P9000 Cluster System

User Manual

P9000 Cluster System User Manual

Documentation ID: CS9000-UG-v002-01

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Compiled in the United States of America. November 11, 2012.

Contents

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CHAPTER 1 Introduction

Chapter Outline

This chapter discusses P9000's main features, hardware components, operating console, and system setup procedures. It covers the following topics:

- Product overview
- Key features
- P9000 operating console
- System setup procedures
- Product safety
- Technical support
- About this *User Guide*

Product Overview

The P9000 is a high-throughput, multi-purpose, wafer-processing system that can be configured as a coater, developer, vapor primer, baker, chiller, etc., or a combination of all the aforementioned and is capable to process a wide range of photoresist and photosensitive polymer applications. Its sophisticated system software, along with its state-of-the-art hardware, allows the operator to process hotplates at various bake temperatures, and prime, coat, and develop wafers in parallel according to pre-configured recipes. The system is easily scalable to keep pace with business growth and changing production requirements.

Key Features

The P9000 comes with the following key features:

- Powerful, intuitive application software makes the system easy to program and operate.
- Recipe-driven, automated system operation ensures operation efficiency, high productivity, consistency, and quality.
- Ability to process 50mm-200mm substrates without hardware changeover.
- Dual-cassette indexers able to support two parallel recipes at the same time.
- A hardened, reliable automated system also supports manual operations.
- A central atmospheric robot with dual-end effector -high-volume processing and wafer temperature sensitivity.
- A stackable station design dramatically saves floor space.
- CE certification ensures compliance with European Union (EU) requirements.
- Semi S2 certification ensures the Safety Guidelines for Semiconductor Manufacturing Equipment

. **Facility requirements**

Electrical	
Power	208V
Phase	3 Φ
Frequency	50 - 60 Hz
Current	25A
AIC	5000 A Interrupt Rating

Physical	
System Foot Print	3.79ft length x 4.79ft wide x 6.25ft height
System Weight	1800LBS
Vacuum Pressure	22-25 in Hg/
Fuse/Circuit Breakers	Appendix A
System Interlocks	Appendix B

NOTE: *P9000 Systems are custom, each System Layout Drawing contains the appropriate resource information for individual Facility Requirements. It is highly recommended each customer use the Facility Layout Drawing, Preventive Maintenance and Users manuals when familiarizing themselves with the P9000 System prior to commencing use.*

P9000 Operating Console

The P9000 operating console is the system's graphical user interface (GUI) by which the operator interacts with the system. This section provides a detailed discussion about each of the components of the P9000 operating console. It is highly recommended that the operator should familiarize him- or herself with these components before starting to operate the system.

Figure 1-1 highlights the major sections of the P9000 operating console user interface. For ease of reference, we mark each section with a reference number. Detailed discussions about each of these sections are provided in the following paragraphs.

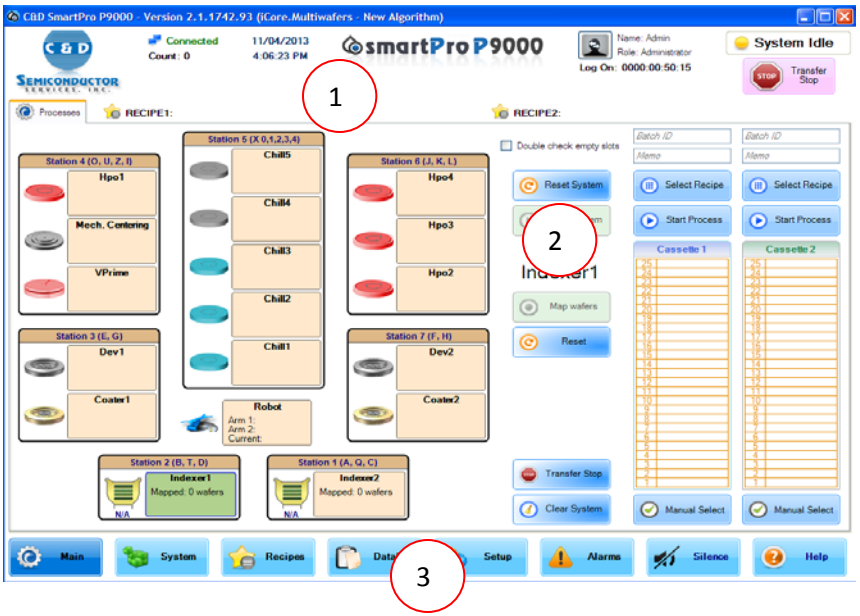

FIGURE 1-1: P9000 console graphical user interface

1. Top panel
2. Workspace
3. Navigation bar

Top Panel

The top of the P9000 operating console displays some general information about the system's current operating status. Figure 1-2 highlights the major items of the P9000 operating console's top panel.

FIGURE 1-2: P9000 Operating Console Top Panel

Table 1-1 briefly describes the various components of the P9000's top panel.

TABLE 1-1: P9000 Operating Console Top Panel UI Components

UI Component	Description
Connection Status	Shows the connection status between the system's software and hardware (via the firmware), which can be either of the following: • Connected • Disconnected
Wafer Count	Indicates the total number of wafers the system has processed.
Date & Time	Shows the current date and time.
User Information	Shows the name and role of the current user, as well as the length of time the user has been operating the system for the current session.
System Status	Shows the system's operating status which is indicated by the color of the dot and the words in the text field next to it. **Note:** *The words in the text fields vary, depending on the page being selected as well as the system's operating status. See the following chapters for more information.*

Workspace

The middle section of the P9000 operating console is the workspace. Its content changes with the system page being opened. Figure 1-1 shows the look and feel of the Main page. For more information about this part of the P9000 GUI, see the following chapters.

Navigation Bar

The navigation bar contains buttons that allow you to navigate through the system's main pages. Clicking a button opens its corresponding page. It's important to note that access to these main pages is determined by a user's role and privileges granted by the system administrator. Figure 1-3 illustrates the navigation bar.

FIGURE 1-3: P9000 System Navigation Bar

Table 1-2 briefly describes the navigation buttons and their related main pages. For more information about the main pages, see the following chapters.

TABLE 1-2: P9000 System Navigation Buttons

Menu	Description
Main	Opens the Main page where the operator performs wafer-processing operations. By default, the Main page opens after you have logged into the system, as shown in Figure 1-1. **Note:** *For information about the Main page and instructions on how to perform wafer- processing operations on the page, see Chapter 2.*
System	Opens the System page where the system administrator or a qualified technician can configure and calibrate the various modules of the system. **Note:** *For information and instructions about system configuration, see Chapter 3.*
Recipes	Opens the Recipes page where the system administrator or a qualified technician can create and manage recipes that the operator can use to process wafers. **Note:** *For information and instructions on how to create and manage recipes, see Chapter 4.*

TABLE 1-2: P9000 System Navigation Buttons

Menu	Description
Datalog	Opens the Datalog page which contains various reports the system has generated. **Note:** *For information and instructions on how to view and manage system reports, see Chapter 5.*
Setup	Opens the Setup page where the system administrator or a qualified technician can set up the system. Below are some of the tasks for setting up the system: • Enabling or disabling system modules • Configuring system networking settings • Performing remote component exercise • Managing user accounts • Configuring pumps • Performing system diagnostics • Configuring system messages • Configuring miscellaneous settings. **Note:** *For information and instructions on how to perform the above-mentioned tasks, see Chapter 6.*
Silence	Silences an ongoing system alarm, i.e., making it inaudible. **Note:** *Silencing an alarm only makes it inaudible; it does not solve the problem that triggers the alarm. The operator must read the error message to troubleshoot and resolve the problem. The alarm light will continue flashing until the error is cleared.*
Help	Opens the Help page where the operator can view a copy of this *User Manual.*

System Setup Procedures

Before putting the P9000 into production, the system administrator or qualified technician must set up the various components of the system. The following are the procedures we recommend for setting up the system prior to putting it into production:

1. Make sure that there are no wafers sitting on any module in the system. Remove them if otherwise.
2. Ensure that the power cord from the main control enclosure is plugged into a grounded power outlet. In addition, some installations may even require that the circuit breaker at a customer-supplied panel be switched on.
3. Power up the computer.
4. Wait until the computer fully boots up. *(**Note:** It may take a few minutes for the system to fully boot up.)*
5. Turn on the power to the system.
6. Wait until the automatic system check completes to ensure that the system is ready to function. *(**Note:** The system automatically starts the system check which may take a couple of minutes to complete.)*
7. Create user accounts and assign roles.
8. Configure programs and recipes.
9. Put the P9000 into production. See Chapter 2.

Product Safety /Definitions & System On/Off

The P9000 is powered by high voltages and uses potentially hazardous chemicals. It is housed inside a chamber made of stainless steel to prevent the operator from exposure to these hazards during normal system operation and maintenance. Hard-wired interlocks, programmable process alarm conditions, covers, and other safety safeguards are provided wherever required to protect the operator from harm. Refer to Appendix A for instructions on the safe shut down of hazardous energy sources and the elimination of any solid waste contained as a result of processing activities. Refer to Appendix B for table of System Interlocks.

EMO- fail safe control switch or circuit that, when de-energized, will stop the operation of associated equipment and will shut off potential hazards outside the main power enclosure. Depressing the Manual EMO actuator will de-energize the P9000 System's Spindle Controller, Watlow Heaters, MCE Box and the Systems Computer. Following an EMO Shut Down; Reset the MCE Box first by switching to "ON", immediately followed by Power Reset of the Green Power Button. Refer to Resetting the System Section to continue at the systems Computer

Green Power Button: Depressing the Green Power Button in a Power Down situation will shut off the power to the DC Power Box and halt the module functions. Restarting the system if only from a Power Down can be facilitated by utilizing the Green Power On button. Refer to "Resetting the System" Section to continue reset at the systems Computer

Interlocks - a device that prevents you from making an inappropriate maneuver, or adjusts the system to a safe state if you make an inappropriate maneuver. The P9000 is equipped with Interlocking devices;

Seismic Anchoring –method of securing a system to protect from or pertaining to, an earthquake or vibration of the earth, Seismic anchors are System option on the P9000 Cluster System, it is the responsibility of the End User to provide adequate seismic anchors.

Exhaust -To drain, metaphorically; to use or expend wholly, or till the supply comes to an end. The P9000 System is designed with internal exhaust, supporting module activity. Dampers are present to control the flow of exhaust for dedicated modules. An audible alarm will sound should the exhaust go below its established set point (Ref. Appendix B, System Interlocks). System facility exhaust flow requirements are suggested and must be verified at End Users site.

The operator must strictly adhere to the operating and maintenance procedures at all times to prevent potential hazards or injuries. Under no circumstances should this system, including its electrical wiring, be altered or modified in any manner or by any means. Modifying the system, its wiring, otherwise overriding the hard- wired interlocks, or failure to follow the operating procedures defined in the product documentation could cause damage to the equipment and bodily injuries or even death

CAUTION

TO ENSURE SYSTEM AND PRODUCT SAFETY, IT IS CRITICAL A WAFER BE ON THE CHUCK WHEN DISPENSING LIQUID AND AIR RING PRESSURE MUST BE VERIFIED TO SPECIFICATION

WARNING: ***In case of an emergency situation, immediately stop the system by pressing the red (EMO) emergency stop actuator on the P9000 System..***

ONLY WELL-TRAINED PERSONNEL SHOULD OPERATE OR MAINTAIN THE SYSTEM. LACK OF KNOWLEDGE OF OR UNFAMILIARITY WITH THE OPERATING AND MAINTENANCE PROCEDURES COULD RESULT IN BODILY INJURIES OR EVEN DEATH.

For more information about product safety, refer to the master product documentation provided by the hardware manufacturer!

Technical Support

We provide product technical support to our customers around the world. For technical support, visit our web site at `http://www.cdsemi.com/contactus.html`.

Product Documentation

This *User Manual* mainly covers P9000's operating console which is the software portion of the system.

CHAPTER 2 Operator's Guide

Chapter Outline

This chapter discusses the general operating procedures an operator should follow when operating the P9000. It covers the following topics:

- P9000 operational requirements
- System Turn On/ Log into the P9000 operating console
- Main page workspace UI components
- Wafer-processing operation procedures
- Managing system operation
- Dealing with alarms
- Module-specific controls

P9000 Operational Requirements

Normally, an operator is required to have the following in place in order to operate the P9000:

- A user account with valid user name and password
- Programs and recipes

It is the system administrator's responsibility to set up user accounts and create programs and recipes.

Logging into the P9000 Operating Console

As an operator, you can start the P9000 using the following procedures:

1. From the desktop of the P9000, click the P9000 software icon. The P9000 login page opens.
2. Enter your user name and password, and press **Login.** The P9000's Main page opens.

Main Page Workspace UI components

The Main page contains all the tools the operator needs to operate the P9000, as shown in Figure 2-1.

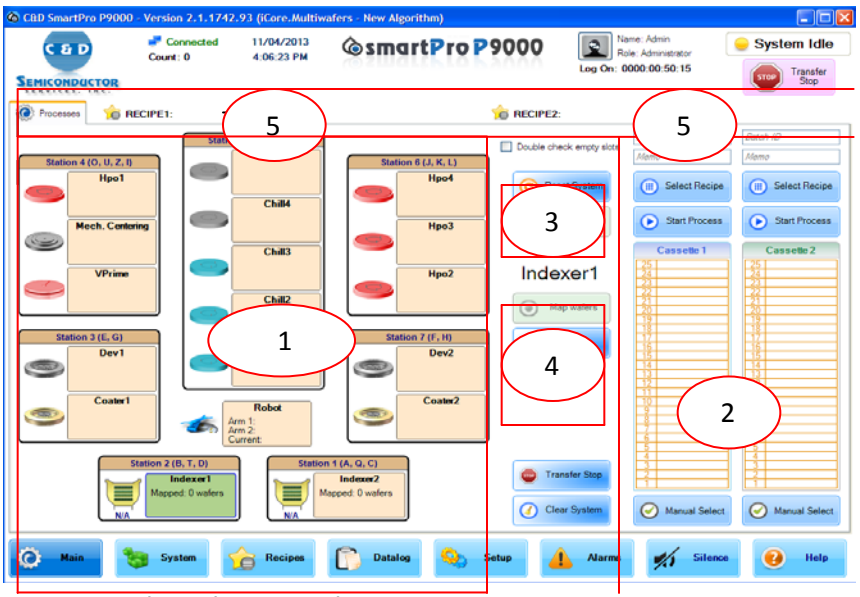

FIGURE 2-1: The Main page work space

1. Processes — Displays all modules available on the P9000. *(**Note:** The P9000 is a custom-built system. The types of modules and the number of units of a specific type of module may vary, depending on customer contracts.)*
2. Cassettes — Displays the two cassettes on the P9000.
3. System Controls — Displays buttons used to control the operation of the whole system.
4. Module-Specific Controls — Displays buttons used to control the operation of the currently selected module.
5. Recipe Information — Displays the names of the recipes used in the current session.

Wafer-Processing Operation Procedures

You can follow the instructions below to perform a wafer-processing operation:

1. Load wafers into a cassette.
2. Place the cassette of wafers on the Indexer station you intend to use.
3. Identify the Indexer with the Cassette on the P9000 UI.
4. Click **Get Recipe.** The Download Recipe dialog box opens.
5. Select the recipe you intend to use and click **Download.** *(**Note:** Information about the selected recipe shows up in the Recipe Information area on the top of the work space once the recipe has been successfully downloaded.)*
6. Optionally, enter a batch ID and short memo for the wafers to be processed. *(**Note:** The system automatically assigns the default batch ID,* 0000000000000000 (20 zeros) *to the batch of wafers if no batch ID is specified.)*
7. Click **Start Process.**
8. If you want to run two processes simultaneously, place another cassette of wafers on the other Indexer station and repeat Steps 3 through 7.

Managing System Operations

As a recipe-driven wafer-processing system, the P9000 automatically performs wafer-processing operations according to the selected recipe. Once a session starts, little effort is required of the operator. However, it does needs the operator's attention when an incident occurs which will trigger the alarm. In that case, the operator can use the instructions in the following sections to troubleshoot and resolve the issues.

Resetting the System

Each time you have powered up the P9000, you need to press the **Reset System** button so that the system application software can communicate to all modules and initialize them. You must do this before selecting a recipe.

You may also need to reset the system when the P9000 operating console (i.e., the GUI) lost connection to the modules. In this situation, clicking the Reset System button enables the software to reconnect with the modules.

Clearing the System

If a power outage occurs while a session is in progress, the system software and the modules will be disconnected. As a result, the session will be interrupted, leaving wafers on the stations. Once power is restored and the system is back on, the first thing you need to do is press the **Clear System** button. This will let the system check through all stations for wafers left in/on them and put them back into the cassette, clearing the way for you to resume the session.

Note: ***The only station the P9000 system does not check through is the Centering tool as the action is a momentary or temporary presence therefore it is not recognized. Wafers should be manually checked at this module following a power outage.***

Confirming Wafers

At the start of each session, the Robot automatically scans all slots in the cassette for wafers and marks the result on the Cassette: slots with wafers are labeled "Present" and those without wafers show up blank. However, there are times when the sensor may fail to detect wafers in some slots even though they are present.

This is where the Wafers Confirmation check box comes into play. If selected, this feature will enable the Robot to go through all slots, including the vacant ones, during the operation. If it detects wafers in those initially vacant slots, the Robot will pick up them up for processing and mark the slots as "Present" at the same time. Without checking the Wafers Confirmation check box, the system will skip all slots that come up "empty" even though there are wafers in them.

Dealing with Alarms

In the course of a session, the alarm will sound whenever the system encounters a problem. If that happens, you must first click the **Silence** button on the navigation bar to turn off the audible alarm. You should then read the error message on the screen to understand the nature of the error. Troubleshoot and resolve the issue if you can and seek assistance from a qualified technician if necessary. Reference the table provided here for Alarms and their associations.

Note:

Clicking the Silence button only turns off the audible alarm, but does not make the problem go away. You must resolve the issue that triggers the alarm before you can continue with the session.

ALARM TABLE

COATER / DEVELOPER										
Code	Message	State								
		Not allow to start new lot	Not send any more wafers from cassette	Not accept next wafer	Stop processing wafer in current process		Audible alarm	Red light	Yellow light	Yellow light flashing
75	Drain high?		x	x			x	x		
79	EBR level low?		x	x			x	x		
83	Level Sensor 1 low?		x	x			x	x		
84	Level Sensor 2 low?		x	x			x	x		
85	Level Sensor 3 low?		x	x			x	x		
86	Level Sensor 4 low?		x	x			x	x		
125	Level Sensor 5 low?		x	x			x	x		
126	Level Sensor 6 low?		x	x			x	x		
161	Level Sensor 7 low?		x	x			x	x		
98	Coolant temperature out?		x	x			x	x		
100	Coolant Fluid level low?		x	x			x	x		
104	Exhaust out of band?						x		x	
151	Leak sensor on?	x	x	x			x	x		
71	Cover open?			x	(by firmware)		x	x		
153	Chemical 1 low warning?	x					x			x
154	Chemical 2 low warning?	x					x			x
155	Chemical 3 low warning?	x					x			x
156	Chemical 4 low warning?	x					x			x
HPO / ALLOY										
Code	Message	State								
		Not allow to start new lot	Not send any more wafers from cassette	Not accept next wafer	Stop processing wafer in current process		Audible alarm	Red light	Yellow light	Yellow light flashing
	Temperature out of band?		x	x			x	x		
	Heater over temperature?		x	x			x	x		

VAPOR PRIME

Code	Message	State								
		Not allow to start new lot	Not send any more wafers from cassette	Not accept next wafer	Stop processing wafer in current process	Abort current processing wafer	Audible alarm	Red light	Yellow light	Yellow light flashing
	Temperature out of band?		x	x			x	x		
	Heater over temperature?		x	x			x	x		
	HMDS low level?		x	x			x	x		
	HMDS flow low?					(by firmware)	x	x		

SYSTEM

Code	Message	State								
		Not allow to start new lot	Not send any more wafers from cassette	Not accept next wafer into coat bowl	Stop processing wafer in current process bowl	Stop robot transfer	Audiblealarm	Red light	Yellow light	Yellow light flashing
10	System air failure?					x				
12	System exhaust failure?					x				
14	System leak?					x				
19	Door opened? - Transfer stopped					x				
21	Chemical Cabinet Leak/Exhaust Fail?		x	x	x					
23	Chemical Cabinet Power Off?		x	x	x					

CHEMICAL CABINET (ACMS)										
Code	Message	State								
		Not allow to start new lot	Not send any more wafers from cassette	Not accept next wafer	Stop processing wafer in current process		Audible alarm	Red light	Yellow light	Yellow light flashing
	Leak detected?		x	x	x		x	x		
	Exhaust low?		x		x		x	x		
	Bubble detected?		x	x			x	x		
	Canister pressure low?		x	x	x		x	x		
	Pump pressure low?		x	x	x		x	x		
	Canister level high high?		x	x	x		x	x		
	Canister level high?						x		x	
	Canister level low?	x					x	x		
	Canister level low low?		x				x	x		
	Bottle low level?	x					x		x	
	Controller is off-line?		x	x	x		x	x		

Module-Specific Controls

In addition to system-wide tools, the P9000 also provides module-specific tools which enable you to manage the operation of individual modules. These tools become available only when you click/select a module. Refer to Figure 2-1.

