OSI SOFTWARE, INC.

jma
James-Mangan Automation
A Wholly Owned Subsidiary of MANGAN

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Case Study of a PI-Batch Application

The Good, The Bad, & The Ugly

OSI 2002 Conference - Monterey, CA

Nigel James - Mangan/JMA
Gary Hall - CCP Engineer Manager
Stan Kersch - Mangan / JMA

What we will cover

- Client Company Background
- Plan / Justification
- Hardware / Setup
- Systems Integration
- End User GUI
- Batch Analysis / Results

The Company - CCP

- Cook Composite Polymers www.ccponline.com
- A world leader in the production and distribution of gel coats, composites polyester resins, coatings resins and emulsions.
- The number one producer of gel coats in the world, CCP also has the largest composites distributor network in North America.
- With associated companies, we share the position of world's second largest producer of resins.
- CCP's other businesses include products for maintenance and graphic arts, and industrial cleaners.

FUN STUFF

View all available colors

Where are they located

Kansas City

Arlington, Washington

Chatham, Virginia

Drummondville, Quebec, Canada

Grand Rapids, Michigan

Houston, Texas

Lemont, Illinois

Marshall, Texas

Mississauga, Ontario, Canada

Monterrey, Mexico

Oxnard, California

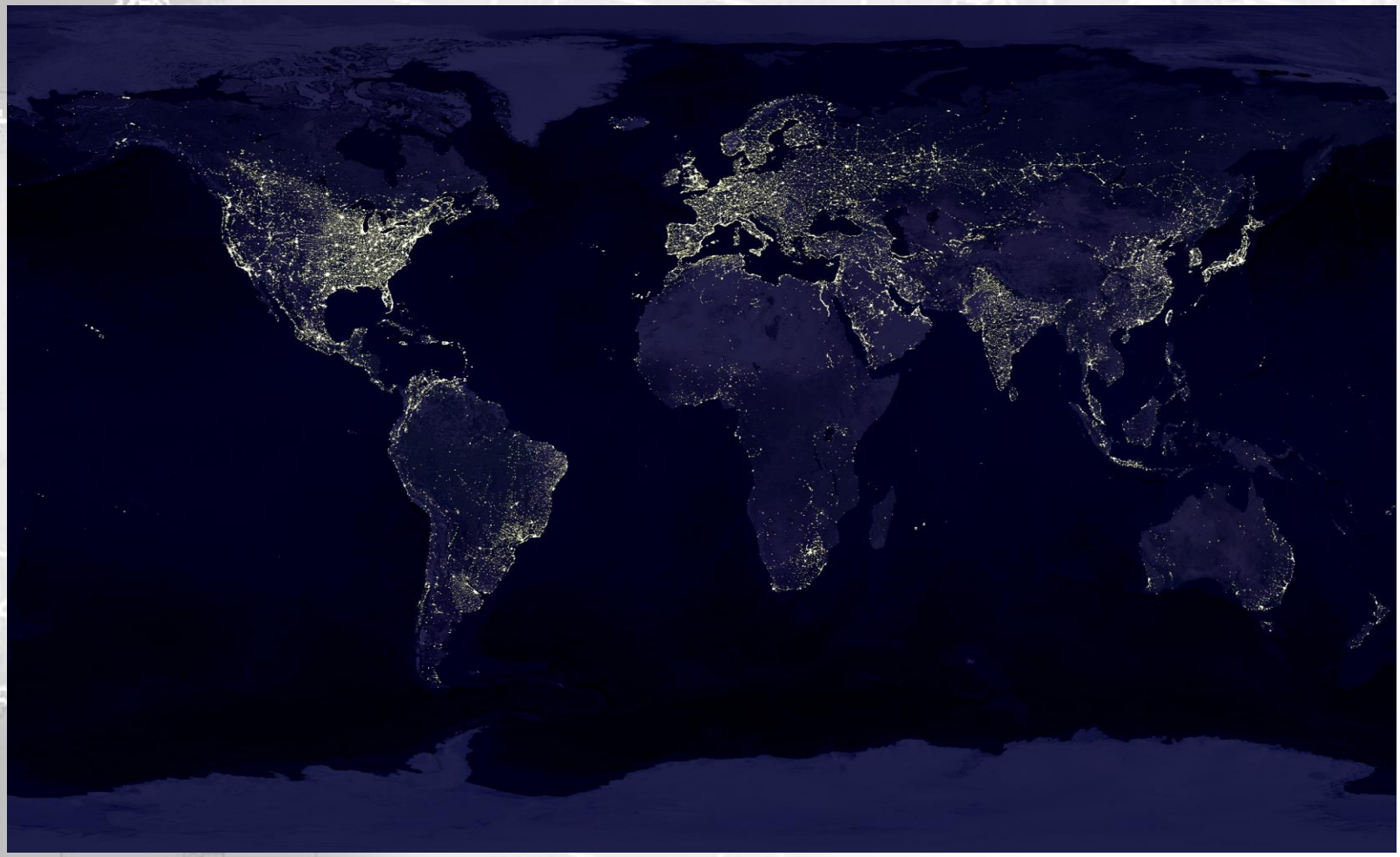
Orlando, Florida

Saukville, Wisconsin

Sandusky, Ohio

Pennsauken, New Jersey

In the Beginning



…There was “The Plan”

Master Control Strategy was started in June 2000

Goal was:

- Improve yield and production efficiency
- Improve profit and ease of use
- Improve safety and “plant to desktop” data extraction
- Establish a standard that is consistent across all plants and lowers overall engineering

Oh, and Solve World Hunger while your at it.

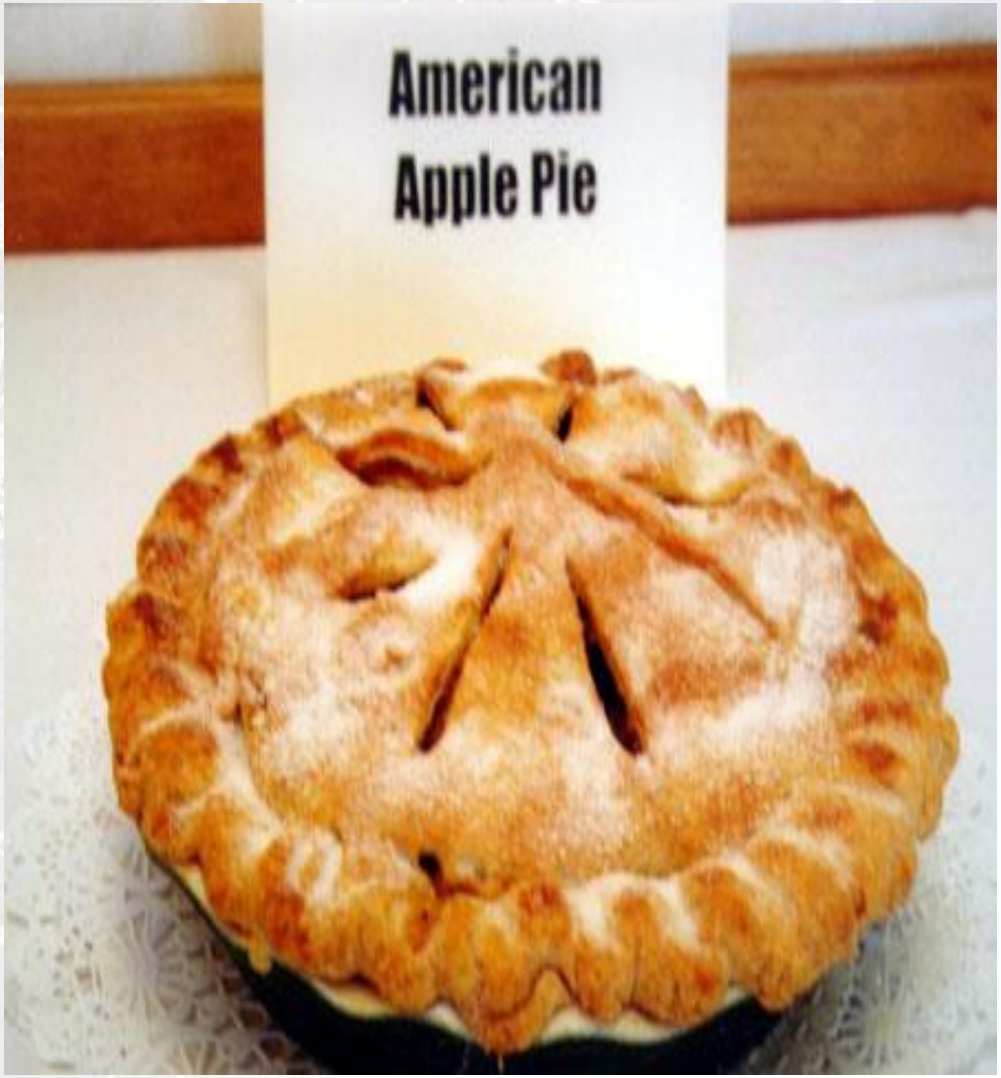
The Potential $$

- Total Capacity is 300 MM lbs / yr
- Cycle time varies from 17 hours - 24 hours
- Reduce cycle time by 10% (2-3 hours)
- Make 30 MM lbs of product in the same year without additional capital

