fieramilano
9-13/10/2018

Bosch Rexroth SpA

La manifattura digitale con le soluzioni I4.0 di Bosch Rexroth diventa accessibile, a tutti i livelli

Michele Pirelli

CNC Segment Market Manager

World class –
60 channels and 250 axes with a single control

Genius and simple –
programming and commissioning with one common tool

Innovative functions –
perfect in all applications

Open for new ideas –
customer specific extensions

We provide the most powerful CNC
in the market

50 Years CNC Technology

Future-proof –
IoT-ready with complete OPC-UA-server/ client-functionality

Lightning fast –
shortest PLC and CNC cycle times

rexroth
A Bosch Company

BI-MUpiù

MTX - The Innovative Multi-Technology CNC solution

90 new software functions in version 14

2-channel display
User management for panels
No punch
CML75
FFW asynchronus axes
Extended system limits
programable safety zones
Multi-part punching
Checkbounds
PCSPROBE
ASUP can interrupt ASUP
C1-steady
LLLAB
automation Interface
Multi-touch Bedienung
stop watch
Leap Frog
Lock OP-area
Sercos Hot-Plug
MTX ewb
Emulation in engineering
2D-laser function kit
Easy HMI
visIREC
Fast Actions
Energy Management
CheckDivReal
Vereinfachte Variableneingabe
Customized spindle designation
Online-Simulation
dynamic start screen
Safe homing
Language specific layout
OPC UA Diagnosis
CIP Safety on Sercos
compensation für virtual axes
OPC-UA name plate
PLC pre-compiling
Werkzeugtypeditor
Fly-Cut
Height control
kerf compensation
Micro Anwenderbilder
Safe cams
Swiveling cycle for 4 axes kinematics
Home Control
Pierce Points
Punch/Nibble cycles
Retrace
OPC-UA Discovery
PLC project comparison
Cockpit Design
Secure Unlock
Operation Simulator in engineering
Preview finished part

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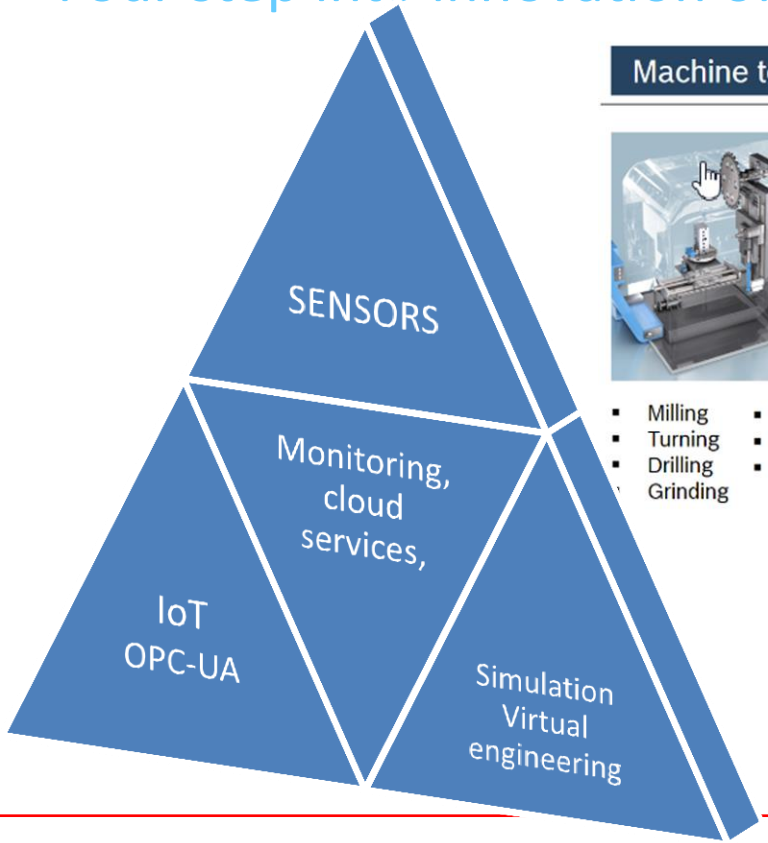
BI-MUpiù

