



# GSPC Process Windows

Graphic Statistical Process Control

by MeltLab Systems

844-MeltLab

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Fast • Accurate • Comprehensive

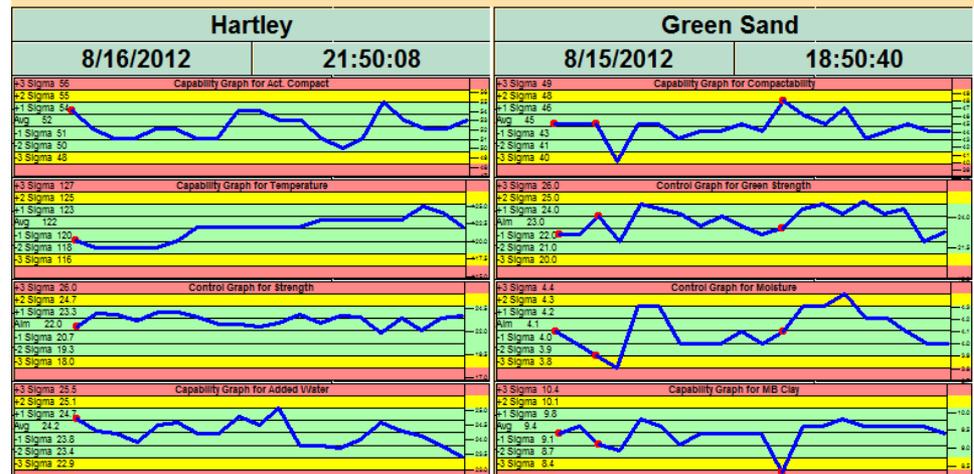
# GSPC Process Windows

- The flow of information is important in controlling any process.
- Process windows allows users to pull what information they want and need directly to their desktops or to on the floor displays – automatically.
- Displays can be individually configured across any plant wide network.
- The process windows can run in background on superintendent's or foremen's computers.

# Types of windows

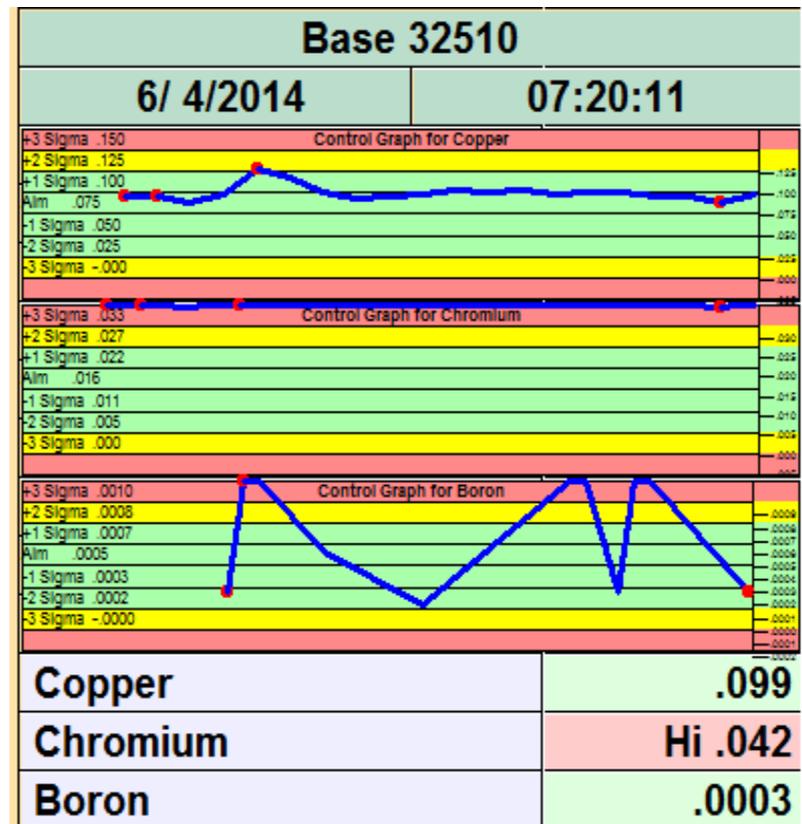
- Text based data can display up to 12 variables per window
- Graphics based data can display up to 4 graphics per window

Hartley		Green Sand	
8/16/2012	21:50:08	8/15/2012	18:50:40
Batch	123	MB Clay	9.4
Temperature	122	Moisture	4.0
Conductive	.35	Compactability	44
Compact Aim	52	Hartley Comp	52
Act. Compact	53	Green Strength	22.8
Needed Water	23.5	Hardness	92
Added Water	23.4	Volatile	
Bias	14.7	Permeability	92
Weight	4524	Specimen Wt	149
Amps	189	Working bond	4.07
Moisture	Hi 5.20	Mulling Eff	53.1
Strength	23.7	Avail Bond	7.7



