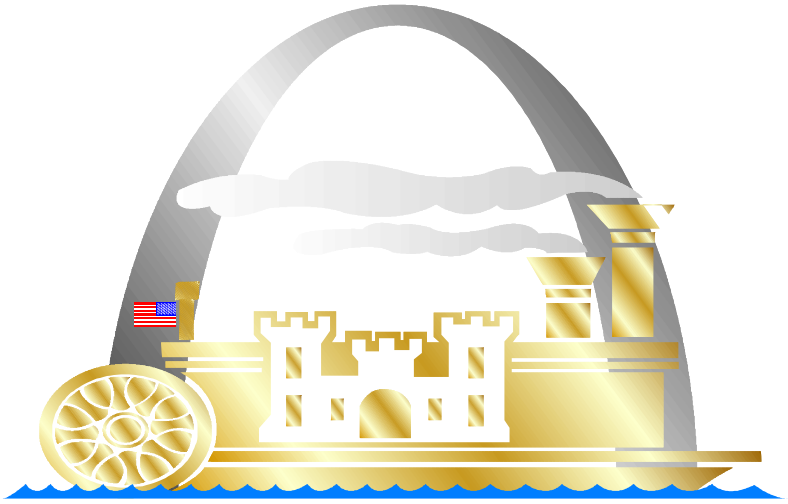
2005 Tri-Service Infrastructure Systems
Conference & Exhibition

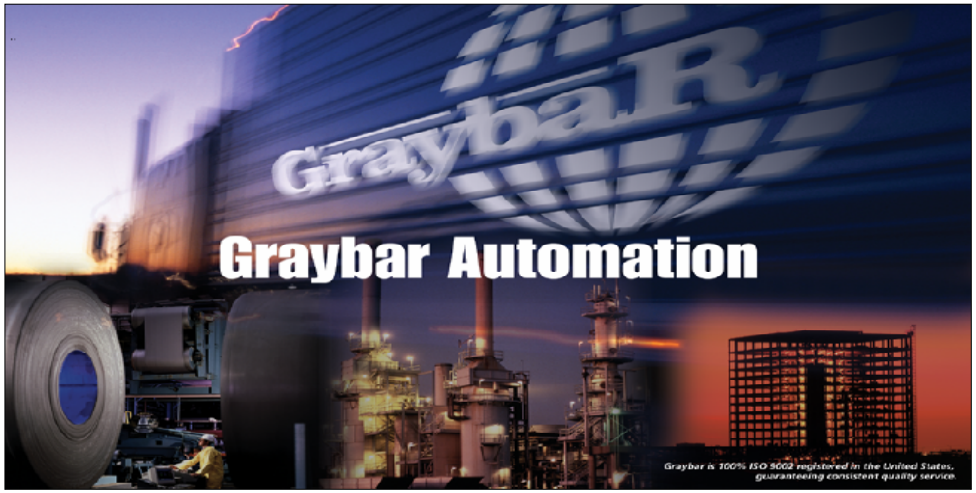
Technological Advances in Lock Control Systems

Presenters:

Andy Schimpf, P.E.
Electrical Engineer
St. Louis District, USACE

Mike Maher
National Automation Support Manager
Graybar Electric Company





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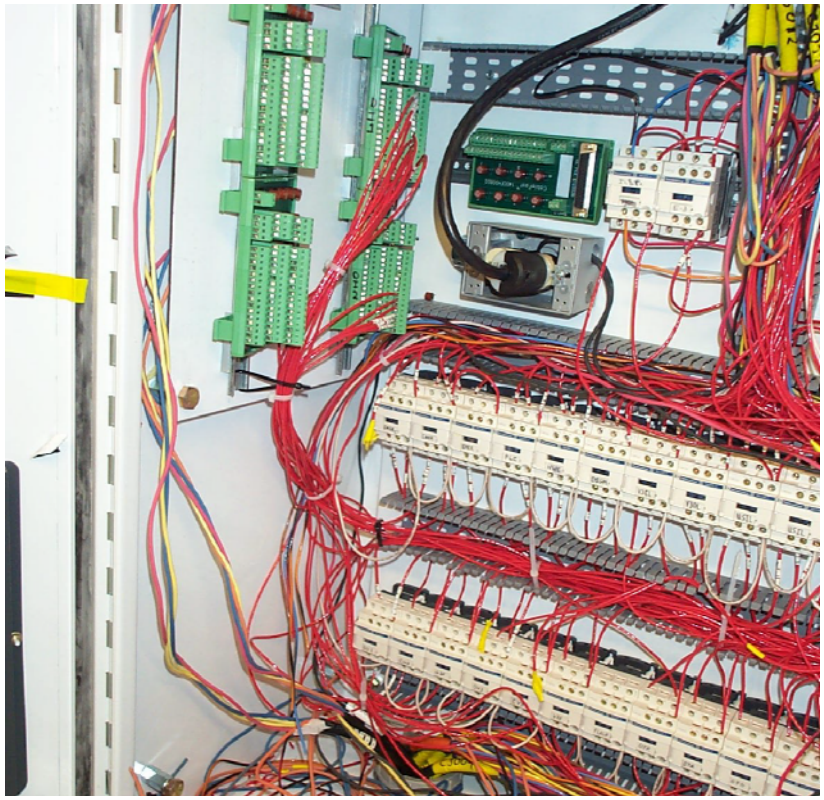

The Opportunity to Improve Presents Itself in Small AND Dramatic Ways!

