Cypress Systems

Wireless Gauge Reader Overview

http://www.cypress.com/systems

CYPRESSSYSTEMS

Agenda

- Who is Cypress Systems?
- What is the problem we are solving?
- What is our solution?
- How does this compare with alternatives?
- Who has used this solution before?

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Cypress Systems Overview

- Subsidiary of Cypress Semiconductor.
- Mission: Introduce **leading edge technologies** to **legacy plants** with **minimal disturbance**.
- **Improve uptime**, reduce **maintenance** cost, reduce **scrap**, reduce **energy/utilities use**.
- Combine Cypress semiconductor fab knowhow with instrumentation & service focus.
- Committed to delivering **full solutions** with tangible dollar savings and **attractive payback**.

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The Opportunity

Silicon Valley Technology Today

- Wireless
- Image capture + sensors
- Intelligent Processing
- Large memory
- Programmable
- ALMOST FREE!

Typical Legacy Plant Technology

- Manual Reading
- Simple Analog 4-20mA wires
- or “No Connection”
- COSTS HUNDREDS OR THOUSANDS $$

Apply leading edge wireless, non-invasive instrumentation technologies to legacy plants!!

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What Problem Are We Solving?

Pharma, Food & Beverage

Semiconductor Fab

Panel Mounted Gauges
on Equipment

Air Dryer

Process Gases Regulator Gauges
For Plating shop, Bio Lab

Lots of Legacy Gauges, Cost & Hassle to Add Transducers

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Do You…

- Have valuable field personnel doing rounds reading gauges?
- Have clipboards and logbooks with handwritten data?
- Need to be alerted of excursions more often than 1-2 times per day?
- Need to tie your manual data points to your DCS or SCADA system?
- Find it too expensive to wire up transducers to replace old gauges?

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Our Solution: Wireless Gauge Reader

Wireless

Non-Intrusive Reader Mounts <u>On Top of Existing Gauge</u> in Minutes…
Alarming, Trending, Historization for Process/Asset Monitoring.

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Key Components

Wireless Gauge Reader
Wireless Transducer Reader

Wireless Range Extender

Blue Box Receiver and Server

Configuration Tool

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Wireless Transducer Reader

- Reads virtually any analog transducer or instrument with 4-20mA, 0-5V, or 0-10V output, and transmits data to Cypress Blue Box Receiver and Server
- Non-disruptive – no need to change out transducers, break pressure seals, or run wires
- Compatible with most existing particle counters, temperature loggers, weigh scales etc.
- Enables data logging to enable trend analysis, notification, or statistical process control
- Battery life of 2-3 yrs under typical sampling rates
- Wireless range of over 300m
- Robust Cypress wireless protocol (millions of units deployed over past three years)

Installed on Gas Monitoring System Weigh Scale

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How Does This Compare with Alternatives?

Benefits

- Non-invasive, clamp-on
- No downtime
- No leak check
- No audit/requalification (e.g. FDA, OSHA)
- No running wires
- No drawings and approvals
- Minimal retraining of staff
- No new enterprise software

Comparison with Alternatives

	Wireless Gauge Reader	Wired Transmitter	Wireless Transmitter
Process Downtime	$0	$1,000	$1,000
Transducer/Sensor	$1,200	$300	$800
Installation Labor	$50	$1,500	$200
Drawings, Reviews	$0	$500	$300
Code Compliance	$0	$1,000	$1,000
I/O Panel Termination	$0	$300	$200
Total Cost (per point)	$1,250	$4,600	$3,500

About 1/3 the Cost of Alternative Solutions

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More Savings vs. Manual Readings

Better Operational Savings

- Reduce maintenance cost from condition based maintenance vs. scheduled maintenance.
- Reduce excursions, facilities downtime, scrap by early detection/notification
- Reduce labor to perform rounds
- Reduce time and effort of energy audits, troubleshooting
- Reduce usage/waste of consumables, process gases
- Trending, graphing, alarming, notification, historization

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Who Has Used This Solution Before?

