

**2005 Tri-Service Infrastructure Systems
Conference & Exhibition**

Technological Advances in Lock Control Systems

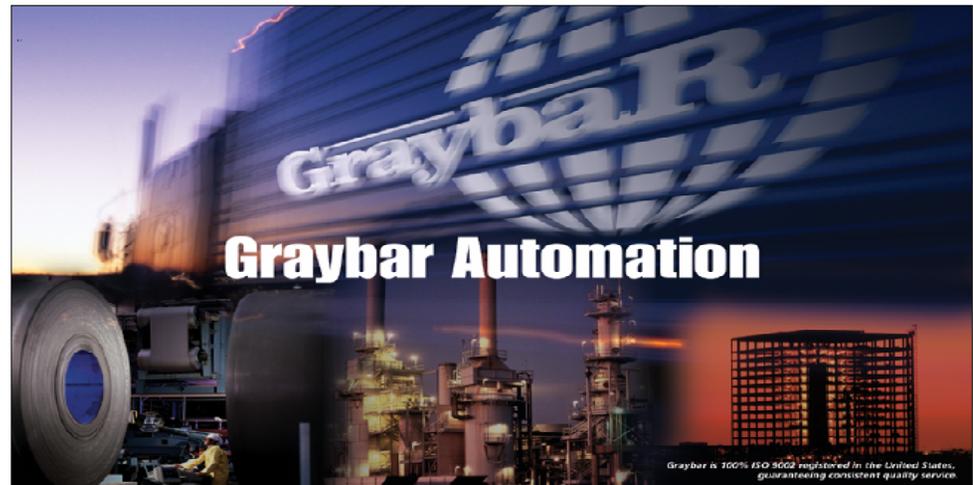
Presenters:

Andy Schimpf, P.E.

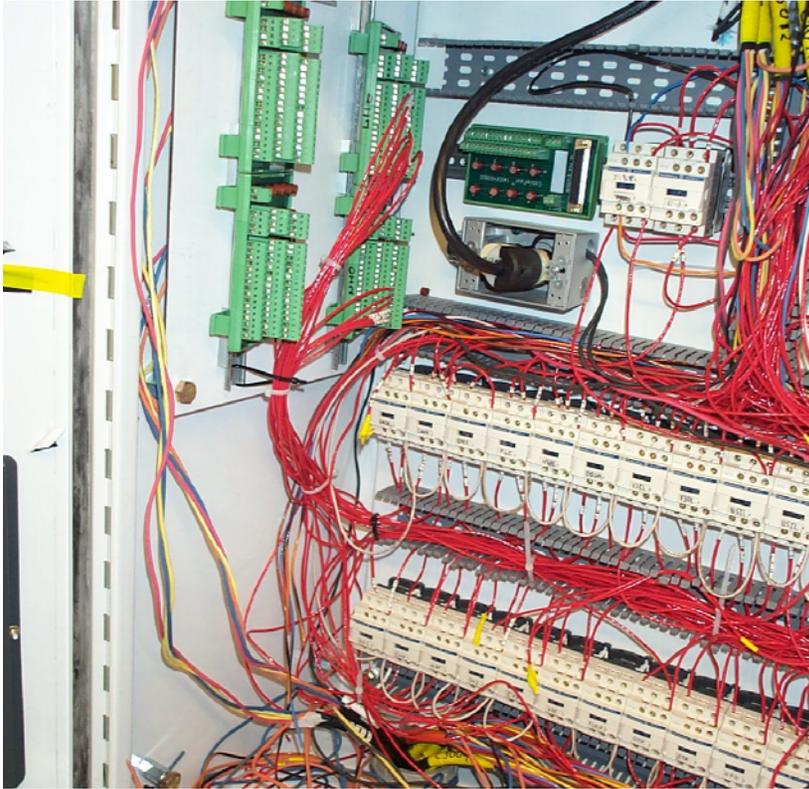
Electrical Engineer
St. Louis District, USACE

