Where No-Code PLCs Fit in Automation (And Where They Don't)

Programming a PLC is a complex task. Engineers with this specialized skill don't come cheap, resulting in compounding costs when installing and troubleshooting controls. While this pain point is often not avoidable, it might be for more applications than you think.

The traditional programmable logic controller (PLC) has been a foundation of factory automation and still is. These devices can handle advanced and high-speed I/O processing with complex logical instructions. They form the backbone of intelligent factory control. However, technology is changing at a rapid pace. New ways of monitoring and control are flooding the market—including soft PLCs, industrial PCs, and micro (even nano) PLCs.

The applications for automation are changing, too. Logic is increasingly needed outside the factory floor and beyond traditional processes. The Industrial Internet of Things (IIoT) promises more data at less cost, leveraged to optimize everything from building energy efficiency to critical boardroom decisions.

Accelerated IIoT development has given rise to a new kind of programmable controller. These micro PLCs are faster and easier to implement, and cost-effective. They are better suited to varying applications as IIoT extends through commercial and industrial spaces. Often, small PLCs require no coding and no software for programming.

What Is a No-Code PLC?

The concept of a no-code PLC is still new and may seem hard to believe. Many control engineers have a difficult time conceptualizing what a no-code PLC might be. Defining what it is (and isn't) becomes quite important.

A no-code PLC is simply a controller with a user interface that allows programming through predefined options—taking the code out of the equation for the programmer.

That doesn't mean a no-code PLC is unable to accept code inputs. It simply offers a way to perform significant programming without code.

No-code programming can include network settings, email server connection, security settings, I/O setup, conditional and/or scheduled logic, data logging, and even dashboard customization to display and control I/O endpoints.

The Rise of the No-Code PLC

The birth of the no-code PLC is a direct reaction to the complexity of programming controls in industrial settings—even for seemingly simple tasks. For many automation tasks, both on and off the factory floor, the complexity of a traditional PLC is too much, the capabilities overkill, and the cost too high.

For most IIoT applications, pre-programmed if-else tasks are enough to monitor and control a broad spectrum of processes and equipment. This is the domain of the smart relay, programmable I/O, edge controller, or no-code PLC.

Even as no-code PLCs gain traction, it's still common to find larger PLCs in use where they

no longer belong: Controlling doors, opening a solenoid valve, monitoring only a few analog inputs, or performing other mundane tasks where high processing power and advanced equations are unnecessary. Engineers favor the familiar out of a healthy desire for reliability, but that can often lead to specifying the wrong solution.

The Right Applications

The traditional PLC is muscular, capable, and very customizable. It's at home in applications where complex math is involved, such as PID loops and trigonometry. It excels at high-speed processing and can handle many inputs and outputs per second. These applications could involve production lines, robotics, automated inspection, and continuous processes.

In these scenarios, custom programming and high-powered processing are absolutely necessary. But for many other applications, these PLCs only serve to increase complexity, difficulty, and cost with no tangible benefits.

No-code PLCs shine in classic IIoT applications such as remote monitoring and control of isolated equipment and simple processes. They work very well when environmental conditions are monitored and logged, and where control is often a series of turning equipment on and off.

Building automation is an ideal fit for a no-code PLC, where it can be used to control the energy output of lighting or HVAC systems. They also integrate well in applications where control software is handling the complex math.

Distributed control scenarios are often perfect for these devices because the challenging calculations are either offloaded or eliminated by breaking processes down to their simpler parts.

Applications for no-code PLCs:

- Building automation
- Monitoring and rebooting network devices
- Tank level monitoring and control

Applications for larger PLCs:

- Production line automation
- Continuous process automation
- Robotics control

Using no-code PLCs in these applications speeds up implementation, reduces cost, and empowers maintenance staff to understand and troubleshoot the system on their own. This brings automation to more applications and to more people, delivering the benefits of IIoT in the real world.

These IIoT devices are growing in number and popularity, but they are still up-and-coming in the industrial space. As the transition to industry 4.0 continues to expand, so will the use of these smart controllers and the breadth of applications they call home.

Choosing a No-Code PLC

Eliminating Unnecessary Software

Software still plays a major role in control systems, but that doesn't have to extend to programming your control hardware. Smart controllers now exist that can be programmed via a user interface installed on an embedded web server.

This means setup and programming can be done via a simple web browser. By visiting the device IP address and logging in, the user can avoid operating system compatibility, software updates, and any licensing fees.

Combined with the ability to program a PLC without code, an embedded web server and user interface dramatically reduces the complexity of setting up, programming, and supporting control hardware.

Open API and Compatibility

For a no-code PLC to be fully capable, it needs to be compatible with third-party control software. This boosts the usability of the PLC beyond simple if-else or on-off logic. The technology, while inherently beneficial, is diminished significantly if hampered by proprietary protocols and a closed communication system.

Truly open APIs are important for a PLC or programmable I/O controller to be as versatile as it can be. The application potential increases when simple edge processing is handled by the device and signals are sent to robust control software for more advanced control. Open compatibility means a no-code PLC is now relevant in factories, wastewater treatment, refineries, or food processing plants.

Additionally, an open API strengthens the integration between Operational Technology with Information Technology. As more software programmers enter the industry, the talent pool improves, leading to increased innovation from other technological fields that cross-pollinates with the automation space.

Open protocols range from simple HTTP-based APIs to modern industrial protocols such as MQTT. These are widely used and understood, easy to learn for novice programmers, and drive new and interesting ways to gather and use data in a secure environment.

Flexible for More Applications

Traditional PLCs are the epitome of custom-programmed flexibility, but they are paywalled by the need for specialized skills, complex software, and licensing fees. No-code PLCs:

- Provide significant flexibility without the baggage
- Bring logic to a wider industrial audience
- Unlock more opportunities to explore Industry 4.0
- Make programming logic accessible to more users

ControlByWeb® offers a line of no-code PLCs designed for commercial and industrial applications from building automation to process control. They are built for flexibility and ease of use to speed up implementation and operation. While the controllers can be programmed without code using pre-built if-else logic options, they can also be coded using BASIC to take full advantage of all capabilities.

These micro PLCs are surprisingly capable given the simplified user-interface hosted on the embedded web server. There is no software needed to program or use these controllers. The open API makes integration easy, as well as common modern industrial protocols such as MQTT, Modbus TCP/IP, and even SNMP.

Users love the simplified platform that allows them to implement robust controls in a fraction of the time and cost that a traditional PLC would take. Most monitoring and control applications do not require the power–or complexity–of a larger controller or industrial PC, so our product line is a perfect fit.

Contact us to learn more: call 435-750-5999, send an email to sales@controlbyweb.com, or visit controlbyweb.com to schedule a consultation.