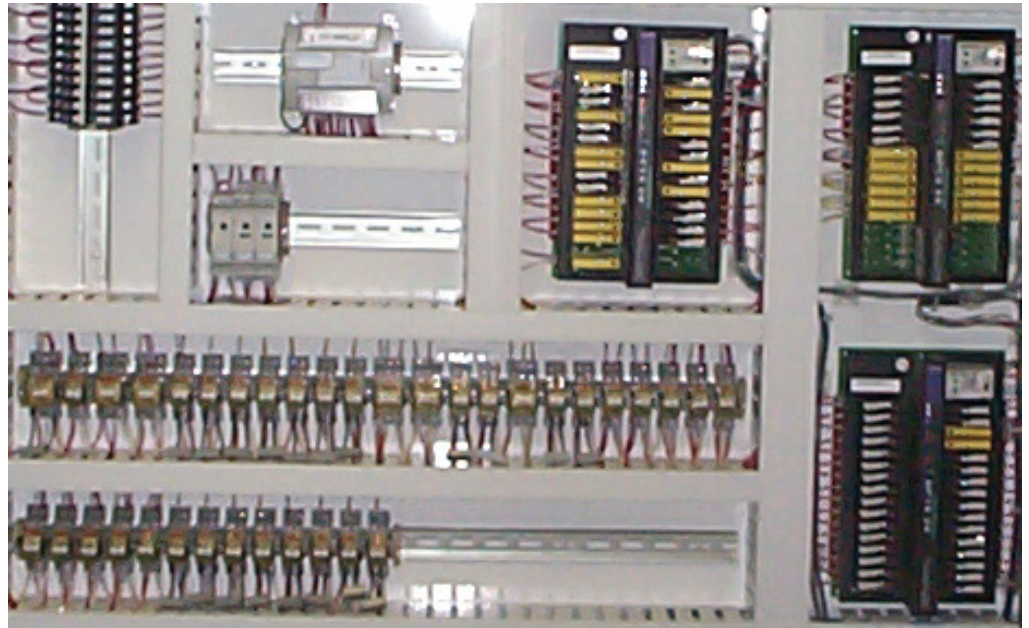


# Reducing project cycle time by 75%

With AutoCAD Electrical, FRICK automates design tasks to reduce errors and speed time to market.

“When we create a drawing, the BOMs are created automatically. Everything we need is now completed when the design first goes to the customer for approval. We’re saving a tremendous amount of time and reducing manual work.”

—Samuel Cox  
Electrical Designer  
FRICK, by Johnson Controls



## Project Summary

FRICK, a Johnson Controls Company, designs and manufactures a complete line of heating, ventilation, process cooling solutions, control systems, and industrial and marine refrigeration systems for residential, commercial, and industrial facilities throughout the world. For the last 150 years, FRICK has established a reputation as the industry’s premier supplier of cutting-edge products—a reputation the company is eager to maintain. Keeping its competitive edge requires that FRICK deliver the highest quality products quickly and efficiently. The electrical engineers and designers who design control panels for FRICK’s refrigeration systems have surpassed their speed and efficiency goals by switching from AutoCAD® to AutoCAD® Electrical. By adopting AutoCAD Electrical software, FRICK has:

- Slashed retrofit design time from three weeks to three days
- Automated many design processes—making them up to 80% faster
- Reduced design errors and rework
- Reused existing designs in a more efficient manner

## The Challenge

### Slash Cycle Times and Rework

Since the early 1990s, FRICK has depended on Autodesk software to design its products. FRICK was an early adopter of 3D technology, and the company uses Autodesk® Inventor™ to deliver digital prototypes to manufacturing and drastically improve its ability to fill orders—from 40 hours to four hours for a typical recirculator order, for example. For several years, the company has also relied on Autodesk® Vault and Autodesk® Productstream™ for data, revision, and product lifecycle management.

However, the company continued to use basic AutoCAD to design control panels until it became increasingly clear that AutoCAD was no longer able to deliver the kind of efficiencies that FRICK needed to remain competitive. After experiencing substantial benefits with other Autodesk manufacturing solutions, FRICK decided to adopt AutoCAD Electrical to help it revamp and accelerate its process for designing electrical control panels.

“Using AutoCAD to design control panels was time-consuming,” says Brian Hess, an electrical project engineer at FRICK. “Retrofitting old panels was particularly tedious. We’d have to hunt for panels

# Frick slashed retrofit design time from three weeks to three days.

close to the existing one or start from scratch and build all the symbols. During the design process, we might pull parts and pieces from as many as nine different drawings. It would take a week just to do the initial drawings.”