Mike Maher

National Automation Support Manager
Graybar Electric Company



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

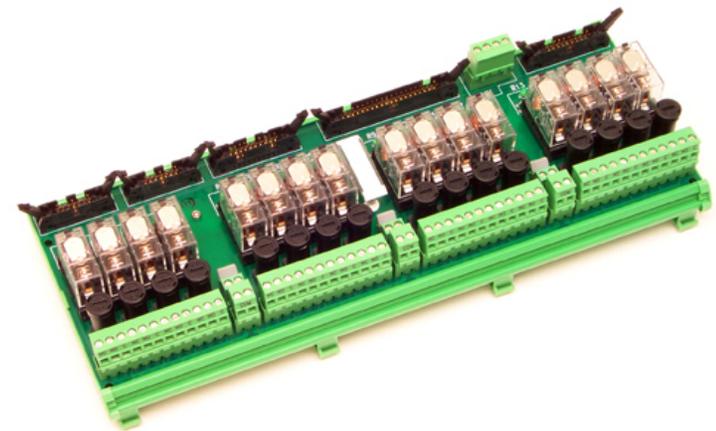
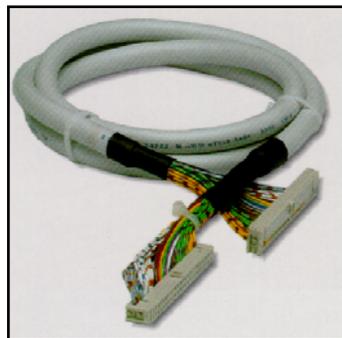
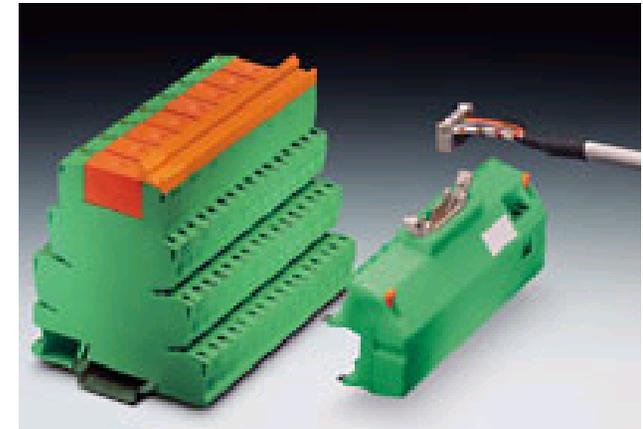
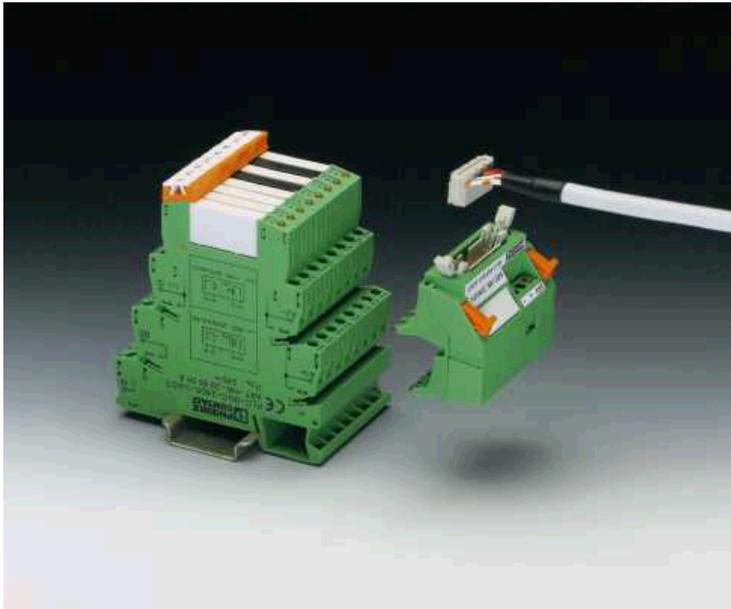
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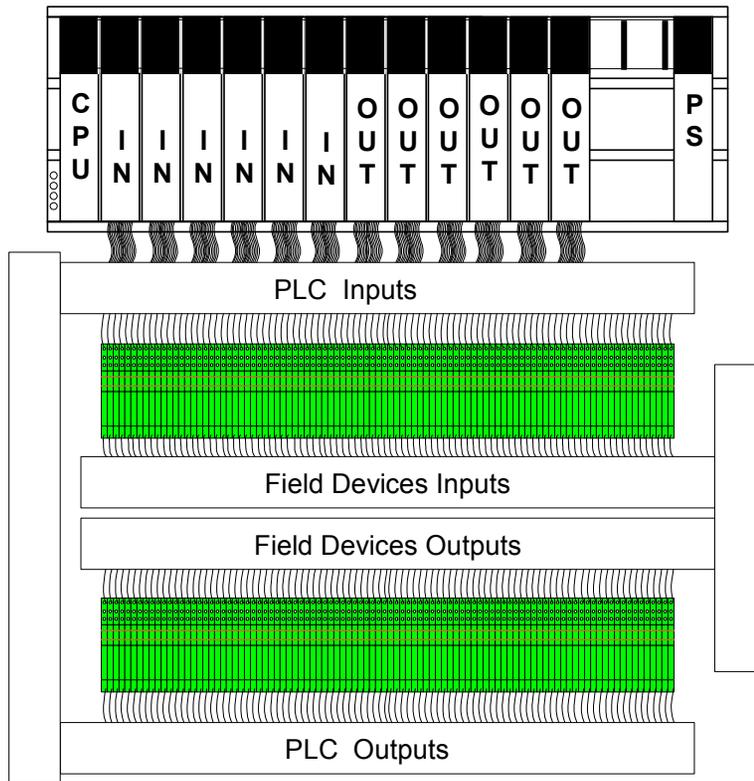