CHAPTER 3

Configuring Programs & Recipes

Chapter Outline

This chapter discusses the procedures for creating and managing recipes as well as arm, pump, and module programs. It covers the following topics:

- Recipes and programs
- Accessing the Recipes page
- General recipe-creation procedures
- Creating and managing arm programs
- Creating and managing pump programs
- Creating and managing module programs
- Creating and managing recipes
- Sharing programs and recipes
- Managing module settings

Recipes and Programs

Recipes are formulas that the system uses to process wafers. It specifies the system modules to be used for a wafer-processing operation and the sequence in which wafers pass through the modules. Programs, on the other hand, are operational procedures or actions performed by various system components, which include wafer-processing modules (e.g., coaters, etc.), the pumps, and the transfer arms.

Note:

Before creating all programs for the components used in the recipe must be created. YOU CANNOT CREATE A RECIPE WITHOUT THE NEEDED ARM, PUMP, AND MODULE PROGRAMS.

Accessing the Recipes Page

You can create and manage recipes and programs on the Recipes page. To access the Recipes page, click **Recipes** on the navigation bar. Figure 3-1 shows the default Recipes page.

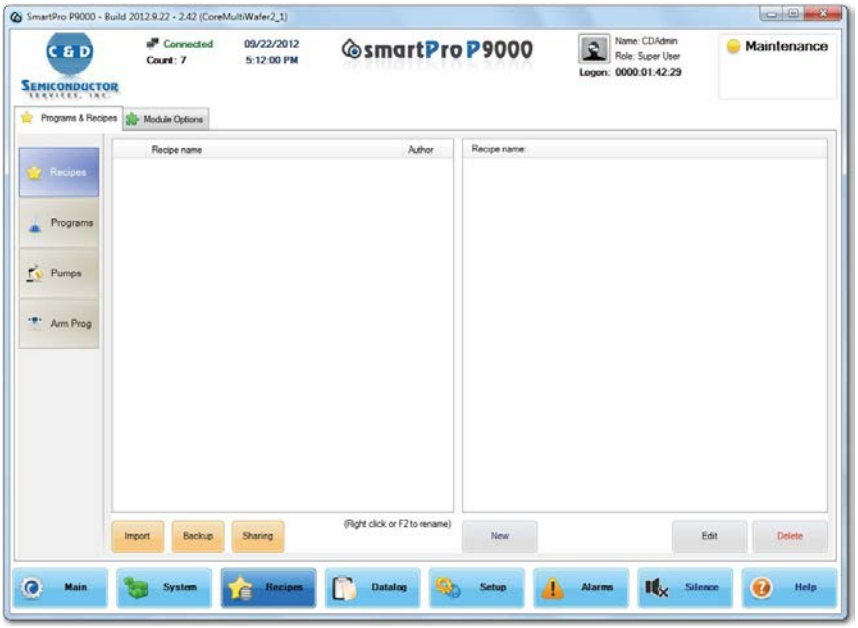

FIGURE 3-1: The Default Recipes Page

As shown in Figure 3-1, the Recipes page has two tabs across its top: Programs & Recipes and Module Options. The former allows you to create and manage programs and recipes; the latter allows you to choose the system modules and modify their settings. Table 3-1 briefly describes the UI components on the Recipes page.

TABLE 3-1: Recipe Screen UI Components

Tab	Description
Programs & Recipes	The Programs & Recipes tab has four menu options: • Recipes — Allows you to create, edit, delete, import, export, and share recipes. • Programs — Allows you to create, edit, delete, import, export, and share module programs. • Pumps — Allows you to create, edit, delete, import, export, and share pump programs. • Arm Programs — Allows you to create, edit, delete, import, export, and share arm programs.
Module Options	Allows you select or deselect the system modules as well as modify their values.

General Procedures for Recipe Creation

A recipe encompasses programs which are the operations or events carried out by various system modules during a wafer-processing operation. Recipe creation should follow these general procedures:

1. Creating arm programs
2. Creating pump programs
3. Creating module programs
4. Creating recipes

Managing Arm Programs

Arm programs are an important ingredient of a recipe. This section discusses how to create, edit, delete, import, export, and share arm programs.

Keep in mind that parameters for arm programs differ, depending on the module with which the arm program is associated. The following paragraphs provide general instructions for managing arm programs.

Creating a New Arm Program

Arm programs govern the operation of the dispense arms. They are important ingredients of recipes. As a best practice, we recommend that you have some arm programs configured before you go about creating a recipe.

To create an arm program:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click the Arm Program tab, as shown in Figure 3-2.

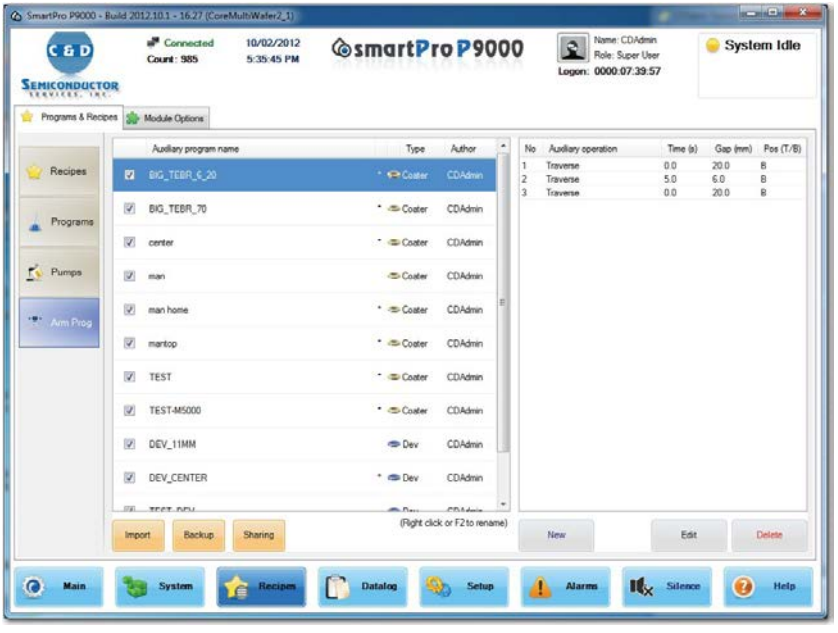

FIGURE 3-2: The arm programs page

3. Click **NEW**. The Create New Program dialog box opens. See Figure 3-3.

FIGURE 3-3: Selecting a module

Note:

As shown in Figure 3-3, arm programs are needed for Coaters and Developers.

4. Click the desired module. The Arm Program dialog box opens. See Figure 3-4.

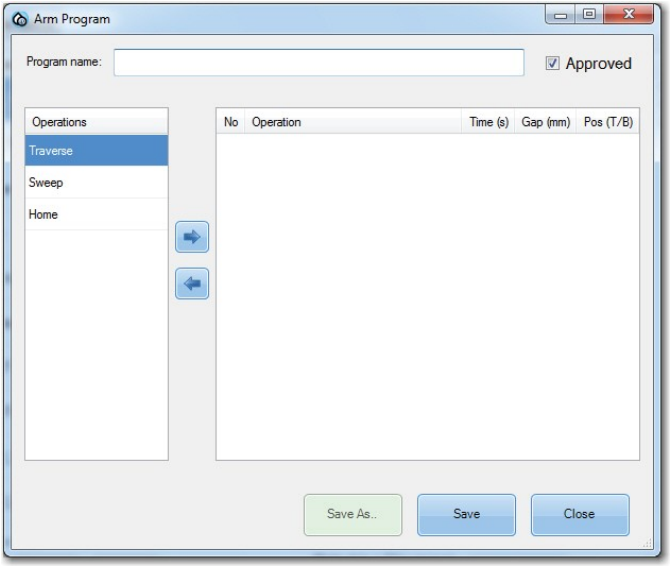

FIGURE 3-4: Creating a new arm program

5. Where it says Program Name, enter a unique name for the arm program.

6. Under Operations, highlight a desired option and add it to the right pane by clicking the right arrow. Repeat this step to add the other operations as needed. See Figure 3-5.

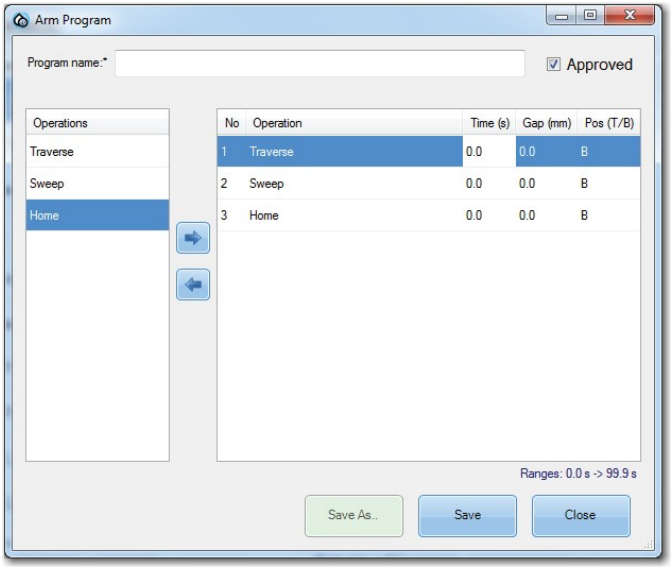

FIGURE 3-5: Configuring arm operations

7. Highlight each operation and specify the values for Time, Gap, and Position.
8. In the upper-right corner of the page, check the **Approved** check box to make it available for use.
9. Click **Save**.

Note:

Unless approved, an arm program will not show up on the Arm Program page and, therefore, will not be available for use.

Dispense Arm Operations and Measurement

The operations of the dispense arms refer to the way they handle wafers. You must specify movement of the dispense arms. Table 3-2 describes the actions the dispense arms can take during a wafer-processing operation.

TABLE 3-2: Dispense Arm Operation Options

Dispense Arm Movement	Description
TRAVERSE	The dispense arm moves from the start position to the destination position as programmed.
SWEEP	The dispense arm moves back and forth according to the pre-programmed settings.
HOME	The dispense arm returns to its home position above the outer part of the pre-dispense cavity.

Table 3-3 describes the units of measurement by which the movement of the dispense arm is measured.

TABLE 3-3: Dispense Arm Movement Parameters

Parameter	Description
Time (s)	The time (in seconds) it takes for the dispense arm to complete an event. Range: 0 ~ 99.9 seconds.
Gap (mm)	The distance (in millimeters) the dispense arm moves to complete an event. Range: It varies, depending on the measurement selected in the configuration setting.
Position	The position of the dispense arm. Options: T/B (T = top; B = bottom)

The dispense arm can be positioned to start or stop at any wafer radius and in either direction. Each dispense nozzle is automatically referenced to the center of a wafer. When in a processing position, the dispense arm moves at the maximum speed from its HOME position above the pre-dispense cavity to the wafer center line.

Modifying an Existing Arm Program

You can modify existing arm programs to accommodate your changing production requirements.

To modify an existing arm program:

1. On the Recipes page, make sure the Programs & Recipes is selected.
2. From the side menu, click the Arm Prog tab. The Recipes page refreshes.
3. From the list of arm programs, highlight the arm program of interest and click **Edit** (or inside the right pane). The Edit Arm Programs dialog box opens.
4. Make the desired changes.
5. Click **Save** to save the changes without changing the arm program name or **Save As** to save the arm program under a different name.

Note:

You can also right-click an arm program to bring up the pop-up menu, which allows you to rename, edit, delete, or make a copy of the arm program. See Figure 3-6.

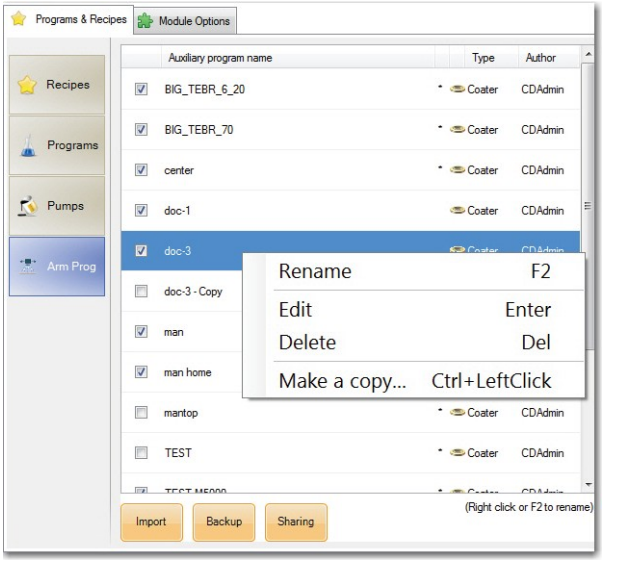

FIGURE 3-6: Arm Programs page pop-up menu

Deleting an Existing Arm Program

The Arm Programs page can become crowded as more arm programs are created. To keep the page less cluttered, you should delete arm programs that are no longer needed.

To delete an arm program:

1. On the Arm Programs page, highlight the arm program of interest and click **Delete**.
2. When the confirmation message pops up, click **Yes**.

Exporting Arm Programs

You can export arm programs to a location on your computer, network, or a storage device to back them up.

To export arm programs:

1. On the Arm Programs page, click **Backup.** The Export Arm Programs dialog box opens. See Figure 3-7.

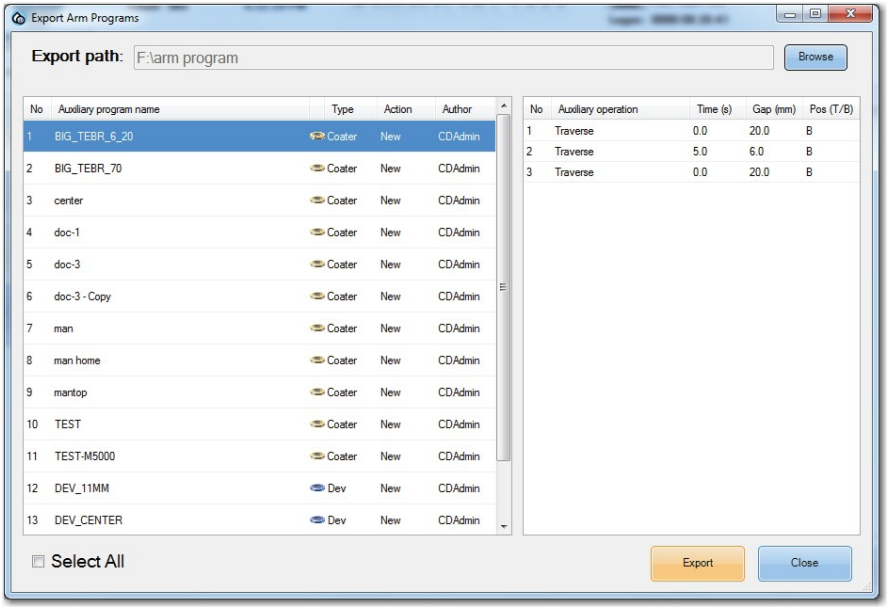

FIGURE 3-7: Exporting arm programs

2. Click **Browse** and select the export path.
3. Check the **Select All** check box and click **Export.**
4. When the confirmation message shows up, click **OK.**
5. Click **Close** to exit the Export Arm Programs page.

Importing Arm Programs

If you have arm programs saved on your system, network, or a storage device, you can easily import them to the system's database.

To import arm programs:

1. On the Arm Programs page, click **Import**. The Import Arm Program dialog box opens. See Figure 3-8.

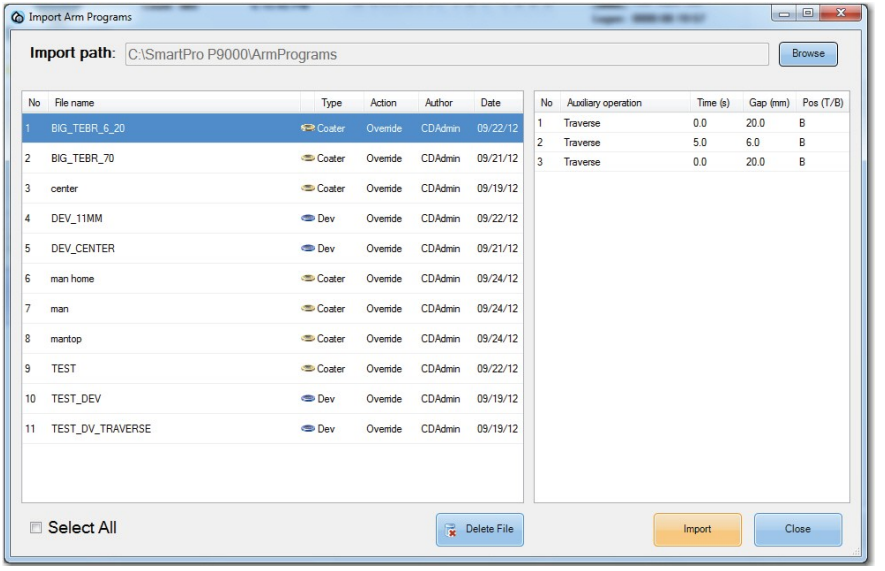

FIGURE 3-8: Importing arm programs

2. Click **Browse**. The Browse For Folder dialog box opens.
3. Browse for the folder containing the arm programs and click **OK.**
4. In the Import Arm Programs dialog box, check the Select All check box, and click **Import.**
5. When the confirmation message shows up, click **OK.**

6. Click **Close** to exit the Import Arm Programs page.

Note:

*If you do not want to import an arm program, you can highlight it and click **Delete File** before you click **Import.***

Sharing Arm Programs

Normally, arm programs created by a user may not be available for use by other users unless they are shared. Sharing arm programs means placing them in the Public pane on the Arm Programs page so that other designated users can access them.

To share arm programs:

1. On the Arm Programs page, click **Share.** The Arm Programs Sharing dialog box opens. See Figure 3-9.

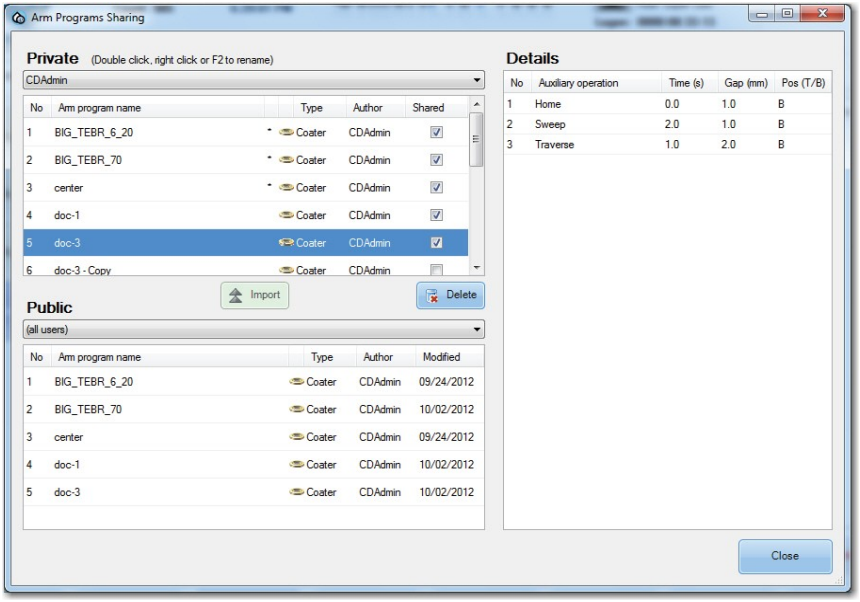

FIGURE 3-9: Sharing arm programs

2. In the Private pane, click the down arrow and select a user account whose arm programs you want to share, and check the arm programs to be shared. The arm programs will be added to the Public pane below as you check them.
3. In the Public pane, click the down arrow to select the user with whom the arm programs will be shared.
4. Click **Close** when done.

Managing Pump Programs

Like arm programs, pump programs are also an important part of a recipe. This section discusses how to create, modify, delete, import, export, and share pump programs.

Creating a New Pump Program

You can create a new pump program using the following procedures:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click Pumps. The Recipes page refreshes.
3. On the Pumps page, click **New**. The Create New Pump Program dialog box opens. See Figure 3-10.