Four step into innovation of digital era of Machine Tool



Machine tool cutting

- Milling
- Turning
- Drilling
- Grinding
- Gear Cutting
- Broaching
- Honing

Wood and Glass

- Milling, Drilling
- Routing
- Glass Grinding
- Glass Cutting

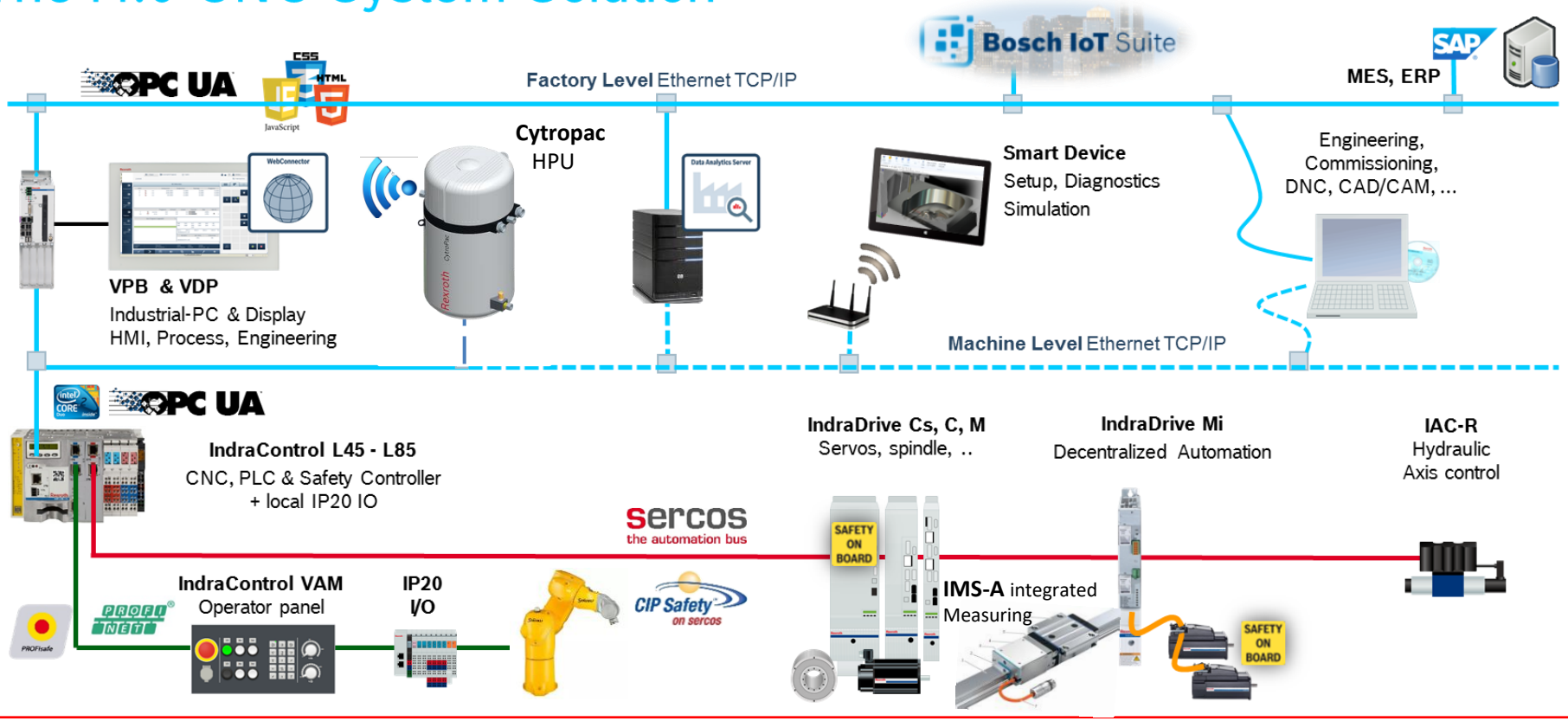
Machine tool forming

- Laser, Plasma, Waterjet, Oxyfuel Cutting
- Nibbling, Punching
- Tube, Wire, Sheet metal bending