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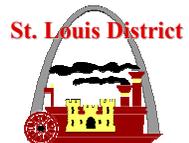
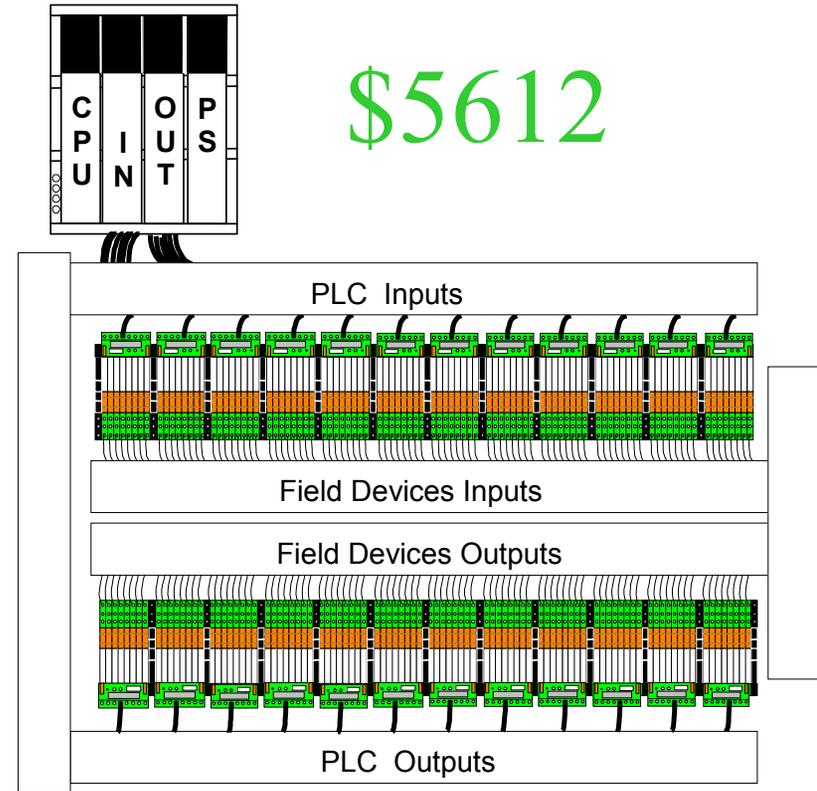