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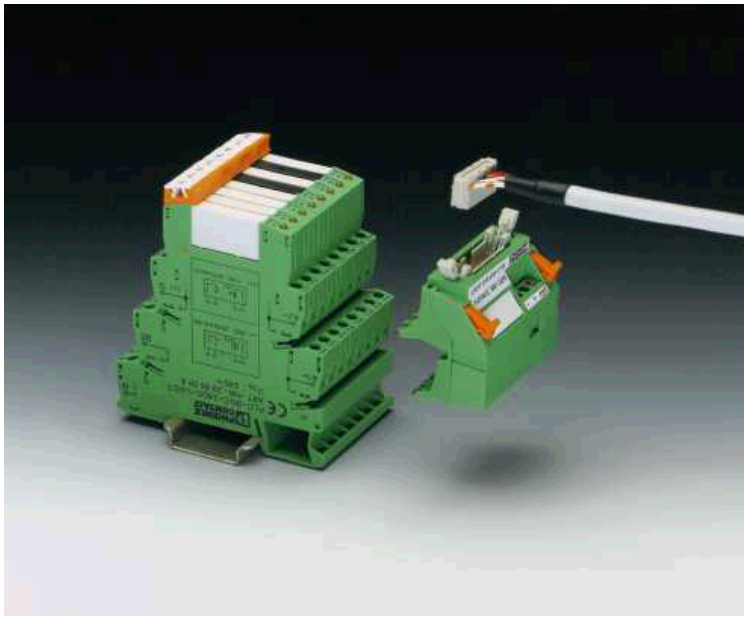

