Put the power of Industry 4.0 and Rexroth's Factory of the Future to work for you today. Whether you require precise positioning with minimum cycle times, fast changeover for small-size batches or flexible adaptation to changes in production, Bosch Rexroth's i4.0-ready technologies can increase productivity while reducing engineering time and costs. Our proven portfolio of drives, controls, linear modules, conveyors and mechatronics technology, combined with extensive industry application expertise, makes Bosch Rexroth the ideal partner for moving into the Factory of the Future. Now. Next. Beyond.
The smart ActiveAssist Workstation offers intuitive worker guidance, allowing teams to easily visualize all information and complete complex work instructions while indicating errors and increasing quality and productivity.

Connectivity Features
- An interactive assembly guidance tool that uses an open web platform to connect hardware with MES/ERP systems
- A projector, pick-to-light, HMI touchscreen, virtual surfaces accessed through data glasses and checking via 3D cameras

Benefits
- Freely configurable system for any user
- Easily integrated into a standard workstation area
- Interactive experience
- Web-based software, standardized for open source interface

• Precise identification of work pieces in real time with corresponding work instructions

Applications
• Manufacturing systems and equipment, assembly lines

Digital Assistant for Assembly Tasks
The ActiveMover is a linear motor transfer system that moves magnetic pallets at high speed with incredible accuracy. It is a pre-engineered solution that provides a user-friendly programming environment. The ActiveMover has built-in collision avoidance and allows interfacing with nearly any PLC. The ActiveMover can control pallets individually at speeds over 2.5 meters/second with automatic pallet pitching.

**Connectivity Features**
- Rexroth ActiveMover is a high speed linear motor transfer
- AMPro software system that provides an open programming platform compatible with most PLCs
- Using the optional Rexroth PLC, the ActiveMover becomes an IoT gateway that can communicate with other IoT devices
- Collects and displays machine and production data with

**Benefits**
- Flexible integration, the system can be increased in length by 1 meter all the way up to 60 meters
- Easy connection to the internet using the IoT Gateway
- Pallets can be controlled individually and can move in either direction on the track

**Applications**
- Machine data collection through various sensors and IoT-ready products
- Cloud-based software to collect, analyze and display machine and production data
- High speed conveying applications with high precision
High-precision guidance and integrated measuring system.

**Connectivity Features**
- Detects the absolute position and works with high precision, even in a rugged environment
- Temperature and motion sensors installed directly into hardware, enhancing data set for predictive maintenance

**Benefits**
- Absolute position entry, without buffering battery
- High system accuracy
- Inductive, contactless measuring principle
- Measuring function integrated into the guideway
- Resistant to contamination without any additional measures

**Applications**
- Integrates with both Ball Rail and Roller Rail Systems
- Universal implementation in machine tools, additive production processes, and other applications requiring high levels of precision
ActiveCockpit is an interactive data visualization and communications platform to support employees and management personnel with continuous process improvement. ActiveCockpit is the ideal communications hub for today’s smart factory.

**Connectivity Features**
- ActiveCockpit communicates, filters and visualizes all relevant production data in real time
- Interfaces to all current MES and ERP systems, including data streams from assembly systems and production machines
- Quickly reveals improvement opportunities to help increase productivity
- Displays opportunities to achieve higher energy efficiency

**Benefits**
- Enables fast response to deviations, aids in disruption management and continuous improvement
- Increases productivity through collaboration and visualization

**Applications**
- Manufacturing systems and equipment, assembly lines

ActiveCockpit
Improvidus is an online tool used to effectively calculate overall equipment effectiveness (OEE) in production processes. The software lets users see equipment availability, production output and deviation information and helps ensure quality and performance standards are met, by integrating to Andon systems and a PLC.

**Connectivity Features**
- Cloud software allows users to simply visualize key performance indicators that determine production efficiency
- Provides big data analytics and cloud data storage to your manufacturing team at the click of a button
- By connecting your Andon system, PLC and the Improvidus software, users can easily understand from where in production processes deviations are coming.