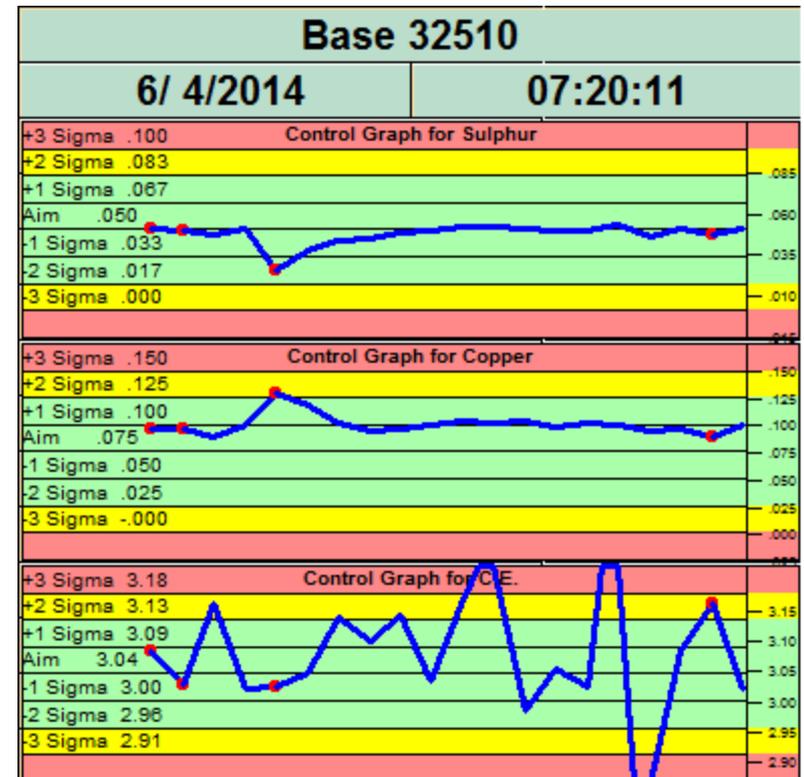
# Mixed Graphic Windows

- Here is a 4 graph window with the 4<sup>th</sup> graph left blank.
- Data underneath shows through.



# Different sized Graphics

- Reducing the graphs to three increases the size of the graphs for better readability.
- Red dots indicate the start of a new day.
- Limits are from the process specifications



# Access to the last 20 data points

- Hartley Controller 1

Rec 25	Time	Reco	Bat	Tem	Con	Com	Act.	Need	Adde	Bias	Weigl	Am	Moistu	Strer	Avail	Bon	Avrg	Bond	Devia
8/16/12	21:50:08	60486	123	122	.35	52	53	23.5	23.4	14.7	4524	189	5.20 hi	23.7	7.00	60	9.33	9.09	-1 lo
8/16/12	21:44:25	60485	122	124	.35	52	52	23.8	23.8	14.8	4529	187	5.25 hi	23.4	7.00	57	9.37	9.09	
8/16/12	21:41:26	60484	121	125	.35	52	52	24.0	24.1	14.8	4519	187	5.23 hi	22.1	7.00	56	9.20	9.09	
8/16/12	21:37:26	60483	120	123	.35	52	53	24.3	24.3	15.0	4588	188	5.27 hi	23.4	7.00	55	9.39	9.09	-1 lo
8/16/12	21:34:11	60482	119	123	.35	52	55	24.6	24.6	15.7	4544	192	5.44 hi	21.8	7.00	56	9.45	9.09	-3 lo
8/16/12	21:31:51	60481	118	123	.35	52	51	24.6	24.0	15.5	4544	182	5.41 hi	23.5	7.00	56	9.59	9.09	1
8/16/12	21:29:09	60480	117	123	.35	52	50	24.0	23.7	15.2	4465	182	5.28 hi	23.6	7.00	57	9.43	9.09	2
8/16/12	21:26:35	60479	116	123	.35	52	51	23.6	23.8	15.0	4446	184	5.26 hi	22.9	7.00	57	9.33	9.09	1
8/16/12	21:23:58	60478	115	122	.35	52	53	23.7	23.8	15.2	4524	184	5.20 hi	23.8	7.00	56	9.34	9.09	-1 lo
8/16/12	21:21:26	60477	114	122	.35	52	53	23.8	25.1	15.4	4482	187	5.26 hi	22.8	7.00	56	9.32	9.09	-1 lo

# Data configuration is by User

- A user can be a person or a function
- Sparkman can be a user
- Spectrometer Lab can be a user
- Pouring Deck can be a user
- Superintendent can be a user
- Each gets 16 windows to configure in any which way he wants.
- Configuration can be copied from one user to another