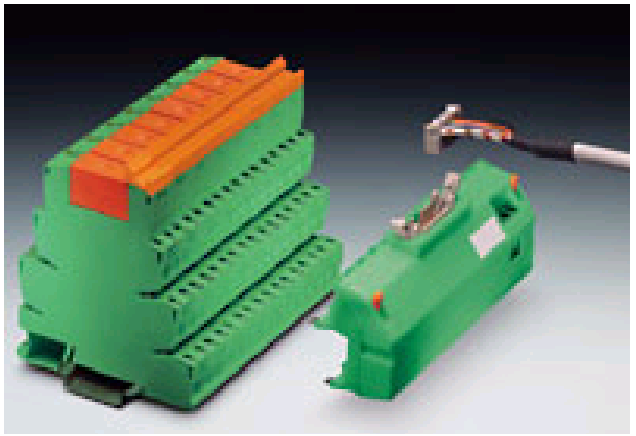

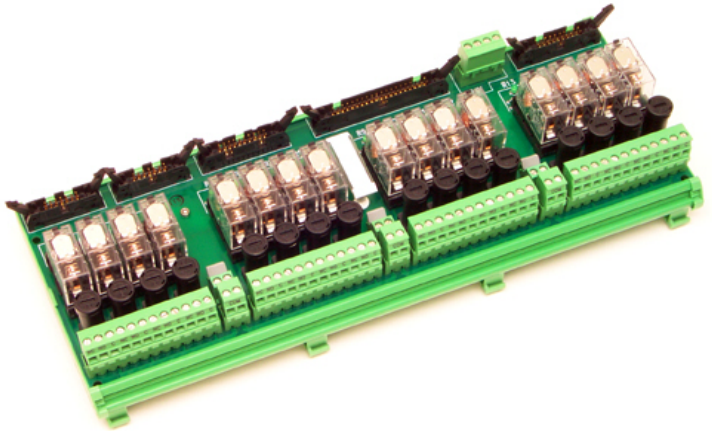

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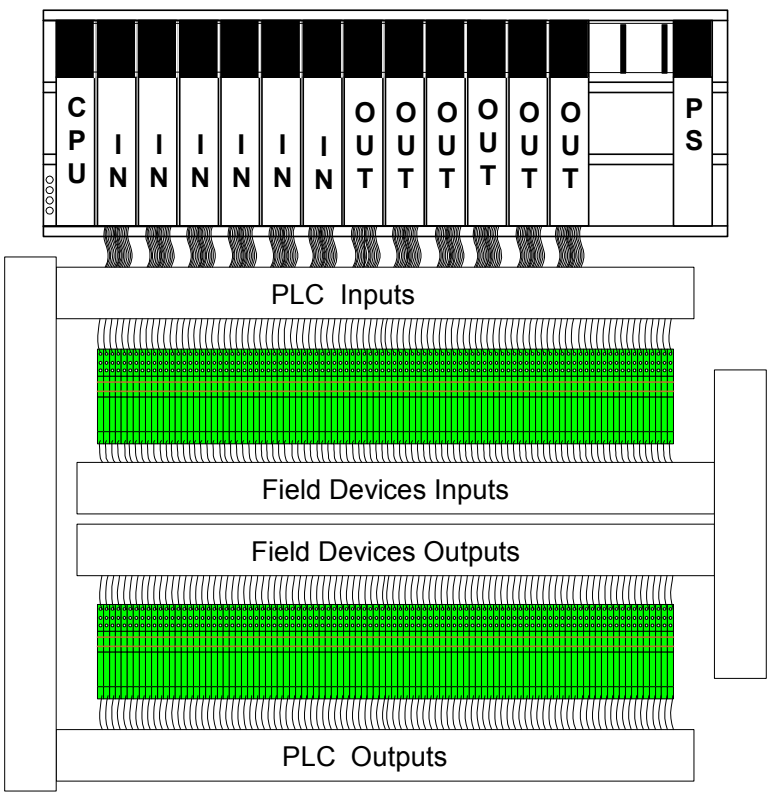

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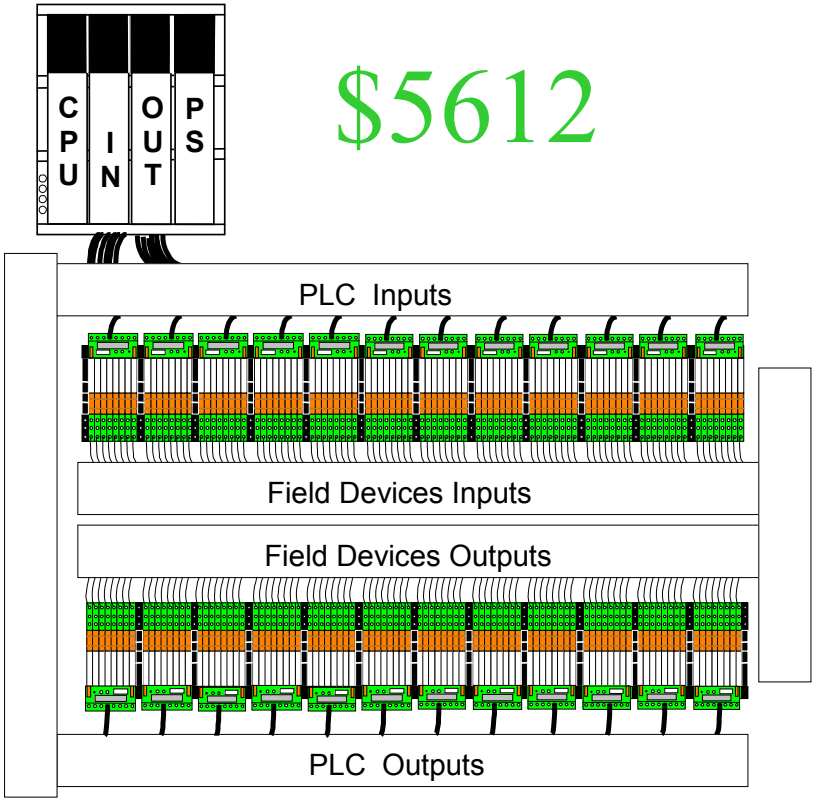