- So 10 cts/lb = $ 3MM/ year savings

That Pays for a lot of "PI"

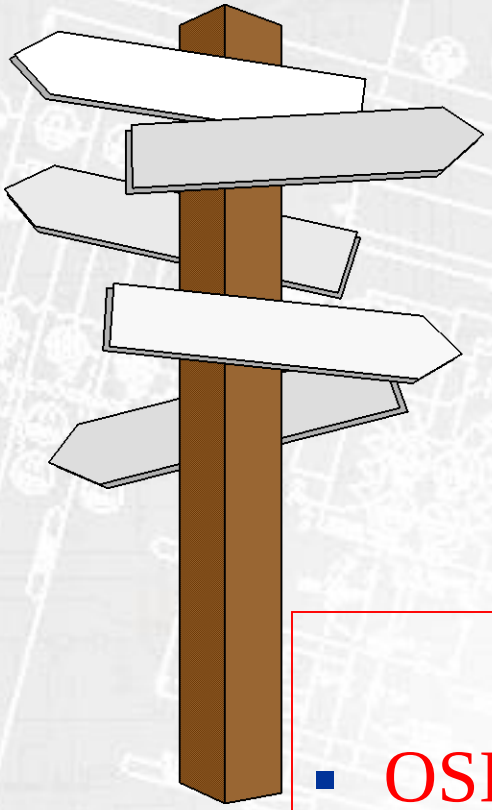
- Costs to install
- $50K/site base install (1,000pts + machines + 5 clients)
- $10-$15K/site base services
- $20K - $40K / site for batch triggers setup and training



The options - A little of everything

Hardware

- AB - PLC-5
- Foxboro I/A
- Panel Relays
- Think-n-Do
- Rockwell PLX



HMI

- RS View
- Intellution
- Wonderware
- Think-n-Do

Historian

- OSI PI
- Aspen Infoplus 21
- Rockwell Historian

And the winner is:

- Rockwell PLX on new plants
  - Hybrid Control
  - S-88 / Function block
  - Compatible with A-B
- OSI PI
  - Installed Base
  - Ability to interface to multiple platforms
  - Technical Support
  - End User Tools (Data Link / Process Book)
  - Batch Analysis capabilities

Just nice guys

Who does What?

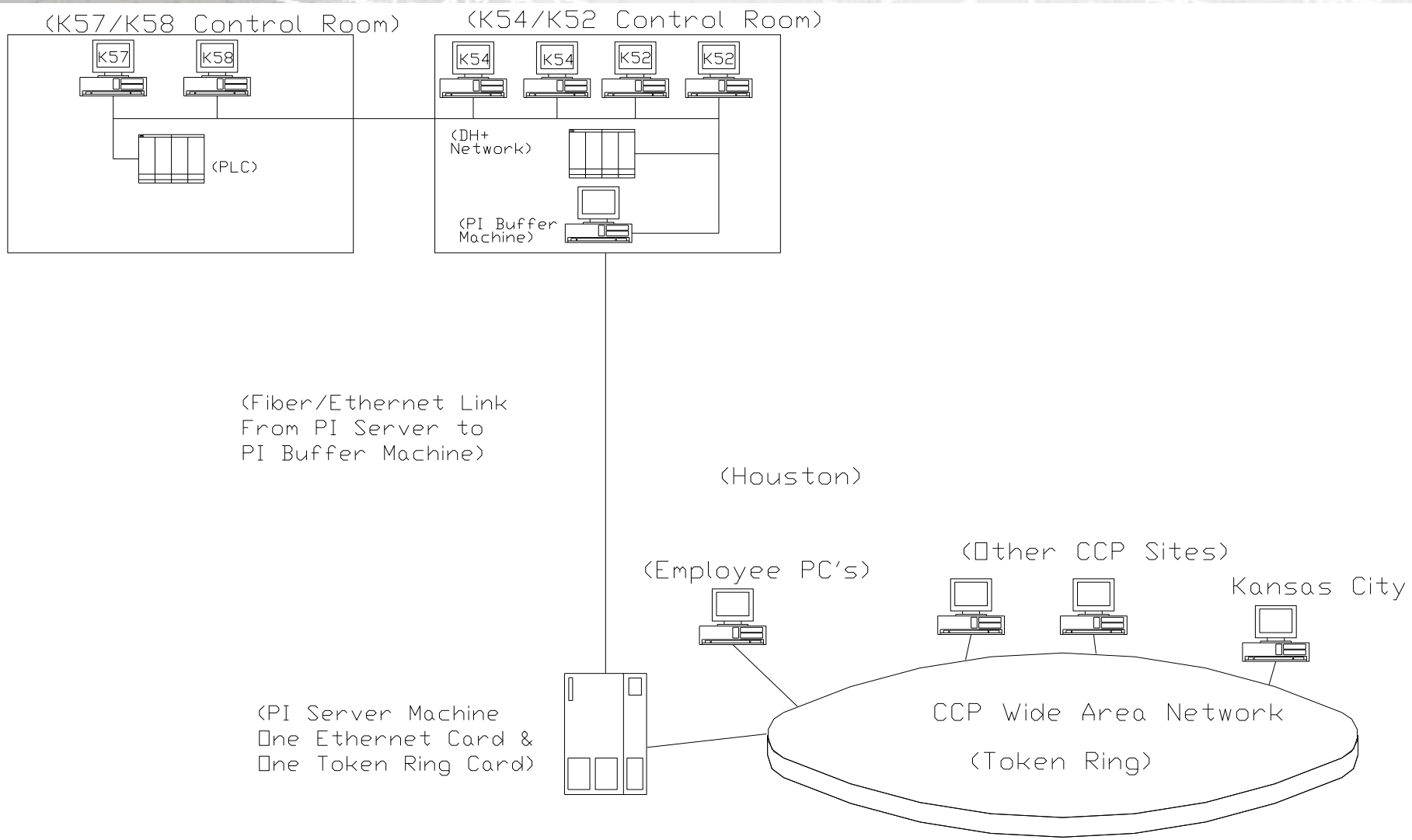
PLX - Batch Control

- SCM (Sequence Control Modules) automate sequences
  - Fill
  - Heat
  - Cook (ramp / soak)
  - Push
- One button process
- Remove operator Delay time
- Easier than ladder logic

OSI - PI Batch Analysis

- Manual entry of lab data
- “Golden Batch”
- Troubleshooting control problems
- Easily Track Product by Batch/Lot/Shift, etc
- Improve Plant Reporting
- Access Current & Historical Process/Production Data Easily From Your Desktop