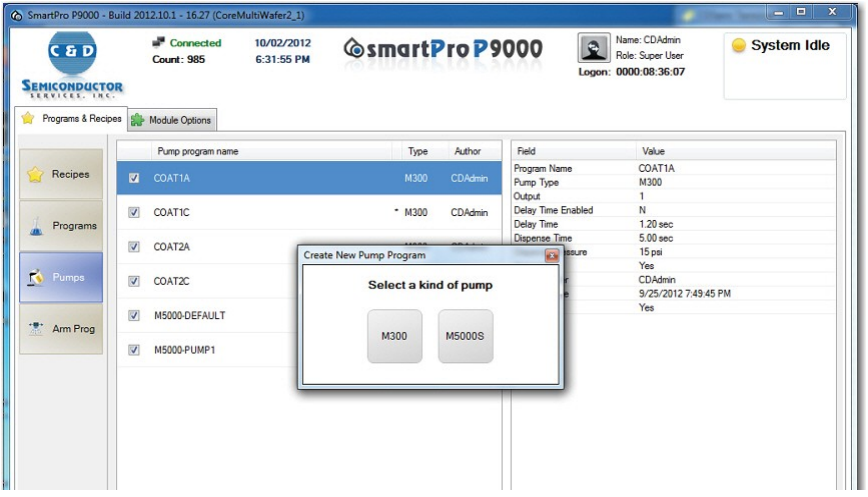

FIGURE 3-10: Creating a new pump program

4. Select a pump type. The Pump Program Builder dialog box opens. See Figure 3-11.

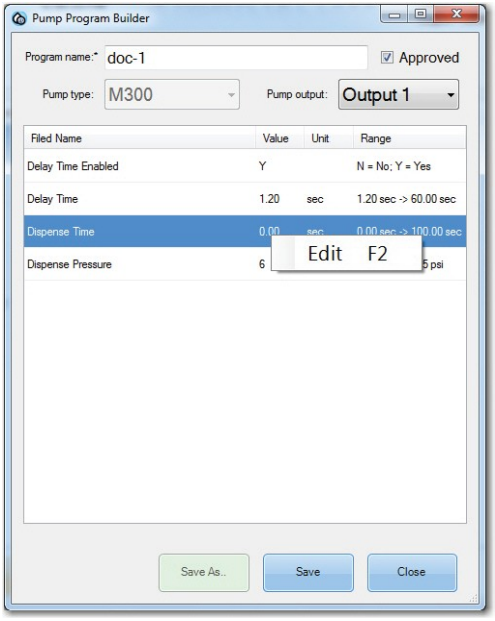

FIGURE 3-11: The Pump Program Builder dialog box

5. Where it says Program Name, enter a unique name for the pump program.
6. Where it says Pump Output, click the down arrow and select an option from the drop-down menu.
7. In the Value column, highlight a field and enter a desired value. Repeat this step to specify the other values as needed.
8. Click **Save**.

Modifying an Existing Pump Program

You may need to modify the configuration of existing pump programs to accommodate changes in your production requirements.

To modify an existing pump program:

1. On the Recipes page, make sure the Programs & Recipes tab is selected.
2. From the side menu, click the Pumps tab. The Recipes page refreshes.
3. On the Pumps page, highlight the pump program of interest and click **Edit.** The Edit Pump Program dialog box opens.
4. Make the desired changes.
5. Click **Save** to save the changes without changing the program name or **Save As** to save the program under a different name.

Note:

You can also right-click the pump program to bring up the pop-up menu, which provides options for you to rename, edit, delete, or make a copy of the pump program. See Figure 3-12.

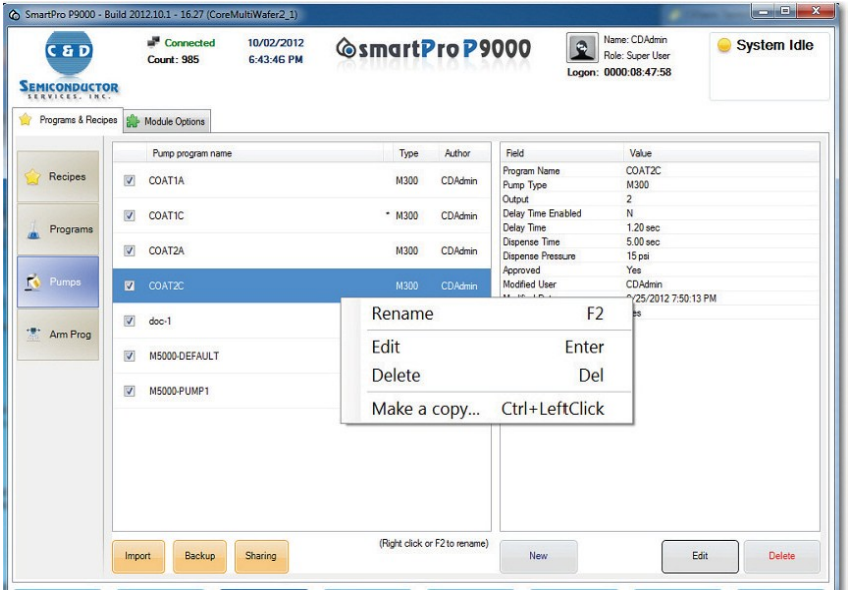

FIGURE 3-12: Pumps page pop-up menu

Deleting a Pump Program

You can delete pump programs that are no longer needed.

To delete a pump program:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From side menu, click the Pumps tab. The Recipes page refreshes.
3. On the Pumps page, highlight the pump program of interest and click **Delete**.
4. When the confirmation message shows up, click **Yes.**

Exporting Pump Programs

You can export pump programs to back them up on your computer, network, or storage device outside the system's database.

To export pump programs:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click the Pumps tab. The Recipes page refreshes.
3. On the Pumps page, click **Backup**. The Export Pump Programs dialog box opens. See Figure 3-13.

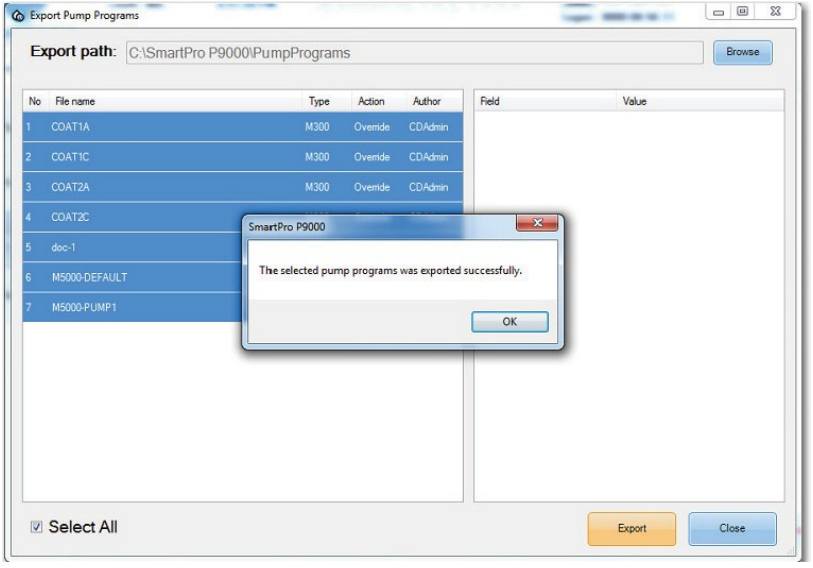

FIGURE 3-13: Exporting pump programs

4. Click **Browse.** The Browse For Folder dialog box opens.
5. Browse for the location where the pump programs are to be saved and click **OK.**
6. In the Export Pump Programs dialog box, check the **Select All** check box.
7. Click **Export.**
8. When confirmation message shows up, click **OK.**
9. Click **Close**.

Importing Pump Programs

If you have pump programs saved on your system, network, or storage device, you can import them to the system's database.

To import pump programs:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click the Pumps tab. The Recipes page refreshes.
3. On the Pumps page, click **Import**. The Import Pump Programs dialog box opens. See Figure 3-14.

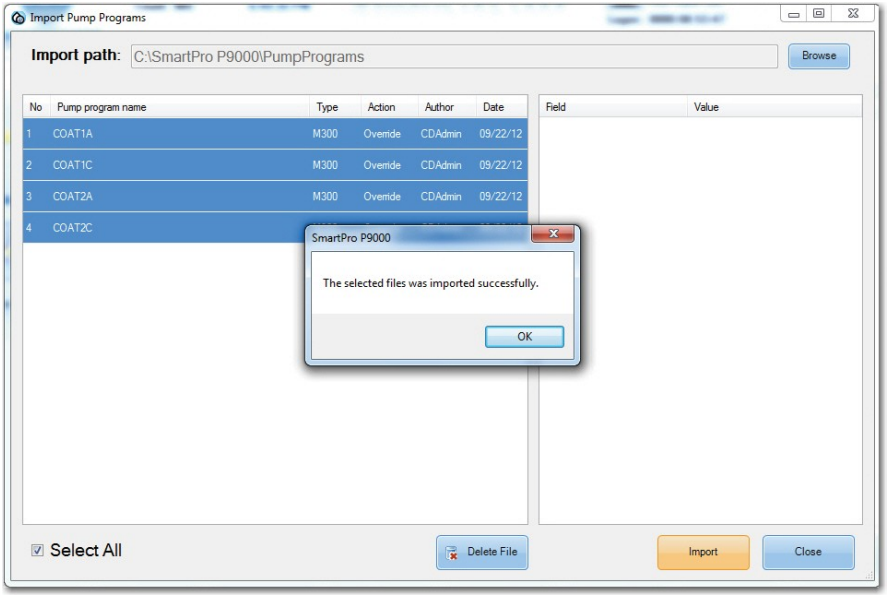

FIGURE 3-14: Importing pump programs

4. Click **Browse** to browse for folder that contains the pump program files.
5. In the Import Pump Programs dialog box, check the **Select All** check box.
6. Click **Import.**
7. When the confirmation message pops up, click **OK.**

Note:

If you want to exclude some of the pump program files from being imported, you can do so by highlighting them, one by one, and then clicking ***Delete File*** *before clicking* ***Import.***

Sharing Pump Programs

Normally, pump programs created by a user won't be available for use by other users unless they are shared. Sharing pump programs means placing them in a public area on the Pump Programs page so that other users of the system can access and use them.

To share pump programs:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click the Pumps tab. The Recipes page refreshes.
3. On the Pumps page, click **Share.** The Share Pump Programs dialog box opens. See Figure 3-15.

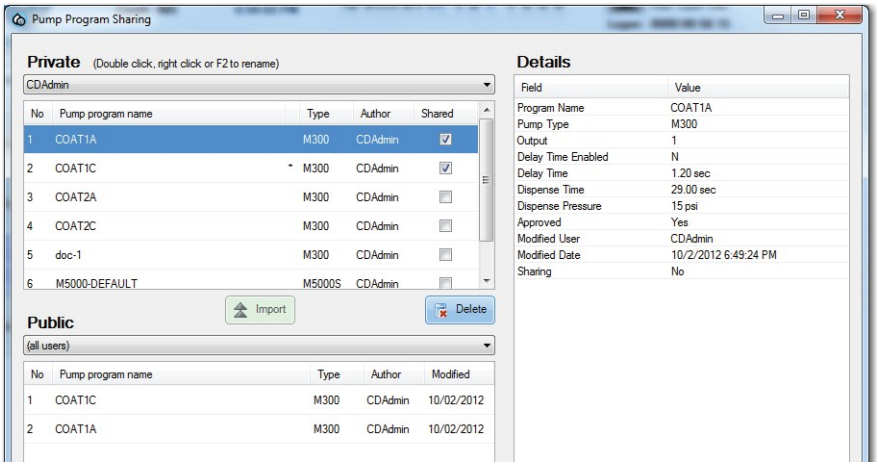

FIGURE 3-15: Sharing arm programs

4. In the Private pane, click the down arrow and select a user account whose arm programs you want to share, and check the pump programs to be shared. The programs will be added to the Public pane below as you check them.
5. In the Public pane, click the down arrow to select the user account with whom the pump programs are to be shared.
6. Click **Close**.

Managing Module Programs

Module programs are programs configured for system modules that are used in a wafer-processing operation, such as coaters, chill plates, hot plate ovens, etc. To ensure that all system modules operate in the way you want them to, you must have them properly programmed.

Creating a New Module Program

You must configure programs for all the system modules before creating recipes.

To create a module program:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.

2. From the side menu, click the Programs tab. The Recipes page refreshes. See Figure 3-16.

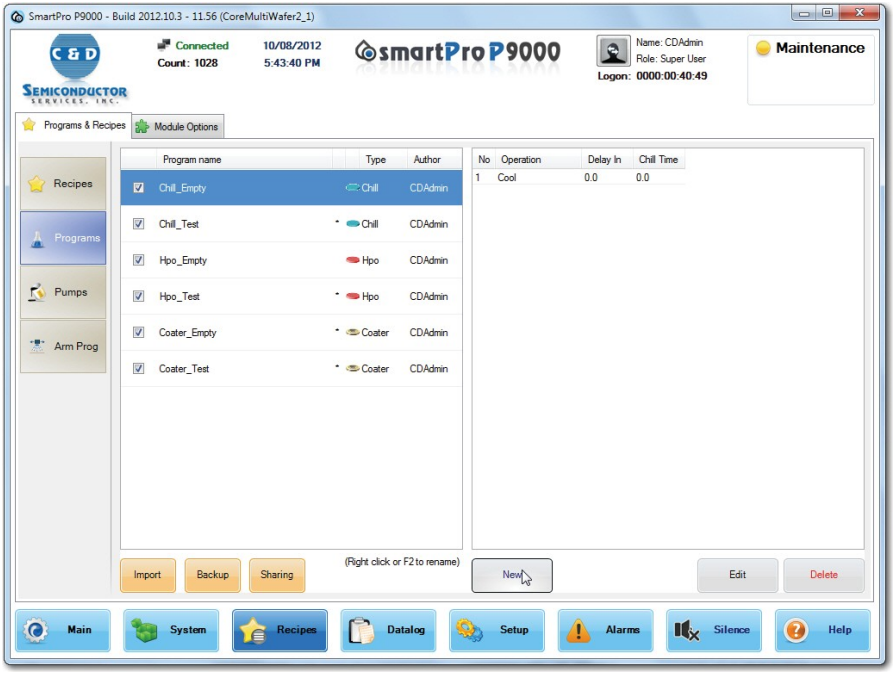

FIGURE 3-16: Creating a new module program

3. Click **New.** The Select a module dialog box opens. See Figure 3-17.

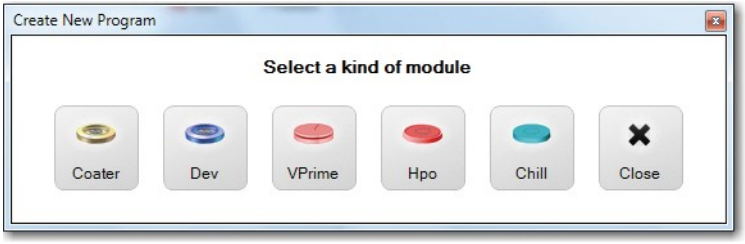

FIGURE 3-17: Selecting a module

4. Click a module. (For illustration purposes, we select Coater.) The Coater Program Builder dialog box opens. See Figure 3-18.

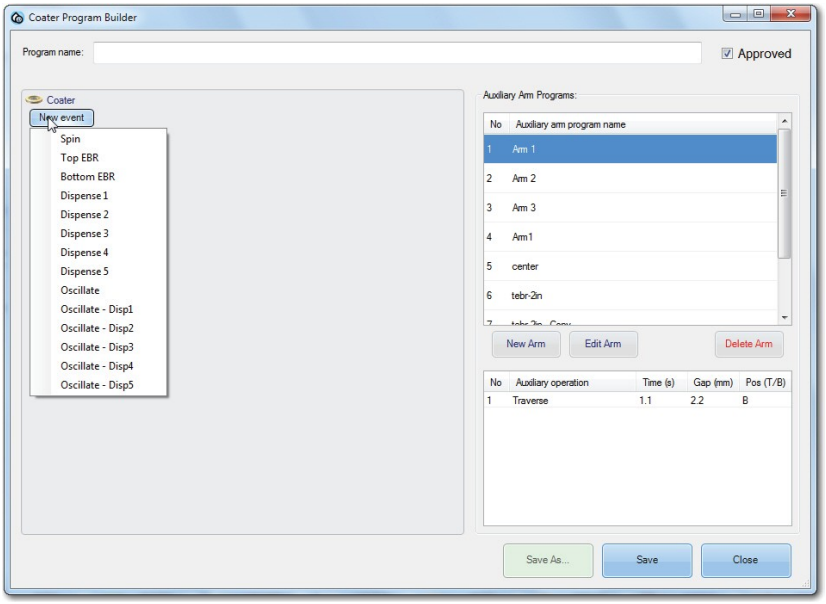

FIGURE 3-18: Creating a new coater program

5. Enter a unique name for the program.
6. Click **New Event** and select the events from the drop-down list menu. The selected events show up on the screen. See Figure 3-19.

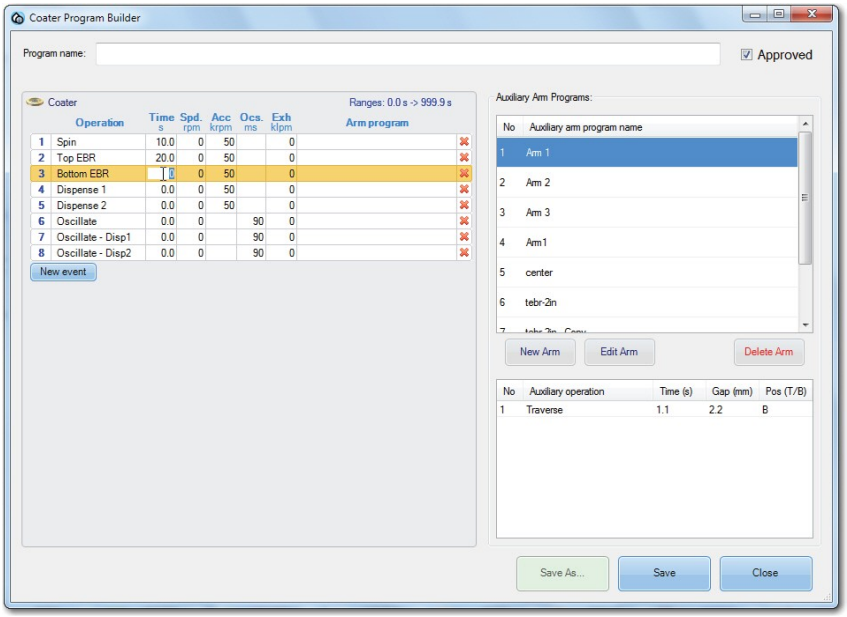

FIGURE 3-19: Configuring Coater events

7. Specifying the parameters of each event by highlighting the values and override them with desired ones.
8. Click **Save.**
9. When the confirmation message shows up, click **OK.**
10. Click **Close** to exit the Program Builder dialog box.

Note:

*If for some reason you want to remove an event from the Coater Program Builder, simply click the corresponding letter **X** and then the letter **D**, as shown in Figure 3-20. The event will be removed when the page refreshes.*

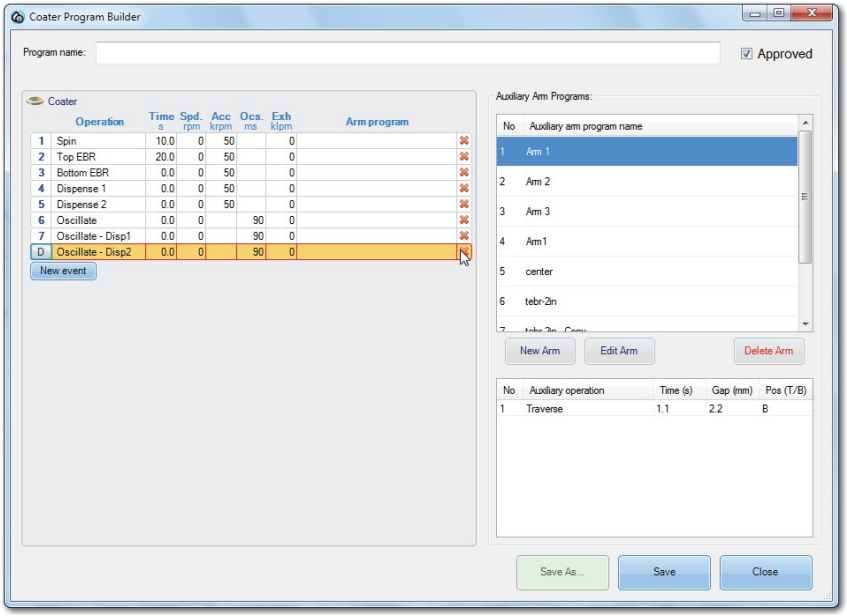

FIGURE 3-20: Deleting an event from the Coater Program Builder

Editing Existing Module Programs

You have to edit your existing module programs to accommodate changes in your production requirements.

