Rexroth
Bosch Group

The Expanding World of Robotics Applications

In industries from automotive to packaging, the use of robots is increasing steadily and impressively.

North American robotics orders rose 24% in 2007 over 2006.[1]

It's easy to see why. 21st century robots can offer:

- Repeatability
- Speed
- Accuracy
- Ability to operate in harsh environments
- Reduced total footprint
- Less scrap
- More flexibility

That last attribute, flexibility, probably gets the most attention. Flexibility means that countless robotic

solutions can be configured from a few basic types of robots:

- **SCARA** (Selective Compliant Articulated Robot Arm) robots, with arms rigid in the Z-axis and moveable in the X-Y axes, are ideal for assembly operations like inserting pins in holes. SCARA robots can be faster than Cartesian robots and have a small footprint, but are often more costly.

- **Parallelogram** robots use 3 parallelograms and rotating levers operated by servo motors or linear actuators. They're well suited to pick and place operations.

- **Delta** robots are a form of parallelogram robots used for top loading and infeeds, and can execute up to 150 picks per minute – perfect for packaging, pharmaceutical, assembly, and clean room applications.

- **Cartesian** robots have linear axes of control, and can be configured for "brawn" operations (transporting auto body parts) or "brains" operations like creating precise designs on a surface.

- **Articulated** robots have a rotatable trunk, shoulder, bicep, forearm and wrist. They are well suited for placing small parts accurately as well as packing and palletizing.

Another factor that adds flexibility is the availability of standardized programming, making robots easier to control, configure, and reconfigure. Unlike the expensive and proprietary products of the past, today's motion control and PLC products allow plants to run robotics using standard programming languages such as IEC 61131-3. Result: standardized controls with user-friendly software setup wizards that require no downtime for specialized operator or programmer training. Bosch Rexroth's IndraControl MLC, for example, uses standard IEC programming to run kinematics for hundreds of different types of robots and offers an all Ethernet-based interface for drives, I/O's, HMI's, safety, and vision systems.

Today, OEMs are starting to run robotics with off-the-shelf controls -- and even large robot manufacturers are adopting the use of embedded nonproprietary software. That development promises to expand the world of robotics applications more quickly than ever in the next few years.

1. "North American Robot Orders Jump 24% in 2007." Robotics Industries Association Robotics Online, February 16, 2008.

 (BRL_CKK_App.jpg) Cartesian robots are ideal for precise operations like electronics assembly.