Customers

- Micrel – Silicon Fab Facilities/Gas Cylinders
- Novellus* – Facilities/HVAC
- Genentech – Facilities/Utilities
- Stanford University* – Laboratory, Fab
- Silicon Valley Technologies Center – Silicon Fab
- Microchip – Silicon Fab/Facilities
- Cypress Semiconductor – Silicon Fab/Facilities
- Linear Technology – HVAC, Utilities
- PDL BioPharma – Pharmaceutical Manufacturing

*Agreed to be a customer reference center, available for visits

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$ Savings Applications to Date

			APPLICATIONS											
			Process Tools, Clean Area						Pump Chases, Facilities					
			CMP	Diffusion	CVD	Venting/ Exhaust	Mains/ Laterals Supply	Com- pressed Air	Process Chilled Water	Burn Boxes	DI Water Filter	Gas Cylinders	Boilers	Pumps	HVAC Chillers AH, Water Soft
COST	Materials	Process Gases, Consumables					$$$		$		$	$$$			
		Energy, Water, Utilities				$	$		$		$				
		Scrap	$$$	$$$	$$$			$$$		$$$					
	Labor	Planned Maintenance				$$$			$$$		$$$	$$$	$$$	$$$	$$$
		Trouble- shooting	$	$	$	$	$	$	$		$	$	$	$	$
		Rework, Recovery					$								
	Equipment	Parts													
		Breakdown Replacement							$		$				
	Down Time	Loss of Production	$	$	$		$	$	$$$	$$$	$$$	$	$	$	$

Case Study: Reduce Gas Management Cost

- Maximize gas usage
- Reduce rounds labor
- Reduce unplanned outage
- Micrel: $215K savings, 7 month payback

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Case Study: Upgrade Old Tool

- CMP Reduce Scrap, Improve Yield
- Troubleshooting
- $350K savings, 1 week payback

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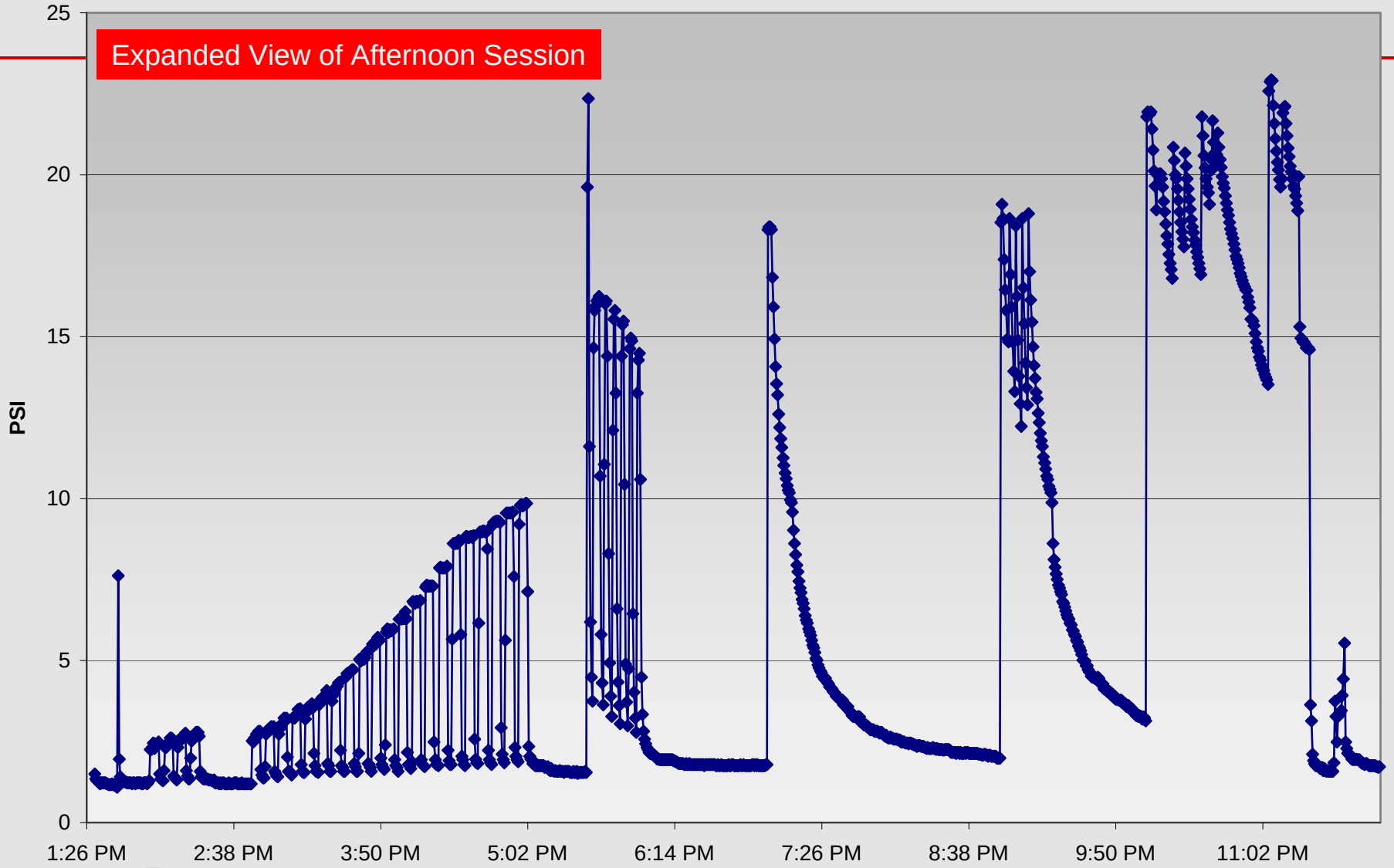
Sep 26 Afternoon - CMP Westech Unit 2 POS Filter Upstream Pressure