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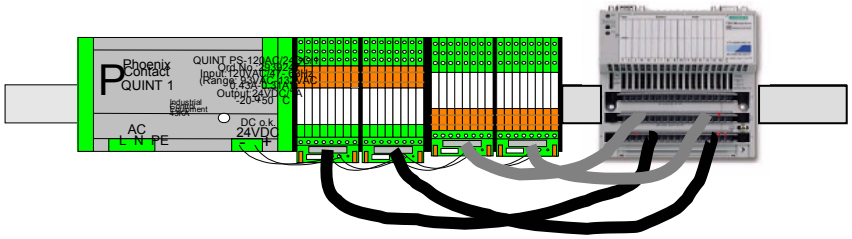
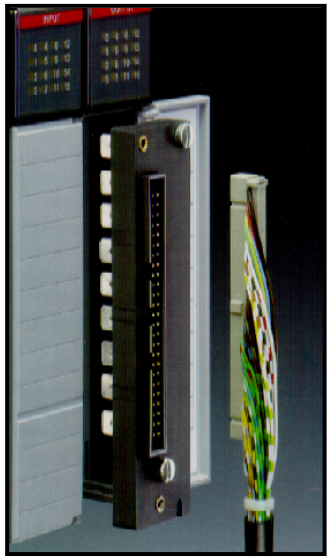
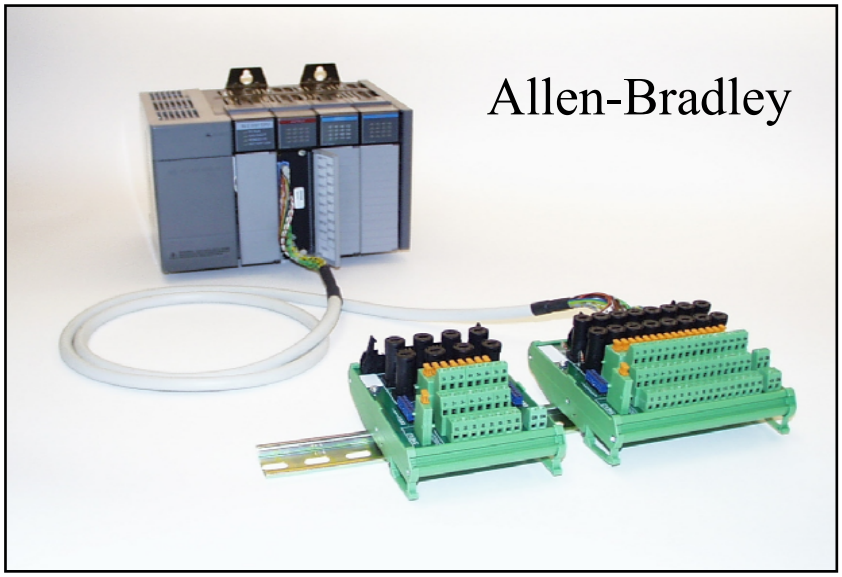
Modicon

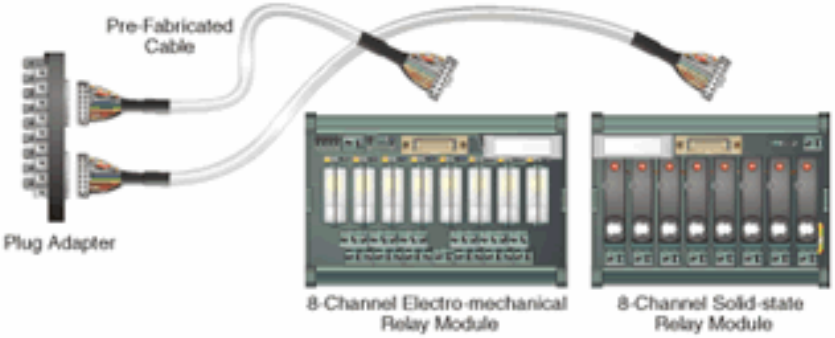




Allen-Bradley



Programmable Logic Controller (PLC)



Seimens

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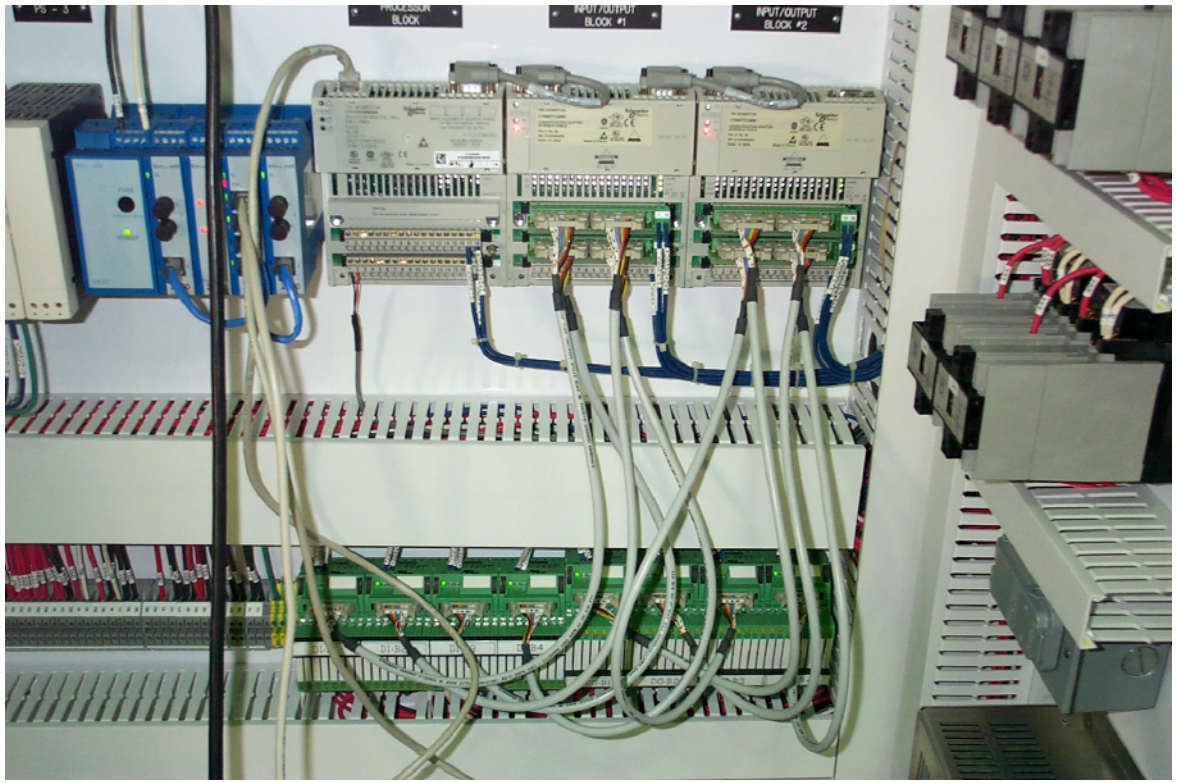