To edit an existing module program:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click Programs. The Recipes page refreshes.
3. On the Programs page, highlight the program of interest and click **Edit.** The Edit Program dialog box opens.
4. Make the desired changes.
5. Click **Save** to save the changes without changing the program name, or **Save As** to save the program under a different name.
6. Click **Close.**

Deleting Module Programs

You can delete module programs that are no longer needed.

To delete a module program:

1. On the Programs page, highlight the program of interest.
2. Click **Delete.**
3. When the confirmation message shows up, click **Yes.**

Exporting Module Programs

You can export modules programs so that you can back them up on your hard drive, network, or removable storage device.

To export your module programs:

1. On the Programs page, click **Backup.** The Export Programs dialog box opens. See Figure 3-21.

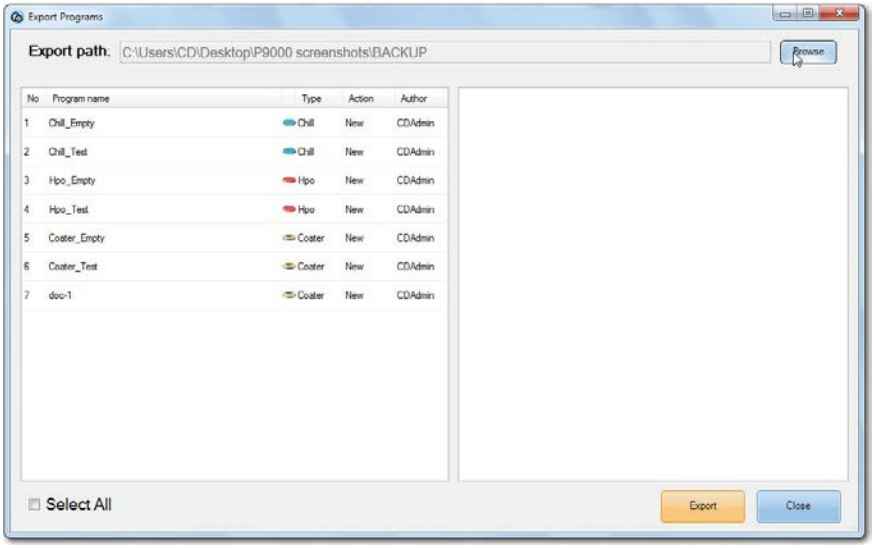

FIGURE 3-21: Exporting module programs

2. Click **Browse**. The Browse For Folder dialog box opens.
3. Browse for the location where the programs files are to be saved and click **OK.**

4. In the Export Programs dialog box, check the **Select All** check box.
5. Click **Export.**
6. When the confirmation message shows up, click **OK.**
7. Click **Close**.

Note:

You can remove programs from the list of programs to be imported by highlighting them, one at a time, and clicking ***Delete File.*** *See Figure 3-22.*

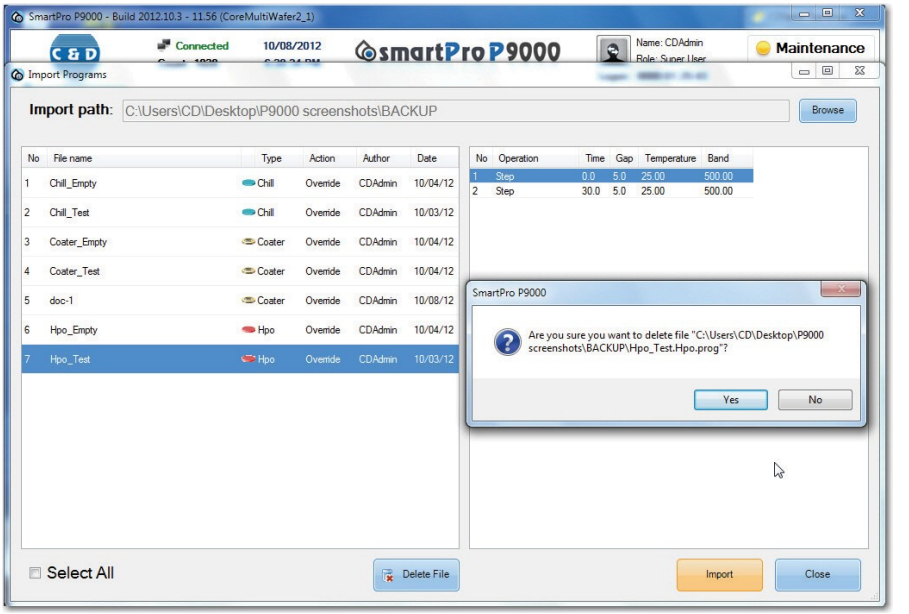

FIGURE 3-22: Deleting programs before importing

Importing Module Programs

If you have module programs saved on your computer, network, or storage device, you can import them to the system's database.

To import module programs:

1. On the Programs page, click **Import.** The Import Programs dialog box opens.
2. Click **Browse.** The Browse For Folder dialog box opens.

3. Browse for the location where the programs files are located and click **OK.**
4. In the Import Programs dialog box, check the **Select All** check box.
5. Click **Import.**
6. When the confirmation message pops up, click **OK.**

Sharing Module Programs

Typically, module programs created by a user won't be available for use by other users unless they are shared. Sharing module programs means placing them in a Public pane on the Programs page so that other users of the system can access and use them.

1. On the Programs page, click **Share.** The Program Sharing dialog box opens. See Figure 3-23.

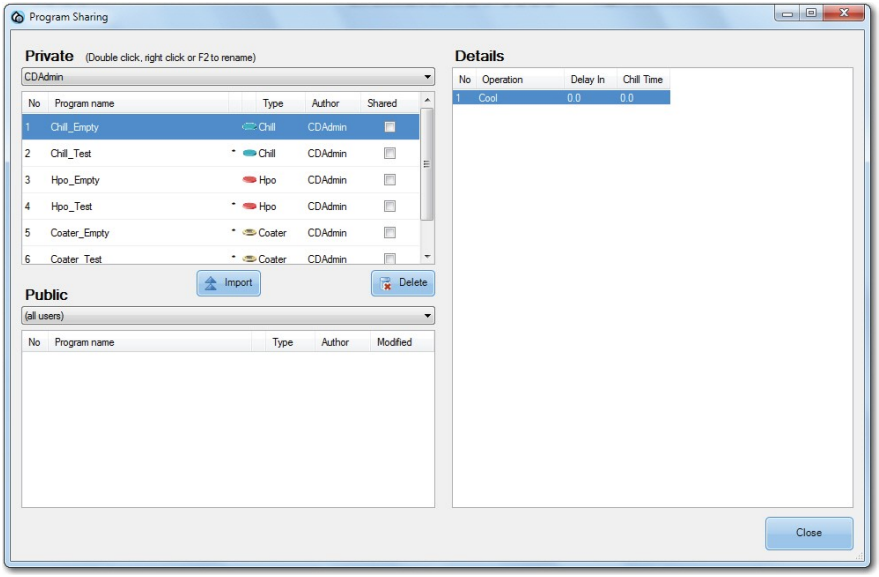

FIGURE 3-23: Sharing module programs

2. In the Private pane, click the down arrow and select a user account whose arm programs you want to share, and check the module programs to be shared. The programs will be added to the Public pane below as you check them.
3. In the Public pane, click the down arrow to select the user account with whom the module programs are to be shared.

4. Click **Close**.

Managing Recipes

A recipe can contain one or more flows, each representing a system module, e.g., Coater, Chill, Alloy, Vapor Prime, and Centering. When creating a recipe, you must first select a flow and then add events to the flow. Events are actions performed by a system module. Events are module-specific, meaning different modules may or may not have the same events. Once you have added events to a flow, the next thing you do is to add arm and pump programs to it.

To help make recipe creation easier, we recommend that you create arm, pump, and module programs first. With all programs in place, you can simply add them to the recipe you are creating.

Creating New Recipes

The most efficient way to operate the P9000 is through the use of recipes, which is a series of modules arranged in a certain sequence. Before you start creating a recipe, make sure that you have programs in place for all the system modules, pumps, and dispense arms.

To create a new recipe:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.

2. From the side menu, click Recipes. The Recipes page opens. See Figure 3-24.

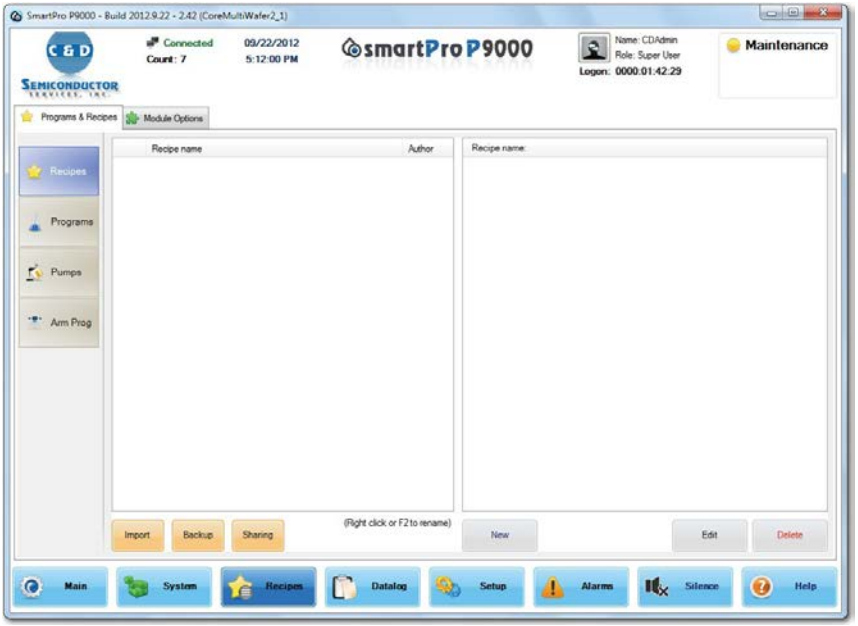

FIGURE 3-24: Managing recipes

3. On the Recipes page, click **New**. The Recipe Builder page opens. See Figure 3-25.

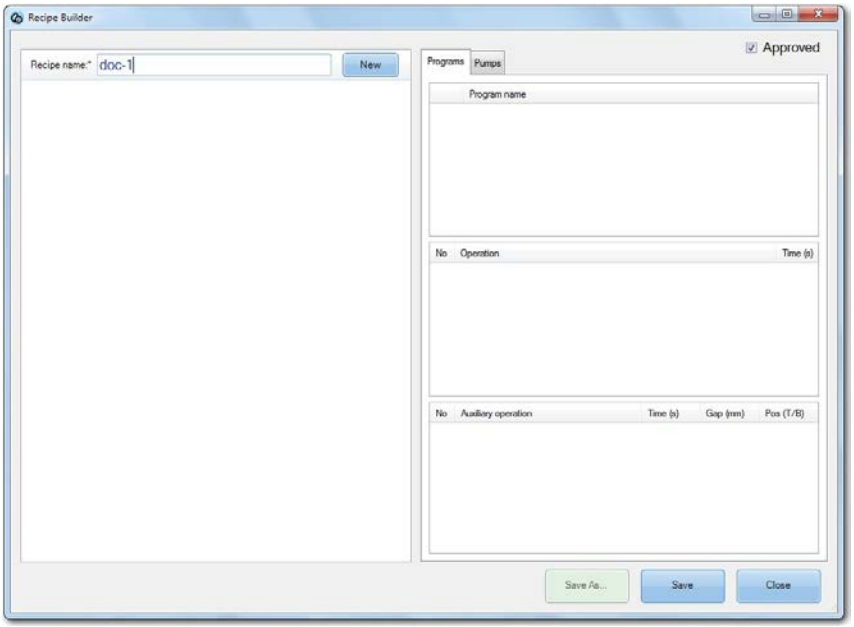

FIGURE 3-25: Creating a new recipe

4. Where it says Recipe Name, enter a unique name for the recipe.
5. In the Click **New** and create a work flow by selecting the desired modules from the list menu. See Figure 3-26.

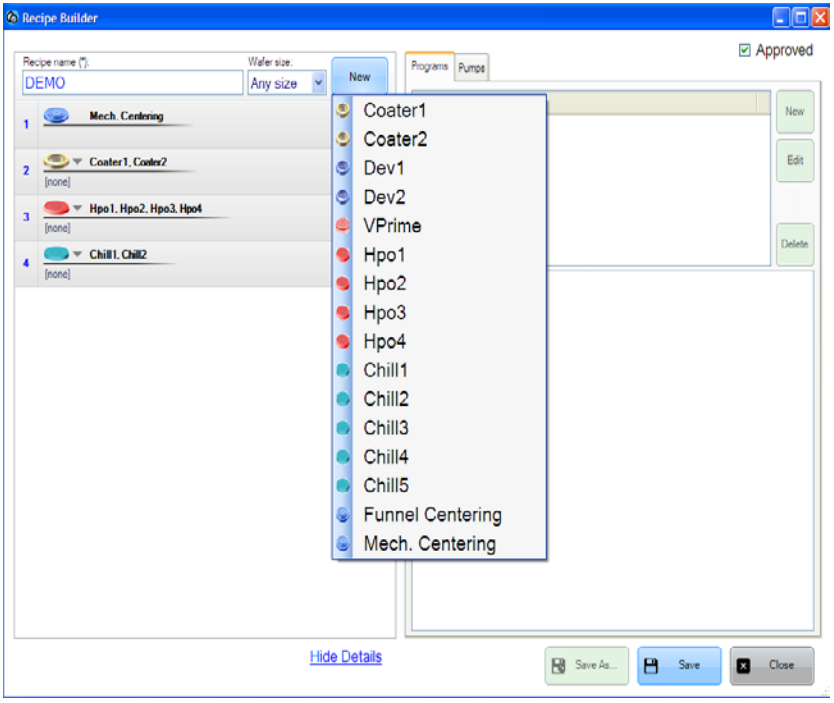

FIGURE 3-26: Creating a work flow

6. After you have selected all the modules for the work flow, click the down arrow next to each module and select the components to be used in the work flow. See Figure 3-27.

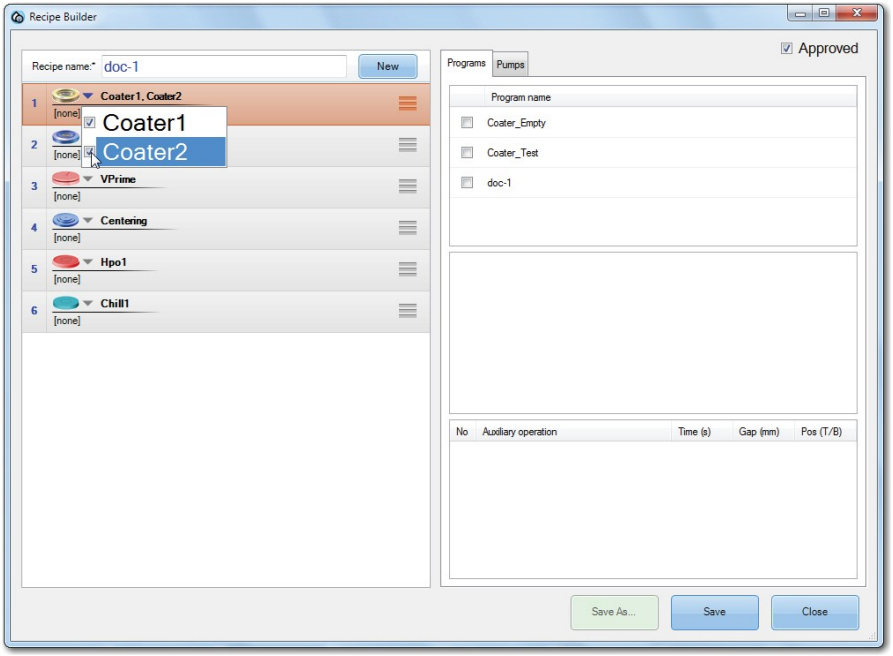

FIGURE 3-27: Selecting system modules

7. To add a program to a module, highlight the module, and click the Programs tab on the right to select a program for the module.
8. To add a pump program to the module, click the Pumps tab on the right and select a pump program.
9. Repeat Steps 7 through 8 to add module and pump programs to the other modules in the work flow.
10. Make sure to check the Approved check box in the upper-right corner of the page.
11. Click **Save** when completed. The new recipe will be added to the collection of recipes on your system and ready to use.

Modifying an Existing Recipe

You can modify an existing recipe to accommodate for changes in your production requirements. After you have made the needed changes, you can either save the

changes without changing the name of the recipe or save the recipe under a different name.

Also, if you are unfamiliar with the recipe concept used in the P9000 Cluster System, agood way to get started is by opening an existing recipe and see what it consists of. You can then try to modify the parameters to see how they work.

To modify an existing recipe:

1. On the Recipes page, make sure the Programs & Recipes tab is selected.
2. From the side menu, click Recipes. The Recipes page opens, showing all available recipes. See Figure 3-28.

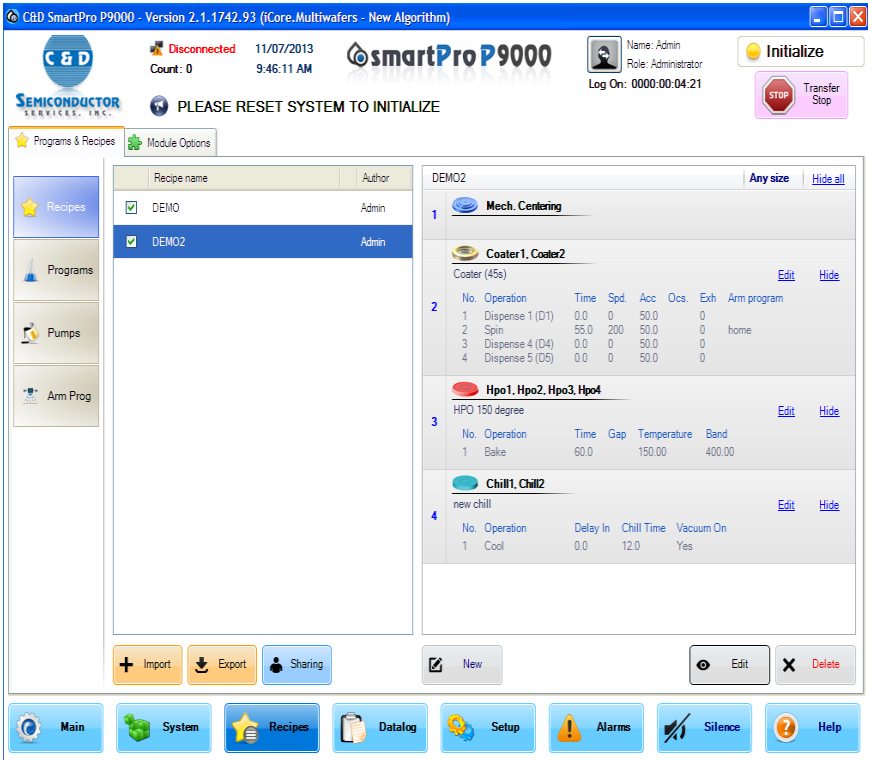

FIGURE 3-28: Selecting a recipe to edit

3. Highlight the recipe of interest and click **Edit**. The Recipe Builder dialog box opens, showing the flow of the recipe. See Figure 3-29.

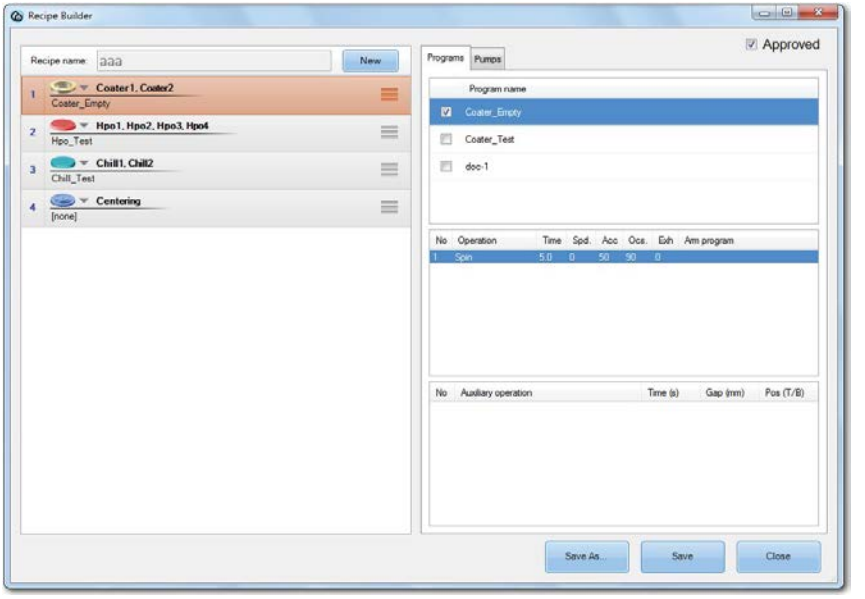

FIGURE 3-29: Editing a module program

4. Highlight a module of the recipe.
5. To change the program of the module, click the Programs tab and make the desired changes to the program by highlighting the values and overriding them with new ones.
6. To change the pump program, click the Pumps tab and make the desired changes to the pump program by highlighting the values and overriding them with new ones.
7. Click **Save** to save the changes without renaming the recipe or **Save As** to save it as a different recipe.
8. Optionally, you can also add new modules to the recipe flow by using the New button, as described in the previous section.