Additive Manufacturing

- Selective laser sintering
- Electron beam welding
- Fused filament fabrication

The i4.0 CNC System Solution



Products, Systems and CNC solutions, all connected

Controls

MTX

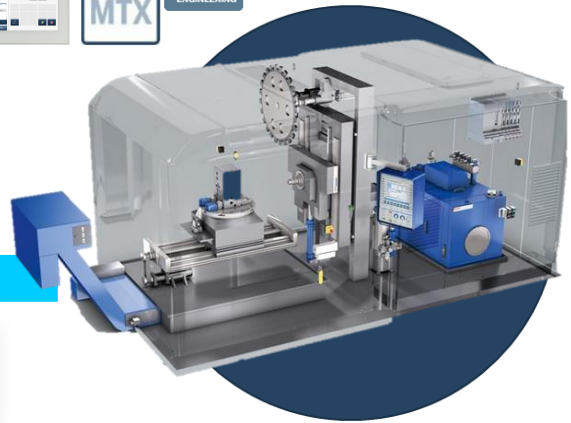
OPEN CORE ENGINEERING

Hydraulics

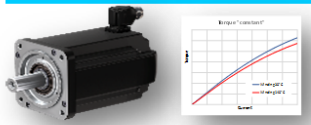
SENSORS

Electric Drives

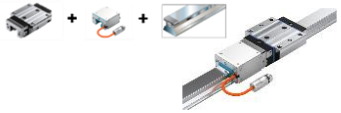
Transport



Servo motors



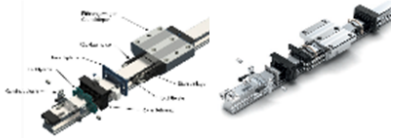
Integrated measuring system



Industrie 4.0 Internet of things

i 4.0
CONNECTED INDUSTRY

Linear guides



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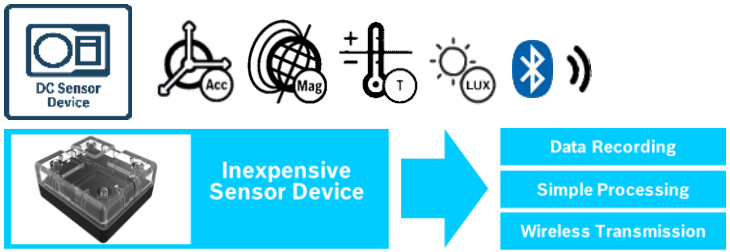
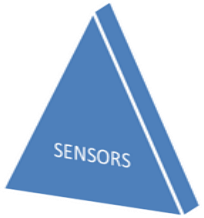
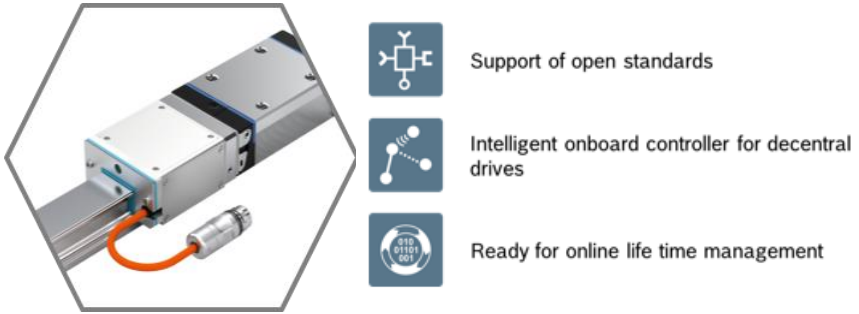
CISS, XDK , sensors for process monitoring