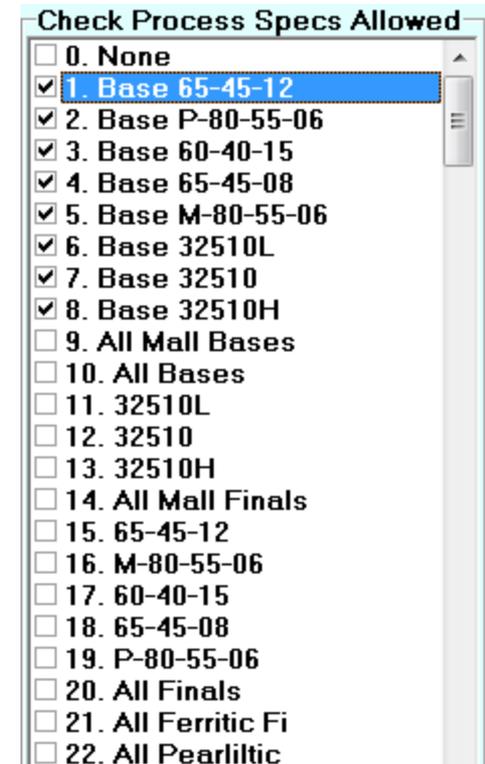
# Choose the Window to configure

Process Window			
<input checked="" type="radio"/> PW 1	<input type="radio"/> PW 5	<input type="radio"/> PW 9	<input type="radio"/> PW 13
<input type="radio"/> PW 2	<input type="radio"/> PW 6	<input type="radio"/> PW 10	<input type="radio"/> PW 14
<input type="radio"/> PW 3	<input type="radio"/> PW 7	<input type="radio"/> PW 11	<input type="radio"/> PW 15
<input type="radio"/> PW 4	<input type="radio"/> PW 8	<input type="radio"/> PW 12	<input type="radio"/> PW 16

- Select a process window to configure
- Select the processes (process specifications) to include in the window – they need to be similar.
- Select the tests to be displayed
- Select the tests to be graphed
- Set miscellaneous variables to control how data is displayed.

# Select the Processes to be displayed

- If you melt different grades of Iron, but only one grade at a time, mark all the grades and the computer finds the current one based on “most recent” and displays it.
- Multiple windows can use the same process to display more information than just 12 lines or 4 graphs.



# Select the tests to be displayed

- Save the Processes from the previous step so that the test box is populated.
- Select a line on the Tests Displayed.
- Pull down the variable box to the test you want there.
- When all is done, save the changes.
- All processes chosen should have similar variables.

Specification  
Base 32510

Variables  
15. Lead

User  
SPARKMAN

Tests Displayed

No.	Names	Values
1	Carbon	3.84
2	Silicon	1.65
3	Phosphorus	0.008
4	Sulphur	0.010
5	Manganese	0.000
6	Magnesium	0.001
7	Lanthanum	0.000
8	Nickel	0.042
9	Molybdenum	0.015
10	Copper	0.125
11	Chromium	0.040
12	Boron	0.0000

In order

# Select the tests to be graphed

- Click on the Configure Graphics button.
- Select how to divide up the screen (2, 3, or 4 areas).
- Select the variables to be graphed or leave the graph empty to let the underlying data to show. (Graphs overlay data).
- Show only current data makes these graphs ignore data from previous days.
- The hand with the pencil eraser, wipes out the Graphs displayed table.
- Be sure to save all changes or cancel to undo.

**Test Graphs Displayed**

No.	Names	Used
2	Silicon	Yes
8	Nickel	Yes
0		No
23	C.E.	Yes



**Graph Sizes**

2 Graphs per Window

3 Graphs per Window

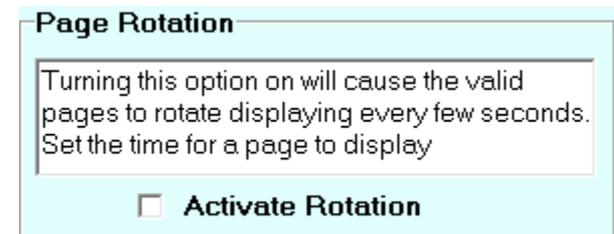
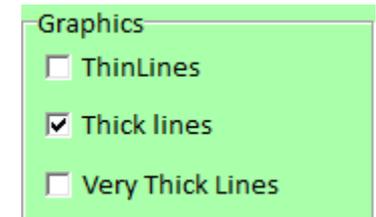
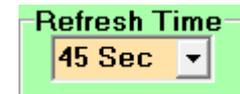
4 Graphs per window

The run time graph displays the last 20 samples which may span many days. If you want to see only current data check the box below.

