iPro extends functionality of HVACR equipment

Many HVACR original equipment manufacturers rely on advanced electronics to ensure flawless equipment performance within clearly defined operating conditions. It's one way engineers can guarantee reliable equipment performance and keep product development within scope.
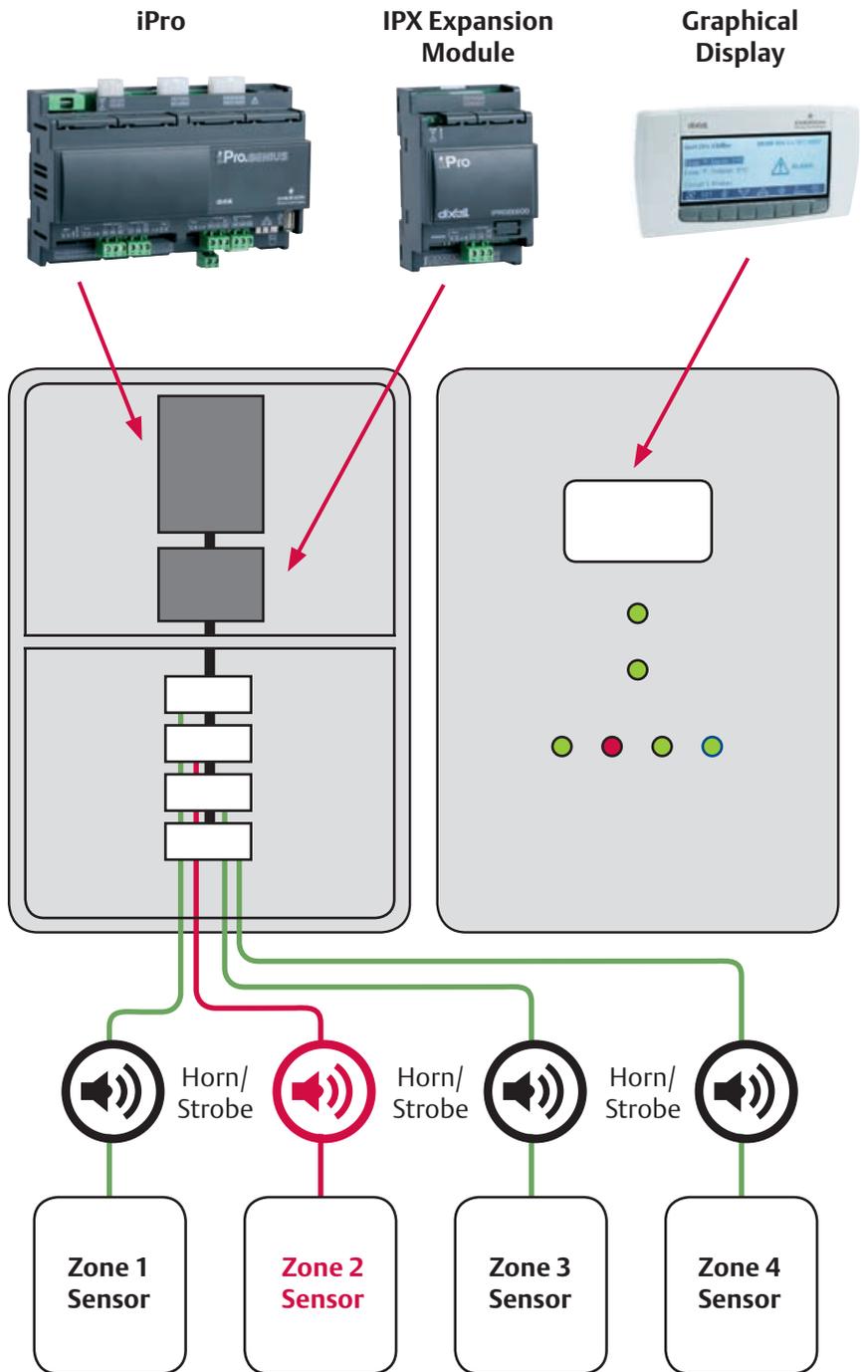
But the reality is, many end users have unique requirements that push the limits of their equipment's capabilities. Whether it's providing refrigerant pressure control, ensuring supermarket energy reduction or adhering to precise temperature across refrigerated cases, end users seek tools to extend the basic functionality of their HVACR equipment. Enter the iPro control platform.