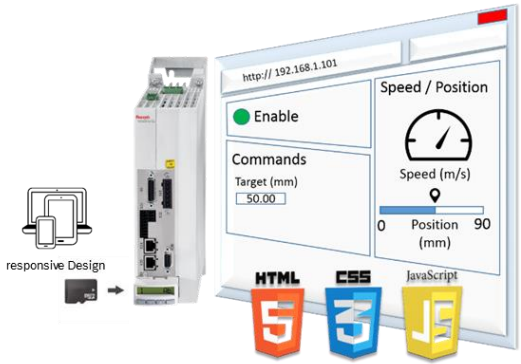


Cytropac ,sensorized power pack



IMS-A absolute integrated measuring system



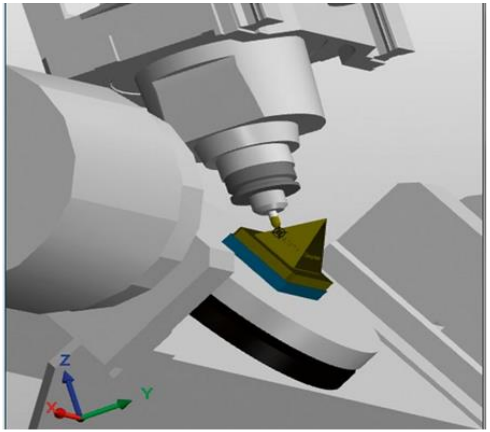


Open Drive Software

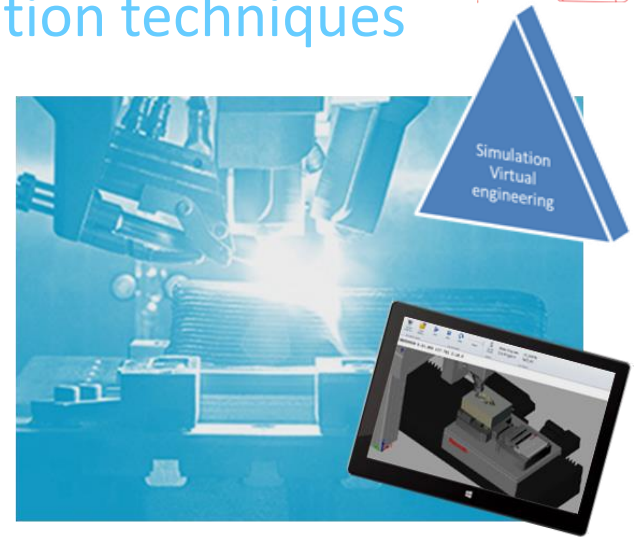
- Algorithms avoiding anti-vibration filters setting
- Commissioning the electromechanical axis with readout of the application data
- Parameterization, software update and diagnostics with the drive-integrated web server

MTX simulation : motivation using CNC Simulation techniques

OEM / Machine Manufacturer
configuration, programming and commissioning based on a virtual machine controller (virtual CNC) without real components set up yet



OEM and End-User
validate and optimize CNC part programs and the machining process without blocking a real machine



End User
digital machine model running in sync with the real machine as a “window into the machine” where no proper visual access to the machining area

CNC virtual simulation : a process chain for seamless data

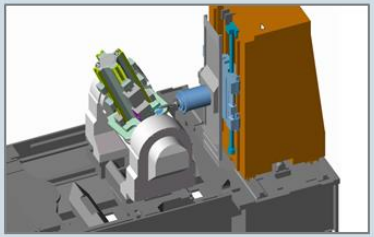
Simulation Virtual engineering

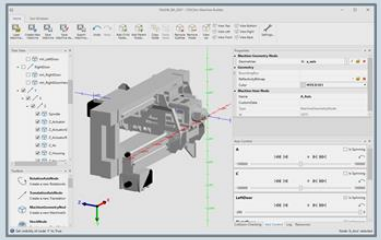
CAM partners
- Import CAD file
- Definition of machining process incl. tools
- Tool path Calculation
- Post processing

Offline simulation components
- Machine Builder
- Collision Detection
- Material removal

Job setup export (XML)
- Tooling
- Work piece
- Fixtures
- Offsets

IndraMotion MTX
- NC File from PP
- Job Setup Import
- Online simulation (incl. collision detection and material removal)





Gnutti Transfer „Piccola“ goes Virtual in MTX

Digital Workflow

Dassault Digital Twin

Digital data model of the machine tool

- Machine simulation and visualization
- Planning of CNC machining
- CNC code generation

MTX Virtual Machine Simulation

- Import of generated CNC code
- CNC simulation based on a real CNC kernel
  - Precise behaviour
  - Material removal
  - Tool path visualization
  - Collision detection