Guinea Pig - Houston



The Control Room

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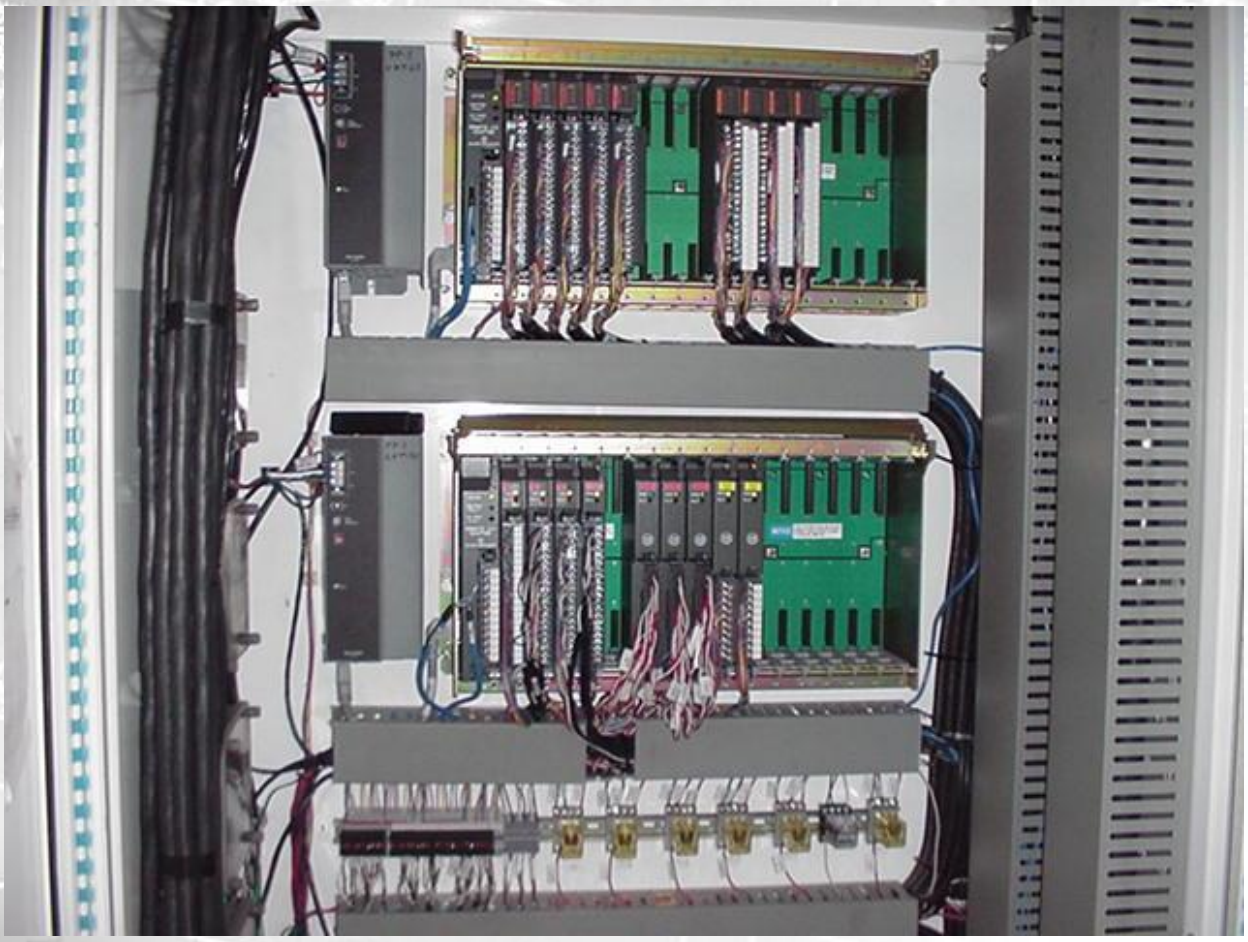
A-B PLC-5



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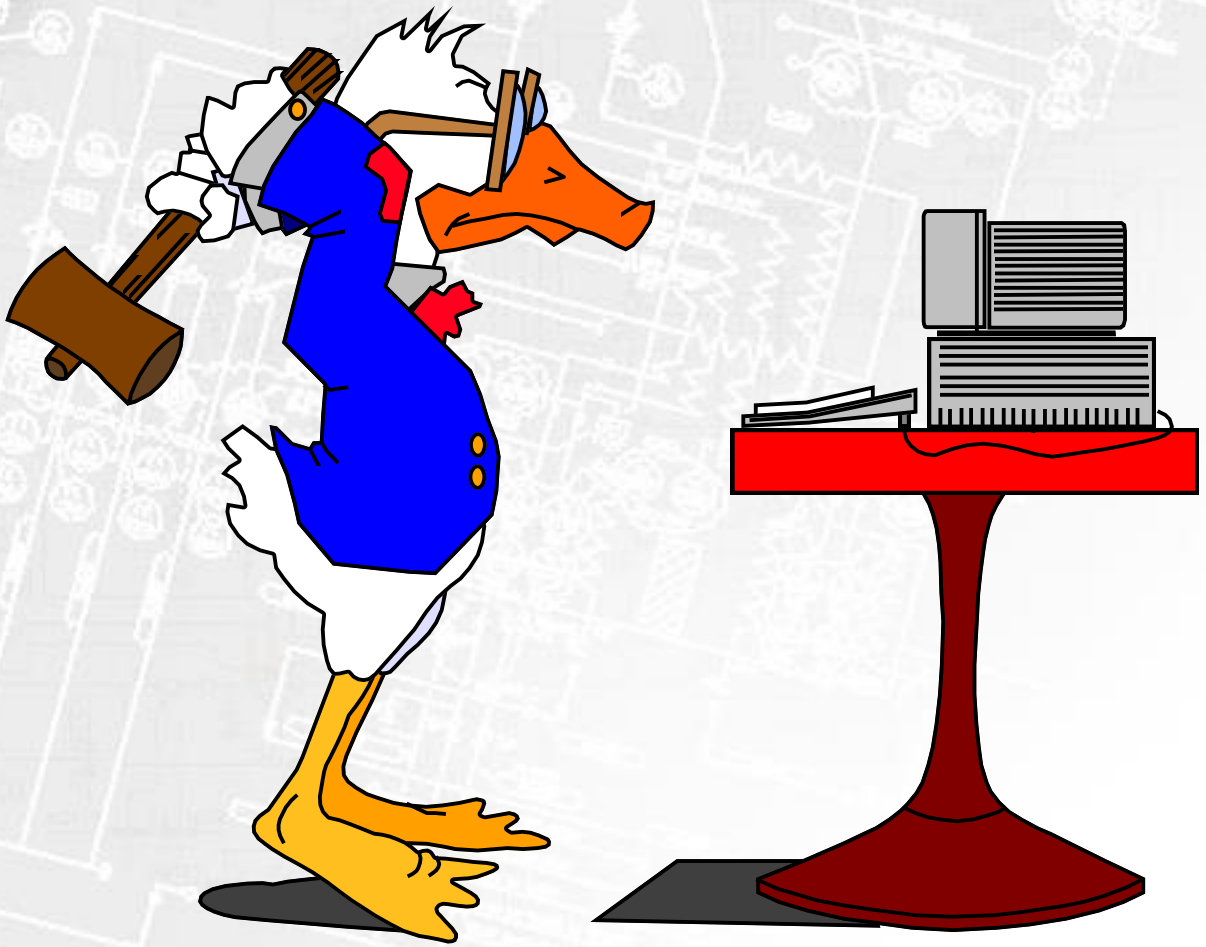
K57/K58

Batch Analysis?? right

Some Techie Stuff

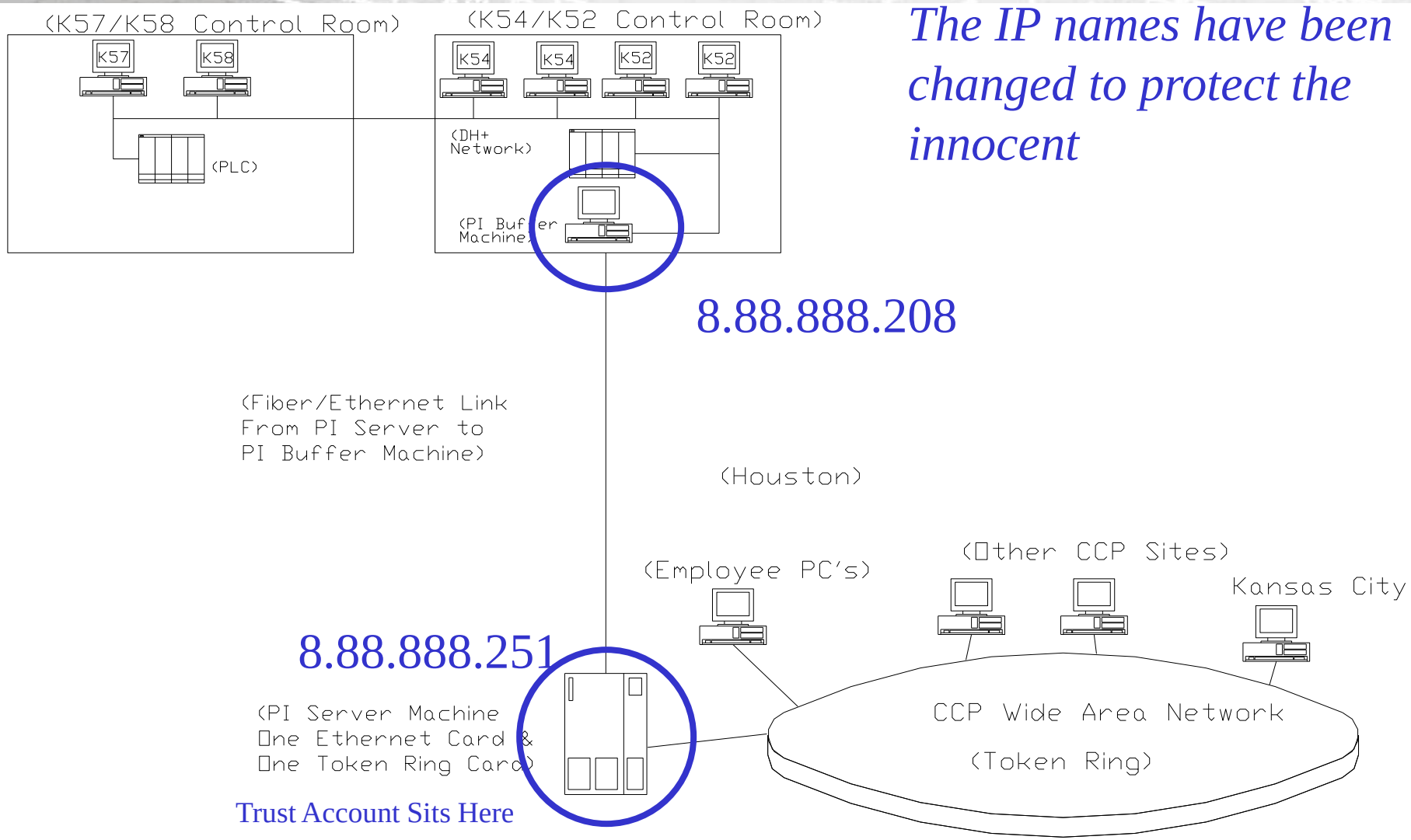
- Networks
- Drivers
- Points
- Graphics