**Benefits**
- Data analytics applied to OEE data to find the root cause of the deviation
- Customer specific reporting and integration of data (from PLC, Andon, CSV)
- Free out-of-the-box analytics applied to OEE data

**Applications**
- Visualization of quality, equipment availability and performance with integration to customer specs
- Transparency of most common deviations and downtime for process improvement opportunities.
Technology interface allowing users to create their own individual functions in a wide range of IT and internet high-level languages that run in parallel with the PLC application directly in the controller or external devices.

**Connectivity Features**

- Increased flexibility in customized product manufacturing using a software-based automation kit
- Increased modularization and decentralization with intelligent components/machine modules
- Improved data networking at the machine level via multiprotocol support of IndraDrive and IndraControl automation components
- Smart and simple machine operation to reduce complexity in the application through Web-based technologies and HMI solutions
- Efficient engineering and simplified workflows via toolbox modules, automated software generation, model-based engineering, and simulation
- Vertical networking of machines in production networks through the seamless connection of machine automation with IT automation solutions using open protocol standards such as OPC UA

- Use of IT knowledge and software solutions as a basis for new mechanical engineering business models in production networks

**Benefits**

- High engineering efficiency in automation with technology-oriented toolbox components with easy adaptation to machines and processes
- Scalable control solutions with decentralized intelligence with automation controls and drives from an extensive portfolio
- Combined machine control and IoT applications via Open Core Interface
- Multi-Ethernet-based communication and support of standardized IT and IoT technologies

**Applications**

- Open Core Interface also supports the programming of controls in Java and Lua
- Seamlessly connect engineering solutions such as LabVIEW, MATLAB/Simulink, or Modelica-based tools such as CATIA into overall automation
- Direct networking of MES solutions or cloud services based on Bosch IoT Cloud, Oracle IoT Cloud, or Microsoft Azure is limitless thanks to the Open Core Interface.
Nexo Wireless DC Intelligent fastening technology for industrial production applications where safety or function-critical fastening is needed. Its flexible software package provides an interactive interface for worker guidance, assembly instructions, error proofing, documentation, data collection, and user feedback.

**Connectivity Features**
- Nexo's integrated controller and open WiFi interfaces make it ideal for wireless connection to other devices such as the worker guidance software, cloud, or local network. These interfaces can also be used for control, monitoring, and data collection.
- Interactive guidance keeps workers connected to the process and external production systems.

**Benefits**
- WiFi onboard allows the tool to communicate with supervisory systems, data collection servers, web/cloud, or interlock with lineside controllers.
- Maintenance-free construction technology and onboard safety critical rated digital torque/angle sensors provide long life, high accuracy, and exceptional durability under typical manufacturing conditions.
- Worker guidance allows for complex processes to be realized with minimal operator training. The display also keeps the worker informed of the process status and provides a high level of error proofing when interlocked to the tool functions.

**Applications**
- Automotive
- Aerospace
- On-Highway and Commercial Vehicles
Digital communications protocol IO Link allows sensors, valves, and actuators to receive and send information to a machine PLC for truly connected hydraulics.

**Connectivity Features**
- Sensors, valves, and actuators transmit data to a machine PLC which can be used for predictive component failure analysis
- Allows sharing of Information regarding operating conditions and expected responses

**Benefits**
- Makes digital information available from the hydraulic valves and sensors
- Costs less than analog signals when incorporated into OEM equipment
- Easy to implement: No third party commissioning software needed
- True plug-and-play digital communications
- Internationally supported standard for point-to-point device communications

**Applications**
- Wide ranging application possibilities, including plastics processing machinery
- Presses
- Machine Tools
- Wood and Paper Processing Equipment
Compact hydraulic power unit housing integrated i4.0 technologies. New ways of thinking and new design approaches are what make hydraulic power units the key components in the efficient and intelligent factory of the future. Today, the latest power units already boost efficiency in production with their energy-efficient operation, innovative design and intelligent connectivity. With CytroBox, we are revolutionizing hydraulic supply units and are sustainably changing people’s perception of hydraulics. We are writing a new chapter in the history of hydraulic drive technology.