Wallisville Lock
Galveston District
August 2004

St. Louis District

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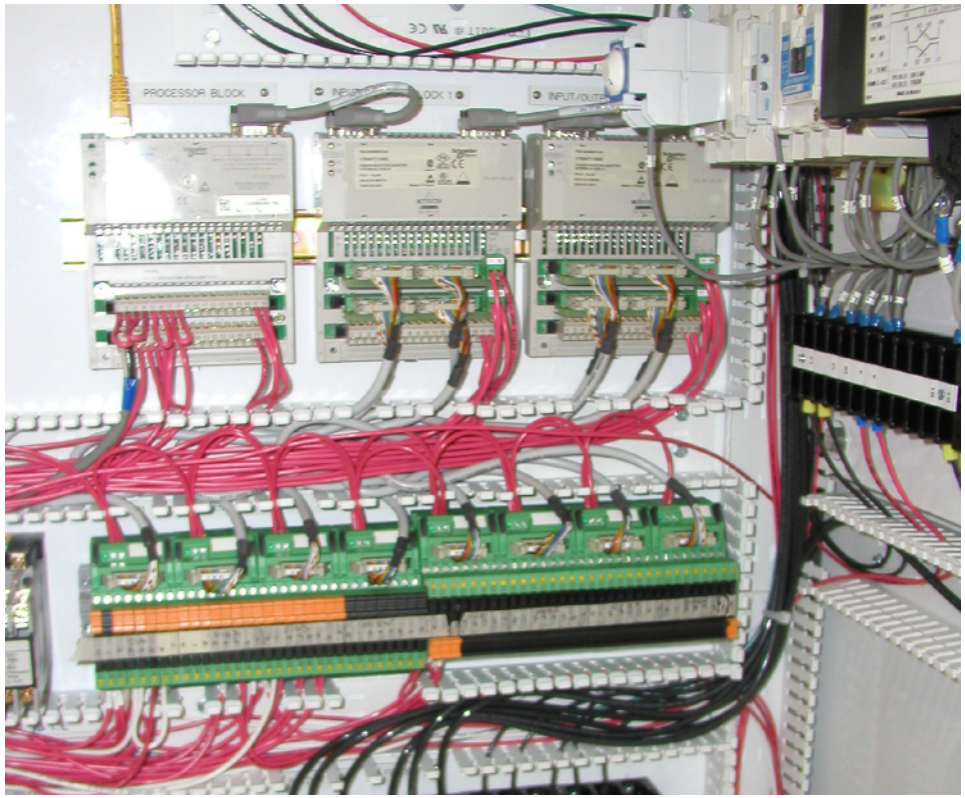

Kaskaskia Lock

St. Louis District

February 2005

St. Louis District

August 3, 2005

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What are the future trends?

- Embedded web pages into intelligent devices
- Lower cost Ethernet connections
- Less proprietary networks - More open Ethernet

- Remote condition monitoring
- Allowing engineering to easily support operations
- Global approach to river management
- Security through USACE WAN