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\$ 12,389



\$5612

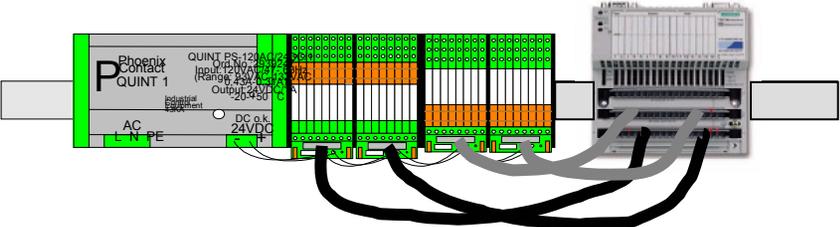


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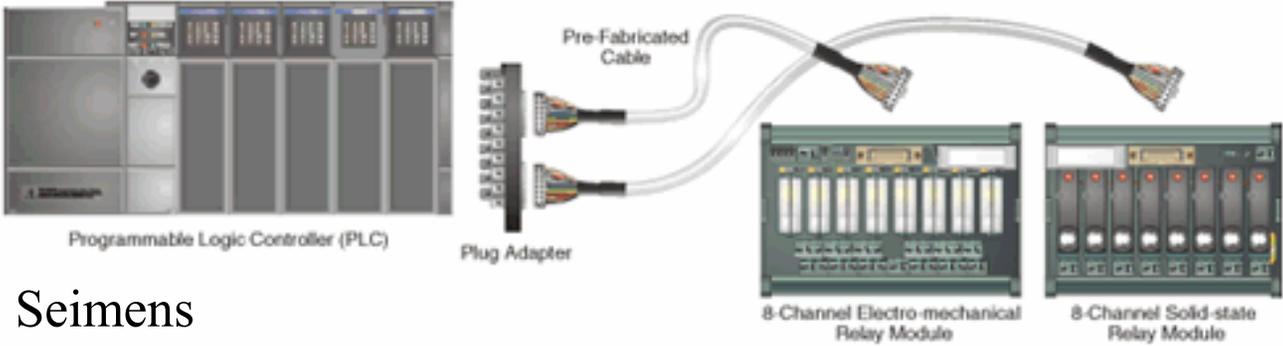
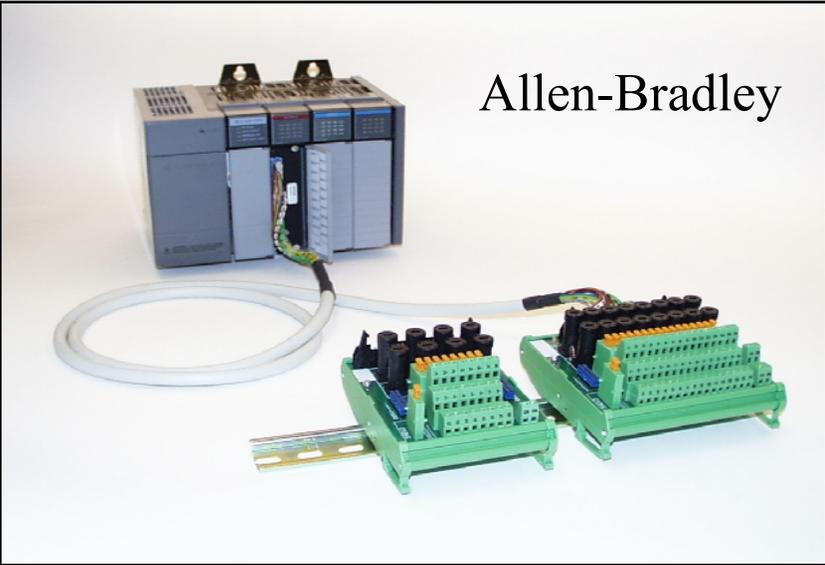