**Connectivity Features**

- Variable-speed drive, axial-piston pump, integrated sensors, and internal cooling
- Detects the absolute position and works with high precision, even in a rugged environment
- Temperature and motion sensors installed directly into hardware, enhancing data set for predictive maintenance

**Benefits**

- Compact cabinet with small footprint
- Energy savings of up to 80 percent
- Condition monitoring and data analysis
- Improved oil flow and reduced pressure loss
- Low noise emissions (less than 75 db at full load)

**Applications**

- Integrates with any applications requiring hydraulic power units to connect to the IoT
- Ideal for applications requiring a performance range from 7.5 to 30kW
CytroPac is Rexroth’s i4.0-Ready, compact hydraulic power unit up to 4kW (motor, pump, frequency converter and sensors).

**Connectivity Features**
- Integrated frequency converter collects, as a sensor node, data relating to oil level, temperature, pressure, as well as filter contamination sensors
- CytroPac recognizes wear before it leads to system failure and notifies maintenance personnel or higher-level monitoring systems about actions needed based on detected conditions
- Multi-Ethernet interfaces for all current real-time Ethernet protocols

**Benefits**
- Demand-based rotational speed control reduces energy requirements by up to 80%
- Simplified cable requirement minimizes space needed in the controls enclosure
- Dimensionally compact thanks to space-saving design
  - 20-liter tank optimized to ensure optimum degassing of oil
  - Space-saving water cooling with heat pipe technology
- Plug & Run: Fast start-up requires only the following:
  - Connection to the power supply and communication with the control system
  - Connection to the hydraulic circuit + connection to the cooling system

**Applications**
- Pressure clamping and related applications with limited floor space
The latest in valve technology from a world leader in hydraulic valves: 4WRPQH6 direct-operated flow control valve (independent of load) with electrical pressure compensator, and 4WRLD_4X size 10 – 35 pilot operated high response directional valve with integrated safety function.

**Connectivity Features**

- Connectivity with Sercos & Multi-Ethernet enables fast and easy connection to 3rd-party control
- Software tools support commissioning, administration, parameterization and diagnostics of all latest generation motion control systems

**Benefits**

- Efficient engineering. Cost savings through integration irrespective of the control concept
- Time saving through fast, easy mounting and set up
- Highest accuracy and precision. Faster movement increases productivity

**Applications**

- Wide ranging application possibilities, including Plastics processing machinery, Presses, Machine Tools and Civil projects that benefit from excellent accuracy, performance and best-in-class control

- High machine uptime thanks to robust design. Ambient temperature rating -4° to 140° F. Increased maximum flow, hence reduction in space requirement
The award-winning Sytronix drive systems are intelligent variable speed drives for hydraulic systems using variable displacement hydraulic pumps and asynchronous electric motors. Quiet, energy efficient and powerful, these systems can be added with no re-design to most existing hydraulic systems using variable speed pumps.

**Connectivity Features**
- Intelligent drive technology measures and calculates pump and electric motor operating conditions and transmits the data to a machine PLC via fieldbus
- Adds operating data collection and digital communications to conventional electric motors and hydraulic pump systems that normally do not have this capability

**Benefits**
- Adds automatically adjustable variable speed technology to conventional hydraulic systems
- Up to 75% electrical energy savings for systems that have long dwell times
- Noise reduction, average sound power reduction between 8 to 10 dB(a) is possible
- Lower heat generation in the hydraulic system, some systems will no longer require a heat exchanger
- Longer hydraulic component life due to lower average operating speed of the pump and reduced operating temperature in the hydraulic oil and components
- Low initial cost

**Applications**
- Any hydraulic system that includes variable displacement hydraulic pumps. The highest benefit will be achieved with hydraulic systems that have longer dwell times
Hägglunds CM and CM premium (CMp) are connectivity suites that enable condition monitoring for Hägglunds hydraulic direct drive systems.