Web Based Technology

Use a Common Ethernet Infrastructure From Manufacturing to MES

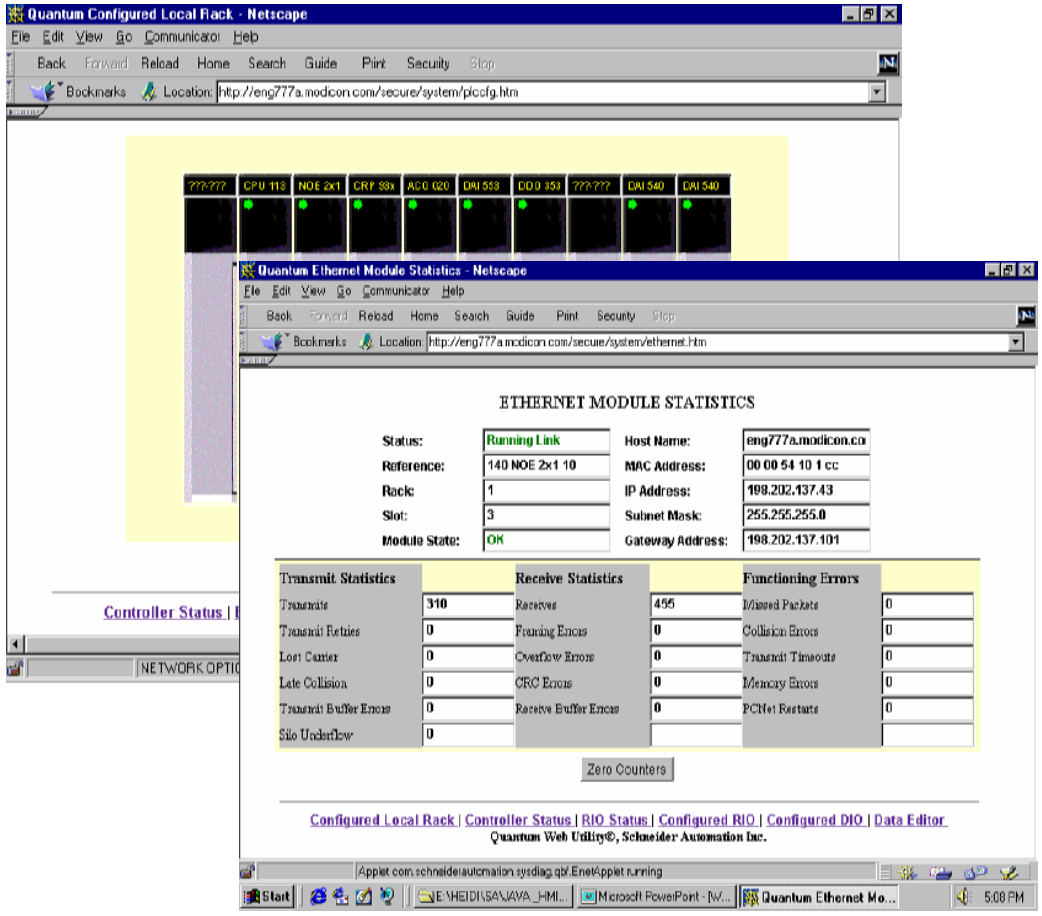
Gain Competitive Advantage Through Proven Real-time Performance

Reduce Downtime Through Web Based Diagnostics

Cut Training Costs With Everyday Tools

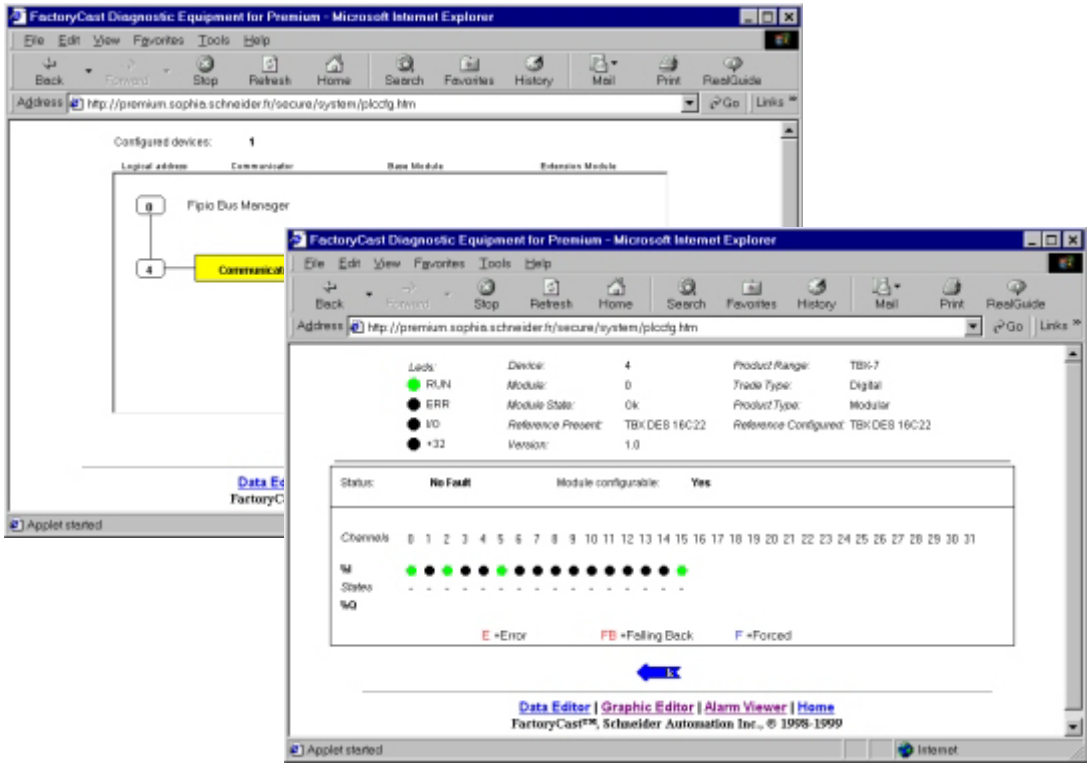
Contain Cost Through Open Standards

Web server functionalities: System Diagnostic



- **Out-of-the-box**
- **Graphical visualization of the PLC configuration**
- **Visualization of PLC defaults**
- **Detail diagnostic of each module**