What is iPro?

iPro is a multi-faceted electronics platform designed to give end users custom functionality for their varying requirements. At its essence, the iPro platform is comprised of two components:

1. iPro control module — a computer processor/hardware component that has generic assignable inputs and outputs and serves as the brains of the platform

2. Flexible software architecture — a customizable set of function blocks (firmware) combined as apps, similar to those commonly used with mobile devices

The iPro control module can be embedded in a panel with ancillary hardware (like relays or a display) in coordination with the specific functionality defined by the software application, to provide a complete packaged solution.

iPro

IPX Expansion Module

Graphical Display

Horn/ Strobe

Horn/ Strobe

Horn/ Strobe

Horn/ Strobe

Zone 1 Sensor

Zone 2 Sensor

Zone 3 Sensor

Zone 4 Sensor

iPro control serves as the brains of the input/output panel.

For example, the inputs can be attached to performance sensors on equipment, from which the iPro control module processes the information and relies on the software app's instructions to perform specific actions (set off alarms, notifications, etc.). To provide greater visibility to its data, iPro also can feed into a facility's computerized management system, such as Emerson's E2 controller. Since the iPro control module has its own IP address, it can be accessed independently from a Web browser.

Nimble programming and application flexibility

iPro's modular application architecture allows for customization late in the product development cycle, after the equipment's core functionality has been fully engineered and tested. This means new functionality can be developed with minimal engineering effort, relying on an agile programing language and a short app development cycle.

Trained application engineers work closely with the customer to capture their requirements, and using the iPro hardware and a flexible set of code, can put the desired functionality into their hands in less than 12 weeks without the traditional — and sometimes lengthy — process of product development.

A growing library of functions

As application engineers respond to customer requests, the amount of available iPro function blocks continues to grow.

These apps are stored in a library that developers can access to develop more complex functions. The iPro control module's nimble programming language supports integration between existing function blocks, allowing engineers to combine segments of executable code to assemble new apps for any number of advanced scenarios, including:

- Rack controller
- Case controller
- Supermarket energy reduction
- CO_2 high-pressure controller
- Rooftop compressor and fan controller

These applications can then be loaded onto the iPro hardware to provide the desired solution.

Case in point:
## Multi-zone refrigerant leak detection

Problem

A well-known retail giant sought a leak detection system to ensure there were no refrigerant leaks in any of their many refrigerated zones in their stores. They had installed a series of leak sensors, but they were not connected to a single system, so response to issues was fragmented and couldn't be easily coordinated.

Solution

iPro was used to take data from leak detection sensors and centralize them into a single point that would allow them to integrate with their store controller system and set off alarms (buzzer and strobe lights). A leak detection sensor was placed in each zone and connected as inputs to the iPro control panel. The software was designed to process information from each zone, evaluate the existence of leaks and make decisions that result in output functions (e.g., to set off alarms and contact store management in the case of a leak).

In addition, the iPro panel also included several modular add-ons to improve its monitoring functions:

- User interface/graphical display
- Panel lights and push buttons
- UPS panel
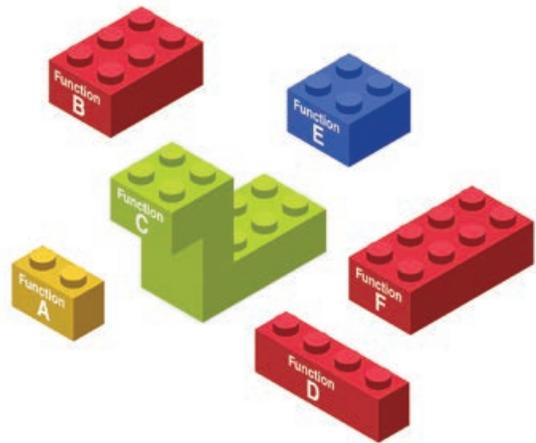
Function blocks can be combined to provide advanced new iPro functionality.