Newell Automation

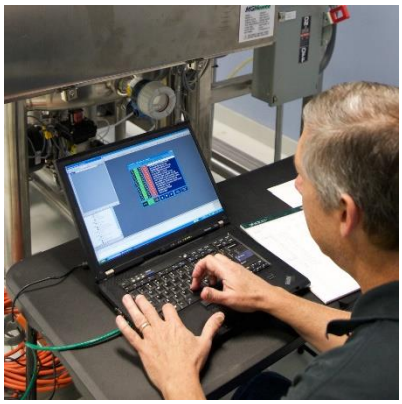
Industrial Automation: Is It Time To Upgrade Your Control System?

How old is the control system at ***your*** facility? In most processing plants, the control system consists of field instruments that are wired to I/O cards which feed to a central PLC controller. Operators communicate with the PLC through a human machine interface (HMI) computer.

While the lifespan of an HMI computer is about the same as a typical desktop computer, the instruments, field wiring, I/O boards and PLC controllers last a lot longer — and the mentality of most operators is: "if it ain't broke, don't fix it." Upgrading a control system is a costly investment, and, as a result, many facilities have field hardware that is decades old.

So, when is it worth upgrading your control system? And what options do you have?

When to Upgrade your Control System



Normally, we recommend to upgrade control systems for clients when:

- Their system has reached the end of its life and/or no longer functions
- An upgrade would result in significant energy and/or cost savings
- They're already undergoing other major plant renovations or upgrades

There are a few red flags to keep in mind. When software versions are no longer supported or will not run on currently supported versions of your operating system, it's time to upgrade. The risk is too high for virus and cybersecurity issues.

Another indicator is when hardware is no longer being manufactured and spare parts are difficult or impossible to find. For example, Rockwell Automation announced that their SLC/PLC-5 software systems were being discontinued. When you're buying used parts on eBay, it's definitely time to start budgeting for an upgrade. The risk of a minor failure taking down your whole facility while you search for spare parts is too high.

Partial Upgrade vs. Full Upgrade

As I mentioned, a new control system can get expensive, but sometimes that cost can be minimized by upgrading in phases.

In a partial upgrade, you can often replace individual components while keeping the rest of the system intact. However, there are limitations. For example, the technology in the old and new components must be able to talk to each other.

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But in the right situation, this allows plant owners to take advantage of features offered by more modern computers and software without the expense of fully replacing all the control hardware.

Some potential partial upgrades would be:

- Replace the HMI computer and software and keep the existing control hardware in place. This allows the control system to communicate on a modern Windows network for printing temperature reports, saving historical data, doing remote alarming, etc. However, the PLC program stays the same, so you won't get the benefit of improved functionality and energy efficiency.
- Replace the PLC controller and program and leave the I/O, field instruments and wiring in place. This option takes advantage of the newest energy-saving algorithms and control functions.

That being said, a full upgrade may be required if your control system is obsolete. Legacy systems — often 20+ years old — were frequently manufactured as proprietary, stand-alone systems. When the control hardware is too old to communicate with a new HMI on a modern network, it generally can't be upgraded in phases. Replacing the entire system is inevitable.

Benefits of Upgrading

Control systems aren't like the newest iPhone: You don't replace it just because a new model becomes available. But when the time ***does*** come for an upgrade, the features can be a big advantage to your business and the quality of life for plant personnel.

Here are some of the biggest benefits with newer automation systems:

- **Process efficiency** — Modern systems have advanced controls for efficiently sequencing your process and controlling all critical parameters (temperature, pressure, etc) to their optimum point. If your system is more than 10 years old, you're probably missing out on some efficiency benefits.
- **Communication** — There are great labor-saving benefits to be gained from integrating all equipment and sensors from the basement to the rooftop. Operators can see the entire plant from one screen and can make better choices about how to spend their time, and managers can monitor and improve usage.
- **Mobile access —** Today's cloud-based software allows for remote alarming and mobile access. A refrigeration engine room is frequently staffed with only one operator and is often not staffed at night. When an alarm goes off after hours, someone — like a security guard doing their rounds — would have to notice and call the off-duty operator to come onto the plant and investigate. A control system with remote capabilities will alert the off-duty operator, who can log in and address the alarm from home. This increases efficiency, saves time and improves quality of life for operators.

Today, people increasingly expect all controls to be integrated and to be controlled from one central location. A modern control system should be expected to be fully integrated — including process equipment, tank level controls, pump controls, skid-mounted equipment, etc. — on a common control network. An operator should be able to view the same information from every control screen around the plant. Older systems simply don't do that.