AutoCAD forced FRICK’s electrical engineers and designers to work with unintelligent elements, such as lines, circles, and squares. Even after they thought a drawing was complete, FRICK’s engineers often found mistakes. Explains Hess: “We had to use plain lines to do all the connection points on an electrical control panel. A design might look good on the screen, but when printed out, sometimes lines wouldn’t even touch. Then we’d have to go back and fix them. It wasted a lot of time.”

In addition, compiling a bill of materials (BOM) was a tedious manual process with basic AutoCAD. FRICK’s electrical engineers and designers had to hand type BOMs for each design, a process that significantly impacted design cycle time. “We really wanted to automate BOMs,” says Samuel Cox, an Electrical Designer at FRICK. “We knew that if we could create BOMs more efficiently, we’d save tons of time.”

## The Solution

### Leverage Built-in Intelligence

AutoCAD Electrical is living up to FRICK’s high expectations, in large part because the software builds-in engineering intelligence. For example, rather than using lines, circles, and squares,

AutoCAD Electrical provides a simple menu-driven system for inserting intelligent representations of specific electrical and pneumatic devices. The included symbol library includes devices such as electrical systems, push buttons, selector systems, pilot lights, relays, contacts, fuses, and more.

“With AutoCAD Electrical, you insert a symbol from the library or that you’ve created, and it breaks the line and attaches itself,” explains Cox. “You select the part you need out of the parts library and AutoCAD Electrical puts it on the wiring diagram. You don’t have to go back in and do trim or extend lines. The automation saves us a lot of time.”

Now, when a design contains errors, FRICK’s engineers know before they print it out. Because the software has built-in error-checking capabilities, it automatically alerts users when there’s a mistake.

“If we’re doing a wire diagram and create a short circuit, AutoCAD Electrical tells us—it actually flags it,” says Hess. “The software handles a lot of the engineering work, helping reduce errors significantly, if not completely.”

### Numbering Automatically

Another manual process AutoCAD Electrical eliminates is the numbering of wires and component tags. FRICK’s engineers choose a configuration and then AutoCAD Electrical automatically places sequential or reference-based numbers on all wires and components in their control panel design. The software knows if an inserted number will overlap

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anything and automatically searches laterally along the wire for a clear spot for the wire number. If it doesn’t find a spot, it searches for a spot away from the wire and draws a ladder back to it.

Numbering the title blocks on all the sheets of a drawing is another manual process that FRICK’s electrical engineers have shed. “Some of our control panel designs are 40 to 60 sheets long,” says Cox. “We used to manually input the title block for each and every sheet.”

“With AutoCAD Electrical, the title block itself is intelligent,” continues Cox. “We set up a template and reuse it through all our drawings. When you type in the description of the project and do a title block update, AutoCAD Electrical automatically pulls that information into every sheet, keeping track of all the sheets, numbers, and everything else.”

### Generating Reports Quickly

FRICK’s engineers/designers no longer labor for a week to create BOMs, as AutoCAD Electrical compiles BOM information automatically. Engineers simply run the BOM report function whenever they need to. They can also create From/To wire lists, or generate multiple reports with a single command.

“In addition to automating BOMs, AutoCAD Electrical makes it easy for us to print wire markers,” adds Cox. “We just run a nameplate report to create wire markets that we send directly to print on the sticker machine.”

Autodesk Consulting has played a role in FRICK’s implementation of AutoCAD Electrical—as well as its other Autodesk solutions. The support and service that FRICK receives makes a big difference to its engineers and designers. “Autodesk’s support is unbelievable,” says Samuel Cox, electrical designer at FRICK. “We’ve had help from support personnel all the way up to Nate Holt, the Father of AutoCAD Electrical.”