Web server functionalities: System Diagnostic



- **Out-of-the-box**
- **Graphical visualization of the remote I/Os configuration**
- **Visualization of module defaults**

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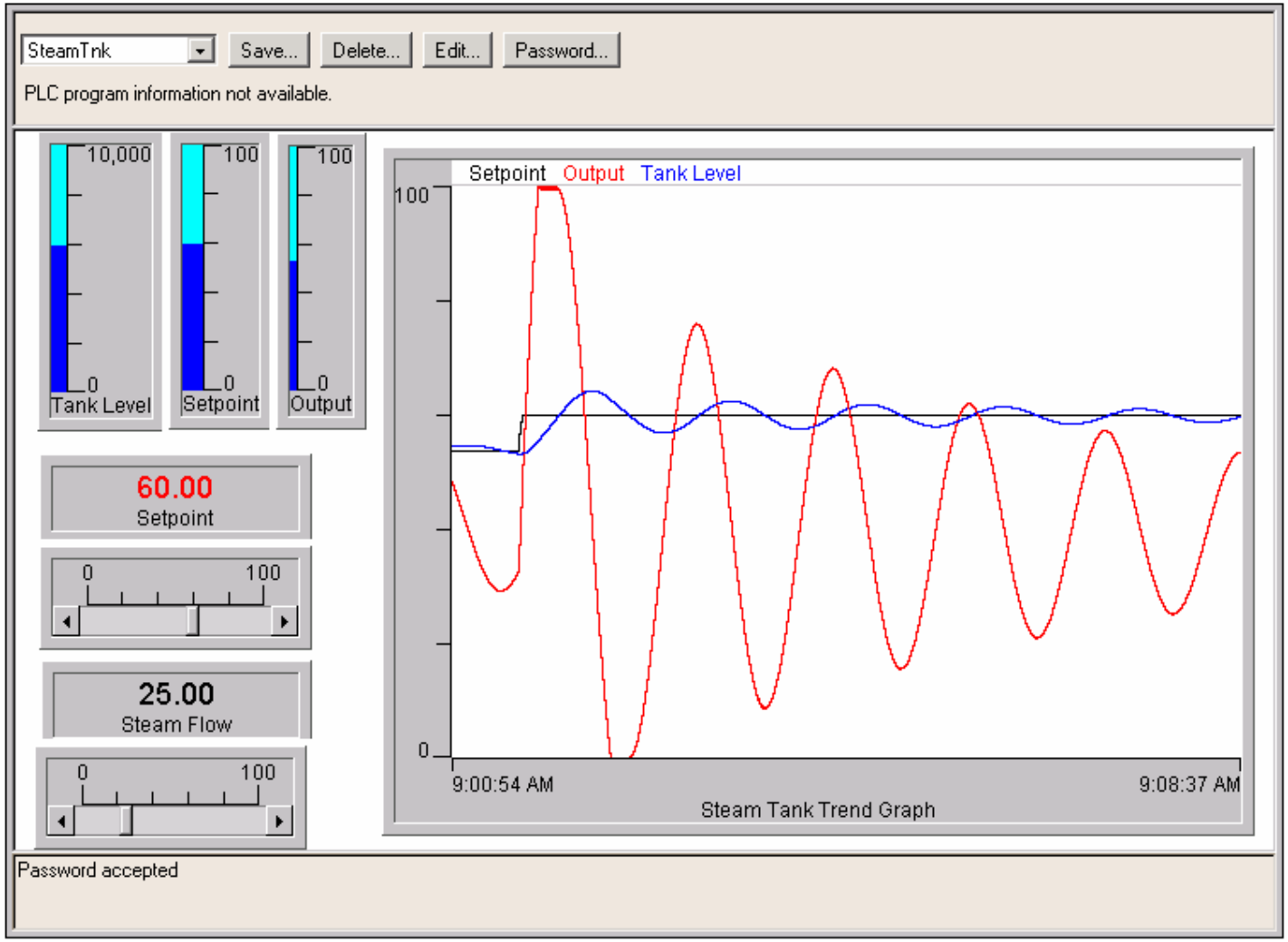

Your HMI could be a traditional panel mounted HMI PC, a laptop PC, a portable hand-held PC (PDA), or any device able to run a standard web browser software.

The Factorycast HMI web server modules essentially provide 4 main features:

1. Real-time communications (Ethernet TCPIP, Modbus or UNITE)
2. Web Diagnostics – pre-written diagnostic, adjustment, alarm management web pages for the PLC in which the module is installed
3. User Web Pages – 8MB of space for a user defined web site
4. Active Web HMI services:

•Publisher-Subscriber protocol

This open standard provides "many to many" deterministic communications, synchronization of distributed applications, global availability of reliable information, automatic discovery and reconfiguration, and optimized traffic load — all without the need for network programming.