Deleting an Existing Recipe

As more recipes are created, the recipe screen can become cluttered, making recipe selection less convenient. To solve this issue, you may need to delete recipes that you no longer need.

To delete a recipe:

1. On the Recipes page, make sure the Programs & Recipes tab is selected.
2. From the side menu, click Recipes. The Recipes page opens. See Figure 3-30.

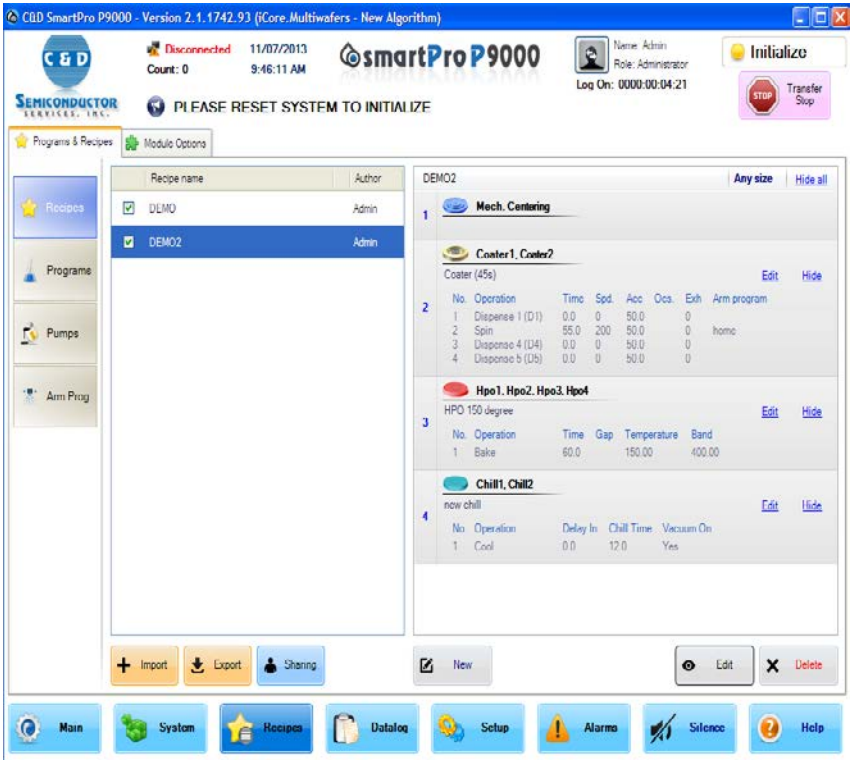

FIGURE 3-30: Deleting a recipe

3. Highlight the recipe of interest and click **Delete**.
4. When the confirmation message appears, click **Yes**.

Exporting Recipes

You can export recipes out of the system's database so that you can back them up on your hard drive, network, or removable storage device.

To export recipes:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click the Recipes. The Recipes page refreshes. See Figure 3-31.

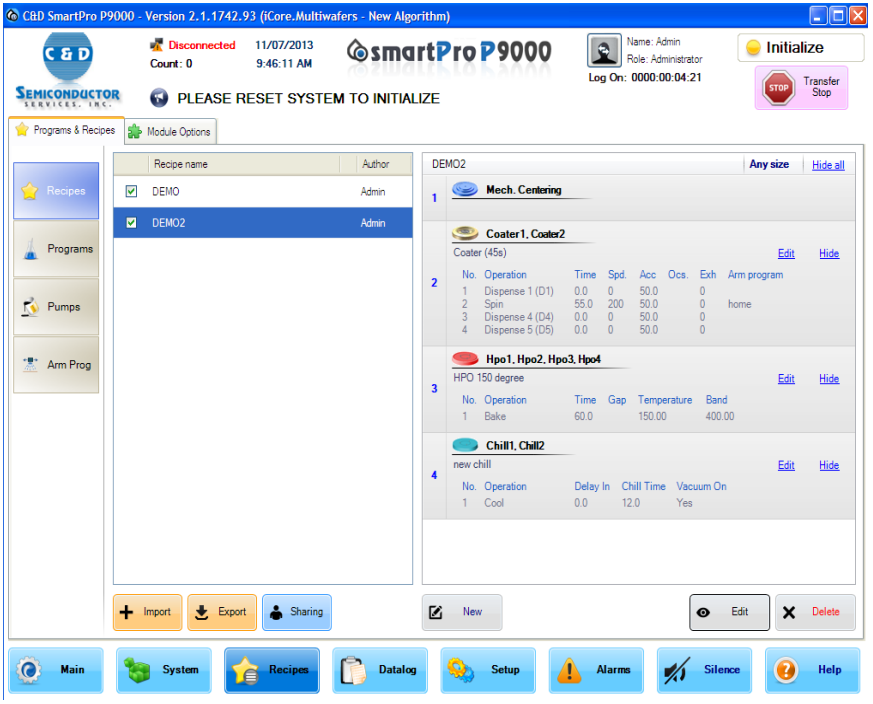

FIGURE 3-31: Exporting recipes

3. Click **Export.** The Export Recipes dialog box opens.
4. Click **Browse.** The Browse for Folder dialog box opens. See Figure 3-32.

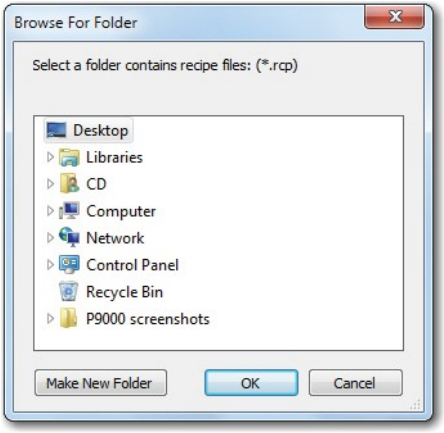

FIGURE 3-32: Selecting backup directory

5. Browse for the location where you want to back up the recipes and click **OK.** The dialog box closes.
6. In the Import Recipes dialog box, check the **Select All** check box and click **Export.**
7. When the confirmation message appears, click **OK.**

Importing Recipes

If you have recipes saved on your computer, network, or a storage device, you can import them to the system's database.

To import recipes:

1. On the Recipes page, make sure that the Programs & Recipes tab is selected.
2. From the side menu, click Recipes. The Recipes page refreshes.
3. On the Recipes page, click **Import**. The Import Recipes dialog box opens.
4. Click **Browse.** The Browse For Folder dialog box opens.
5. Browse for the recipes and click **OK.**
6. In the Import Recipes dialog box, check the **Select All** check box.
7. Click **Import.**
8. When the confirmation message pops up, click **OK.**

Note:

If you want to exclude some recipes files from being imported, you can do so by highlighting them and clicking ***Delete File*** *before clicking* ***Import****.*

Sharing Recipes

Normally, recipes created by a user may not be available for use by other users unless they are shared. Sharing recipes means placing them in the Public pane on the Recipes page so that other users can access and use them..

To share recipes:

1. On the Recipes page, make sure the Programs & Recipes tab is selected.
2. From the side menu, click Recipes. The Recipes page refreshes. See Figure 3-33.

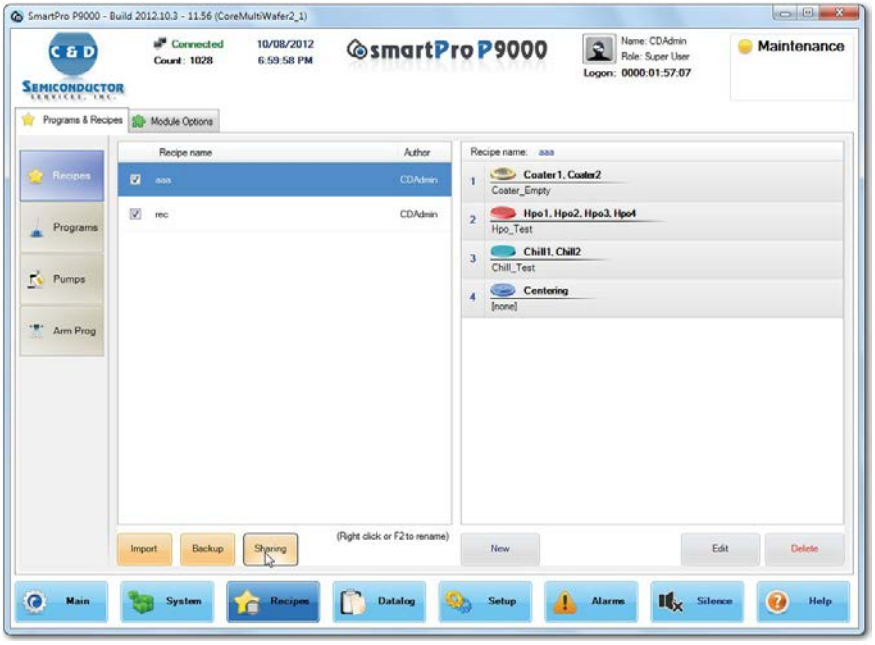

FIGURE 3-33: Sharing recipes

3. Click **Share.** The Share Recipes dialog box opens. See Figure 3-34.

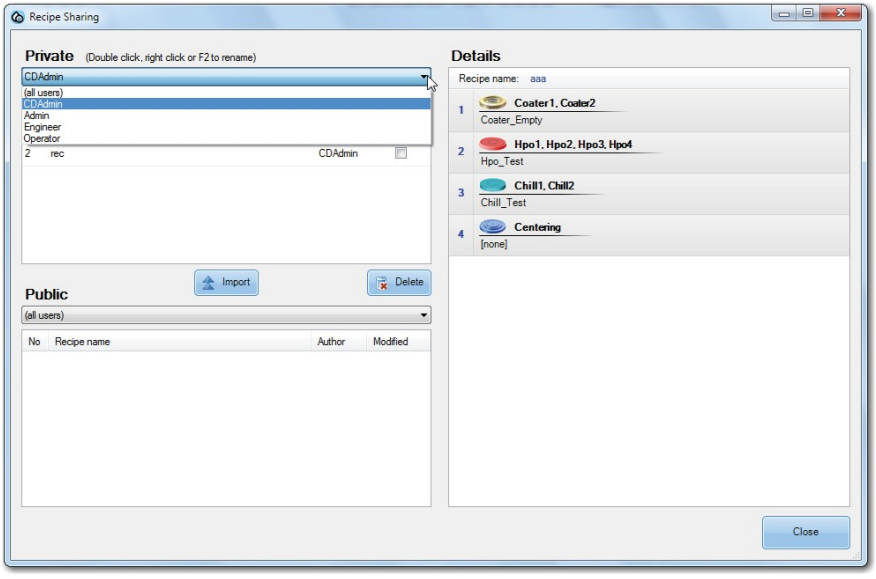

FIGURE 3-34: Sharing a user's recipes

4. In the Private pane, click the down arrow and select a user account whose recipes you want to share, and check the recipes to be shared. The recipes will be added to the Public pane below as you check them. See Figure 3-35.

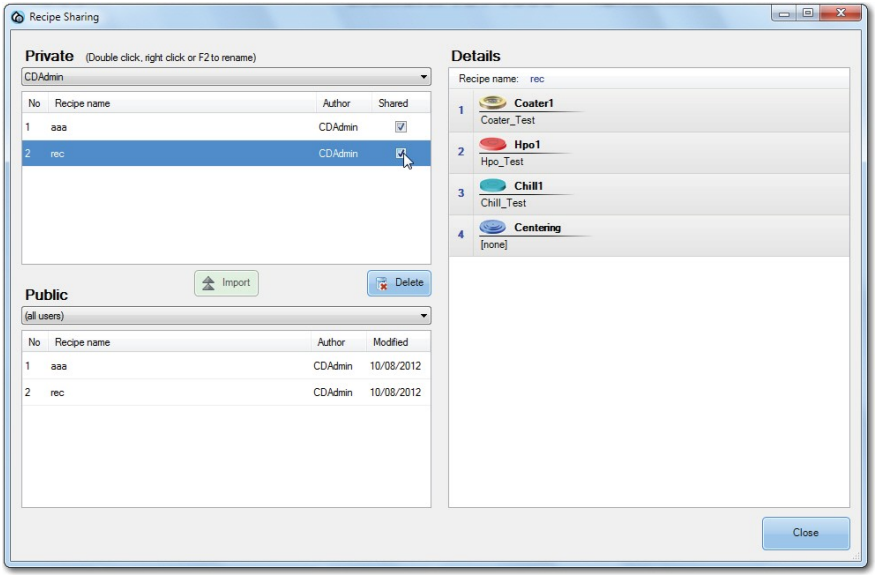

FIGURE 3-35: Selecting recipes to share

5. In the Public pane, click the down arrow to select the user account with whom the recipes are to be shared.
6. Click **Close** when done.

Managing Module Options

The Recipes page comes with a Module Options tab, which shows the options for the various modules on the P9000, such as Coaters, Developers, Vapor Primer, and Hot Plate Ovens, etc. Options are the operations or events performed by the modules. From the Module Options page, you are able to view the options available for each module and change the values of each option unless it is marked read-only.

Accessing the Module Options Page

You can access the Module Options page using the following procedures:

1. On the navigation bar, click Recipes. The Recipes page opens.

2. From the top of the Recipes page, click the Module Options tab. The Module Options page opens. See Figure 3-36.

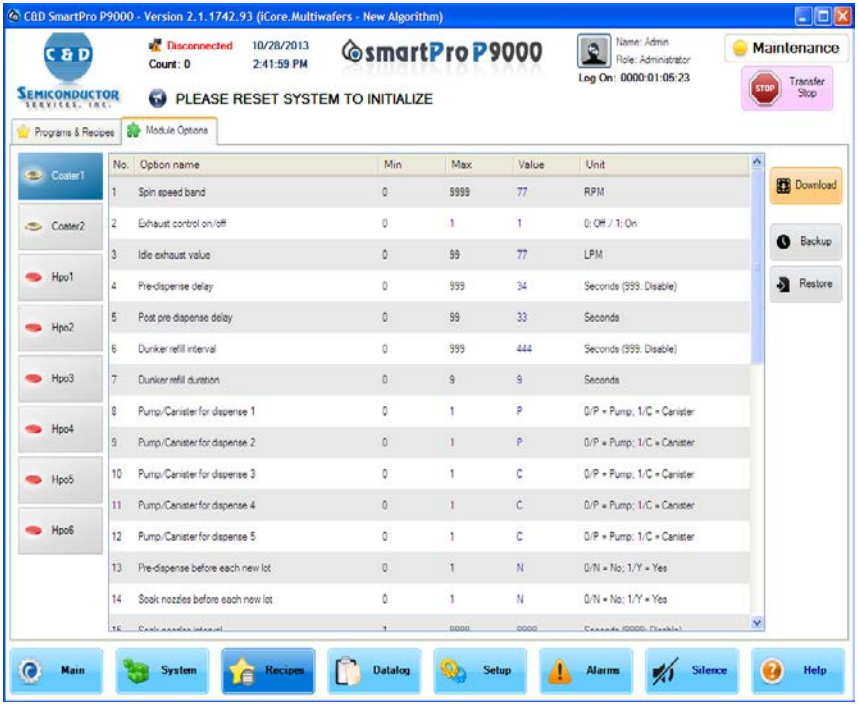

FIGURE 3-36: The Module Options page

Viewing a Module's Options

As you have noticed, the left side of the Module Options page displays all modules available on the P9000. It serves as the menu bar of the Module Options page.

To see the options of a specific module:

1. From the left side of the Module Options page, click the module of interest. The Module Options page refreshes, displaying options available for that module.

Modifying an Option Value

You can modify the value of any option for a module as long as it is not read-only.

To modify the value of an option:

1. On the side menu of the Module Options page, click the module of interest.
2. Identify the option of interest, highlight its value, override it with a new one, and click Save. See Figure 3-37.

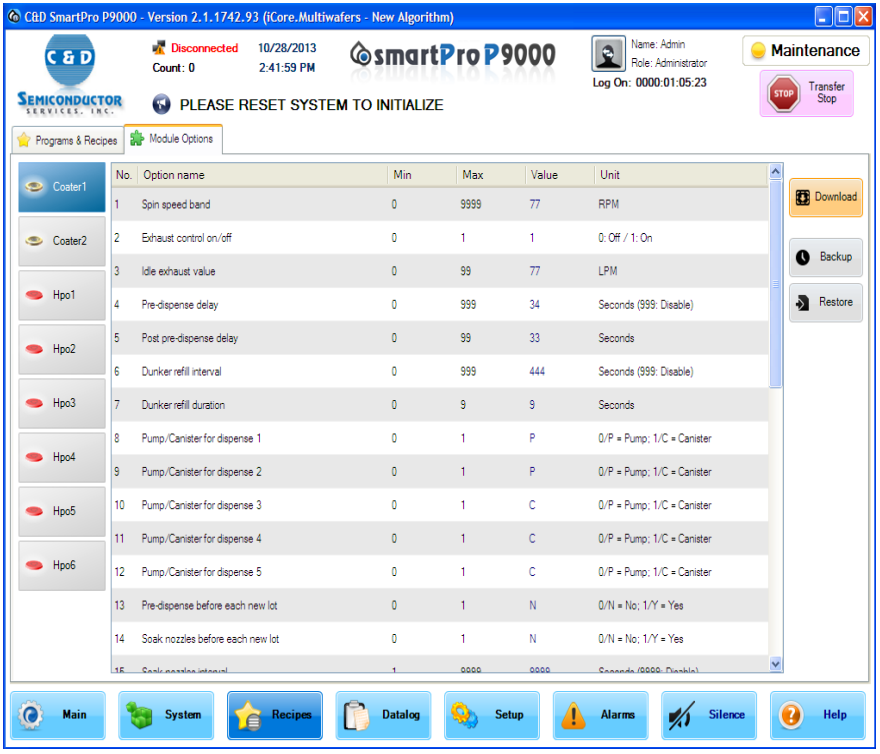

FIGURE 3-37: Modifying the value of an option

CHAPTER 4 System Setup

Chapter Outline

This chapter discusses P9000's system setup. It covers the following topics:

- P9000 system setup
- Customizing P9000's general settings
- Customizing network communication
- Running remote component exercise
- Customizing pump settings
- Managing user accounts
- Customizing system messages
- Miscellaneous configurations

P9000 System Setup

The P9000 comes pre-configured according to customer requirements. This allows the customer to run the system straight out of the package, without having to configure the system from scratch.

However, if you want to change the default settings to accommodate your changing production requirements, you can customize the system settings anytime from the Setup page, which allows you to customize the configuration of various system settings.

Customizing P9000's General Settings

The General page shows the available modules on the P9000, as shown in Figure 4-1.

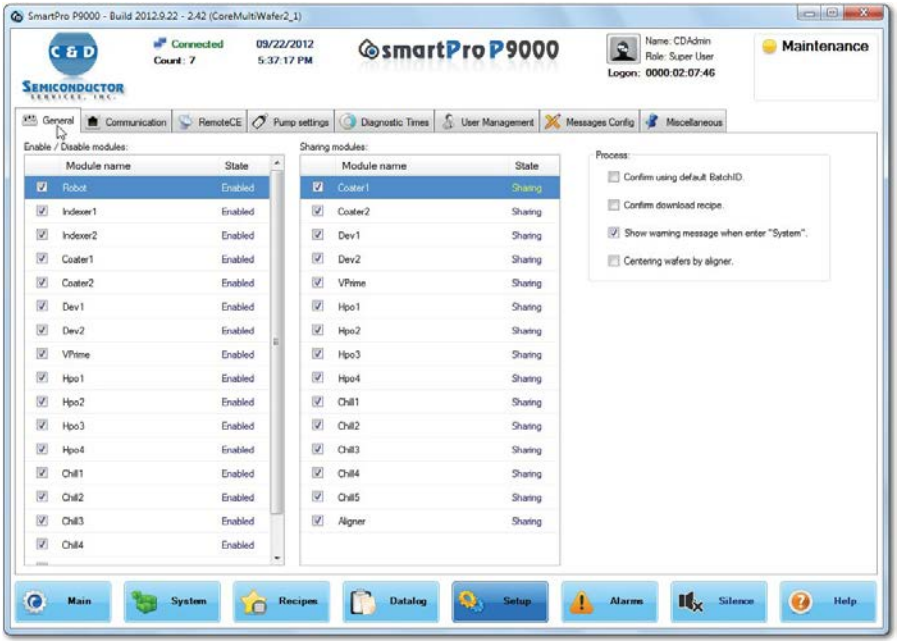

FIGURE 4-1: Configuring General settings

The General page shows the following three panes (from left to right):

- Enable/Disable Modules
- Sharing Modules
- Process

The following paragraphs discusses each of the sections of the General page.