4 Easy Steps to Implement an RSLinx - OPC Interface

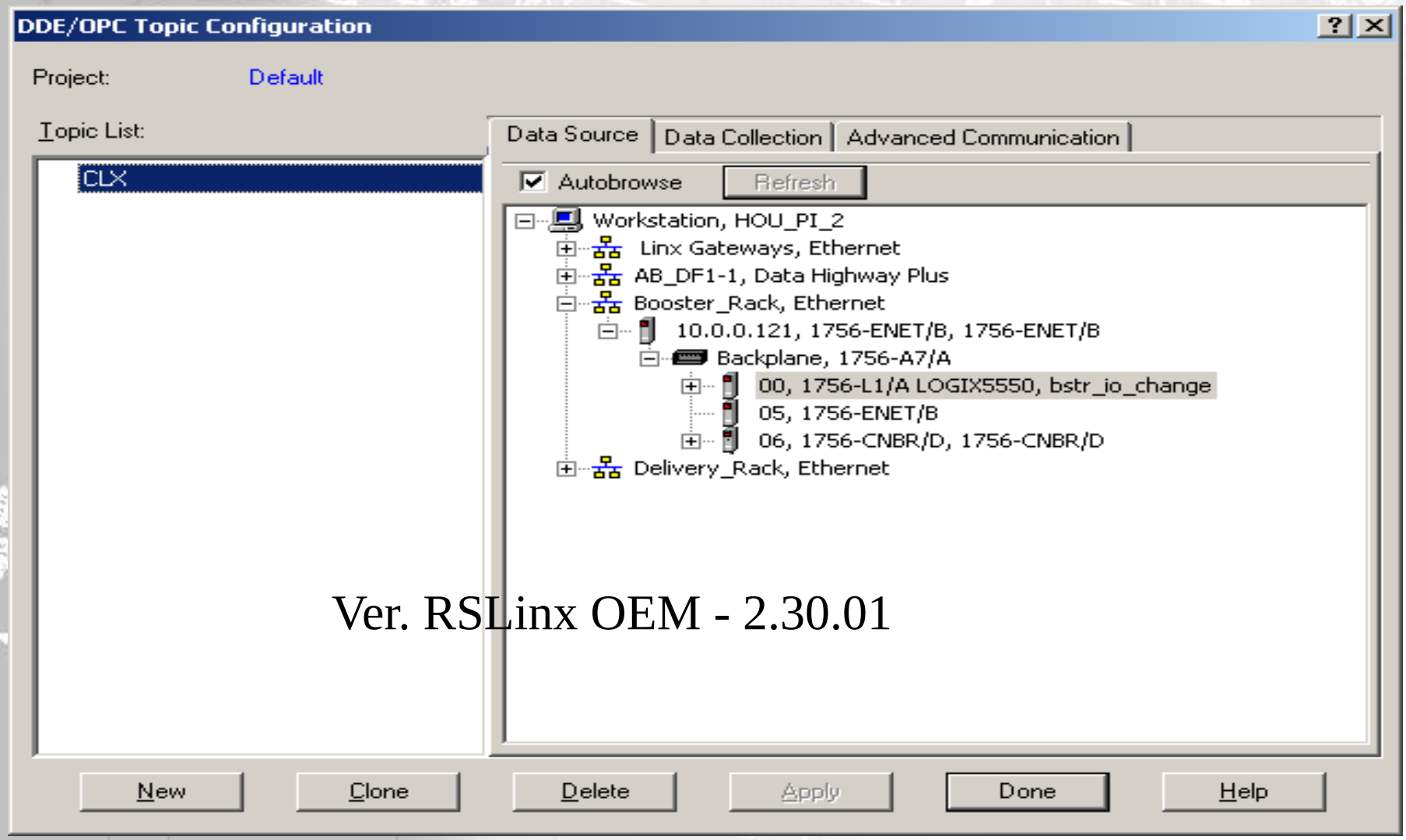
- Install the PI Server and Modify the PI Trust Database (CCP_Houston, 128.5.4.0, 255.255.255.0, PIADMIN)… Can you ping the API-Machine.
- Install RSLinx OPC, create topic on PI API Node
- Install PI OPC interface (as service contingent on Buff service, modify OPCINT.bat, and iorates.dat & Start service OPCint.bat (PI API-node
- Load Points using PI-SMT

TRUST me



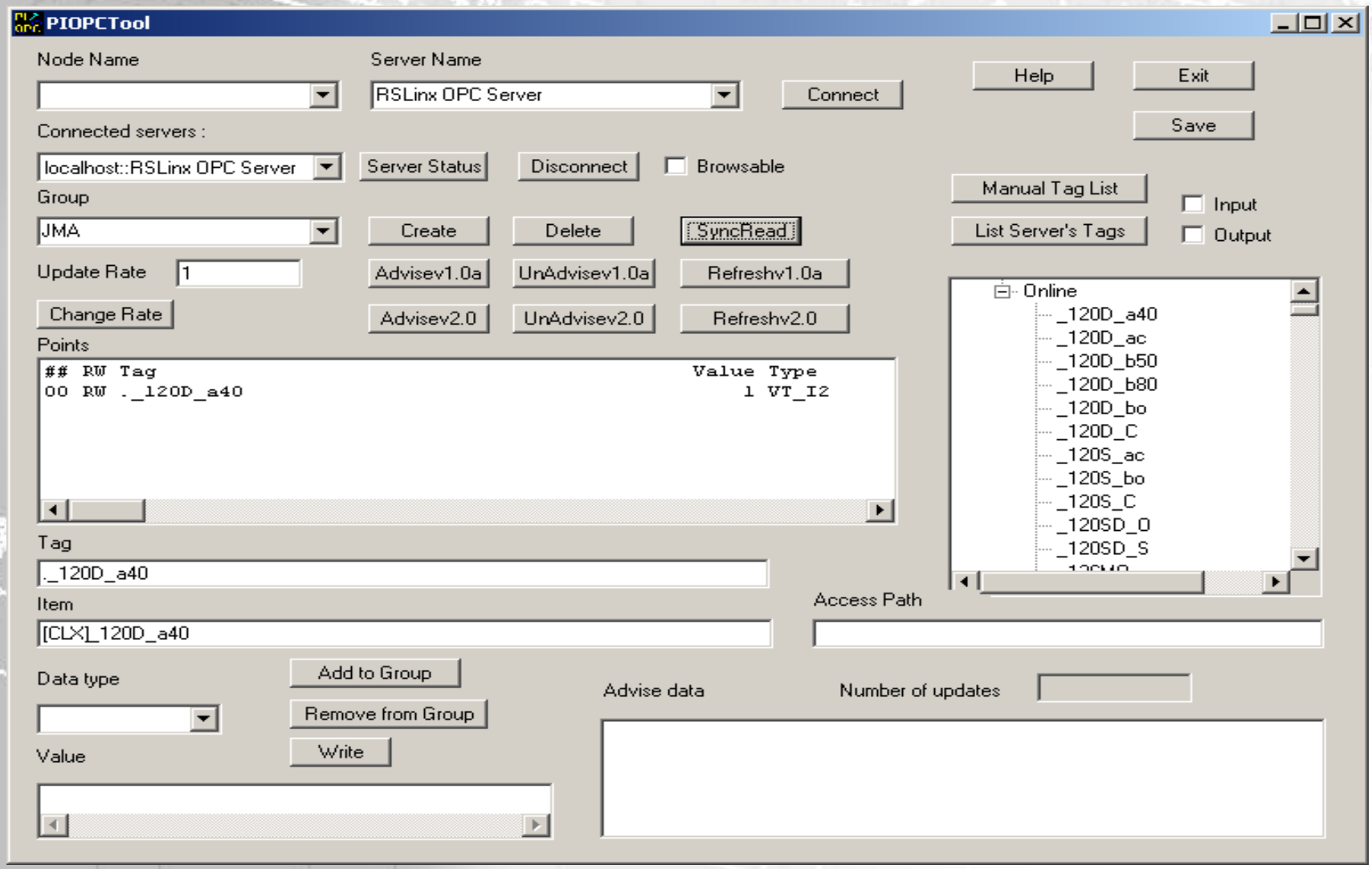
The IP names have been changed to protect the innocent