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Modicon



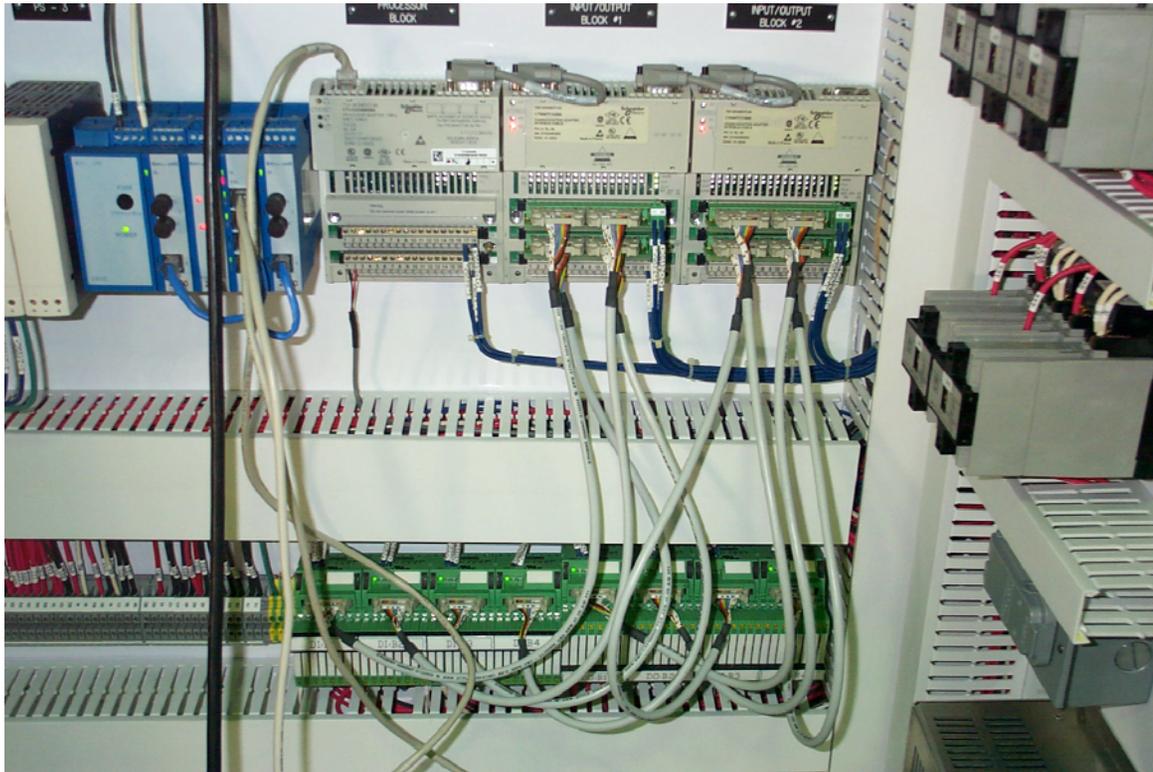
Allen-Bradley



Siemens



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**Wallisville Lock
Galveston District
August 2004**

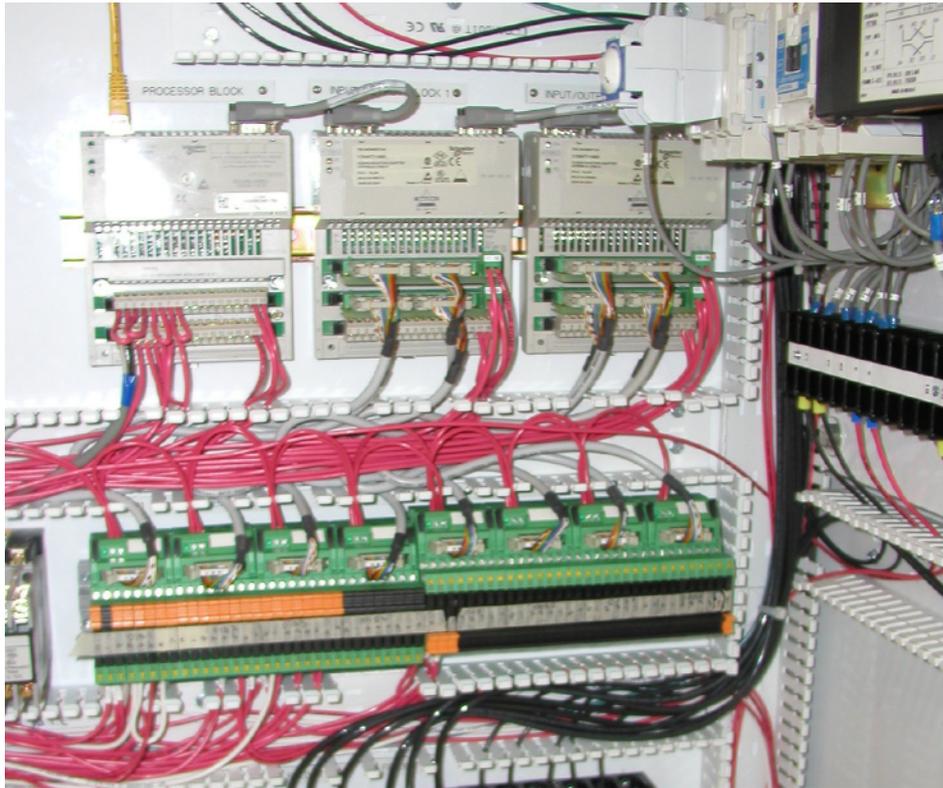
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Kaskaskia Lock St. Louis District February 2005