Enable/Disable Modules

The Enable/Disable Modules pane shows all modules available on the P9000. It also shows which modules are enabled (checked) or disabled (unchecked). By default, all modules are enabled, meaning they are available for use. If, for some reason, a certain module becomes unavailable or you do not want to use them, you can make them unavailable by un-checking the corresponding check boxes.

It is important to know that changes you make in here will affect the recipe you select. For instance, if you disable Coater 1 which is part of a recipe you choose to use, then you must modify the recipe by replacing Coater 1 with Coater 2 before you start the wafer-processing operation. Otherwise, the system will encounter an error and cannot proceed until after you have modified the recipe accordingly.

Sharing Modules

The Sharing Modules pane shows which modules are or are not shared. The P9000 allows two concurrent wafer-processing operations. Sharing a module means that the module can be used by both processes. By default, all modules are shared (checked), but, if you do not want certain modules to be shared, you can uncheck the corresponding check boxes.

Processes

The Process pane shows four system processes, as described below. You can enable or disable these processes by checking or un-checking their corresponding check boxes.

- Confirm using default batch ID — If selected, the system will prompt you to use the default batch ID when no batch ID is specified prior to the start of an operation.

- Confirm download recipe — If selected, the system will display a confirmation message when a recipe has been downloaded.
- Center wafers by Mechanical Centering — If selected, the system will center wafers using the Mechanical Centering module.

Configuring Network Communication

The Communication page shows P9000's network communication settings, such as its IP address and port number. You can open the Communication page by clicking the Communication tab across the top of the Setup page.

The P9000 communicates through its default settings, and these settings should not be changed.

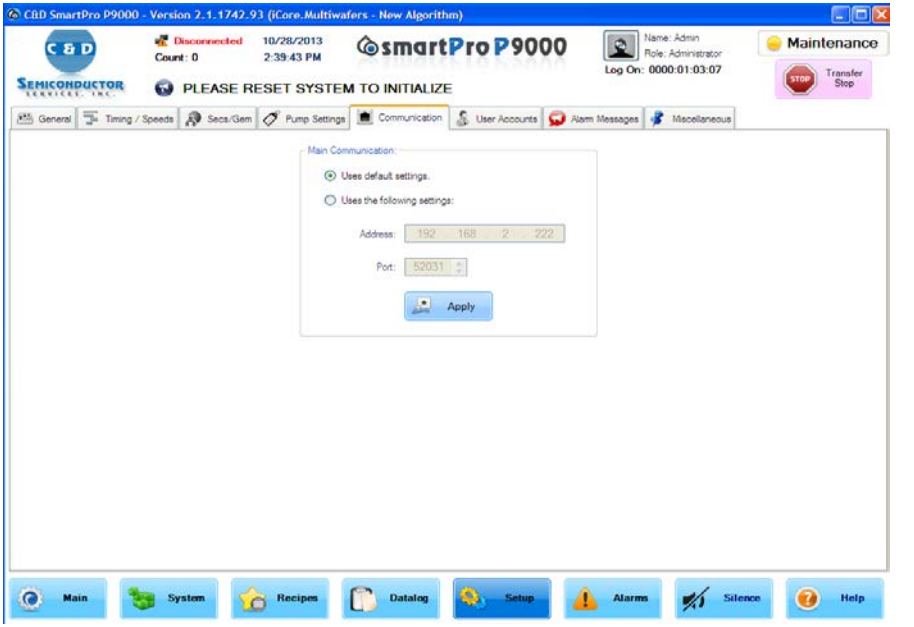

FIGURE 4-2: Configuring network communication

Performing Remote Component Exercise

The Remote CE page allows you to set up remote component exercises, as shown in Figure 4-3. The page has two communication options for remote component exercise: USB and WiFi. By default, the P9000 uses USB for remote component exercise, but you can switch to WiFi using the following procedures:

1. Click the **WiFi Connect** radio button.
2. Specify the IP address.
3. Select a port number.
4. Click **Apply.**

To start a remote component exercise:

1. Select a Remote CE Communication option.
2. Click S**tart.**
3. Once the exercise has started, you can stop it by clicking **Stop**.

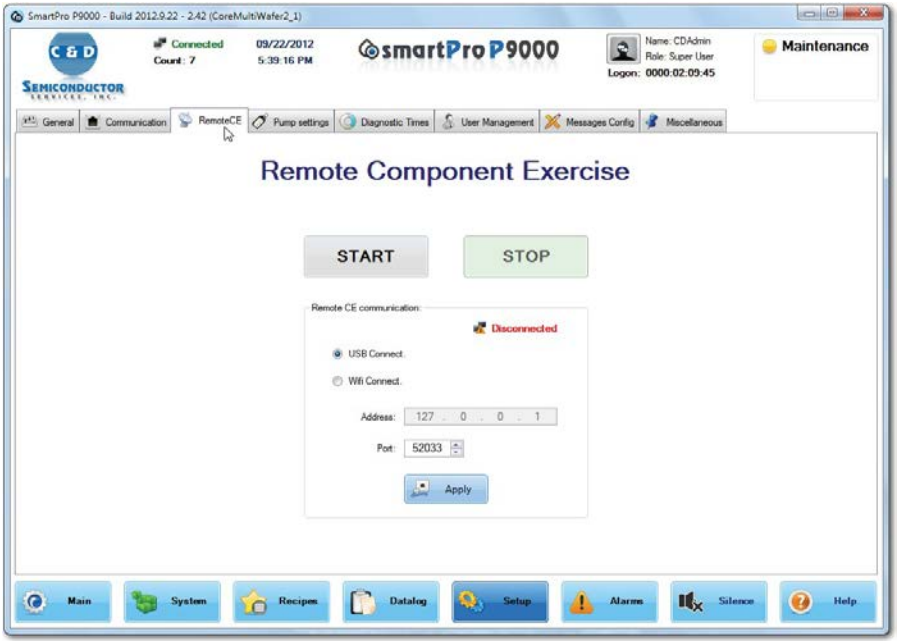

FIGURE 4-3: Setting up remote component exercise

Customizing Pump Settings

The P9000 comes with default pump configurations based customer requirements. This enables customers to put the system into production right away without having to configure the pumps. However, if you want to create custom pump configurations of your own, you can easily do so on the Pump Settings page.

Accessing the Pump Settings Page

To access the Pump settings page:

1. From the menu bar, click **Setup**. The Setup page opens.
2. From the top of the Setup page, click Pump settings. The Pump settings page opens. See Figure 4-4.

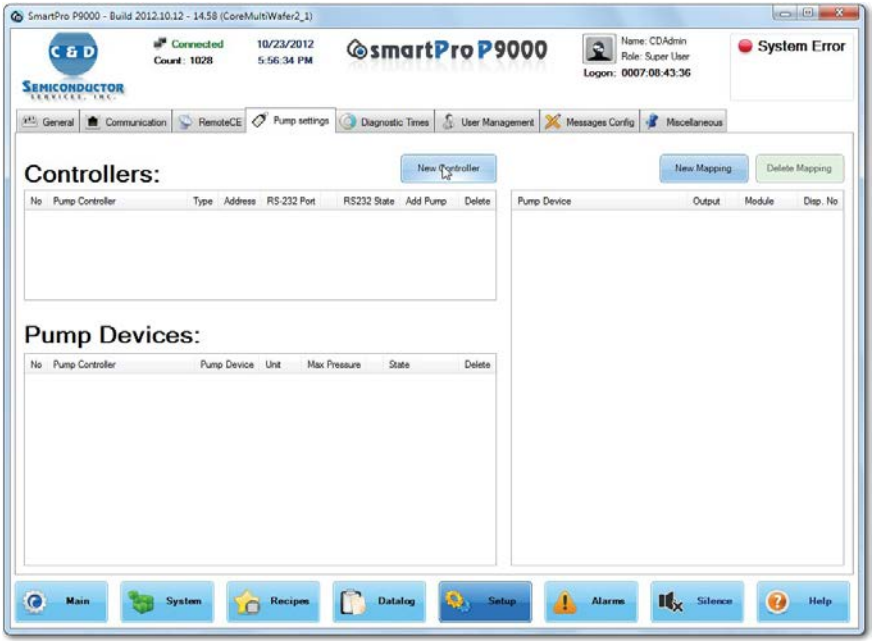

FIGURE 4-4: The Pump settings page

Creating New Pump Controllers

A pump controller is like a container or folder that holds information about the pumps. It provides an easy way to organize the pumps used for wafer processing. The P9000 comes with two types of pumps: Cybor and IDI. By default, the system automatically names the pump controller with either Cybor or IDI, depending on which pump controller you choose, unless you want to use a custom name of your own.

To create a new pump controller:

1. On the Pump settings page, click **New Controllers.** The Create New Pump Controller dialog box opens. See Figure 4-5.

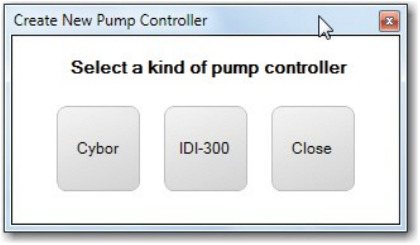

FIGURE 4-5: Select a pump controller type

2. Click to select a pump controller, e.g., Cybor. The Pump Controller dialog box opens. See Figure 4-6.

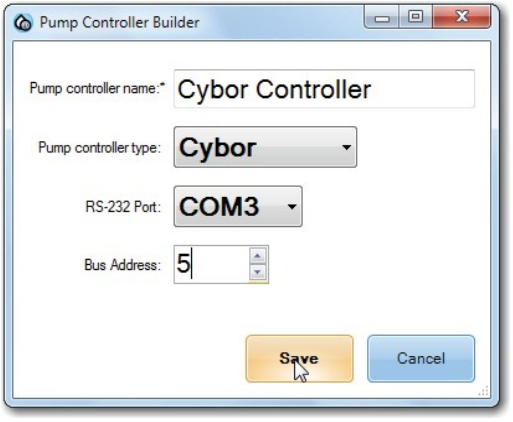

FIGURE 4-6: Creating a pump controller

3. Enter a unique name for the pump controller or simply accept the name the system automatically creates for you.
4. select a RS-232 port.
5. Select a BUS address.
6. Click **Save.**
7. When the confirmation message shows up, click **Yes.** The newly created pump controller shows up in the Controllers pane of the Pump settings page.

Adding Pumps to a Pump Controller

Once you have created a pump controller, the next step is to add pumps to it.

To add pumps to a pump controller:

1. On the Pump settings page, click **Add Pump,** as shown in Figure 4-7.

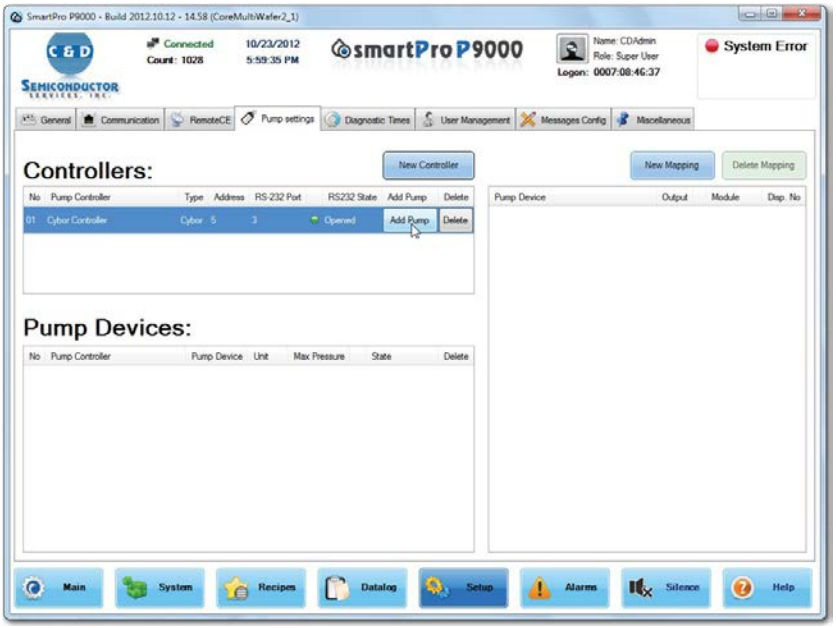

FIGURE 4-7: Adding a pump to pump controller

2. In the Pump Device Builder dialog box, make the desired selections and click **Save.** See Figure 4-8.

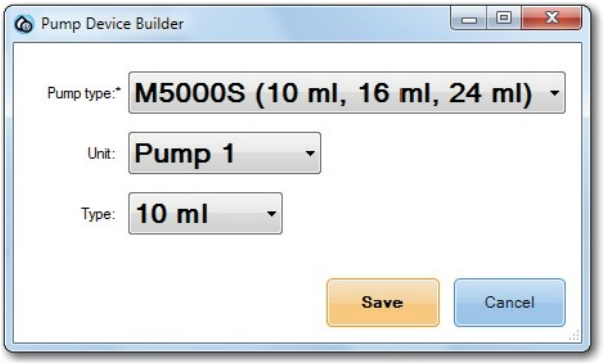

FIGURE 4-8: Adding a new pump

3. When the confirmation message appears, click **Yes.** Figure 4-9 shows the Pump settings page with two pump controllers configured and two pump devices in one controller.

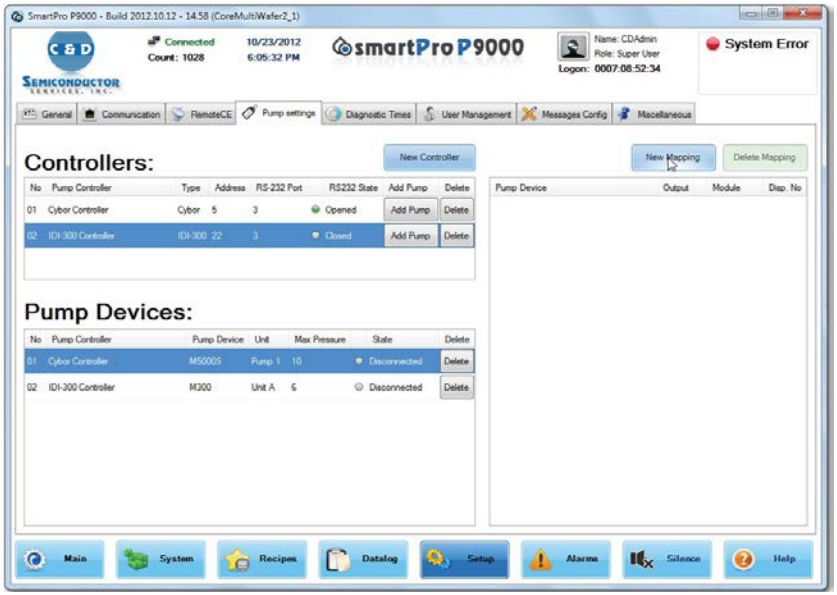

FIGURE 4-9: Pump settings page with sample pump controllers and pumps

Linking Pumps to Modules

Pumps are closely associated with certain modules. They discharge chemicals onto wafers while they are being processed on a module. Once you have created pump controllers and added the pumps to them, the next thing you need to do is to link the pumps with modules. In this way, you tell the system what pump to use with what module or modules.

To link a pump with modules:

1. On the right side of Pump settings page, click **New Mapping.** See Figure 4-10.

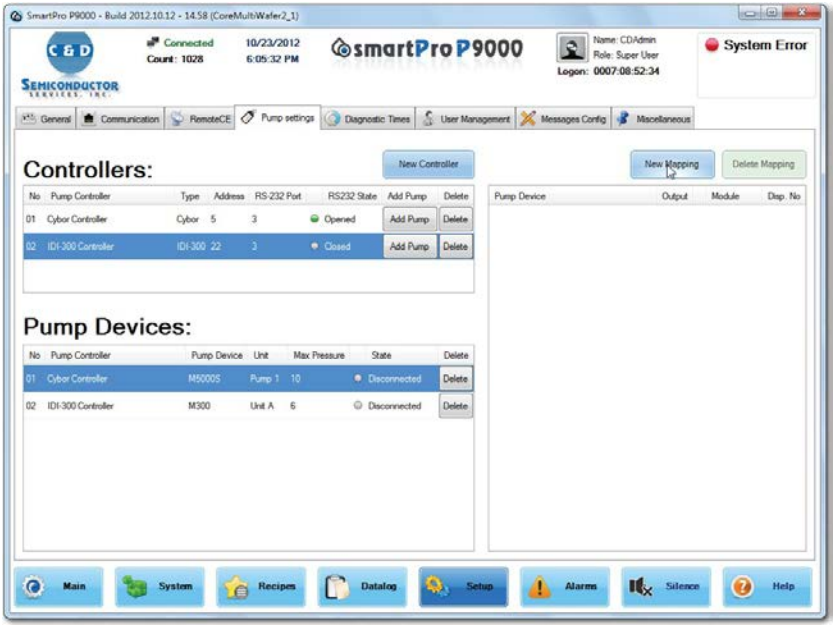

FIGURE 4-10: Mapping pumps with modules

2. In the Pump Output Mapping dialog box, select a pump controller. See Figure 4-11.

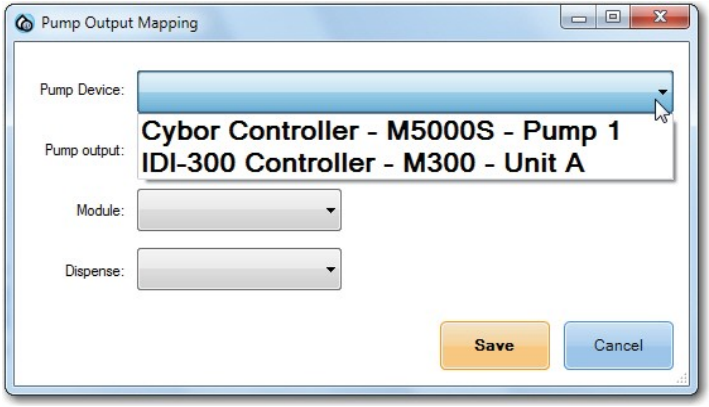

FIGURE 4-11: Selecting a pump device

3. Select a module. See Figure 4-12.

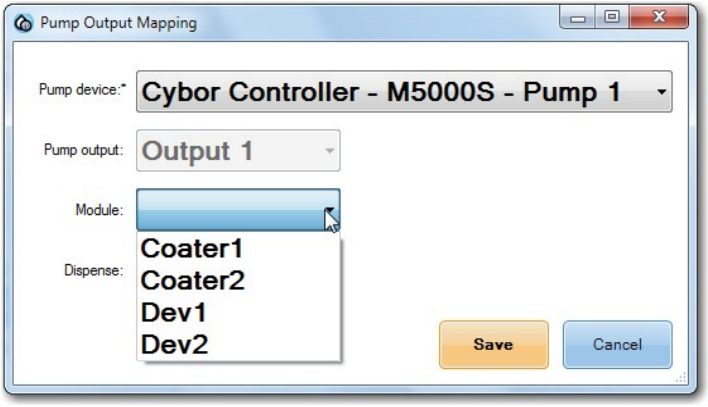

FIGURE 4-12: Selecting a module

4. Select a dispense. See Figure 4-13.

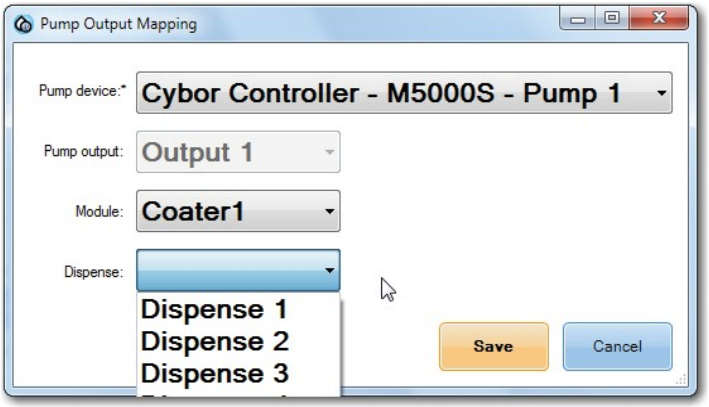

FIGURE 4-13: Selecting a Dispense.

5. Click **Save.**
6. When the confirmation message appears, click **Yes.** Figure 4-14 shows the mapping between the pumps and modules.