RSLinx - OPC Setup



Ver. RSLinx OEM - 2.30.01

PI - OPC Tool


PIOPCTool
Node Name
Server Name
RSLinx OPC Server
Connect
Help
Exit
Save
Connected servers :
localhost::RSLinx OPC Server
Server Status
Disconnect
Browsable
Group
JMA
Create
Delete
SyncRead
Manual Tag List
List Server's Tags
Input
Output
Update Rate
1
Advisev1.0a
UnAdvisev1.0a
Refreshv1.0a
Change Rate
Advisev2.0
UnAdvisev2.0
Refreshv2.0
Points
RW Tag Value Type
00 RW ._120D_a40 1 VT_I2
Online
_120D_a40
_120D_ac
_120D_b50
_120D_b80
_120D_bo
_120D_C
_120S_ac
_120S_bo
_120S_C
_120SD_O
_120SD_S
Tag
._120D_a40
Item
[CLX]_120D_a40
Access Path
Data type
Add to Group
Remove from Group
Write
Value
Advise data
Number of updates

OPC.BAT

- rem /ps=O The pointsource -- this should match the pointsource for your tags
- rem /ec=10 The event counter number for IORATES
- rem /er=00:00:03 The requested update rate for event triggered tags
- rem /id=1 The identifier string used in the pipc.log file for messages
- rem from this interface -- it must match Location1 on the tags.
- rem /SERVER=OPC.OSI.1 The OPC server name; format hostname::servername or just
- rem servername if it's local
- rem /host=mabel:5450 The PI server name and port
- rem /MA=Y Should we try to add tags in large batches rather than singly ?
- rem /ts=a Where do we get timestamps ? (Y/N/A/U)
- rem /stopstat Should we write a status to PI tags when the OPC server goes away ?
- rem /f=00:00:01 scan classes. The first one is for Read On Change tags...
- opcint ^
- /ps=A ^
- /db=1 ^
- /ec=10 ^
- /er=00:00:03 ^
- /id=1 ^
- **/SERVER="RSLinx OPC Server" ^**
- **/host=piserver:5450 ^^**

Check your PIPC.LOG

- 19-Feb-01 16:07:51
- opcint.exe>PI-API> Initial connection to [piserver:5450][1]

- 19-Feb-01 16:07:51
- OPCpi> 1> PIAPI successfully connected to piserver piserver:5450

- 19-Feb-01 16:07:51
- OPCpi> 1> PIAPI login succeeded

- 19-Feb-01 16:07:56
- OPCpi> 1> PISDK successfully connected to piserver piserver via port 5450

- 19-Feb-01 16:07:56
- OPCpi> 1> Server Version: PI 3.2 SR1, Build 357.17

- 19-Feb-01 16:07:56
- OPCpi> 1> Opcint version> @(#)opcint.cpp 2.1.14 2000/06/15

PIPC.log cont

- 19-Feb-01 16:07:56
- OPCpi> 1> C:\Program Files\PIPC\interfaces\opcint\opcint.exe opcint /ps=A

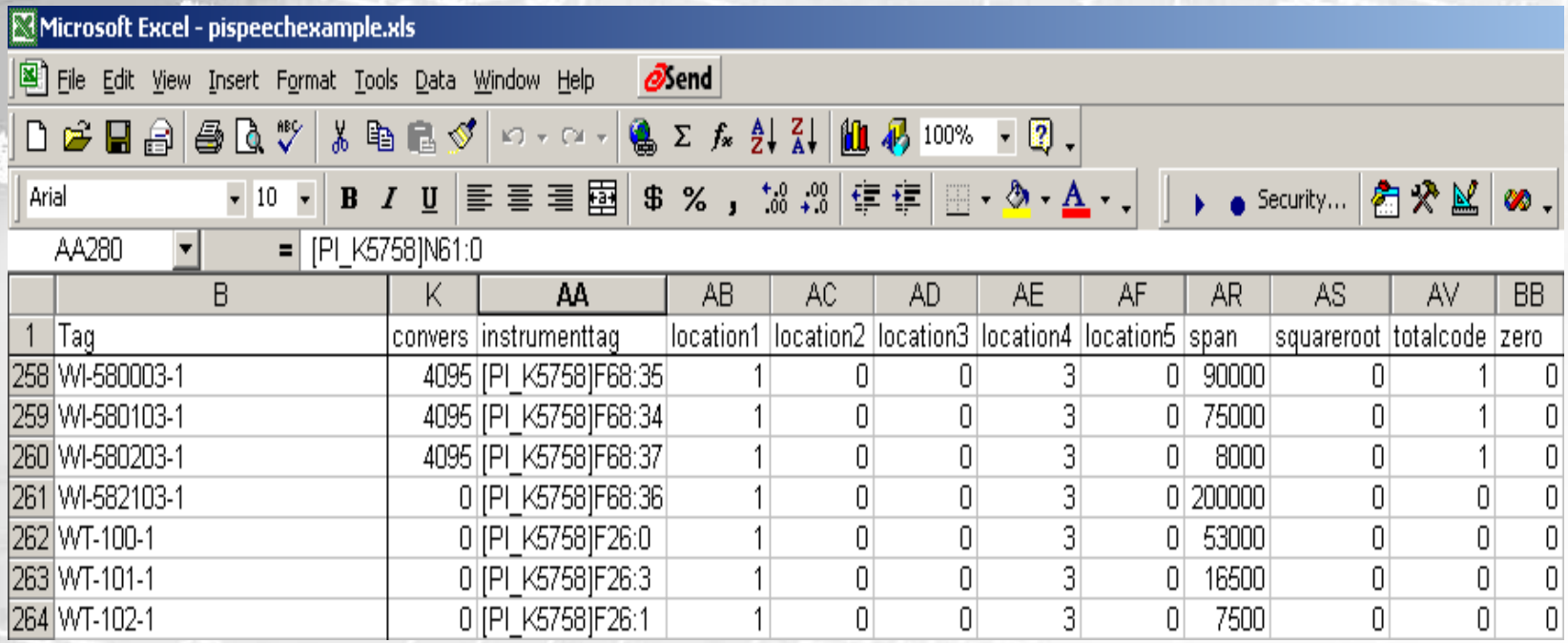
- 19-Feb-01 16:07:56
- OPCpi> 1> /db=1 /ec=10 /er=00:00:03 /id=1 /SERVER=RSLinx OPC Server /host=piserver:5450

- 19-Feb-01 16:07:51
- opcint.exe>PI-API> Initial connection to [piserver:5450][1]

- OPCpi> 1> Connected to server ::RSLinx OPC Server in thread ID 123 (123)...