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Case Study: Facilities Monitoring

- Reduce rounds labor
- Reduce unplanned outage
- Fab pilot project: $60K savings, 5 month payback

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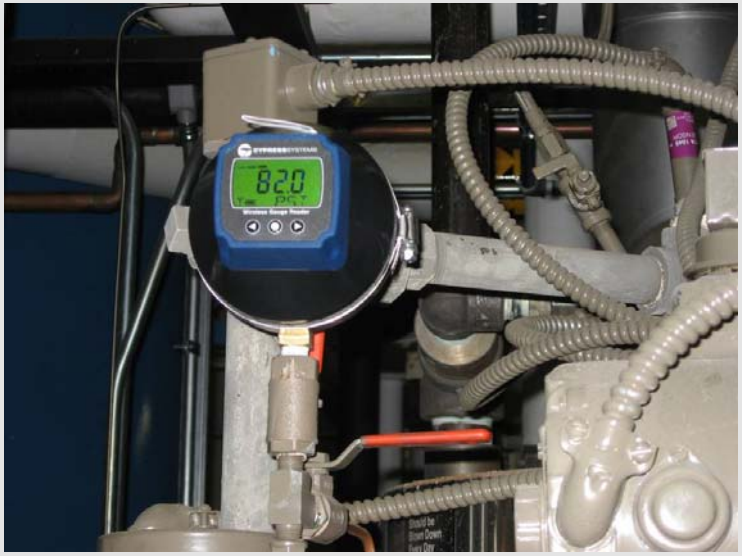
Water Softener

