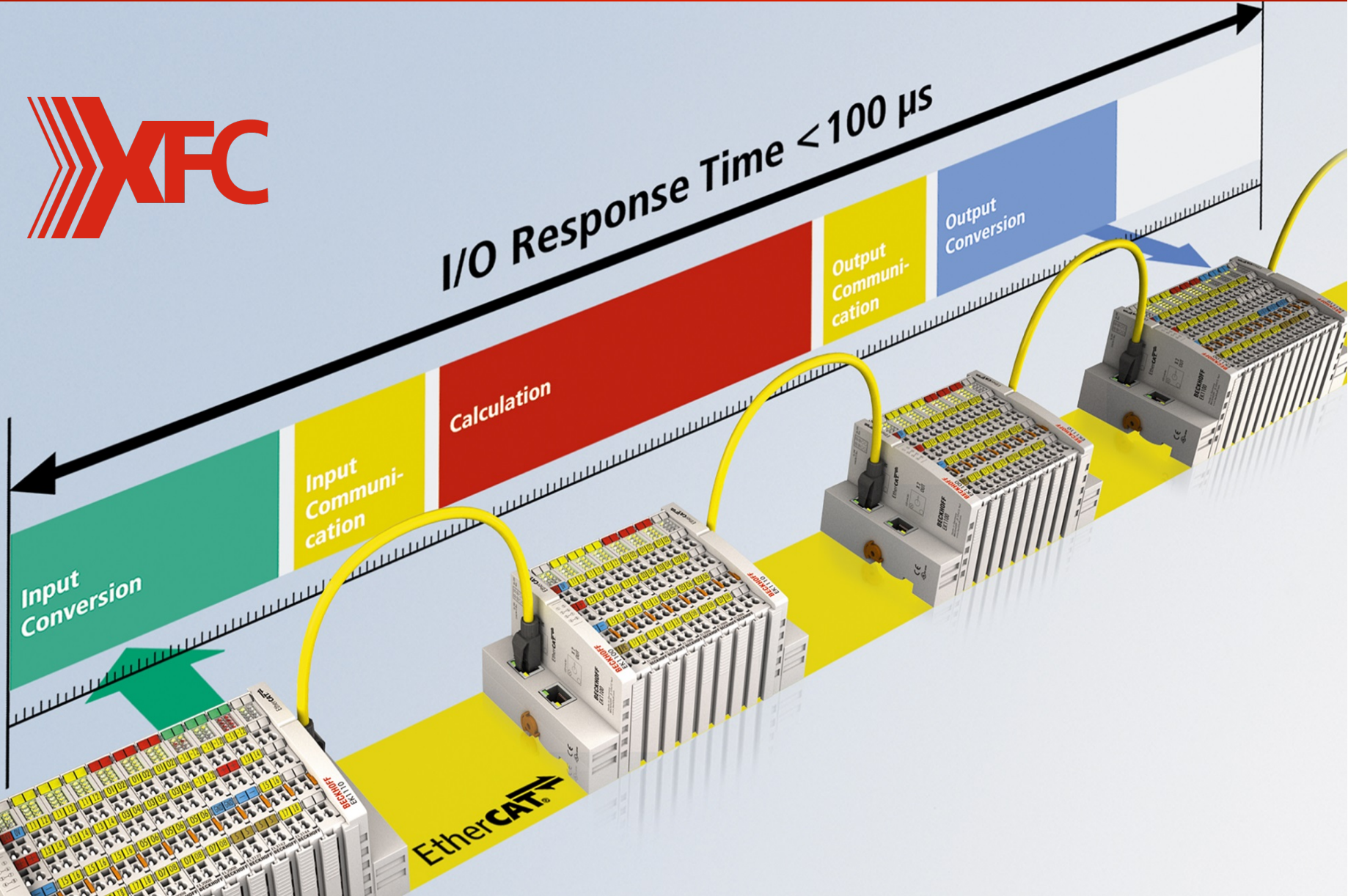


# XFC – eXtreme Fast Control Technology

**BECKHOFF**



I/O Response Time <math>< 100 \mu\text{s}</math>

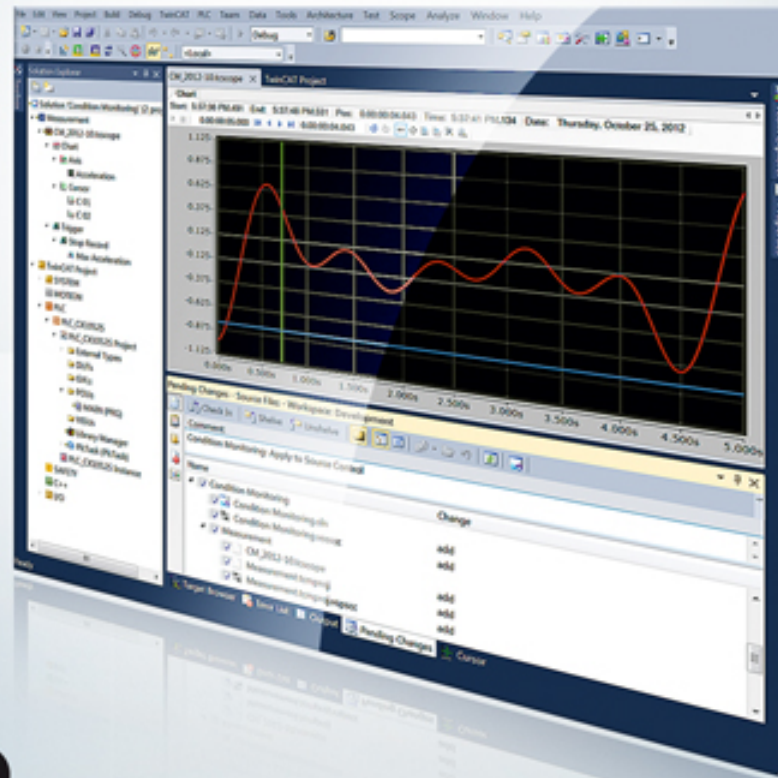






# Scientific Automation

**BECKHOFF**



# TwinCAT<sup>®</sup> 3



- Efficient engineering
- HTML5, JavaScript
- Platform-independent
- Web-based
- Powerful architecture
- Modular expandability





# TwinCAT HMI

**BECKHOFF**



Operating systems, browsers, devices: it's your choice.

TwinCAT HMI automatically adapts to your needs.