- 19-Feb-01 16:07:58
- OPCpi> 1> Enabled by Rockwell Software Server Toolkit

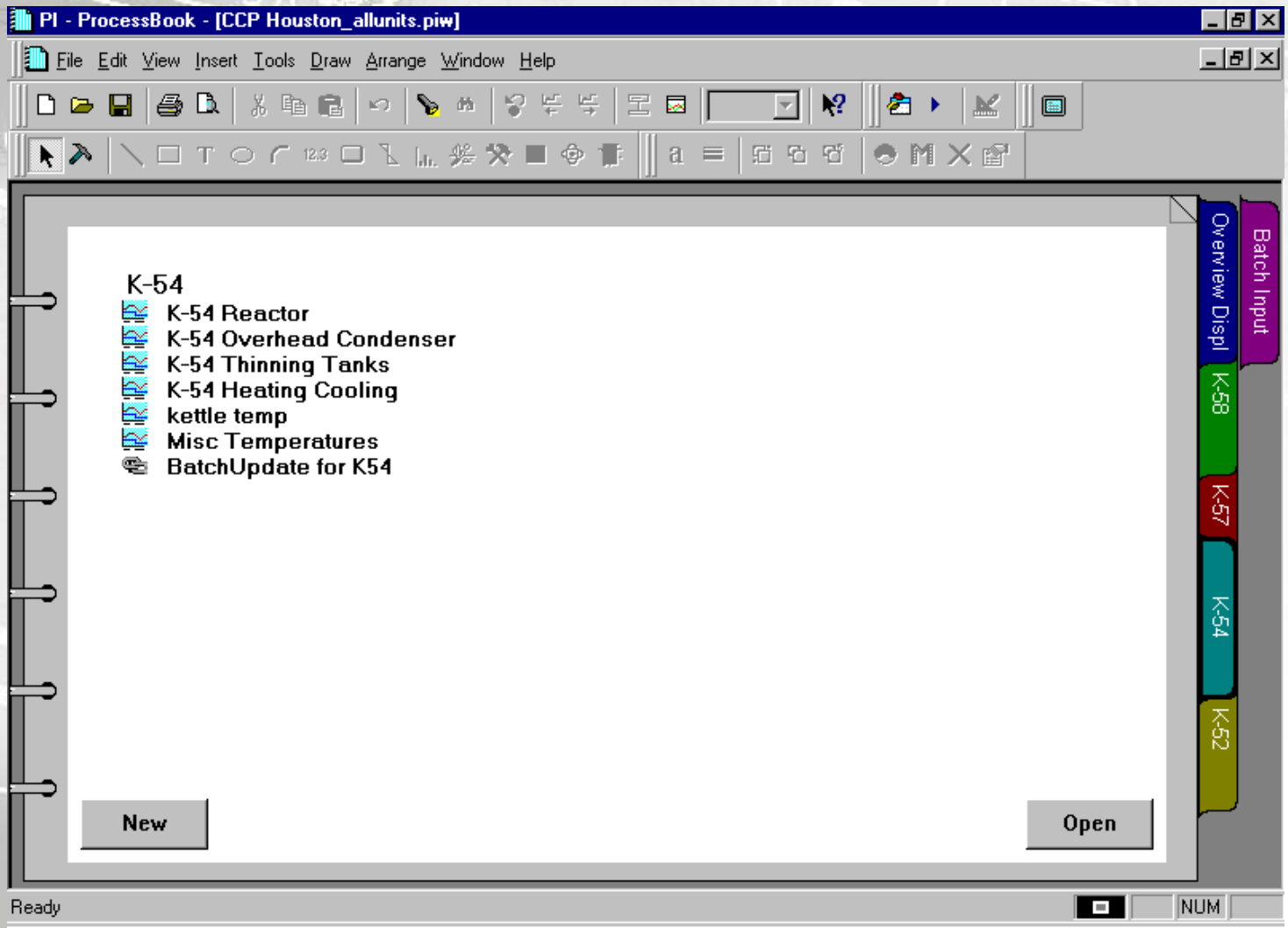
Pt Building - Eng Unit Excel Conversion



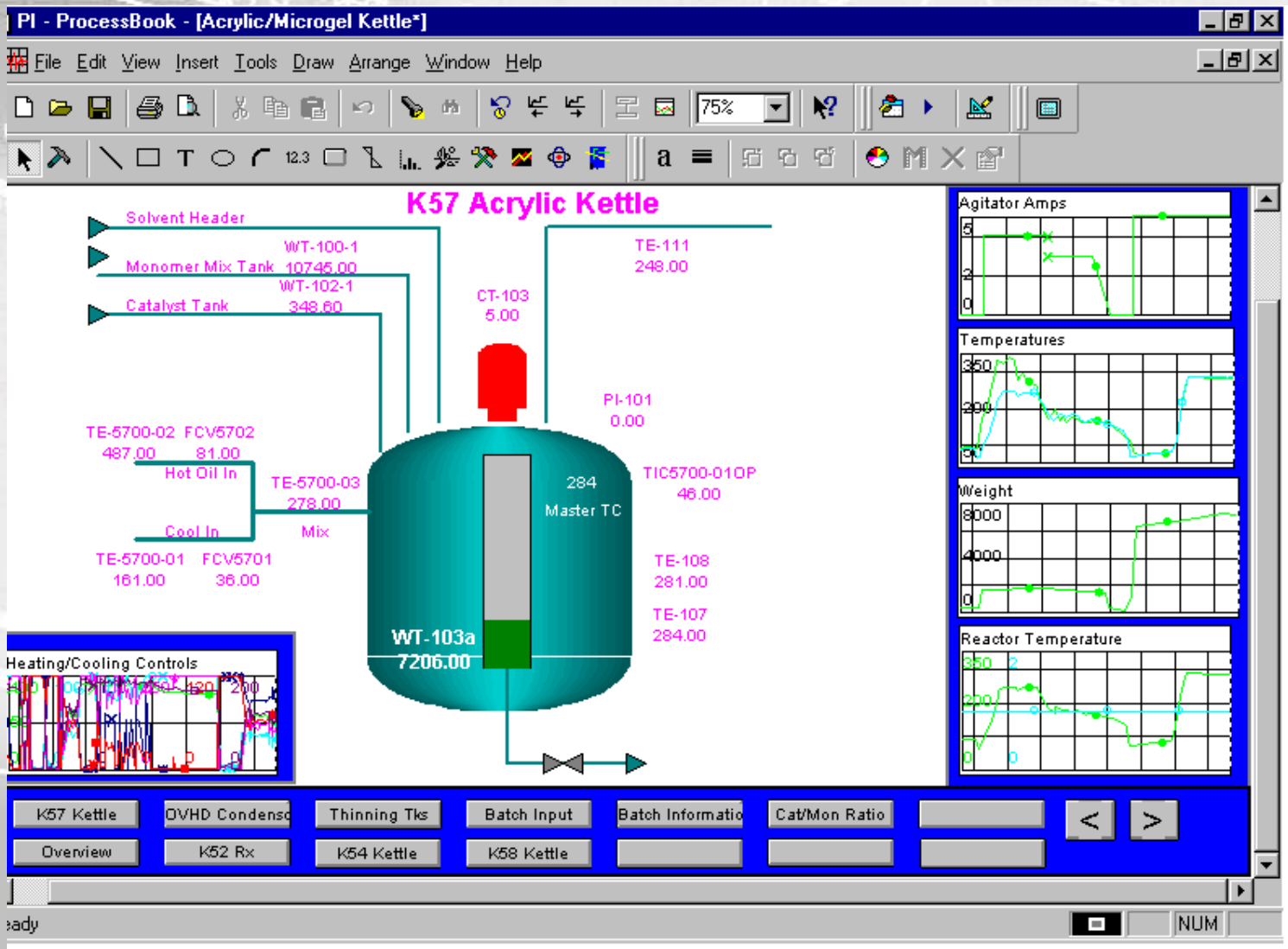
	B	K	AA	AB	AC	AD	AE	AF	AR	AS	AV	BB
1	Tag	convers	instrumenttag	location1	location2	location3	location4	location5	span	squareroot	totalcode	zero
258	WI-580003-1	4095	[PI_K5758]F68:35	1	0	0	3	0	90000	0	1	0
259	WI-580103-1	4095	[PI_K5758]F68:34	1	0	0	3	0	75000	0	1	0
260	WI-580203-1	4095	[PI_K5758]F68:37	1	0	0	3	0	8000	0	1	0
261	WI-582103-1	0	[PI_K5758]F68:36	1	0	0	3	0	200000	0	0	0
262	WT-100-1	0	[PI_K5758]F26:0	1	0	0	3	0	53000	0	0	0
263	WT-101-1	0	[PI_K5758]F26:3	1	0	0	3	0	16500	0	0	0
264	WT-102-1	0	[PI_K5758]F26:1	1	0	0	3	0	7500	0	0	0

Convers	TotalCode	SquareRoot	DZero	Operation:
Not 0	1	0	defined	Input tags: Value = [(Value – DZero) / Convers] * Span + Zero