**Connectivity Features**
- Hägglunds CM provides entry-level monitoring and logging, with access to key performance data that can improve your drive utilization and planned maintenance
- Hägglunds CMp offers a complete health index, including historical data, trending and deeper analytics. Through secure and encrypted data communication, it lets Bosch Rexroth – or your own skilled engineers – look within the drive to optimize performance and initiate condition-based maintenance

**Benefits**
- Allows for complete understanding of the health of your Hägglunds drive system and connected hydraulics
- Insights for decision-making to protect uptime and reduce total cost of ownership

**Applications**
- Implemented with any Hägglunds drive system
- Ideal for applications within a wide range of industries, including Cement Production, Marine & Offshore, Materials Handling, Mining & Excavation, Recycling & Waste Management, and Rubber Production
The IoT Gateway, consisting of embedded control hardware and an installed software package for IoT applications, connects existing machines or closed systems with the IT world's infrastructure. Usually no changes to the existing automation solution or PLC programming knowledge are necessary. The system collects sensor and process data and transfers it to higher-level, IT-based solutions such as MES, cloud applications, systems for local monitoring of machine states, or the analysis of process data.

**Connectivity Features**

- Networking of existing plants, production, and logistic properties with the IT world
- Web-based configuration to lower the commissioning time of the IoT Gateway by up to 90% compared to conventional systems
- Connection of third-party controls, such as Siemens, Allen-Bradley, and Beckhoff, to the IoT Gateway to include the entire shopfloor infrastructure
- As an OSGi-certified product, the IoT Gateway combines real-time critical applications from the production environment with the IT world
- Simple to expand with further apps to connect sensors and IT systems via open interfaces

**Benefits**

- No intervention in the machine program through parallel operation of the IoT Gateway and machine control
- Web-based configuration and handling without any programming effort
- Matched, pre-configured, and validated hardware and software modules
- Robust, reliable, and durable PR21, industrial PC hardware
- Simple, secure, and quick process signal integration with the IndraControl S20 I/O modules
- Flexibly expandable with customer-specific software applications

**Applications**

- Simple data exchange from existing production machinery with IT world applications, such as MES systems, analysis applications, database applications, or cloud architectures such as AWS, Oracle, and Azure
The future of industrial automation is cabinet-free. Bosch Rexroth is moving drive technology from the cabinet onto the machine to save valuable space on the shop floor and streamline production. The electric drive system, IndraDrive Mi, removes drive electronics from the cabinet and allows for a compact controls enclosure mounted directly to the machine – freeing up valuable plant floor space and eliminating energy consumption for cooling the cabinet.

IndraDrive Mi cabinet-free technology provides its users with up to 100% reduced cabinet control space and up to 90% reduced wiring effort, making IndraDrive Mi a fast and flexible solution.

**Connectivity Features**
- Direct integration in programming and engineering makes IndraDrive Mi IoT-ready and reduces engineering for access to drive parameter and PLC variables
- Connection of the drives to the World Wide Web via WebConnector creates easy web-visualization on all devices

**Benefits**
- More shop floor space: IndraDrive Mi reduces the hardware and connection points required in the control cabinet reducing cabinet size up to 100%
- Smaller machine footprint: Thanks to the reduction of the cabinet, IndraDrive Mi generates a machine with a much smaller footprint which substantially lowers weight and can significantly reduce shipping costs
- Flexible and faster machine design: IndraDrive Mi allows engineers to build a machine based on modules; axes and modules can be added without changing the cabinet

**Applications**
For advanced, modern and modular applications and machines that require:
- minimum space
- minimum energy consumption
- maximum flexibility
IndraDrive Mi fits perfectly in applications such as: Packaging & Processing, Machine Tools, Printing Machines and Converting, and Assembly & Handling
The XM is a compact, embedded motion controller and PLC that combines the ability to control electric and hydraulic motion with S20 IO modules to provide complete machine control. It provides motion control in a full power range, supporting small electric motors to high-powered hydraulic applications. Hybrid electro-hydraulic solutions are also available.

**Connectivity Features**
- The XM is the data center for machine control, providing the motion commands to the machine and collecting sensor data as feedback. Rexroth i4.0 solutions like Open Core Engineering and the IoT Gateway are all built around the XM platform because of the data access it has from machine control. Since the control is built to handle both electric motion and hydraulic motion, it can be used in a wide variety of plastic industry applications. With its i4.0 capabilities, customers can feel comfortable in using it as a standard machine control and i4.0 solution.