Beckhoff | The IPC Company

BECKHOFF





# IPCs Overview



Panel PCs



Control cabinet industrial PCs

Embedded PCs

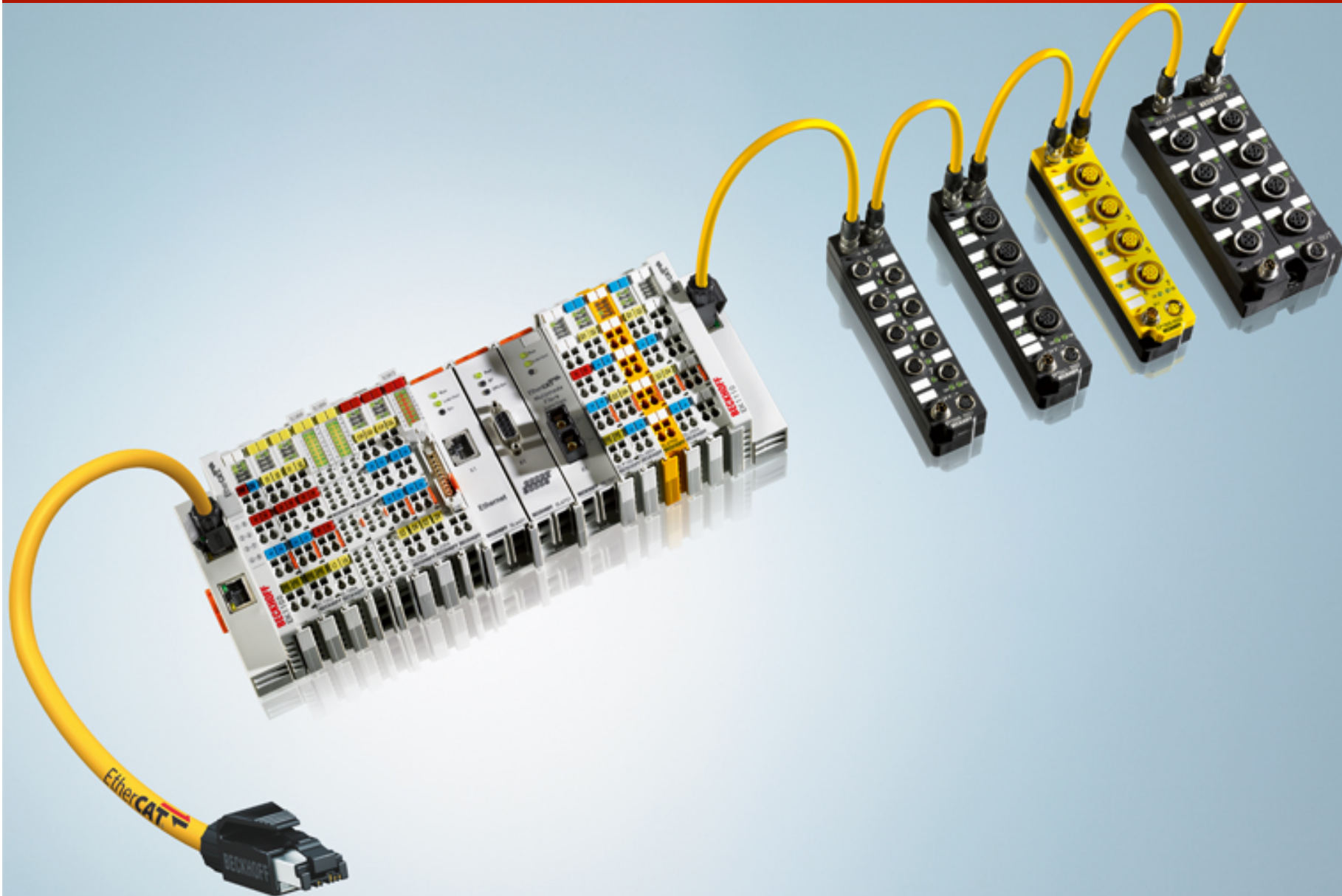
Control Panel





Beckhoff | The I/O Company

**BECKHOFF**







# EtherCAT

**BECKHOFF**

Ethernet for Control Automation Technology







# Ethercat I/O Overview

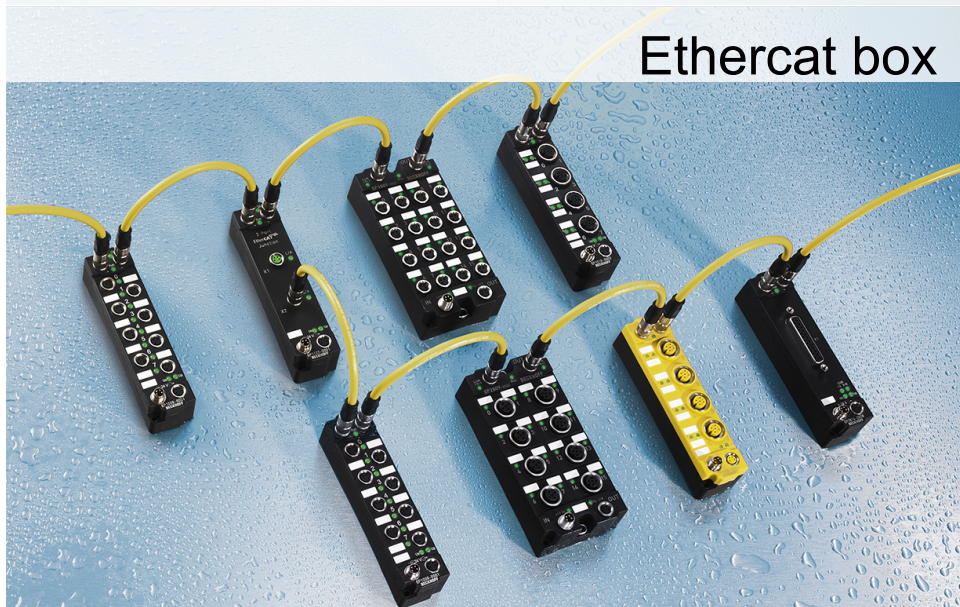
