

## E3 control delivers upgraded capabilities, connectivity and collaboration

*Insiders' views on how the E3 supervisory control streamlines on-site and remote monitoring, troubleshooting and control of refrigeration and HVAC applications.*

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Over the past decade, HVACR technicians have experienced a fundamental evolution in the ways they operate, monitor and maintain commercial refrigeration and HVAC equipment. Mechanical methodologies have progressively given way to the use of more electronically enabled equipment servicing and control strategies, leveraging connected technologies to stay informed and diagnose and troubleshoot issues.

Although it may seem that this evolution has taken place overnight, it has been a process of continuous enhancement, relying on the feedback of contractors, original equipment manufacturers (OEMs) and end users to develop connected products that can support all stakeholders. Copeland adopted this collaborative approach with the development of its next-generation E3 supervisory control platform. As the successor to the industry standard E2 controller, the E3 controller and Site Supervisor deliver a suite of modern, robust and connected features to streamline all aspects of facility management, refrigeration and HVAC system control.

Launched in 2021, the E3 controller is quickly replacing the E2 controller in new OEM equipment designs, contractor-led retrofits and system upgrades. Not only is this growing base of E3 controller customers benefiting from these modern enhancements, but many are utilizing the E3 controller's intuitive programming and customization abilities to their full advantage to simplify servicing models, startup and installation.

We recently spoke with two customers about their experiences upgrading to the E3 controller and wanted to share some of their insights. As long-time end users of the E2 controller and Site Supervisor, these customers also contributed to the E3 controller product development process and helped to inform its design. Tony Imbarrato is an account manager for CoolSys, an HVACR service provider that focuses on system design, installation, maintenance and operation. Lee Churchill is the vice president of sales for Seasons 4, Inc., an OEM that provides custom HVAC systems for commercial buildings. Each provided similar, yet unique, anecdotes about how new E3 features have enabled them to provide much-improved servicing and control capabilities.

## ***First impressions: Improved installation, interface and collaboration***

Because the E3 controller was designed with the same form factor as its predecessor, physically it requires very few changes to complete an upgrade. As Imbarrato explained, that factor alone is a key advantage. “The E3 controller is designed to fit in the same footprint. So if there’s a panel mount on the front of a refrigeration rack, you can unscrew it and replace it with an E3 controller using the same screws,” he said.

From a human-machine interface (HMI) standpoint, the intuitive touchscreen display was often the CoolSys technician team’s first interaction with the E3 platform. “The screen itself provides improved accessibility to the control, and it’s built-in so we don’t have to add a separate display,” Imbarrato said.

For Seasons 4’s HVAC system designs, Churchill explained that this new E3 interface — which can be accessed on the device itself and remotely through a web browser — was a key feature that simplified access to the E3 controller’s many new capabilities. “The E3 controller came stocked with the modern conveniences that we wanted in a control device, and the interface was a big part of that upgrade,” he said.

Churchill explained that for technicians in the field, this modern interface enables fast system navigation into the E3 controller’s deep feature set, while giving team members remote access to the same views. Imbarrato described how the use of an on-site and remote-access service model supports greater team collaboration, including the ability to connect with the Copeland service teams.

“Remote connectivity allows my teams to have two or three people look at the same information at the same time for troubleshooting, and even bring in Copeland’s technical support when needed,” he said.

## ***Simplified programming, conversion and customization***

The E3 controller was designed with intuitive features and capabilities that simplify programming and the process of converting data and parameters from an existing E2 controller installation. For the Seasons 4 team, Churchill explained that leveraging the E2 controller to customize control programming had been a part of their product development requirements for more than a decade. And with the launch of the E3 controller, his teams worked directly with Copeland product development to include a wish list of upgrades that his teams had gathered through the years.

“From a programming standpoint, the E3 controller is considerably faster to navigate and configure. We went from a lot of clicking and pressing and typing to more of a modern website navigation process,” said Churchill.

Imbarrato said that depending on the complexity of CoolSys customer installations, some previous E2 controller configurations relied on intricate programming via the use of flex combiners. The E3 controller enabled them to minimize this complexity by creating a simplified structure that didn’t require specialized programming.