**Benefits**
- Precision motion control: Best in class control of electric motion and hydraulic motion, including electrohydraulic hybrid control, from a leader in motion control in both industries.
- Designed for Connectivity: Built-in Industry 4.0 features can be accessed without the need to add separate PCs or hardware to collect the data. Direct connections to upper level data systems and programming environments provide faster engineering and efficient deployment in the field.

**Applications**
- Electric motor control of hydraulic powered applications provides greater power efficiency, increased position control and reduced noise levels.
- Rated for hazardous locations in marine/offshore applications and explosive gas environments that require IECEx ratings.
Product family of industrial PCs and displays providing scaled performance, high system availability, and a variety of configuration options. The IndraControl PR performance-graduated box PCs are available in conjunction with the IndraControl DR multi-touch displays (connected at distances of up to 100 m) or combined as IndraControl VR panel PCs.

**Connectivity Features**
- High system availability and data security through the use of SSDs, also in a RAID system and Windows 10 embedded and security features
- High performance thanks to the latest Intel ATOM and Core i processor generations
- High flexibility thanks to a multitude of extension options and high interface variance
- Security by design means of the integrated TPM 2.0

**Benefits**
- Energy-efficient design with lower power losses
- Extremely service-friendly and zero maintenance
- Maximum compatibility for long-term use, even in tough ambient conditions
- Long-distance display interface DCI+ as a single-cable solution with Direct Boot for distances up to 100 m
- Scaled performance to meet application demands
- Multi-display networks, up to 4 devices

**Applications**
- Flexible range of applications thanks to expansion options and a variety of interfaces
- Great scalability, high performance, a wide range of expansion options and standard interfaces make VR the ideal platform solution for all HMY-based applications
- The panel PCs are suitable for either horizontal or vertical application
IndraDrive Cs is an intelligent and multiprotocol-capable compact servo drive system that increases the efficiency of machines and manufacturing systems. Featuring continuous power from 50 W up to 14 kW, integrated safety technology, and Multi-Ethernet support for most common communications protocols, the Cs puts highly sophisticated functionality into a space-saving design.

- Multi-encoder interface works with 3rd party-motors
- Intelligent display module for drive exchange without a PC
- Integrated safety technology with Safe Torque Off and SafeMotion

**Connectivity Features**

- Support of high-level languages such as VB, C++, C#, MatLab, LabView, or Java for control via smart devices (cell phones and tablets) in automation
- PC-based IT Automation, and Rapid control prototyping using MatLab or LabView

**Benefits**

- Saves cabinet space
- Simplified engineering and highly sophisticated functionality
- One hardware for all opportunities – increases flexibility to serve different control solutions

**Applications**

- Machine Tools and Automotive
- Assembly and Handling
- Packaging and Processing, Printing and Converting
PLC-based machine automation and IT-based technologies come together to form a uniform complete system for all automation tasks. Innovative software and firmware functions, efficient engineering, and open system interfaces ensure maximum flexibility in all applications.

**Connectivity Features**

- PLC and IT Automation combined into one automation system
- Scaled control hardware for flexible integration into Industry 4.0-compliant automation topologies
- Cross-manufacturer M2M communication using OPC UA architecture and WebConnector, and in real time via Sercos
- Development of automation functions in customary IT and internet development environments without PLC knowledge
- Simple and quick PLC engineering using the integrated IndraWorks engineering framework

**Benefits**

- Scaled and highly functional control solution with flexible expansion options in central and distributed automation topologies for all applications with PLC and motion control
- Homogenous integration in diverse topologies via Sercos, Multi-Ethernet, and PROFIBUS
- Increased productivity and efficient engineering with IndraWorks and function tool kits
- Integration platform for SO A-based architectures of the Open Core Interface technology interface for integrating high-level language-based IoT applications in the total automation
- Integrated run-time systems for motion, robot, and logic control, compliant with open PLC standard IEC 61131-3 on basis of CODESYS V3
- Regulation of up to 192 axes in one control unit with synchronized and coordinated movements
- OpenCore Interface available as a software development kit with 600 library functions
- Support of the control hardware XM21, XM42, CML 75 controllers, industrial PCs IndraControl VPx as well as S20 two-axis module for connecting hydraulic axes
- Auto-tuning and automatic path identification for quick hydraulic axis start-up for the position control
- Enhanced synchronization functionality
- Rotary axis support (SSI/incremental encoders)