**BECKHOFF**



Ethercat terminal



Measurement Modules



Ethercat box



Ethercat P – One cable solution





Beckhoff | The Motion Company

BECKHOFF

Servo Drives from 0.2 to 120 KW  
Servomotors from 0.2 to 180 Nm





# Motion Overview

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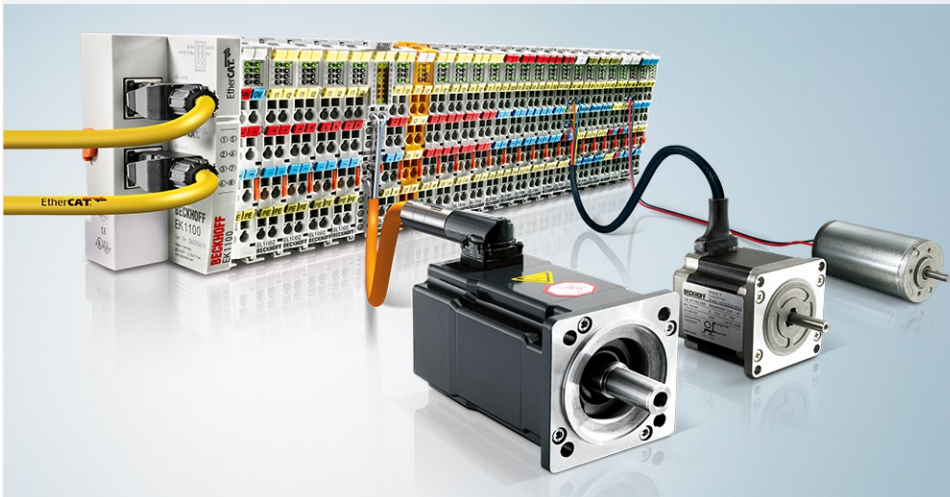
## Servo Drives



