

# Power+Energy, Inc.: TIA Portal Application Awards - 2012

**Company Name:** Power+Energy, Inc.

**Location of Application:** 106 Railroad Drive, Ivyland, PA 18974-1449

**Website:** [www.powerandenergy.com](http://www.powerandenergy.com)

**Key Business Activities:** Power+Energy Hydrogen Gas Purifiers supply Ultra High Purity Hydrogen gas for point-of-use and bulk gas purification applications.

**Name of Application:** PE 9000MZ and PE9000C ranges of hydrogen purifiers

**Description of Application:** Power + Energy purifiers use advanced micro-channel palladium membrane technologies to purify industrial grade hydrogen to 99.9999999% purity. Individual impurities such as H<sub>2</sub>O, O<sub>2</sub>, N<sub>2</sub>, CH<sub>4</sub>, etc are reduced to less than 100 parts-per-trillion (ppt). This ultra-pure hydrogen is required by companies involved in new, high growth industries including manufacturers of Light Emitting Diodes, power semiconductors and some photovoltaic and silicon semiconductor products as well as by providers of hydrogen fuel for fuel cell electric vehicles.



## What challenges led you to look at a new solution?

To enable the introduction of a new lower priced product, Power + Energy needed to upgrade its existing hydrogen purification systems by reducing the machines' cost and by further improving reliability. Most importantly, drawing on customer experience, Power + Energy wanted to upgrade and modernize the controls systems that had been used on earlier models. Power + Energy required that the engineering software in the new machine design needed to be easy to use so as to minimise engineering development time and training costs. Power + Energy therefore looked to Siemens Factory Automation products for solutions.

## What Siemens automation products were chosen for this project and why?

Power + Energy decided to use the S71214 PLC and TP700 Comfort Panel HMIs. These products provided the cost, features and reliability that proved to be a good fit for the redesigned machines. Critically these devices can also be configured, programmed and commissioned with a single engineering software package, the TIA Portal.

## What features in the TIA Portal addressed your project challenges?

The main feature that Power and Energy stated helped them in the redesign of this machine was the integration of the PLC, HMI and Networking devices within a single engineering software package. With integrated software, the tag handling between the PLC and HMI was simple and less error prone than earlier competitive packages. Power + Energy found the software was well laid out, and intuitive to use, especially with the drag and drop features between the editors. With the Device and Networks editor it was easy to connect devices and get them to communicate with each other. Within the programming editors, the Help system provided easy guidance to help on all instructions, and the use of Function blocks allowed for easy reuse and structuring of code. When commissioning the machine the software provided easy guidance to any fault information.

## How has your business improved?

The use of the TIA Portal, S71200 PLC and Comfort Panel HMI has allowed Power + Energy to minimize the engineering development time and cost and has resulted in a low cost, highly reliable control system for its new ranges of purifiers. They estimate that they came in at least 30% below budget for engineering time. In addition, Power + Energy has reduced the control system costs by 50% for each purifier and reduced the build time for each purifier control system. Lower costs and shorter lead times are helping Power + Energy to attract many new customers leading to a strong order book for the new machines.

Siemens - 2162r01

Project Edit View Insert Online Options Tools Window Help

Totally Integrated Automation PORTAL

2162r01 > PLC\_1 [CPU 1214C D0DGD0C] > Program blocks > Cyclic interrupt [OB200]

2162r01 > HMI\_1 [TP700 Comfort] > Screens > Main

PLC programming

Network 2: PID\_A

CellA PID control within OB200 which has a cyclic interrupt time of 100ms

OB200 "PID\_A"

PID\_Compact

EN ENO

\*CellA\_PID\* \*CAL\_CellTempSPActive

\*CellA\_Monitor\* \*COR\_Temp\_TC1

WR 16#0

\*CellA\_PID\*\_PID\_ManualMode

\*CellA\_PID\*\_PID\_ManualValue

\*CellA\_PID\*\_PID\_Reset

ScaledInput

Output

Output\_PWM

SetpointLimit\_L

InputWarning\_H

InputWarning\_L

\*CellA\_PID\*\_PID\_State

\*CellA\_PID\*\_PID\_Error

Home Screen

State A 00

T1 (Cell) +000.0 C

P1 (Feed) +000.0 psia

P2 (UPH) +000.0 psia

P3 (Air) +000.0 psia

Operate

Standby N2

Standby H2

Shutdown

H2 N2 UPH BYP LT HPB

Current User 0000000000

Log On Log Off

Block interface

```

10 END_IF;
11
12 IF #Index>5 THEN
13
14   #OutputSum2:=#OutputSum2+#Input;
15
16 END_IF;
17
18 IF #Index=10 THEN
19
20   #Avg1:=#OutputSum1/5.0;
21   #Avg2:=#OutputSum2/5.0;
22   #Output:=(#Avg2-#Avg1)*6.0; //Avg1, Avg2 is per
23   #Index:=0;
24   #OutputSum1:=0.0;
25   #OutputSum2:=0.0;

```

Portal view Overview Cyclic interr... Main RateOfRise C...

6:54 PM