Show only current data

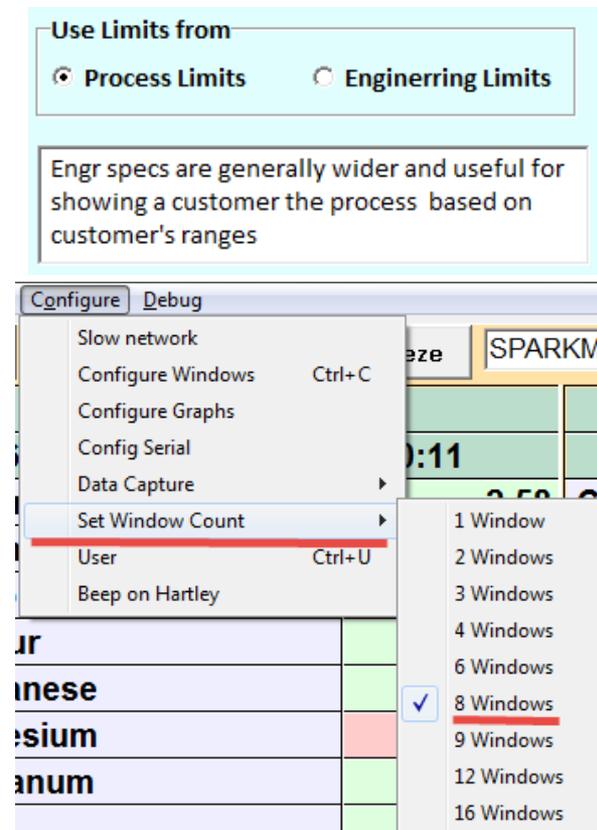
# Set miscellaneous variables to control how data is displayed.

- Refresh Time (10, 15, 30, 45, 60 sec). This controls how frequently new information is checked for and the screen is rewritten.
- Line Thickness is the data line in the different graphs (same for all). Click 2 or more for extra thickness.
- If you have more Process windows configured than fit on your screen, then Page rotation will go to the next page with ever refresh.



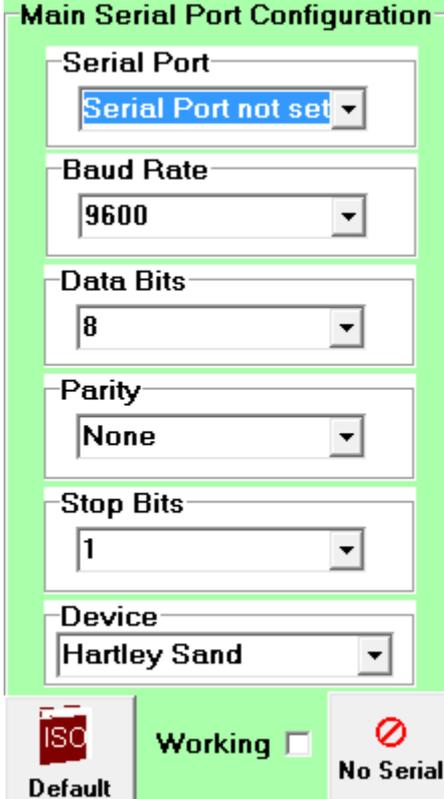
# More miscellaneous variables

- Process limits are always tighter than Engineering limits, but when Customers tour the plan, they can panic when they see a red range violation. So using the wider Engineering limits might be necessary during visits.
- Set Windows Count is provided on the main screen in configure. You can shrink the display to any size on your screen, but the font size will also reduce so make sure it is readable.



# Serial Data Capture

- Some Process Windows are placed out in the foundry near other equipment. We can make use of that to configure a computer running Process Windows to also capture serial data such as a Hartley serial feed to a printer. The data is then filed to the system and can appear immediately in it's configured Process window. Up to 4 serial ports can be monitored by one program.



The image shows a 'Main Serial Port Configuration' dialog box with the following settings:

- Serial Port: Serial Port not set
- Baud Rate: 9600
- Data Bits: 8
- Parity: None
- Stop Bits: 1
- Device: Hartley Sand

At the bottom, there are three buttons: 'Default' (with an ISC logo), 'Working' (with a checked checkbox), and 'No Serial' (with a red prohibition sign).

# Another Trick

- You can run two different sets of Process Windows on a computer to double the processes you are monitoring from 16 windows to 32 windows. If you need more than that ...

# Process Windows Summary

- This is your immediate process feedback system.
- It is faster than a Kelly tube, faster and more accurate than a phone call.
- And it knows the process limits so there is no forgetting.
- The fact that management knows what is happening on the floor, keeps everyone on their toes.
- Something goes wrong, and the boss, who is back in his office, will be here momentarily.