Faulty device replacement

This feature permits automatic reconfiguration and network addressing of ANY faulty device, improving productivity while minimizing risks. It is incorporated into the Momentum ENT communication adapter, which sets the groundwork for future implementations in any type of industrial device.

•Bandwidth Monitoring

This feature allows the user to clearly determine the communication load that a device is exposed to and then tune it to achieve optimal performance, thus providing the user the critical information needed to understand and predict a device's network traffic load.

Enhanced network monitoring, web services and diagnostics

Using standard Internet protocol (SNMP - Simple Network Management Protocol) and standard Network Management Software, every FactoryCast device allows access to its enhanced Management Information Base (MIB). This not only means you can monitor the device for network performance, but you can also perform diagnostics on the operation of its services.

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Instantaneous Readings

7-18-2005
11:24:05

Last Reset	Minimum	Maximum
	7:55:42 01/22/2003	7:55:42 01/22/2003

Current (Amps)	Minimum	Present	Maximum
Phase A	160	311	656
Phase B	184	315	657
Phase C	158	318	664
Three-Phase Average	169	311	659
Neutral/Residual	20	40	79
Ground	---	---	---
Apparent RMS	199	320	671

Voltage (Volts)	Minimum	Present	Maximum
Phase A-B	396	488	497
Phase B-C	371	496	500
Phase C-A	450	493	502
Three-Phase Average (L-L)	412	493	499
Phase A-N	261	282	287
Phase B-N	165	282	287
Phase C-N	258	287	290
Three-Phase Average (L-N)	239	282	288

Powers	Minimum	Present	Maximum
Real Power (kW)	124	234	468
Reactive Power (kVAR)	69	127	284
Apparent Power (kVA)	143	265	546

Power Factors	Minimum	Present	Maximum
Phase A	0.612 lag	0.872 lag	0.938 lag
Phase B	0.763 lag	0.908 lag	0.938 lag
Phase C	0.724 lag	0.875 lag	0.960 lag
Three-Phase Average Total	0.740 lag	0.850 lag	0.928 lag

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Zone Summary

Zone	Zone Name	Status	Zone	Zone Name	Status
1	Group 1	OFF	33	Sales	OFF
2	Group 2	Override ON	34	Lunch Room	OFF
3	Group 3	Override ON	35	TS Config Room	ON
4	Group 4	Override ON	36	Tech Support	ON
5	Group 5	OFF	37	Library	Override ON
6	Group 6	OFF	38	Finance	ON
7	Group 7	Override ON	39	Computer Rm.	OFF
8	Group 8	OFF	40	Exec. Office A	ON
9	Group 9	OFF	41	Reception	ON
10	Group 10	OFF	42	Exec. Office B	ON
11	Group 11	OFF	43	Boardroom	ON
12	Group 12	OFF	44	Mail Room	ON
13	Group 13	Override ON	45	Exec. Office C	ON
14	Group 14	OFF	46	Kitchen	ON
15	Group 15	OFF	47	Exec. Office D	ON
16	Group 16	ON	48	Exec. Office E	ON
17	Group 17	OFF	49	Purchasing	ON
18	Group 18	OFF	50	Purch Office A	ON
19	Group 19	OFF	51	Purch Office B	ON

+Monitoring
- Circuit
- Load Current
- Demand Current
- Power
- Energy

Circuit Summary

7-18-2005
11:31:42

Circuit	RMS Current (Amps) 3-phase Avg.	Thermal Capacity (%)	Drive Output Frequency (Hz)	Device Status
Main	166	42	---	on
Motor 1	65	72	---	on
Drive 1	33	100	53	on
Motor 2	64	71	---	on
Feeder 1	0	0	---	off

Load Current Summary

7-18-2005
11:32:26

	RMS Current (Amps)		
Circuit	Phase A	Phase B	Phase C
Main	165	165	166
Motor 1	65	64	65
Drive 1	34	36	35
Motor 2	66	65	66
Feeder 1	0	0	0

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+Monitoring
- Security
- **Altivar Viewer**
- Data Editor
- FDR Configuration
- PDA Altivar Viewer
- Statistics

Altivar Viewer

7-18-2005
11:22:13

Device Name	Not Defined
Altivar State	RDY
Device File	Local

FRH	Freq. Req.	Hz	23.9
RFR	Output Freq.	Hz	35.7
SPD	Motor Speed	RPM	1.4
ULN	Mains Voltage	V	207.6
LCR	Motor Current	A	0.6
THR	Motor Thermal	%	0
THD	Drive Thermal	%	63
LFT	Last Fault		ILF
OPR	Output Power	%	0
USP	Machine Spd.		0.0
APH	Power Used	kWh	0
RTH	Run Time	h	0

Configuration

LI1 R1
LI2 R2
LI3 AI1 0
LI4 AI2 0

QUESTIONS?