Domestic Water Supply

Boiler Rooms/HVAC



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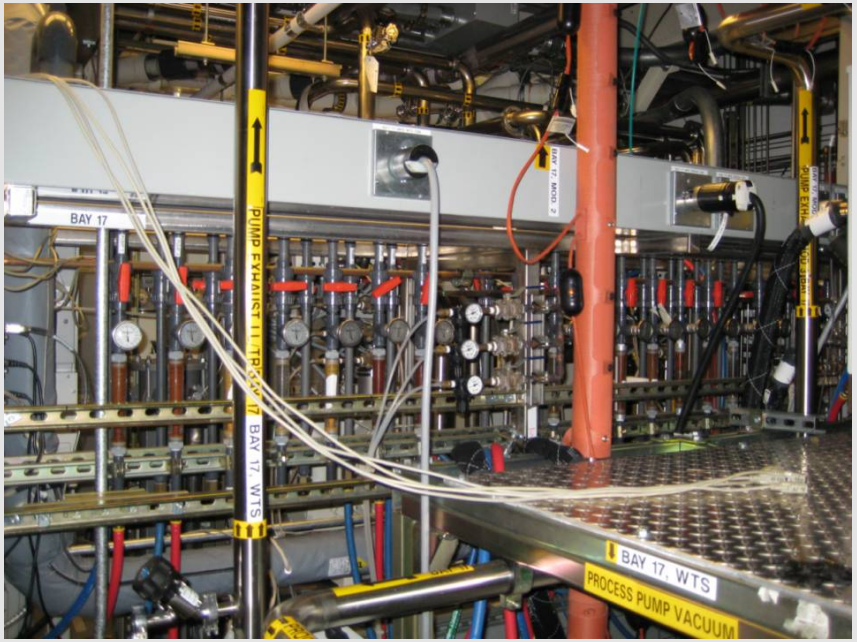
Process Cooling Water Loops
DI Water Loops



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Waste Treatment Digester

Circulation Pumps

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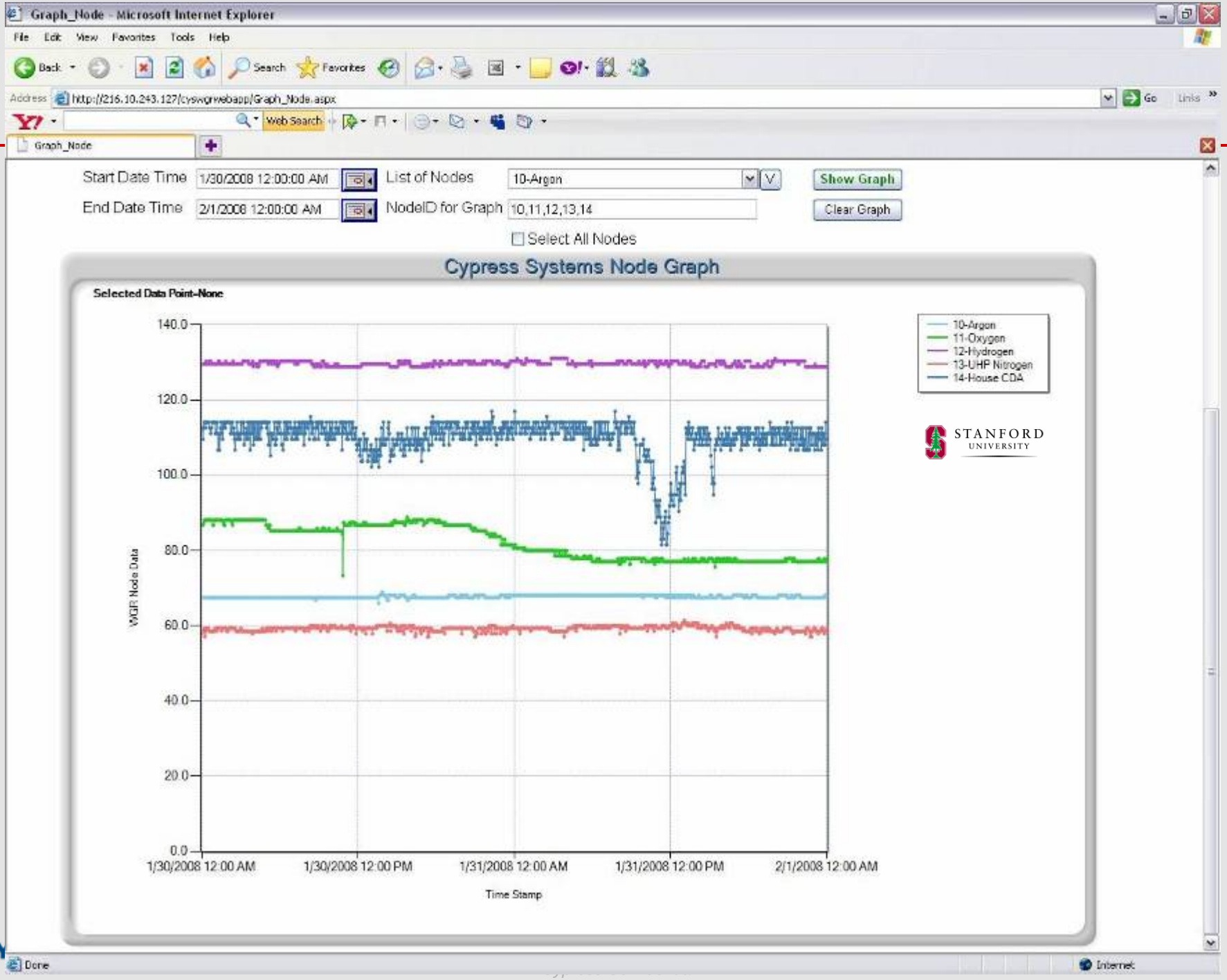
Graph_Node - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://216.10.243.127/cyswgnwebapp/Graph_Node.aspx
Web Search
Graph_Node
Start Date Time 1/30/2008 12:00:00 AM
End Date Time 2/1/2008 12:00:00 AM
List of Nodes 10-Argon
NodeID for Graph 10,11,12,13,14
Show Graph
Clear Graph
Select All Nodes
Cypress Systems Node Graph
Selected Data Point-None
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
VGF Node Data
1/30/2008 12:00 AM
1/30/2008 12:00 PM
1/31/2008 12:00 AM
1/31/2008 12:00 PM
2/1/2008 12:00 AM
Time Stamp
10-Argon
11-Oxygen
12-Hydrogen
13-UHP Nitrogen
14-House CDA
STANFORD UNIVERSITY
Done
Internet