IoT solutions for getting ready in few steps

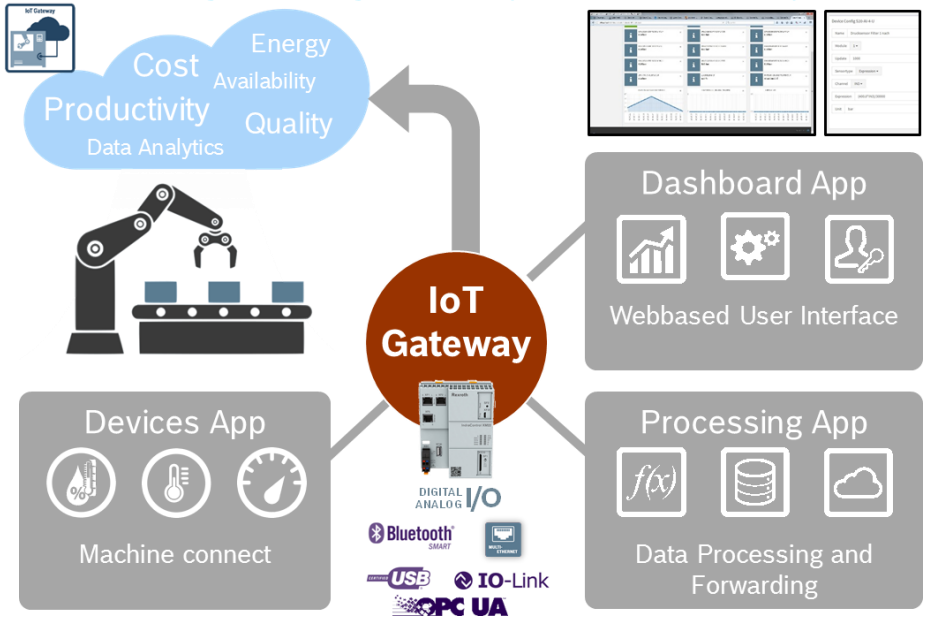
IoT
OPC-UA

-25%
Maintenance costs

-20%
Complexity for manual testing

+5%
OEE

ROI < 1,5 years

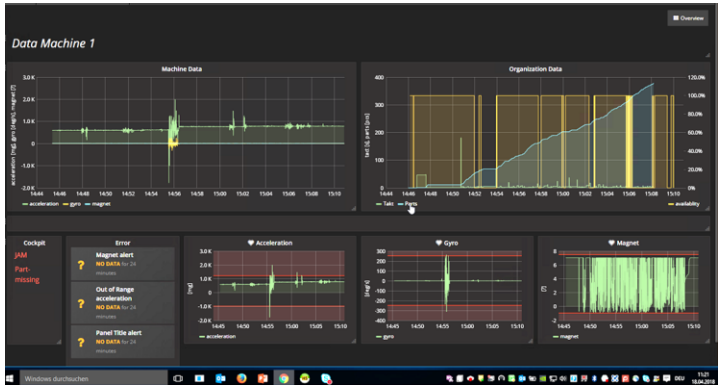


Devices App establishes connections with peripherals (such as sensors).
In the app, signal values are converted into process data

Dashboard App provides web-based interfaces for:
- ✓ Administration
- ✓ Configuration and parameterization
- ✓ Visualization of process data

Processing App ensures fast processing and forwarding of process data
Forwarding of information to higher-level systems, for example:
- ✓ Bosch Energy Platform
- ✓ Bosch Online Diagnostics Network **(ODiN)**
- ✓ Bosch Production Performance Management (PPM)
- ✓ Microsoft Azure
- ✓ MQTT
- ✓ OPC UA Server
- ✓ Oracle IoT Cloud

IoT Gateway and Local Monitoring – Highlights



All relevant information in one view

Fast and easy Setup

Not depending on connection speeds

Cutting-Edge Local Monitoring

Data remain in your Company

Customizable View

Customizable thresholds and warnings

Fast comparison

Management and technical view

Real demo application on Plasma cutting machine

Brown field

Foreing CNC &
Bosch Rexroth Drives

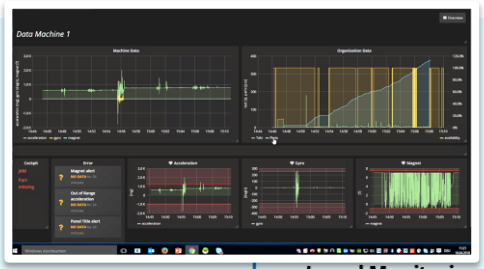
CNC

Ethercat

Ciss
Sensor via
USB

CISS Bosch Industrial Sensor
e.g. Temp, Shock, acceleration

IOT solutions



Local Monitoring

IoT rack
Plug and Go

OPC UA

IoT
OPC-UA

Ethernet
TCP/IP

Green field

MTX Demo for Plasma Application

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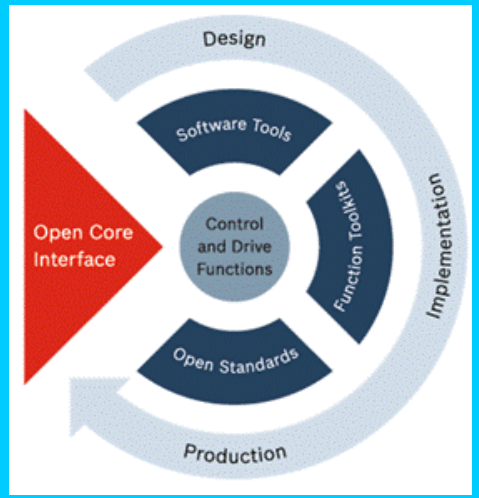
Summary : advance in new dimensions of your know how