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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



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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



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Web server functionalities: System Diagnostic

The screenshot displays a web browser window titled "Quantum Configured Local Rack - Netscape" with the URL <http://eng777a.modicon.com/secure/system/plc/cfg.htm>. The main content area shows a graphical representation of a PLC rack with modules highlighted in yellow. Below this, a "Quantum Ethernet Module Statistics" window is open, displaying the following data:

ETHERNET MODULE STATISTICS

Status:	Running Link	Host Name:	eng777a.modicon.co
Reference:	140 NOE 2x1 10	MAC Address:	00 00 54 10 1 cc
Rack:	1	IP Address:	198.202.137.43
Slot:	3	Subnet Mask:	255.255.255.0
Module State:	OK	Gateway Address:	198.202.137.101

Below the statistics, there are three tables: Transmit Statistics, Receive Statistics, and Functioning Errors.

Transmit Statistics	Receive Statistics	Functioning Errors
Transmits: 310	Receives: 496	Missed Packets: 0
Transmit Retries: 0	Frame Errors: 0	Collision Errors: 0
Lost Carrier: 0	Overflow Errors: 0	Transmit Timeouts: 0
Late Collision: 0	CRC Errors: 0	Message Errors: 0
Transmit Buffer Errors: 0	Receive Buffer Errors: 0	PCN1 Restarts: 0
Slot Underflow: 0		

At the bottom of the statistics window, there is a "Zero Counters" button and a navigation bar with links: [Configured Local Rack](#) | [Controller Status](#) | [RIO Status](#) | [Configured RIO](#) | [Configured DIO](#) | [Data Editor](#). The footer reads "Quantum Web Utility©, Schneider Automation Inc."

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



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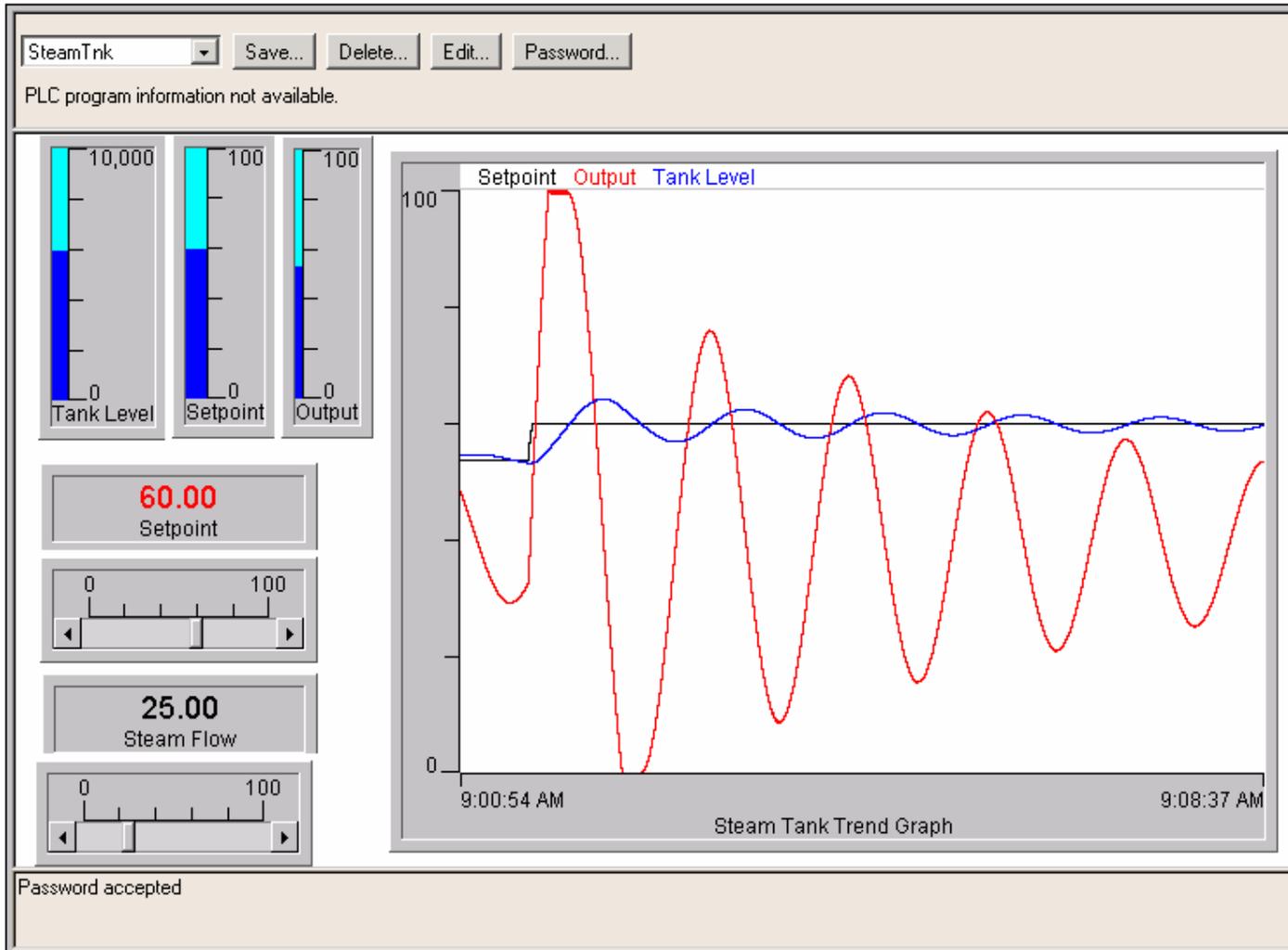
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Web server functionalities: System Diagnostic

