



On the automation horizon

The market demand for automation products, systems and services is growing steadily. Customers clearly see increased return resulting from ABB technologies. And we see new opportunities every day.

With robot eyes

Telling robots what they should do and how they should do it is becoming easier every day. Robots are already learning how to work together on a task, and operators have a whole toolbox of straightforward methods they can use to teach a robot team.

With the help of augmented reality, robot programming will soon be even simpler. The operator simply performs the task virtually, while the robot “looks over his shoulder.” With a few simple instructions, the robot is automatically programmed to precisely perform the same tasks that were practised during the programming run.

Why wires?

Automation equipment is becoming easier to install and operate thanks to wireless technology. Already today, robot sensors are wirelessly connected and handheld, wireless devices to program robots or other components are entering the market.

Pilot installations are even in place to supply electrical energy for operating a device without a wired connection. As new low-voltage installations are converted to wireless technology, this trend will reach ever-increasing applications in control and automation.

Calling for help

Service engineers will make fewer unproductive trips to the field in future as automation components, including the smallest contactors or sensors, literally make their own call for help when a fault is experienced. Not only will service personnel know which part needs repair, but also exactly what actions to take.

With asset data management integrated within the control system to which the components belong, fast and efficient service response is guaranteed. The same database-driven system will also handle preventive services for life-long improvement of assets across the enterprise.

Good things come in small packages

While software is a core ingredient of automation technologies, the final work in manufacturing or process plants is generally done by hardware - motors, presses, reactors, robots and so on. In one way or another, the material properties of these central components determine the performance.

Nanotechnologies will soon directly influence the device's material properties such as electrical and thermal conductivity, surface to volume ratios and friction properties. Small property changes can have a huge impact on the overall concept, design and cost of motors, robots or power electronics, and we will see a broad range of innovative products based on these principles in future.

Pushing for local intelligence

A big contributor to the capabilities of automation systems is the increasing sophistication of "intelligent" components such as sensors and actuators in the field.

Rather than depending on a central control system, individual devices self-monitor their own condition and react locally to activate control steps based on the overall control strategy. Intelligent field devices may also recalibrate themselves for varying tasks and, if necessary, provide alerts when they cannot fulfill a task which they have been assigned by the central system.

Squeezing out the knowledge base

ABB has an installed base of automation technologies worth some \$100 billion. The knowledge of plant processes and the actions needed to optimize them that has been collected in these installations is enormous, and is the basis for development of new control strategies for various industries.

Future control and optimization systems will have much of this knowledge embedded directly within automation devices as overriding "recipes" that can help to improve a customer plant. Technologies to fully exploit this knowledge, embedded in various databases and process algorithms, will further contribute to more comprehensive, industry-specific solutions.