Application Examples - Summary

- **Reduce labor and consumable costs**
  - Gas Cylinder monitoring (regulator gauges, e.g. cal gases)
  - Domestic water supply
- **Improved Equipment Uptime via Monitoring**
  - Filter changeouts (measure delta P)
  - Pumps, compressors, fans (measure delta P)
  - Air handlers, chillers, scrubbers
- **Reduced troubleshooting cost**
  - Fast non-invasive data gathering/logging/alarming
- **Safety/Compliance**
  - Avoid manual reading at difficult to reach or harzardous locations
  - Monitor exhaust/venting (e.g. Magnehelic gauge)
- **Better yield/quality**
  - Upgrade older process units with no data outputs
  - Data for statistical process control, or feed to advanced control models
- **Energy Savings**
  - Compressed Air – ramp down compressor
  - Exhaust/Venting – ramp down fans
  - Low cost audits for steam/water pressure, temp, flow

Feedback on Wireless Gauge Reader

"This is a no-brainer way to save money"
Dan Hutcheson – CEO, VLSI Research

"Micrel saves time, money and effort. We are very happy with our purchase."
Guy Gandenberger – VP Global Operations, Micrel

"We've already discovered a major problem we would have never seen without your equipment" *- Rick Pasquini, Operations Manager, Linear Technology*

"~70% less cost than adding hard wired devices" - *Zach Rhyne, Utilities Specialist, Genentech Inc.*

"Almost certainly the most compelling argument in favour of the Cypress solution compared with possible alternatives is cost" *– Andrew Bond, Industrial Automation Insider*

"The impact of dynamically reading many of these hidden gauges, previously thought too difficult, has uncovered significant cost, resource savings & yield improvement opportunities."
– Dick Deininger, Taylor Deininger Partners Inc.

"Workforce reductions are motivating organizations to increasingly adopt online Plant Asset Management (PAM) solutions. Using the Cypress Wireless Gauge Reader allows real-time distribution of critical asset information to PAM systems enabling the workforce to take proactive action." *– Wil Chen, ARC Advisory Group*

"This is the coolest thing I have seen in the past couple of years"
Walt Boyes – Editor-in-Chief, Control Magazine

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Backup Slides

Current Product Family – Q1 2008

Wireless Gauge Reader

Blue Box Receiver and Server

Wireless Transducer Reader

Analog Output Receiver

Wireless Magnehelic Reader

Wireless Range Extender

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Wireless Connection Options