The top screenshot shows a tree view of configured devices. The bottom screenshot shows a detailed diagnostic view for a specific module, displaying status indicators (RUN, ERR, I/O, +32) and a table of channels (0-31) with their respective states (M, States, IQ).

- 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 TCP/IP, 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:



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•**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.



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•**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
<u>1</u>	Group 1	OFF	<u>33</u>	Sales	OFF
<u>2</u>	Group 2	Override ON	<u>34</u>	Lunch Room	OFF
<u>3</u>	Group 3	Override ON	<u>35</u>	TS Config Room	ON
<u>4</u>	Group 4	Override ON	<u>36</u>	Tech Support	ON
<u>5</u>	Group 5	OFF	<u>37</u>	Library	Override ON
<u>6</u>	Group 6	OFF	<u>38</u>	Finance	ON
<u>7</u>	Group 7	Override ON	<u>39</u>	Computer Rm.	OFF
<u>8</u>	Group 8	OFF	<u>40</u>	Exec. Office A	ON
<u>9</u>	Group 9	OFF	<u>41</u>	Reception	ON
<u>10</u>	Group 10	OFF	<u>42</u>	Exec. Office B	ON
<u>11</u>	Group 11	OFF	<u>43</u>	Boardroom	ON
<u>12</u>	Group 12	OFF	<u>44</u>	Mail Room	ON
<u>13</u>	Group 13	Override ON	<u>45</u>	Exec. Office C	ON
<u>14</u>	Group 14	OFF	<u>46</u>	Kitchen	ON
<u>15</u>	Group 15	OFF	<u>47</u>	Exec. Office D	ON
<u>16</u>	Group 16	ON	<u>48</u>	Exec. Office E	ON
<u>17</u>	Group 17	OFF	<u>49</u>	Purchasing	ON
<u>18</u>	Group 18	OFF	<u>50</u>	Purch Office A	ON
<u>19</u>	Group 19	OFF	<u>51</u>	Purch Office B	ON
<u>20</u>	Group 20	OFF	<u>52</u>	Purch Office C	ON



+Monitoring

Circuit

Load Current

Demand Current

Power

Energy

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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

Circuit	RMS Current (Amps)		
	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

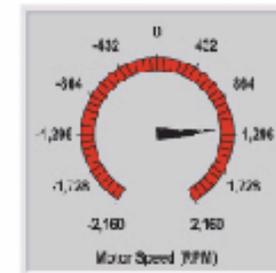
Device Name	Not Defined
Altivar State	RDY
Device File	Local



Configuration

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

LI1		R1	
LI2		R2	
LI3		AI1	<input type="text" value="0"/>
LI4		AI2	<input type="text" value="0"/>



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QUESTIONS?

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