# Success story

Industry: Energy/Boiler

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Justin Butler, Energy Plant Solutions

# PLC +HMI

## ALL IN ONE ™

## Easy Automation and Monitoring with All-In-One PLC Improves Machine Safety

### Summary:

Energy Plant Solutions of Palmerston North, New Zealand provides a wide range of energy solutions. They needed a cost-effective automation solution for a new range of package boilers. They wanted to improve machine safety by automating more of the process. Using Unitronics Vision1040 PLC+HMI, they were able to control the boilers, monitor key functions remotely, and use Unitronics alarm functions to quickly react to any problems that arose.

Energy Plant Solutions of Palmerston North, New Zealand specializes in the supply and installation of industry energy plants. Their goal is to provide high-efficiency products, for a sustainable and energy efficient future.
To achieve that goal, they needed a cost effective automation solution for their range of package boilers; this solution would control all of the functions of the boiler, including feed pumps, pressure control and level control.
They hoped that by standardizing their boiler control systems with an all-in-one PLC+HMI they could reduce development time and improve efficiency.

EPS selected the Unitronics Vision1040; this PLC has an integrated 10.4-inch color touchscreen and function keys. They also added almost a hundred local I/O points, both digital and analog, using I/O expansion modules. Due to the high I/O count and communication needs, the Vision1040's large screen was a necessity, offering room to display important information without crowding the screen. Similarly, the physical keys allowed EPS to certain functions always accessible without dedicating additional screen space to them.

The Vision1040 uses discrete I/O to control the burner. EPS was particularly interested in automating key safety procedures; for example, the PLC shuts the burner down when certain alarms are triggered. They also use the PLC to monitor and log data on the burner's operation, including actuator positions, burner fan speeds, flue gas residual oxygen, fuel valve states and fault details. This trend data is stored using the Vision1040's SD card functionality. EPS also uses the SD card to store set back up points, enabling a quick recovery in the unlikely event of a hardware failure.

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Not only is this data stored locally, Energy Plant Solutions monitors it using their SCADA software. The Vision1040 uses Modbus IP to transfer data to Wonderware® InTouch® SCADA, as well as connecting to the factory network using Ethernet. EPS can remotely access any of the Vision1040 PLC installed on one of their boilers using Unitronics complimentary software utilities. Justin Butler, Senior Electrical Engineer, explains the advantages, saying "With Remote Operator, we can see exactly what the operator sees from our office at the other end of the country via a VPN at absolutely no cost either financially or in development time. This is a huge advantage if the client requires assistance to solve a problem."

The Unitronics Vision1040's powerful communication options also allow for necessary safety features. The boiler control system includes an Enfora GSM modem, enabling SMS messaging. If a fault condition triggers an alarm, the PLC sends an SMS message to a list of operators in sequence to inform them of the condition. The operator receives an actual description of the fault, rather than just a generic "boiler fault" message, allowing the operator to assess how urgent the response needs to be. If an operator responds to the SMS alert, it prevents the message being sent to the remaining operators on the list, avoiding duplicated efforts to fix the problem. The fault messages also appear on the HMI panel; this HMI alarm message and the SMS alert are the same and are pulled from the same string library, meaning that EPS didn't need to code two different messages.

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Another safety feature that EPS was able to implement with the Vision1040 was the use of an uninterruptible power supply, or UPS, which can maintain power to the PL and I/O in case of a power failure. The Unitronics products run on 24VDC power, while the rest of the boiler system uses 230VAC. Using the 24VDC UPS made the system safer because there was no 230VAC present when the main power supply is disconnected.

Additionally, using Unitronics enabled EPS to easily simulate their applications before installing them in the field. Justin Butler explains, "Unitronics PLCs allow us to run the PLC without any I/O attached…We can enter any values we like for conditions and test that the PLC acts as intended…This means we can do 90% of the testing before we even go to the site." This advanced testing means that EPS avoids solving problems last minute, in the field, which saves them time and effort.

Butler notes that Unitronics PLCs also offer significant savings. He explaisn that these saving consist of both "the development software licensing (it doesn't get much cheaper than free) and also in the time required to develop the PLC/HMI software." The Vision1040 is programmed with Unitronics VisiLogic software, which provides a single environment for ladder logic, HMI design, and communication configuration. Butler says, "Making changes is so much quicker when you can add the necessary logic to the PLC program and then immediately add the new elements to the HMI without having to export or import tag data, etc.."

He continues, saying "Working with the Unitronics combined PLC and HMI make other systems feel old fashioned and obsolete. The support from Unitronics, from our local supplier, to email support, to help ideas on the forum, has been absolutely fantastic."



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