**Applications**

- The motion logic system is ideal for operation of electric and hydraulic as well as hybrid drives
- Certified overall solution for marine applications on IndraControl XM22
IndraMotion MTX CNC

Scalable CNC platform with integrated PLC. The outstanding performance and comprehensive technology functions open up new horizons, even in highly dynamic multi-technology machines. Now you can control up to 60 channels and 250 axes with one CNC, for maximum productivity and flexibility.

Connectivity Features

• Cross-manufacturer machine-to-machine communication with open standards such as OPC UA, Sercos, and Open Core Interface
• Simple diagnostics, service, and operation with smart devices
• Fast integration and flexible configuration with automation interface and IndraWorks Engineering
• Simulation of machines, machining processes, and CNC control
• Digital lifetime management with GDS with services such as RCM, RPM, and RDL
• Consistent use of distributed intelligence with decentralized drives
• Security: user management, NC program encryption, mGuard support

Benefits

• Shorter cycle times and greater processing precision for maximum productivity
• Simple engineering through predefined technology functions decentralized intelligence and therefore rapid adaption to customer-specific configurations
• Differentiation by means of consistently open automation architecture
• Controls up to 250 axes in 60 NC channels with one piece of hardware
• The only compact CNC solution for five-axis machining

Applications

• Use the IndraMotion MTX to perform simple, effective control of standard machines for milling, turning, drilling, grinding, nibbling, punching, blanking, or bending operations
More torque, higher speeds, a practical single-cable connection and an extensive options program: The new MS2N motor generation combines high dynamics with compact dimensions and excellent energy efficiency. MS2N single cable motors (with dual cable option) are compact servo motors with high torque density. The offering includes more than 50 motor types in 6 motor sizes, with up to 5 lengths per size. These space-saving motors feature continuous torque from 0.8-215 Nm with max. torque from 3.8-360 Nm, fan-cooled or water-cooled option for higher continuous current, and an encoder option with certified safety up to SIL 3, PI e.

**Connectivity Features**

- Intelligent within IndraDrive system: servo motor as a reliable sensor and data source, and real-time processing i4.0 ready

**Benefits**

- Reduced space, weight, installation costs, and time, increased power
- High overload capability / High energy efficiency / Very low torque ripple
- Extended torque-speed range by field weakening

**Applications**

- Machine Tools and Automotive Manufacturing
- Assembly and Handling
- Packaging and Processing, Printing and Converting
SafeLogic and SafeLogic Compact provide safety systems with scalable functions and performance for all automation tasks. The safety controls can be fully integrated into automation systems of various applications. SafeMotion, Rexroth’s drive-based safety solution, enables safe machine designs. It allows the safe access for the operator, reduces downtimes, and increases productivity.

**Connectivity Features**
- Controls are i4.0 ready with Open Core Engineering, IoT Gateway, Data Acquisition Systems (DAS) or Web connector. Data can be accessed directly via the control or the drive with virtually any high-level language

**Benefits**
- Increased machine productivity
- Less idle time because IndraDrive is not shut down
- Safety Level up to Cat.4, PL e, SIL3
- Reduced cabling with CIP Safety on Sercos
- Minimal control cabinet space due to modular system design and row mounting
- Faster programming: Program both standard and safety applications together on a control system with the same IndraWorks engineering software

**Applications**
- Machine Tools: Safe state for tool setup or when safety doors are open
- Forming Machines: Tool changing, manual loading or unloading, access to press chamber
- Packaging Machines: filling, sealing, group packaging or palletizing. If a product or package gets stuck, the operator needs safe access
- Print and Processing Machines: changing plates or blankets, washing cylinders or changing rollers
- Assembly and Handling Applications: feeding of materials