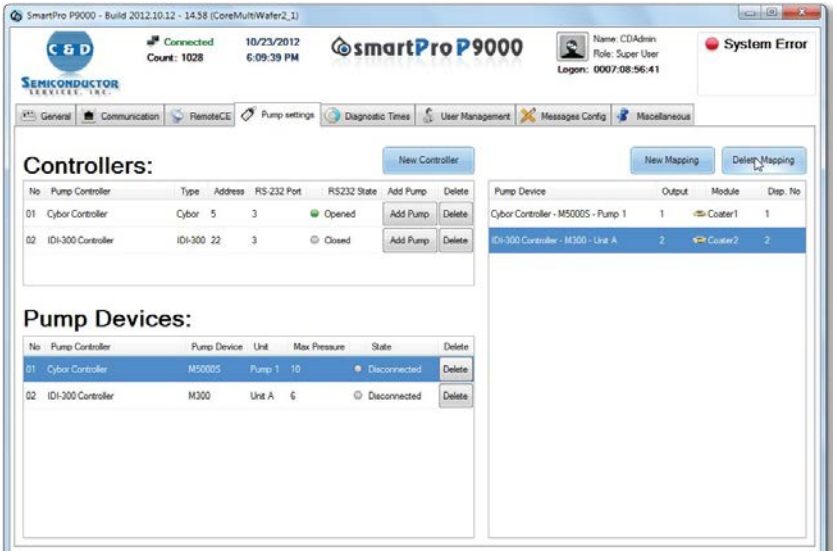

FIGURE 4-14: Pumps linked to modules

Managing Users

Access to the P9000 is password-protected. Every user should have a user account with valid user name and password in order to log onto the P9000 operating console.

The system administrator can create as many user accounts as needed. Prior to creating user accounts, the administrator should define different user roles and assign proper privileges to each of them. Once all the roles are properly defined, it is much easier to assign them to user accounts.

Opening the Manage User Page

Top access the Manage User page:

7. From the navigation bar, click the Setup button. The Setup page opens.
8. From the Setup page, click the User Management tab. See Figure 4-15.

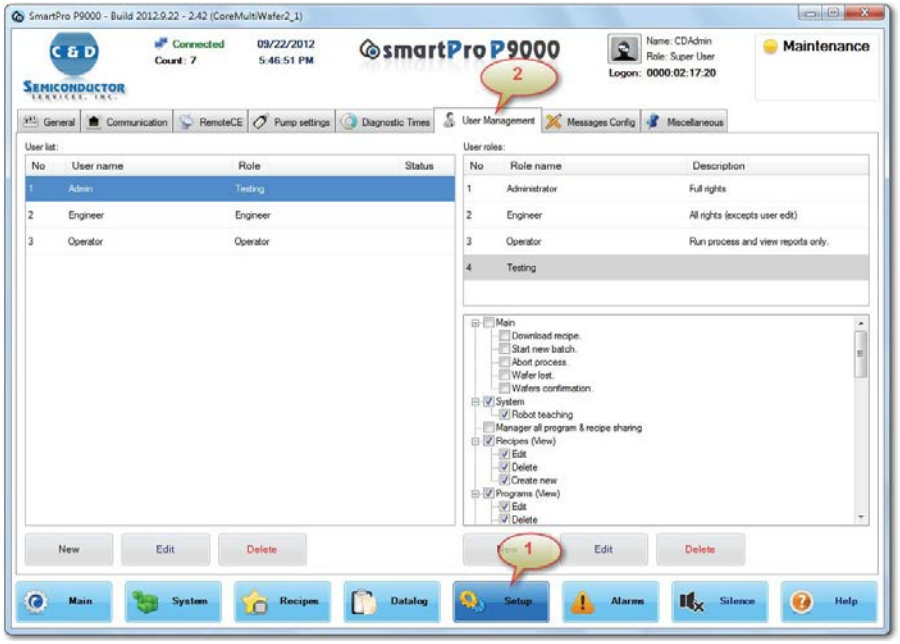

FIGURE 4-15: The User Management page

About the User Management Page

As illustrated in Figure 4-16, the User Management page has two panels: left and right. The left panel lists all available user accounts, showing the user name and role of each account, whereas the right panel provides a brief description of the roles and their privileges.

Each of the panels are some buttons for creating, editing, and deleting users or roles, respectively.

Creating and Defining User Roles

Creating and defining user roles is the first step in creating user accounts.

To create a user role:

1. Under User roles panel, click the New button. The User Role dialog box opens. See Figure 4-16.

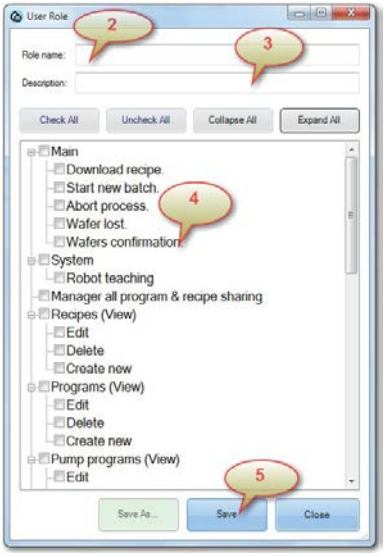

FIGURE 4-16: Creating and defining a user role

2. Enter a unique name for the role.

3. Enter a brief description of the role.
4. Check the privileges to be granted to the role.
5. Click the Save button.

Modifying User Roles

Editing a user role involves changing the role name, description, and/or privileges.

To edit a user role:

1. From the User roles panel (Figure 4-16), highlight the user role of interest.
2. From the bottom of the panel, click the Edit button.
3. Make the desired changes.
4. Click Save As to save the modified user role under a different name, or Save to save it under the same role name. See Figure 4-17.

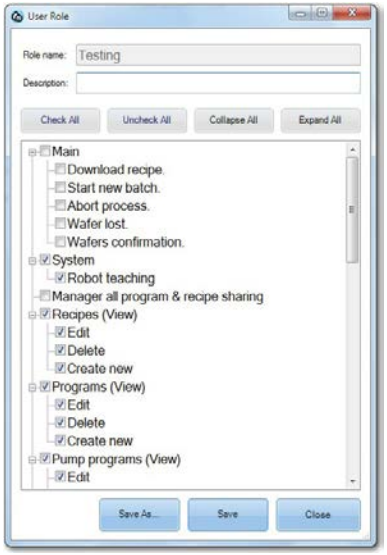

FIGURE 4-17: Modifying a user role

Deleting User Roles

Care must be taken to keep the User Management page nice and clean so that you can easily find what you need. For that reason, user roles that are no longer needed should be deleted in order to reduce the page clutter.

To delete a user role:

1. From the User roles panel (Figure 4-15), highlight the user role of interest.
2. From the bottom of the panel, click the Delete button. A confirmation message window opens. See Figure 4-18.

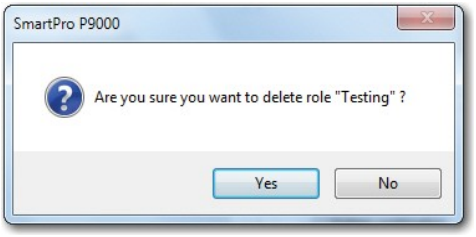

FIGURE 4-18: Confirming to delete a user role

3. Click Yes. The user role will be deleted after the page refreshes.

Creating User Accounts

Once you have created and defined the user roles, you can easily create user accounts.

To create a user account:

1. Under the User list panel, click the New button. The New User dialog box opens.
2. Enter a unique name for the account.
3. Create a password for the account.
4. Confirm the password by entering it for a second time.
5. Click the Role drop-down menu and select a user role.
6. Add a brief description about the account.

7. Click Save. See Figure 4-19. The new account shows up under Account list on the User Management page (Figure 4-15).

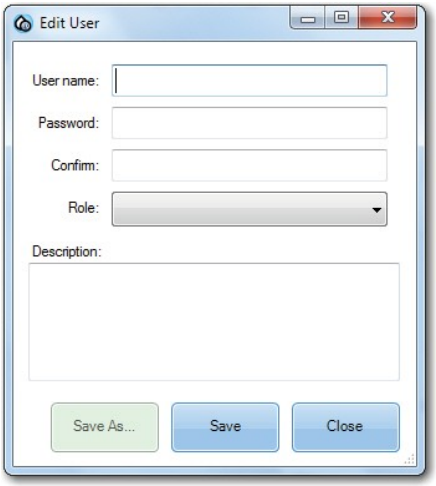

FIGURE 4-19: Creating a user account

Modifying User Accounts

You can modify the configuration of a user account when the responsibility of the account user has changed.

To modify a user account:

1. From the User list panel of the User Management page (Figure 4-15), highlight the user account of interest.
2. Click the Edit button below the panel. The Edit User dialog opens.
3. Make the desired changes.
4. Click Save As to save the modified user account under a different account name, or Save to save it under the same name.

Note:

If you want to modify the privileges associated with the user role, you should modify the role first before making changes to the user account. For instructions on how to modify a user role, refer to "Modifying User Roles" on page 69.

Deleting User Accounts

You can delete the user accounts that are no longer needed.

To delete a user account:

1. From the User list panel of the User Management page (Figure 4-15), highlight the user account of interest.
2. Click the Delete button below the panel. A confirmation message shows up.
3. Click Yes. The user account will be deleted from the User list.

Configuring System Messages

The Message Configuration page shows the default system messages, as shown in Figure 4-20.

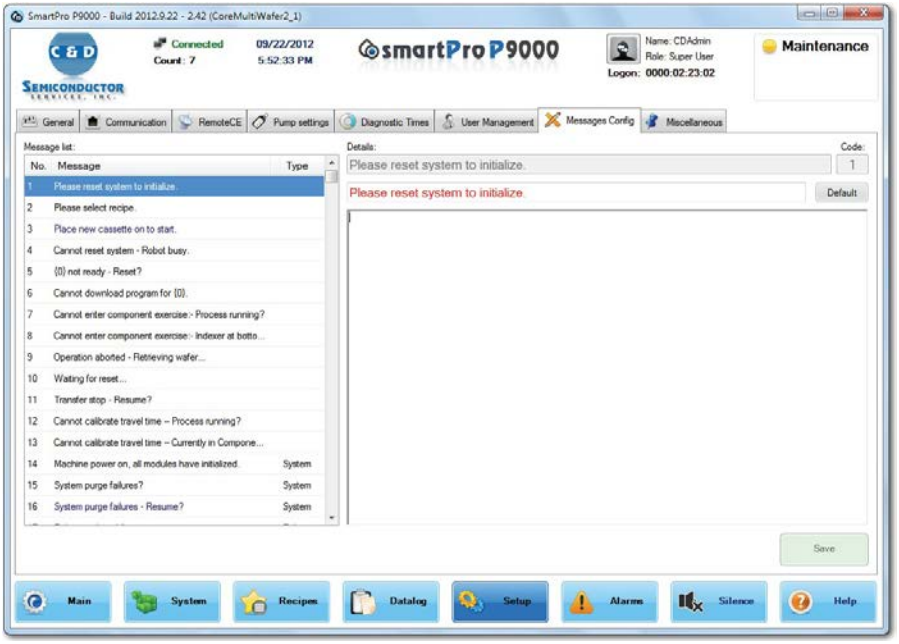

FIGURE 4-20: Configuring system messages

Modifying Existing Messages

You can modify the existing messages using the following procedures:

1. From the Message List on the left, click the message of interest.
2. The message will show up in the Details pane on the right.
3. Highlight the words in the message you want o change.
4. Override the words with new ones.
5. Click **Save.**

Creating New Messages

You can also create new messages using the following procedures:

1. In the blank space on the right, type the message.
2. Click **Save.**

Miscellaneous Configurations

The Miscellaneous page offers some more configuration options, as shown in Figure 4-21.

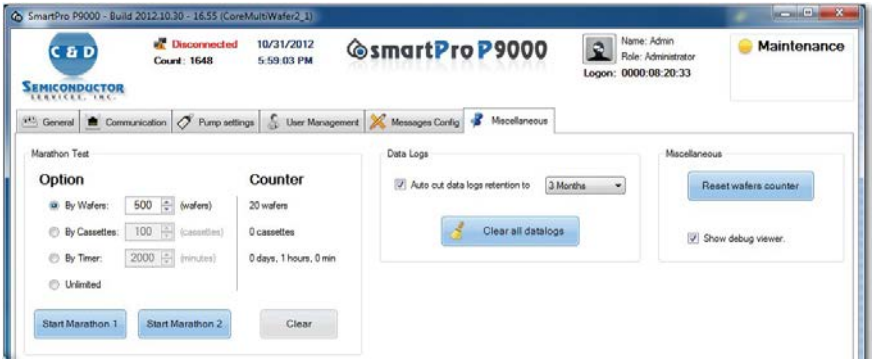

FIGURE 4-21: Configuring miscellaneous settings

The Miscellaneous page has the three sections:

- Marathon Test
- Data Logs

- Miscellaneous

Setting Up Marathon Tests

The Marathon Test section contains controls for configuring and running system marathon tests.

- By Wafers — Sets up a marathon test by the number of wafers. The test stops once the system has processed the set number of wafers.
- By Cassettes — Sets up a marathon test by the number of cassettes. The test stops once the system has processed the set number of cassettes (of wafers).
- By Timer — Sets up a marathon test by the number of minutes. The test stops once the system has reached the set number of minutes.
- Unlimited — Sets up a marathon test that will last forever.
- Start Marathon 1 — Starts a marathon test 1 (on Indexer 1).
- Start Marathon 2 — Starts a marathon test 1 (on Indexer 2).
- Clear — Erases the current readings on the counter.

Managing Data Logs

The Data Logs section provides some basic control on the data logs in the system's database.

- Auto cut data log retention to — Check this check box to let the system retain the data logs for the period of time you specify. The system will automatically remove from the database data logs that are beyond the specified time frame.
- Clear all data logs — Clears all data logs.

Miscellaneous Settings

This section provides the following controls:

- Reset wafer counter — resets the wafer counter to 0 (zero).
- Show debug viewer — shows the debug window.

CHAPTER 5 Viewing & Managing Reports

Chapter Outline

This chapter discusses P9000's Data log page, which contains various reports that the system is able to generated. It covers the following topics:

- Accessing the Data log page
- Types of reports
- Data log page UI components
- Alarm Reports
- Events Reports
- Wafer Lost Reports
- User Reports
- Batch Reports
- Batch Details Reports

Access the Data log Page

The P9000 has the capability to capture various system data and present them in the form of reports. The reports are organized into six major categories, each of which is represented by a tab on the Data log page. You can access the Data log page by clicking **Data log** on the Menu bar.

Types of Reports

Table 5-1 briefly describes the six types of reports that the P9000 is able to generate.

TABLE 5-1: Description of P9000 Cluster System Data Reports

Report Category	Description
Alarm Reports	Shows alarms the system has generated.
Event Reports	Shows data of events the system has performed.
Wafer Lost Reports	Shows the statistics of lost wafers — those that the system was unable to process due to human or mechanical error.
User Reports	Shows activities on the system by user account.
Batch Reports	Shows data by batch ID.
Batch Details Reports	Shows batch data in greater details.

Datalog Page UI Components

Figure 5-1 highlights the major UI components common to all reports pages. Table 5-2 describes each of these components.

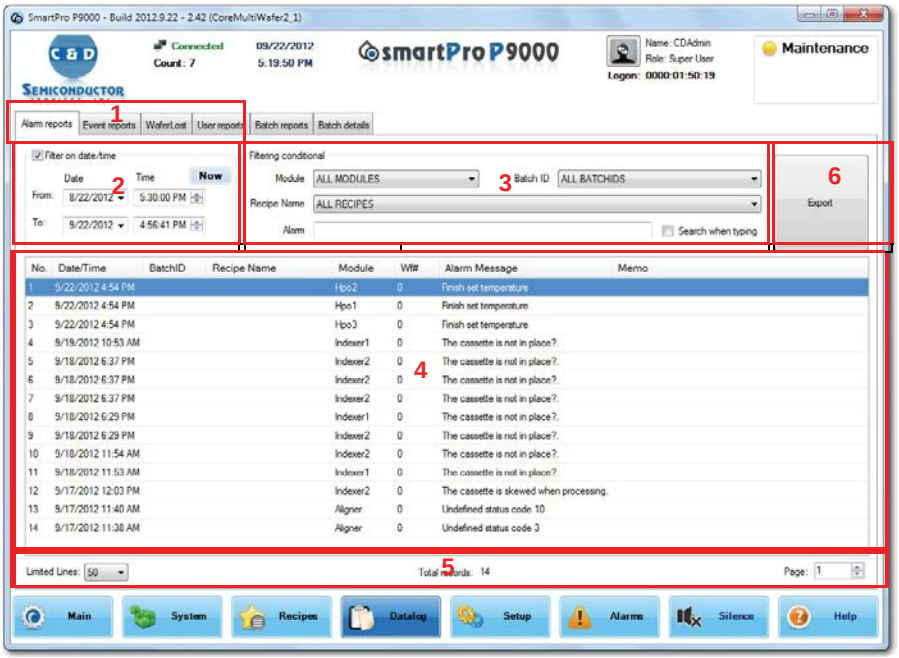

FIGURE 5-1: Reports Page Major UI Components

TABLE 5-2: Reports Page Common UI Components

#	UI Component	Description
1	Report Menu	Displays the types of reports that the system generates. Clicking a tab opens the corresponding report.
2	Filter Date/Time	Allows you to view reports for a specific time frame by selecting the From: and To: date and time. Clicking **Now** allows you to view the most recent reports.
3	Filter Conditional	Allows you to view alarms by module, recipe, batch ID, or text in a alarm message. Ticking the Search when typing check box will allows the system to search the alarm database as you are typing.

TABLE 5-2: Reports Page Common UI Components

#	UI Component	Description
4	Report Panel	Displays the content of the report being selected. By default, this part of the screen is empty when the Reports screen opens because no report is being selected. The screen will also be empty if the type of report you select contains no data at all.
5	Page Control	Allows you to specify the number of logs per page, see the total number of entries in a report, and choose the page of a report to display.
6	Export	Exports the report currently displayed on the screen in Microsoft Excel format.

Alarm Reports

The Alarm Reports page shows alarm messages the system has generated. You can view alarm reports by selecting the Alarm reports tab, as shown in Figure 5-1. However, the Alarm reports page will show up blank (without any entry) if the system has not generated any alarm.

Table 5-3 describes the information shown on the Alarm Reports page.

TABLE 5-3: Data in Alarm Reports

Data	Description
No.	The sequence number of an alarm on the screen.
Date/Time	The date and time when an alarm was triggered.
Batch ID	The ID number for a batch of wafers. It shows 0000000000000000 (20 zeros) if no batch ID was created.
Recipe Name	The name of the recipe used.
Module	The system module, i.e.,CHILL, VP, CTPC, etc. Wafer
#	The Index number that the Indexer assigned to a wafer
Alarm Message	The message associated with a particular alarm
Memo	The memo entered by an operator, if applicable.

Event Reports

The Event Reports lists all the events the system has logged. You can open the Event reports page by selecting the **Event reports** tab. Figure 5-2 shows the Event Reports page.

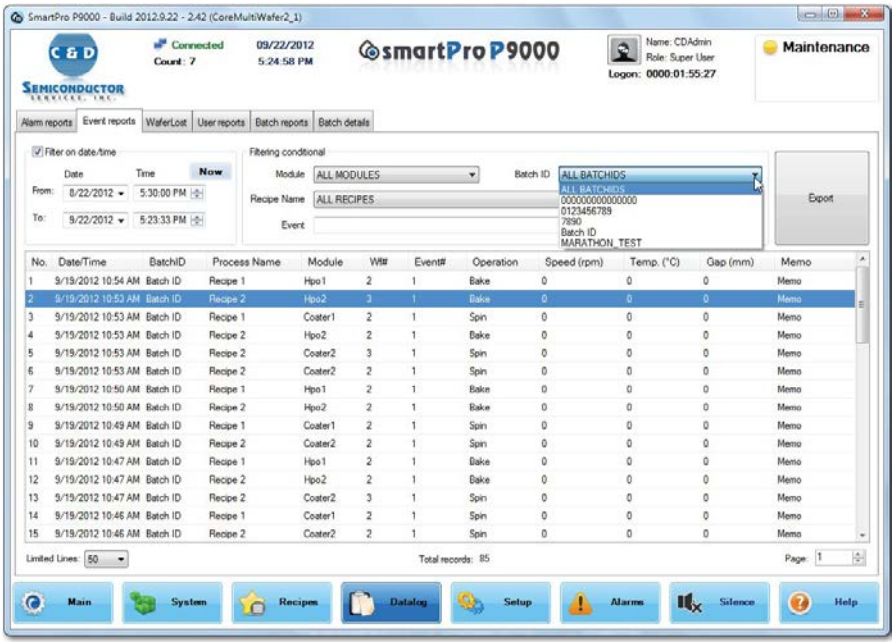

FIGURE 5-2: The Event Reports Page

As seen from Figure 5-2 above, the Event Report contains the following information as described in Table 5-4.