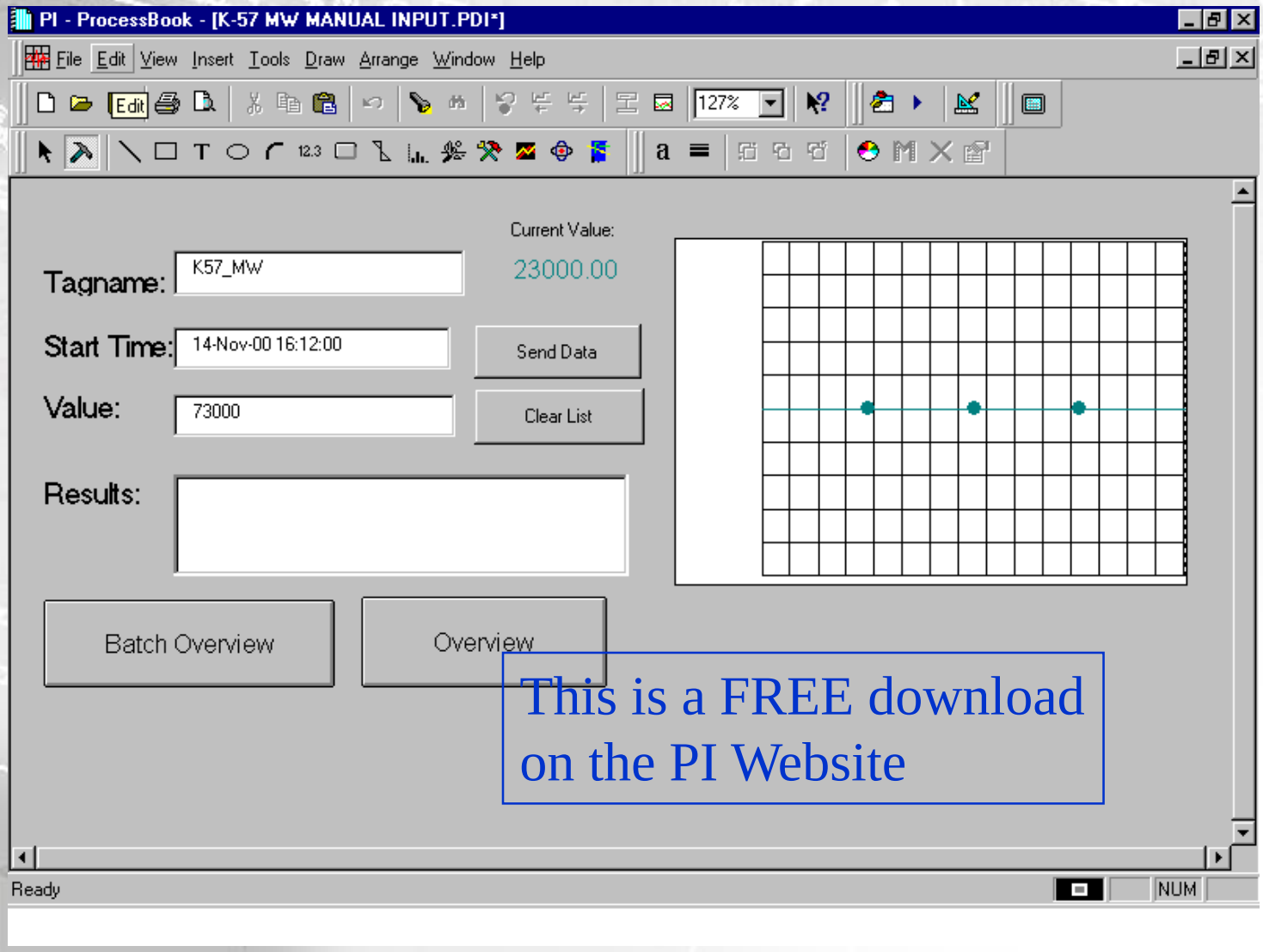
The GUI


PI - ProcessBook - [CCP Houston_allunits.piw]
File Edit View Insert Tools Draw Arrange Window Help
K-54
K-54 Reactor
K-54 Overhead Condenser
K-54 Thinning Tanks
K-54 Heating Cooling
kettle temp
Misc Temperatures
BatchUpdate for K54
Overview Displ
Batch Input
K-58
K-57
K-54
K-52
New
Open
Ready
NUM

Graphics (con't)

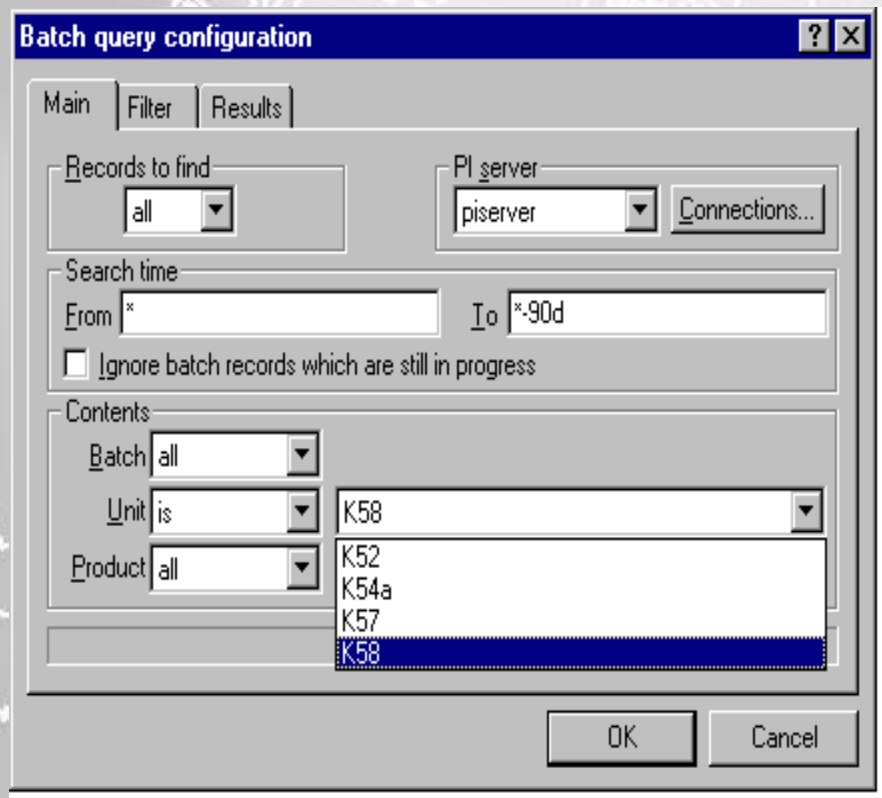


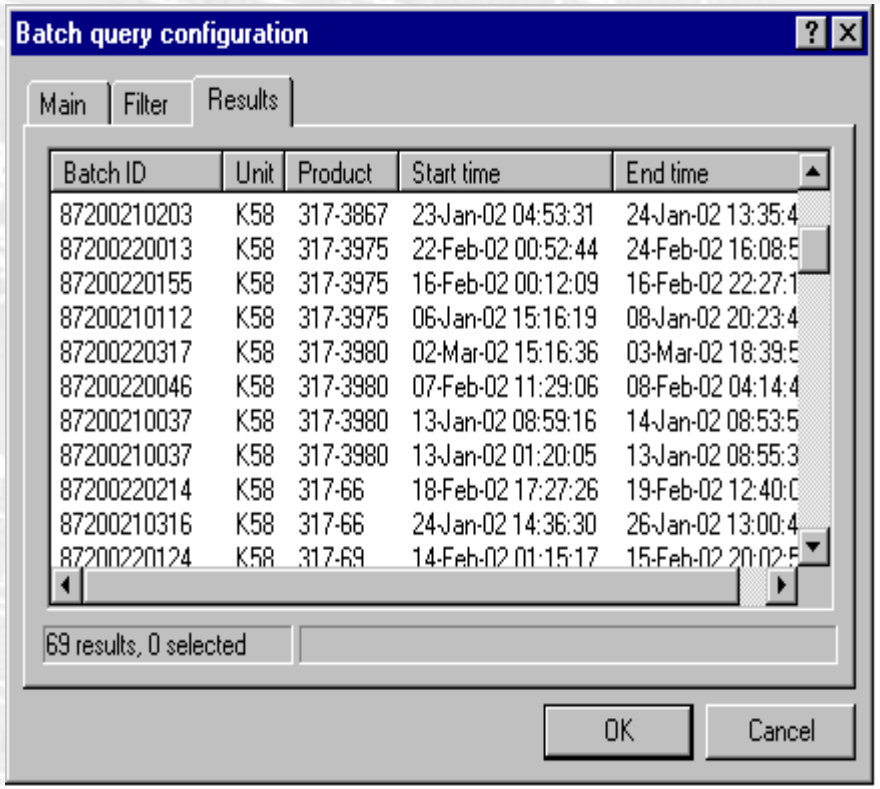
Manual input of M.W.