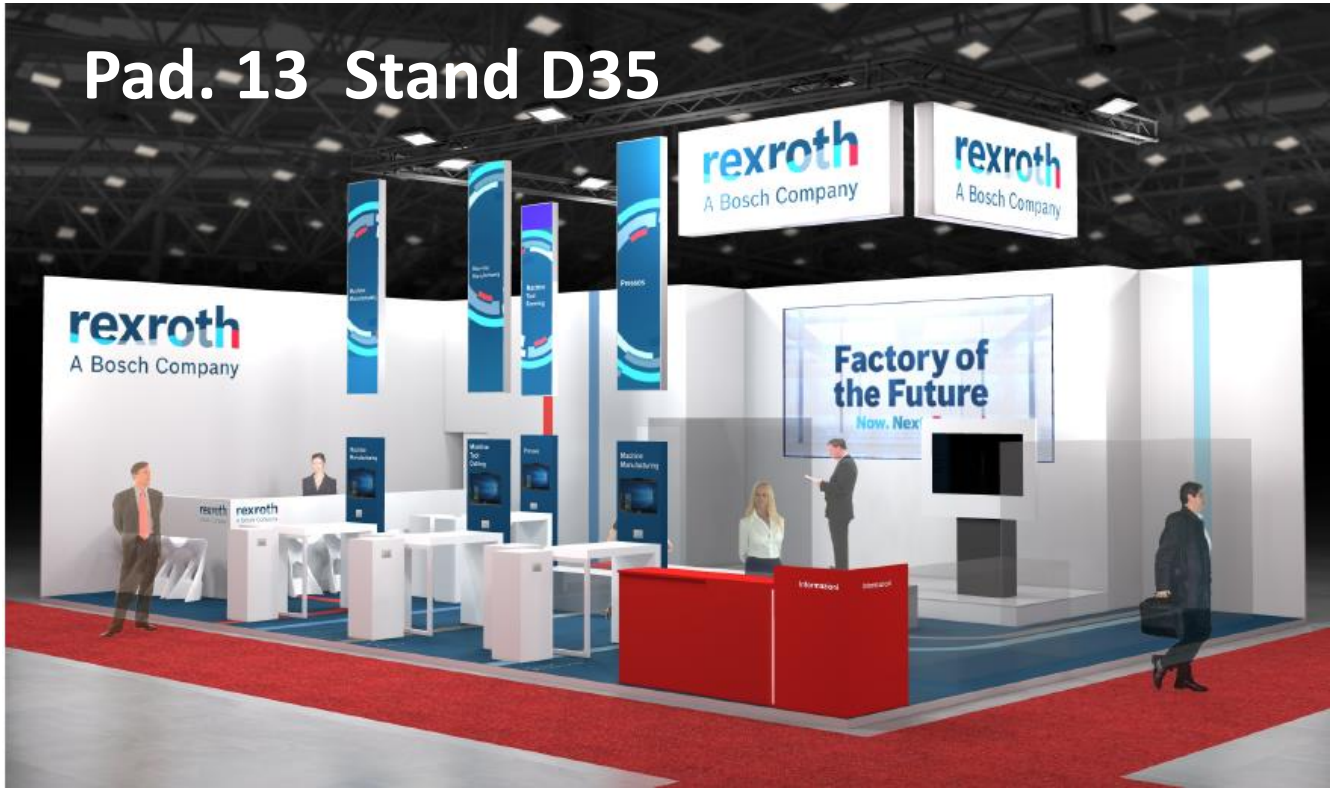


New Possibilities

- Differentiation
- Individualisation
- KnowHow protection
- Innovation
- Flexibility

- Open
- Standards
- Intelligence
- Powerful
- I 4.0 ready

i 4.0 CONNECTED INDUSTRY

Eco System

thank you for the attention !! For more info visit our booth