# Autodesk software helped Frick reduce design errors and rework.

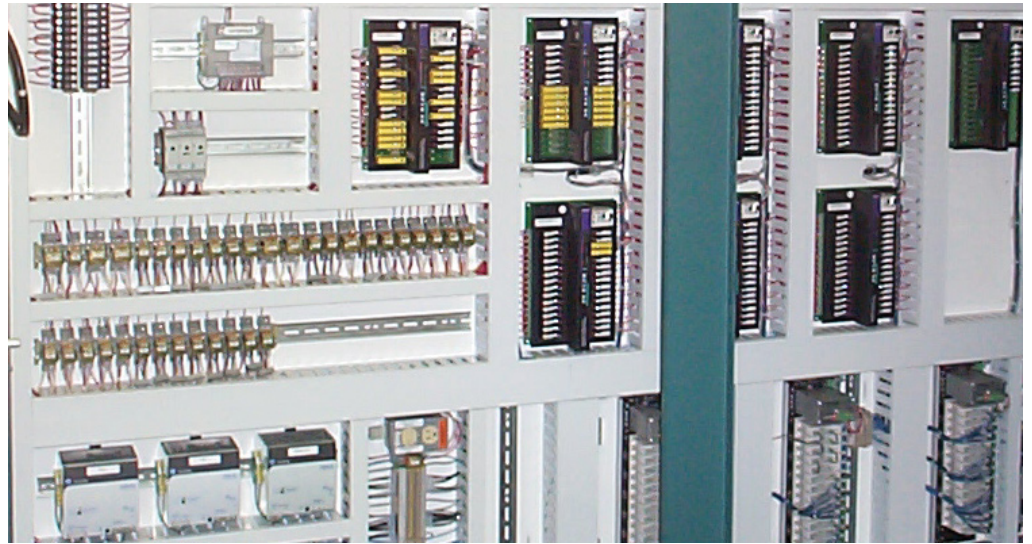
Printing out terminal block ID tags is just as simple. Hess explains, “Before, someone had to manually type in every terminal block number into the sticker machine software, which took up to 20 minutes. With AutoCAD Electrical, we extrapolate the numbers right out of the wiring diagram or panel build. We save them to a text file and send it to the sticker machine. It takes approximately 60 seconds.”

## Reusing Existing Drawings

Although FRICK reused designs with AutoCAD, the process was flawed. “There’s no intelligence in AutoCAD,” says Cox. “It wasn’t easy to reuse designs—there was a lot of manual effort involved.”

With AutoCAD Electrical, all that has changed. Engineers and designers can make a copy of a specific part or reuse an entire drawing set when starting a new design. They can even save commonly used circuits for reuse in future designs, and AutoCAD Electrical will automatically renumber wires and devices to match the new drawing’s configuration. FRICK’s engineers can save even more time by retagging all components in a project that reuses existing design elements with a single command.

In a recent retrofit project, Cox experienced AutoCAD Electrical’s agility with design reuse first hand. He had to retrofit two panels for a refrigeration system—one panel handled the compressor system package and the other was a condenser



control panel. Cox started with a control data sheet that detailed the older package and then began his retrofit from an existing drawing. Using AutoCAD Electrical gave him a list of all the parts in the wiring diagram for him to put in his new panel.

“AutoCAD Electrical makes it so easy because I have all the parts I might need right in front of me,” says Cox. “I just need to place them where they need to be in the panel. It’s so much easier than having to hunt around for components in different projects and drawings.”

## Integrating with Other Autodesk Solutions

FRICK is using AutoCAD Electrical together with Autodesk Vault and Autodesk Productstream. Vault helps the company manage work-in-progress in one central repository that is accessible to designers and engineers at all times. They simply check out drawings when they need to work on them and check them back into the Vault when they are finished.

Autodesk Productstream allows FRICK to automate the management of engineering changes, BOMs, and the process for releasing engineering data to manufacturing. “Productstream creates an item master and we attach our electrical control panel drawings to that item,” explains Hess. “Then the software controls the item master for review and release, managing the entire revision process.”

AutoCAD Electrical enables both electrical and mechanical teams to work collaboratively on a single digital model by making it easy to share the electrical intent from the controls design in AutoCAD Electrical with Autodesk Inventor. In the future, FRICK’s electrical engineers and designers would like to integrate their designs directly with Inventor, and the scalability of the Digital Prototyping solution will enable them to do so at their own pace. “It would be a huge benefit to move from a 2D to a 3D world,” says Hess. “When you build a digital prototype, you actually see the complete package before it’s built—you can get the big picture.”

FRICK’s electrical engineers and designers are already comfortable with digital prototyping. Hess explains, “In the past, to design a new product for the food and beverage refrigeration line you would do a drawing and then actually go build the panel. You’d then check your work, make changes, and only then would the panel go into production. With AutoCAD Electrical, I feel confident that we could go right from the design into production without building a physical prototype.”

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# Frick is reusing existing designs in a more efficient manner, thanks to Autodesk.

## The Result

### Completing Control Panels Faster

Using AutoCAD Electrical is helping FRICK produce electrical control panels 80% faster—the three week design cycle has been compressed to three days. And when the design is done, so is the BOM.

“When we create a drawing, the BOMs are created automatically,” says Cox. “Everything we need is now completed when the design first goes to the customer for approval. We’re saving a tremendous amount of time and reducing manual work.”

With AutoCAD Electrical’s automation, simple tasks no longer drain away design time from FRICK’s engineers and designers. For example, FRICK is now printing out terminal block ID tags 95% faster.

According to Cox, the key advantage of AutoCAD Electrical is clear: “When you use software as powerful as AutoCAD Electrical, it makes you more competitive.”



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