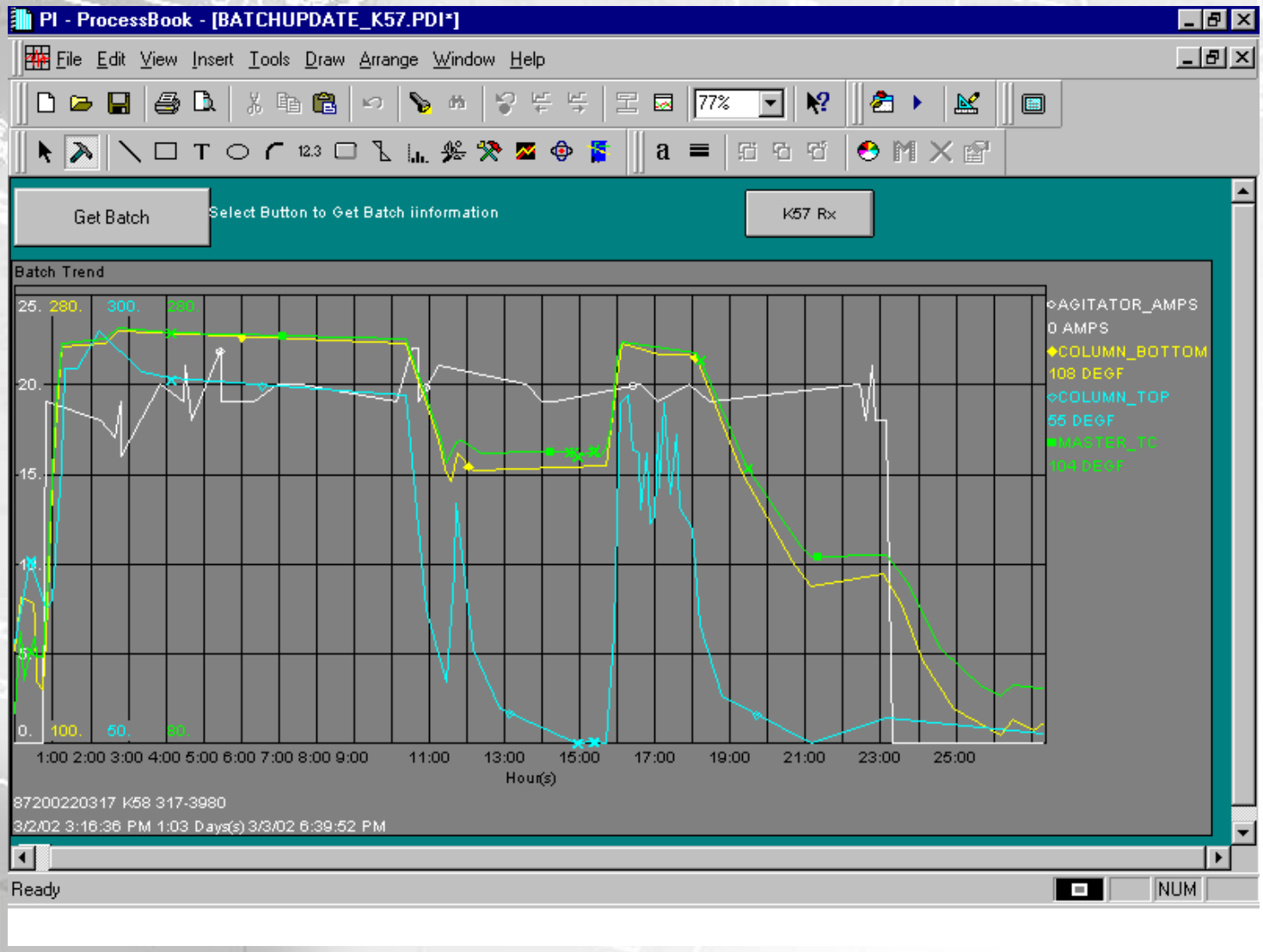
This is a FREE download on the PI Website

Batch Analysis

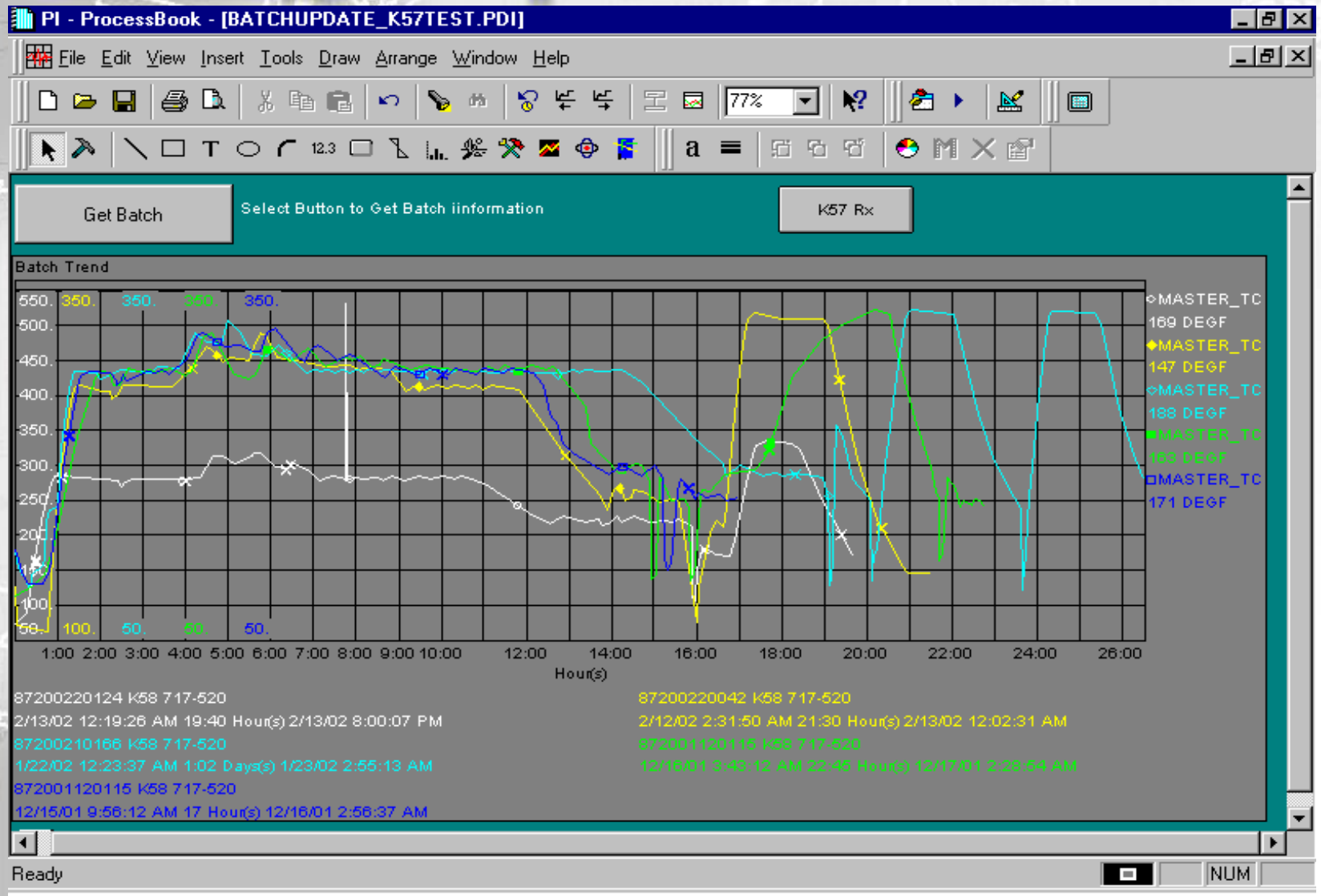




1 Batch View


PI - ProcessBook - [BATCHUPDATE_K57.PDI*]
File Edit View Insert Tools Draw Arrange Window Help
77%
Get Batch
Select Button to Get Batch iinformation
K57 Rx
Batch Trend
25. 280. 300. 260.
20.
15.
10.
5.
0. 100. 50. 0.
AGITATOR_AMPS
0 AMPS
COLUMN_BOTTOM
108 DEGF
COLUMN_TOP
55 DEGF
MASTER_TC
104 DEGF
1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 11:00 13:00 15:00 17:00 19:00 21:00 23:00 25:00
Hour(s)
87200220317 K58 317-3980
3/2/02 3:16:36 PM 1:03 Days(s) 3/3/02 6:39:52 PM
Ready
NUM

Multi Batch - The Result



Success? - Not Yet

- No reduction in cycle time…..yet
- Can't measure it - Can't manage it
- Need to include operators more in analysis
- Need to install in other sites
- More APPLICATION training

- Technology does not solve world hunger - basic project management

Lessons Learned

- Fiber optic line out to Control Room
- Delivery of Dell Machine
- DH+ throughput on AB machines

- RSLinx is not RSLinx (lite, regular, gateway, OEM)
- Scaling on PLC was a pain
- PLC versus WW hookup- redundancy issue “not redundant servers”

The Future

- Additional Training in Houston
- Add Chatham and Oxnard PI servers to new PLX machines
- Hook more R&D and Engineering up in Kansas City with multiple sites for analysis of batches.
- 2002 show process improvement - top level VP will push program

Special Thanks

- OSI - Jim O'Rourke : Working with the client and help present the plan
- OSI - Tom Hosea : Batch Triggers and tips and tricks
- CCP - Gary Hall : choosing skiing over work and leaving me here

Questions??

- Nigel James - 979 265 5556 x101
  - njames@manganinc.com
- Stan Kersch - 979 265 5556 x106
  - skersch@manganinc.com
- THANK YOU FOR YOUR TIME