“We established a standardized strategy that didn’t require our technicians to write code; instead, it was preset within the control,” he said.

Another built-in benefit of the E3 controller is the ability to use longer descriptions or names of input parameters, i.e., not having to use confusing acronyms and shortened codes. Churchill said that his teams took full advantage of this when converting their programming from the E2 controller to the E3 controller.

“Because I can use full descriptions, technicians are able to understand what they’re looking at, and quickly know the difference between a drain pan and a fan, for example,” he said.

In addition, he described how he leverages the E3 controller’s enhanced programming capabilities to convert previous E2 programs into a few master templates that can be easily modified for different equipment or installation configurations.



*E3 controller*

“I can fine-tune a setpoint based on the heat or humidity of the installation, feeding the E3 controller linear equations that it can quickly process and enable control,” Churchill said. And because this is all done within the E3 controller environment — without using a programmable logic controller (PLC) — technicians can easily have remote access to the HVAC unit’s status.

## ***Robust alarms, troubleshooting and control***

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Once installed, the E3 controller provides an integrated suite of robust features designed to help simplify servicing for technicians of all skill levels. For CoolSys, Imbarrato explained that the E3 controller's built-in alarming capability was among his team's most sought-after features.

"The E3 controller can send out alarm notifications directly from the unit, instead of using an open internet connection or an email program. This limits security risks and provides notifications straight from the device or through integration with Connect+," said Imbarrato. He added that his teams often use Copeland Connect+ enterprise management software to help prioritize the severity of alarms.

Churchill described how easy it is to set up specific alarms in the E3 controller — such as compressor short cycling — and how it enables next-level capabilities to support enhanced troubleshooting for Seasons 4's customer service networks.

"With the E3 controller, it's a matter of clicking yes/no for a specific compressor to indicate that it's cycling too frequently. Then I can add a description to say this compressor has cycled more than eight times per hour," said Churchill. He added that this level of information enables technicians to quickly diagnose and respond to issues at hand.

Using the E3 controller's touchscreen or remote interface, technicians have multiple ways of reviewing alarms, including Smart Alarms and Floor Plans screens. Smart Alarms give troubleshooting advice to help the technician solve the problem. Churchill said that Seasons 4 configures the Floor Plans feature to have graphical "cartoons" (i.e., drawings) of all AC system components.

"Floor Plans provides a visual picture of our units, showing temperatures and system status in their correct places. If anything goes into an alarm, it turns red and stares technicians in the face," he said.

Imbarrato also relayed how important the Floor Plans feature is to giving technicians a holistic view of refrigeration system performance for improved troubleshooting.

"We can look at anything and everything in Floor Plans, including cases, temperatures, run times and compressors — all information that's readily available and great for troubleshooting or making energy calculations," said Imbarrato.

Both Imbarrato and Churchill discussed how the E3 controller's built-in graphing provides access to expanded historical performance trends, while the control capabilities allow their teams to fine-tune systems and change setpoints remotely.

From a control standpoint, Churchill explained how Seasons 4 utilizes the E3 to enable precise variable-capacity control of Copeland digital compressors. "We can program, customize and control the performance of digital compressors to run at various speeds based on temperatures or pressures," he said.

## ***Next-generation control and peace of mind***

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At the end of the day, having an E3 controller at the control helm of refrigeration and HVAC systems provides multiple advantages to technicians, end users and OEMs. Many modern retailers are understanding the importance of having a building and/or energy management system, and the E3 controller provides these robust capabilities while streamlining individual system control.

For Churchill, installing an E3 controller on Seasons 4's HVAC units provides a competitive differentiation and peace of mind. "The E3 controller makes our systems work better, and our customers and their technicians like them better. When I ship a unit to a customer with a fully programmed E3 controller onboard, I know it'll be ready to run tomorrow," said Churchill.

To learn more about how the E3 supervisory control simplifies servicing and delivers robust system management and control, please visit our [facility controls resource center](#).

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