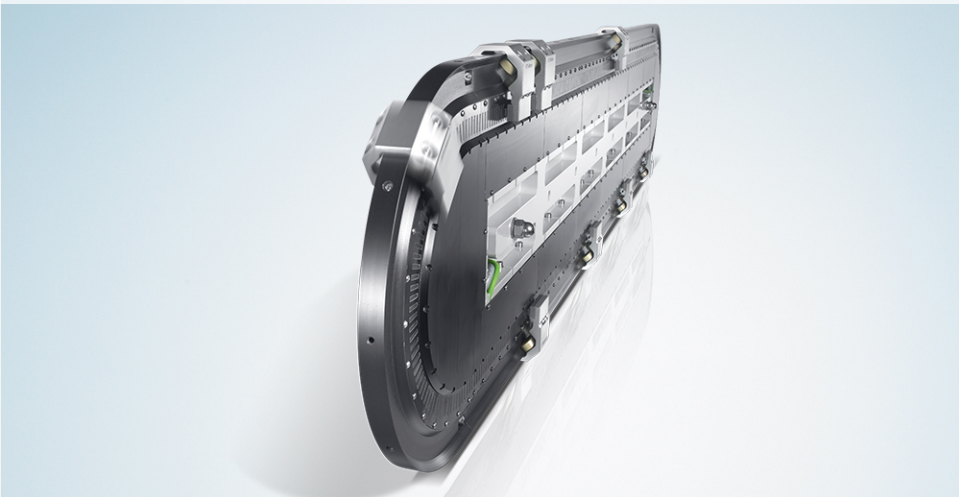
## Servomotors



## Compact Drive Technology



## eXtended Transport System

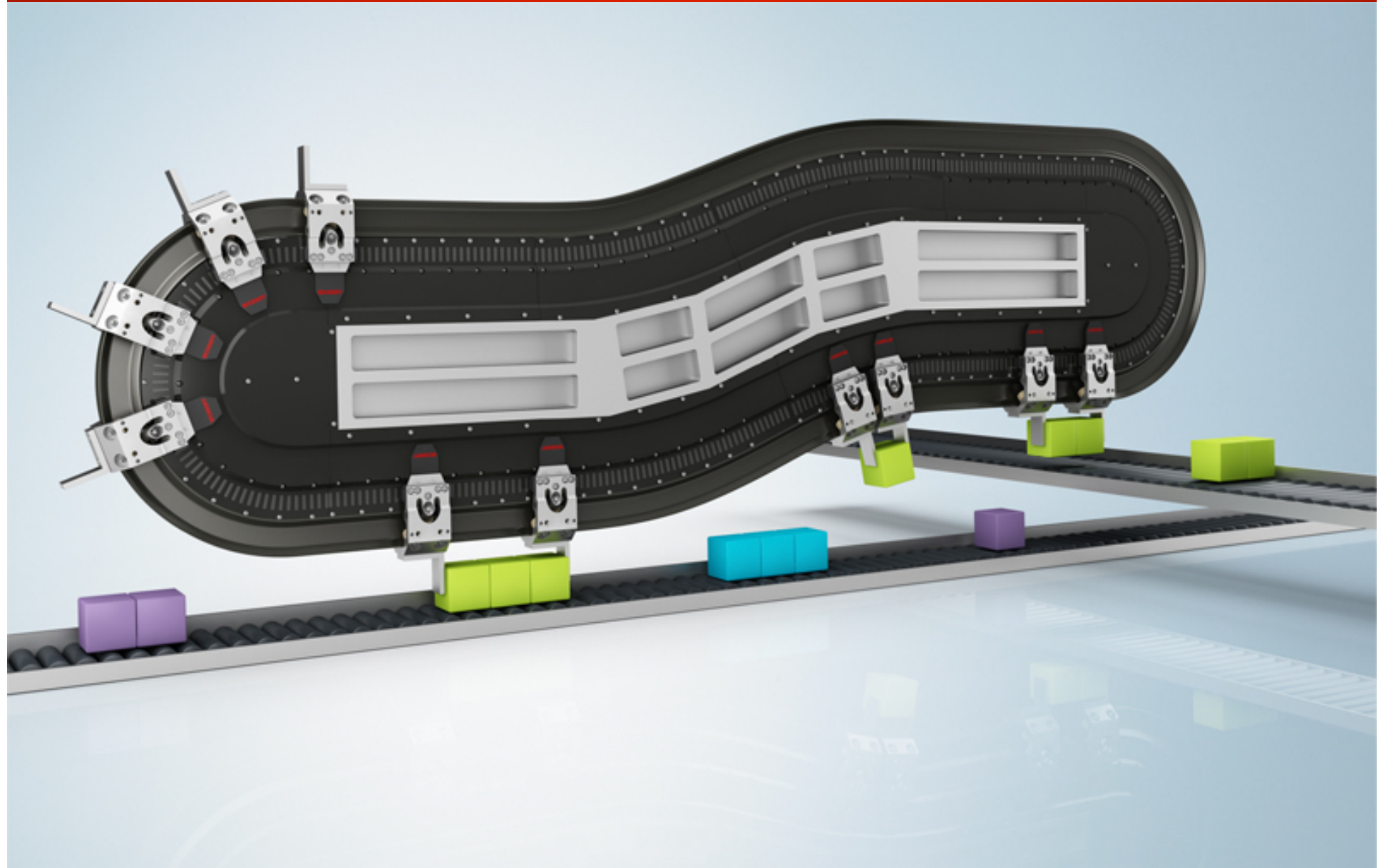






# XTS – eXtended Transport System

**BECKHOFF**



## 3. Career prospect & Opportunities







## What sets us apart

In contrast to most of our competitors, Beckhoff has always been – and will always be – an **owner-driven company**.

I help shape the future with an international high-tech company. At Beckhoff.



People who become part of the Beckhoff Automation team are given the opportunity to:

- ❖ work in a family company with **FAMILY VALUES**
- ❖ face with innovative, **TECHNOLOGICALLY**, advanced and rapidly growing environment
- ❖ accelerate their professional growth: **KNOWLEDGE SHARING** and **TRAINING** are the key elements in a technology driven company such as Beckhoff

We grant high standards of **TRAINING** both local and linked to the German HQ on all the product range (Industrial PCs, I/O and Fieldbus Components, Drive Technology and automation software)

We invest in new ideas.



And in the young people who have them.

Beckhoff Automation offers numerous opportunities for starting careers with:

- ❖ Internships for university students in order to support the development of thesis
- ❖ Hiring for new graduated

## OCCUPATION FIELDS:

### Application Engineer



#### Responsibilities

- Provide technical assistance across Beckhoff's product range for internal and external customers
- Fault finding and troubleshooting on existing systems
- Product servicing and repair
- Represent the organization in a professional, ethical and socially responsible manner

### Sales Engineer



#### Responsibilities

- Manage and generate new business opportunities
- Develop sales with OEM and End User customer accounts using appropriate products and solutions
- Successfully build relationships with current customer base and provide necessary sales support
- Represent the organization in a professional, ethical, and socially responsible manner



We're looking for talented young people who have:

- Bachelor's Degree in Engineering, or equivalent
- Familiarity with Automation and Control Systems
- Strong interpersonal skills with ability to interact with customers
- Flexible and adaptable to changing support priorities
- Willing to travel



Whether you are a university student, graduate or professional, we look forward to your application!

Please send your application to: [jobs@beckhoff.it](mailto:jobs@beckhoff.it).



# BECKHOFF

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Beckhoff Automation S.r.l.

Via Prima Strada , 35

35129 Padova (PD)



## 4. Questions