TABLE 5-4: Data in Event Reports

Data	Description
No.	The sequence number of an event.
Date/Time	The date and time when an event occurred.
Batch ID	The ID number for the batch of wafers, or 00000000000000 if no batch ID was created.
Process Name	The name of the process used for an event.

TABLE 5-4: Data in Event Reports

Data	Description
Module	The system module, i.e.,CHILL, VP, CTPC, etc.
Wf #	The index number that the Indexer assigned to a wafer.
Event#	The sequence number of an event.
Operation	The type of processing operation used for an event.
Speed (rpm)	The processing speed in terms of revolutions per minute.
Temp. (C)	The temperature in centigrade used for an event.
Memo	The memo the user entered about a particular event, if applicable.

Wafer Lost Reports

The Wafer Lost reports show data about lost wafers the system generated. You can open the Wafer Lost Reports page by selecting the Wafer Lost tab. Figure 5-3 shows the Wafer Lost Reports page. Table 5-5 describes the information in Wafer Lost Reports.

FIGURE 5-3: The Wafer Lost Reports Page

TABLE 5-5: Data in Wafer Lost Reports

Data	Description
No.	The sequence number of a log on the current Wafer Lost page.
Date/Time	The date and time when a wafer was lost during an operation.
Batch ID	The ID number for the batch of wafers, or 0000000000000000 (20 zeros) if no batch ID was created.
Recipe Name	The name of the recipe used.
Module	The system module, i.e.,CHILL, VP, CTPC, etc. where the wafer was lost.

TABLE 5-5: Data in Wafer Lost Reports

Data	Description
Wf #	The index number of a wafer.
Memo	The memo the user entered about a batch, if applicable.

User Reports

The User Reports page shows detailed information about activities based on user account. You can open the User Reports page by clicking the **User Reports** tab. Figure 5-4 shows the User Reports page. Table 5-6 describes the information on the User Reports page.

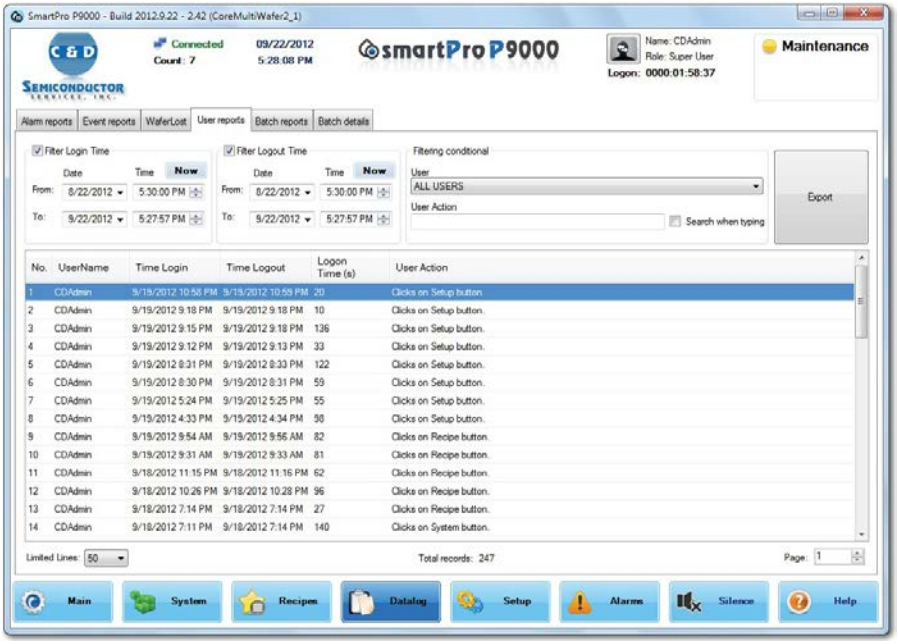

FIGURE 5-4: The User Reports Page

TABLE 5-6: Data in User Reports

Data	Description
No.	The sequence number of a log entry on the current User Reports page.
User Name	The name of a user account.
Time Login	The time a user logged in.
Time Logout	The time a user logged out.
Logon Time (s)	The length of time an user stayed logged on.
User Action	The actions a user performed during a particular session.

Batch Reports

The Batch Reports page lists all the events the system has generated about a particular batch of wafers it has processed. You can open the Batch Reports page by selecting the Batch reports tab. Figure 5-5 shows the Batch Reports page.

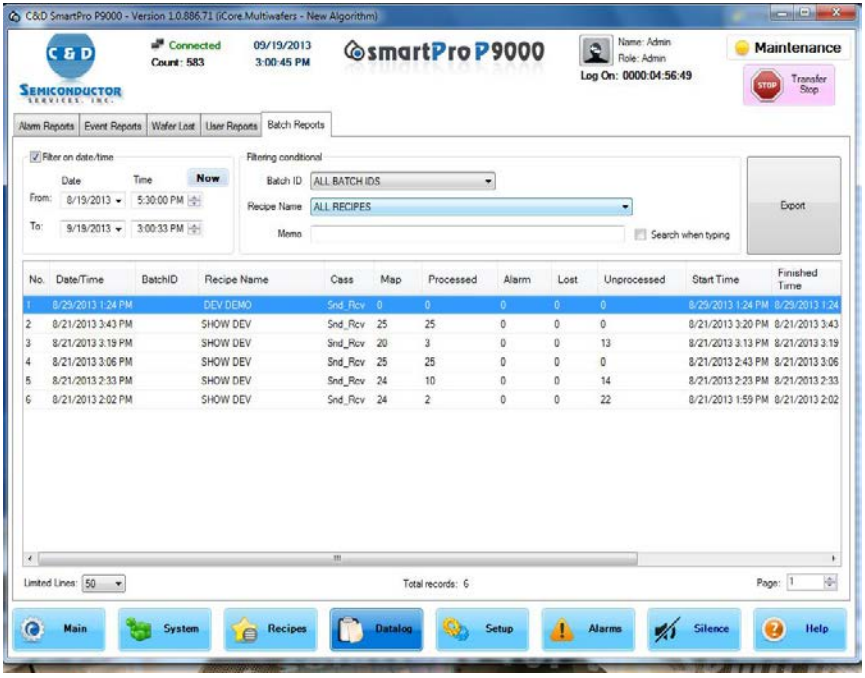

FIGURE 5-5: The Batch Reports Page

Table 5-7 describes the information on the Batch Reports page.

TABLE 5-7: Data in Batch Reports

Data	Description
No.	The sequence number of a log entry on the current Batch Reports page.
Date/Time	The date and time when a batch of wafers was processed.
Batch ID	The ID number for a batch of wafers, or 0000000000000000 (20 zeros) if no batch ID was created
Recipe Name	The name of the recipe used.
Cass#	The cassette number
Map	Number of wafers scanned
Processed	The number of wafers in a batch that were processed.
Alarm	The number of wafer has alarm
Lost	The number of wafers that were lost in a batch
Unprocessed	The number of wafers in a batch that were not processed
Start time	Time process starts
Finished time	Time process finished

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CHAPTER 6 System Maintenance

Chapter Outline

This chapter discusses the system maintenance. It covers the following topics:

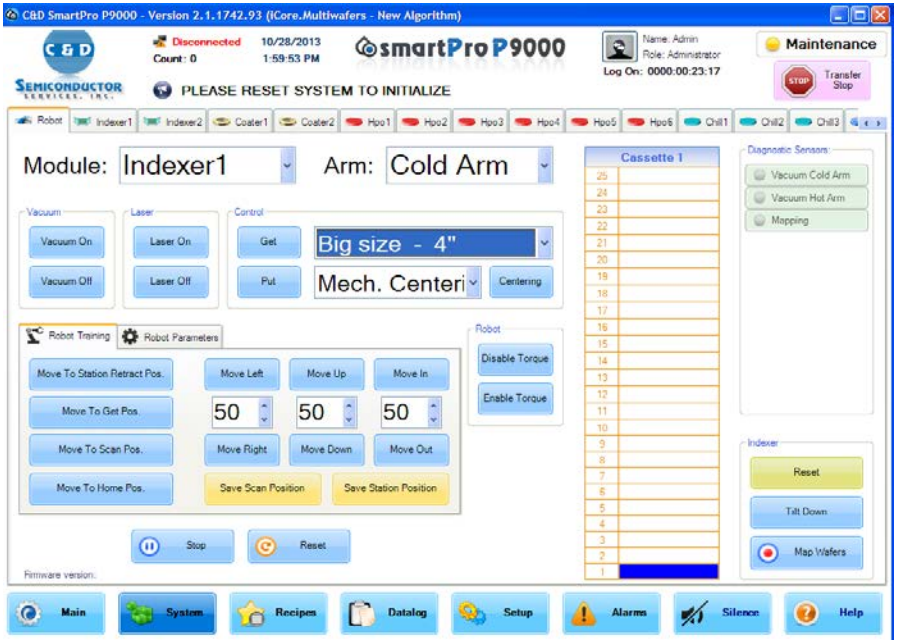
- Calibrating the Robot arm positions
- Centering Coaters/Developers/Chill Plates
- Centering the Mechanical Centering
- Centering the Vapor Primer
- Centering Hot Plate Ovens
- Calibrating Hot Plate Oven/Vapor Prime pin height
- Checking Hot Plate Oven/Coaters/Developer exhaust level
- Checking Coater/Developer spin speed
- Checking Developer air ring gap
- Calibrating Hot Plate Oven/Vapor Prime temperature

System Calibration

All modules on the P9000 are properly calibrated according to customer requirements prior to shipment. Because of this, the system should be ready for use out of the package and no calibration is required.

It is highly recommended users verify appropriate Air ring pressure is established prior to commencing any activities. It is highly recommended users ensure the presence of a wafer on the chuck when dispensing developer.

However, after being put in service in a production environment for an extended period of time, some modules may deviate slightly from their factory settings. As a result, some re-calibration is required in order to correct the deviations to ensure the system's precision and performance.



System calibrations are carried out on the P9000's System page, which you can open by clicking the System button on the navigation bar, as illustrated in Figure 6-1.

FIGURE 6-1: The default System page

As shown in Figure 6-1, the top of the System page is a row of tabs representing all the modules available on the P9000. By default, the Robot tab is automatically selected when the System page opens.

Note:

The P9000 is a customized system whose features and functions are based on customer requirements. For this reason, the types of modules and the number of units of a particular module available on the system may differ. The screen shots used in this User Manual were taken from one of the systems and may or may not apply to all P9000s. Refer to your purchase contract for information about the features and functions of your P9000.

Calibrating Robot Arm Positions

The Robot is an important component of the P9000 system. During wafer processing operations, the Robot uses its arms to get wafers into and out of the system modules (e.g., Cassettes, Coaters, Developers, etc.) and transfers them from one module to another. The precision of the Robot at every move is vital to the operation of the system. Because of this, you must check the position of the Robot in relation to each of the modules to make sure that they work in sync. Calibrate if the positions are off.

Robot position calibration must be done in reference to the modules it interacts with. In this sense, you must calibrate the Robot with every module on the P9000 individually. Furthermore, since the Robot has two arms — Cold/Top and Hot/Bot(tom), you must calibrate each arm with each module separately, using the same procedures.

Calibrating Robot-Indexer Position

The P9000 comes with two Indexers, each of which must be calibrated individually against the Robot. For illustration purposes, the following procedures discuss the calibration of the Robot with Indexer 1. You can use the same procedures to calibrate Indexer 2.

It is important to note that you must use the wafer in the first (bottom) slot in the cassette to calibrate the Robot in relation to an Indexer.

To calibrate the Robot-Indexer position:

1. Put the test wafer in the first slot on a cassette.
2. Place the cassette on an Indexer station. *(Note: You must calibrate both Indexers 1 and 2, but you can start with any one.)*
3. From the navigation bar, click System. The System (Robot) page opens.
4. For Module, select **Indexer1.**
5. For Arm, select **Cold/Top.** *(Note: Both arms have to be calibrated. You can start with either one.)*
6. On the Cassette, select the first slot.
7. At Indexer click "Tilt Down"
8. Under Training, click **Move To Get Position.** The Robot now starts to move to its current *get* position.
9. Observe the position of the Robot arm.
10. If necessary, adjust the Robot arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out** until the arm is properly positioned.
11. When you are about to save the position, move the arm upward until it touches the back of the wafer.
12. Click **Save Station Position.**
13. Click **Yes** on the message. The arm automatically moves to station retract position.
14. Repeat Steps 4 through 13 to calibrate the Robot and Indexer using the **Hot/Bot** arm.
15. After you have successfully calibrated the Robot in reference to Indexer 1, repeat the above steps to calibrate the Robot in relation to Indexer 2.

Calibrating Robot-Indexer Scan Position

The Robot is equipped with a laser scanner which automatically scans all slots in the Cassette at the start of each session. This enables the system to detect which slots have wafers and which ones are empty. The results are shown in the Cassette on the screen. Because the system always starts the scanning with the first (bottom) slot on the Indexer, make sure that you calibrate the Indexer scan position using a wafer in the first slot on the cassette.

To calibrate the Indexer scan position:

1. Put a test wafer in the first slot of the cassette.

2. Place the cassette on the Indexer station.
3. From the navigation bar, click System. The System (Robot) page opens.
4. Under Training, click **Move to Scan Position.** The scanner on the Robot now moves to face the cassette.
5. Under Laser, click **Laser On.** The laser now shines on the cassette near the bottom.
6. Check to see if the laser light hits the test wafer in the first slot on the cassette.
7. If necessary, adjust the scan position by clicking **Move Left, move Right, Move Up, Move Down, Move In,** and/or **Move Out** until the laser hits the wafer in the first slot. *(Note: The Mapping radio button turns yellow when the laser light hits the wafer, which means a good result.)*
8. Click **Save Scan Position.**
9. Click **Yes** on the message.

Calibrating Robot-Mechanical Centering Pickup Position

The Mechanical Centering centers wafers so that they can be placed in the center of the modules where they are processed. The centering of wafers is especially important for operations involving the Coater and Developer modules.

Keep in mind that calibrating the Mechanical Centering requires the use of a

smallest sized wafer. To calibrate the Mechanical Centering pickup position:

1. Place a smallest sized test wafer on the Mechanical Centering.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **Mechanical Centering.**
4. For Arm, select either **Cold/Top** or **Hot/Bot.** ***(Note:** The arms have to be calibrated separately. You can start with either one of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out** until the dot in the center of the test wafer meets the centering dot on the arm.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**

10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.

Calibrating Robot-Centering Pickup Position

The Centering module provides the same function as the Mechanical Centering does — centering wafers. The difference lies in the fact that, while the Mechanical Centering has a clamping mechanism that can automatically sense the size of the wafer placed in it and adjust itself accordingly, the Centering module has a tiered top which means that the user can only place a wafer on the tier that matches its size. Because the Mechanical Centering is more flexible and convenient to use, you most likely will use the Mechanical Centering to center wafers most of the time and use the Centering module only as a backup.

To calibrate the Centering pickup position:

1. Place smallest wafer on the Centering module.
2. From the navigation bar, click System. The System (Robot) page opens.
3. Form Module, select Centering.
4. For Arm, select either **Cold/Top** or **Hot/Bot.** ***(Note:*** *The arms have to be calibrated separately. You can start with either of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out** until the dot in the center of the test wafer meets the centering dot on the arm.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**
10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.

Calibrating Robot-Coater Position

In order for the Robot to get wafers in and out of a Coater smoothly, you need to calibrate the position of the Robot in reference to that Coater. The goal is to make sure that the Robot and the Coater can work together in sync. The calibration requires that both arms of the Robot be calibrated separately using the same proce-

dures outlined below. Once you are done with the calibration of one Coater module, you can use the same procedures to calibrate the Robot with the other Coaters.

To calibrate the Robot-Coater position:

1. Place a wafer on top of the support pins on the Coater.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **Coater1.** *(**Note:** The system has more than one Coater module. You can choose to start with any one, but be sure to calibrate them all.)*
4. For Arm, select either **Cold/Top** or **Hot/Bot.** *(**Note:** The arms have to be calibrated separately. You can start with either of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out**.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**
10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.
12. Repeat the above steps to calibrate the position of the Robot in relation to the other Coaters.

Calibrating Robot-Developer Position

In order for the Robot to accurately get wafers in and out of a Developer module, you need to calibrate the position of the Robot in reference to that Developer. The goal is to make sure that the Robot and the Developer can work together in sync. The calibration requires that both arms of the Robot be calibrated separately using the same procedures outlined below. Once you are done with the calibration of one Developer, you can use the same procedures to calibrate the Robot with the other Developers.

To calibrate the Robot-Developer position:

1. Place a wafer on top of the support pins on the Developer.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **Dev1.** *(**Note:** The system has more than one Developer module. You can choose to start with any one, but be sure to calibrate them all.)*

4. For Arm, select either **Cold/Top** or **Hot/Bot.** *(Note: The arms have to be calibrated separately. You can start with either of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out**.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**
10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.
12. Repeat the above steps to calibrate the position of the Robot in relation to the other Developers.

Calibrating Robot-Chill Plate Position

You need to properly calibrate the position of the Robot in reference to a Chill Plate. The goal is to make sure that the Robot and the Chill Plate can work together in sync so that the Robot can get wafers in and out of the Chill Plate smoothly.

The calibration requires that the two arms on the Robot be calibrated separately using the same procedures outlined below. Once you are done with the calibration of one Chill Plate, you must use the same procedures to calibrate the Robot with the other Chill Plates.

To calibrate the Robot-Chill Plate position:

1. Place a wafer on top of the support pins on the Chill Plate.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **Chill1.** *(**Note:** The system has more than one Chill Plate module. You can choose to start with any one, but be sure to calibrate them all.)*
4. For Arm, select either **Cold/Top** or **Hot/Bot.** *(**Note:** The arms have to be calibrated separately. You can start with either of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out**.

8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**
10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.
12. Repeat the above steps to calibrate the position of the Robot in relation to the other Chill Plates.

Calibrating Robot-Hot Plate Oven Position

You need to properly calibrate the position of the Robot in reference to a Hot Plate Oven. The goal is to make sure that the Robot and the Hot Plate Oven can work together in sync so that the Robot can get wafers in and out of the Hot Plate Oven smoothly.

The calibration requires that the two arms on the Robot be calibrated separately using the same procedures outlined below. Once you are done with the calibration of one Hot Plate Oven, you must use the same procedures to calibrate the Robot with the other Hot Plate Ovens.

For illustration purposes, the following procedures use Hot Plate Oven 1 as an example.

To calibrate the Robot-Hot Plate Oven position:

1. Place a wafer on top of the support pins on the Hot Plate Oven 1.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **Hpo1.** *(Note: The system has more than one Hot Plate module. You can choose to start with any one, but be sure to calibrate them all.)*
4. For Arm, select either **Cold/Top** or **Hot/Bot.** *(Note: The arms have to be calibrated separately. You can start with either of them.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out**.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**

10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.
12. Repeat the above steps to calibrate the position of the Robot in relation to the other Hot Plate Ovens.

Calibrating Robot-Vapor Prime Position

You need to properly calibrate the position of the Robot in reference to the Vapor Prime. The goal is to make sure that the Robot and the Vapor Prime can work together in sync so that the Robot can get wafers in and out of the Vapor Prime smoothly.

The calibration requires that the two arms on the Robot be calibrated separately using the same procedures outlined below.

To calibrate the Robot-Vapor Prime position:

1. Place a wafer on top of the support pins on the Vapor Prime.
2. From the navigation bar, click System. The System (Robot) page opens.
3. For Module, select **VPrime.**
4. For Arm, select either **Cold/Top** or **Hot/Bot.** *(**Note:** The two arms must be calibrated separately. You can start with either one as long as you remember to calibrate them both.)*
5. Under Training, click **Move to Get Position.**
6. Observe the position of the arm.
7. If necessary, adjust the arm position by clicking **Move Left, Move Right, Move Up, Move Down, Move In,** and/or **Move Out**.
8. When you are about to save the position, move the arm upward slightly until it touches the back of the test wafer.
9. Click **Save Station Position.**
10. Click **Yes** on the message.
11. Repeat Step 4 through 10 to calibrate the other arm.

Backing Up and Restoring Robot Configuration

The P9000 is equipped with a pre-calibrated robot which can function in sync with the other system modules with no need for calibration. As a best practice, we recommend that you back up your robot configuration. Doing so will make it easy to restore the original robot settings using the robot configuration backup file if, for some reason, the robot has to be taken out of service for repair or replacement.

Backing Up Robot Configuration

You can use the following steps to back up the Robot configuration:

To back up the robot configuration:

1. Disconnect the RS232 cable that connects the Robot and the Indexer CPU board.
2. Connect the RS232 cable to V3000 PC COM 1. The Robot now should be directly connected to the V3000 PC.
3. Start the Logosol Control Center software on the PC.
4. On the Logosol Wafer Handling Control Center Window, click Connection and then Terminal.
5. In the Terminal window, select RS232-COM1-115200 to establish communication with the Robot. See Figure 6-2.

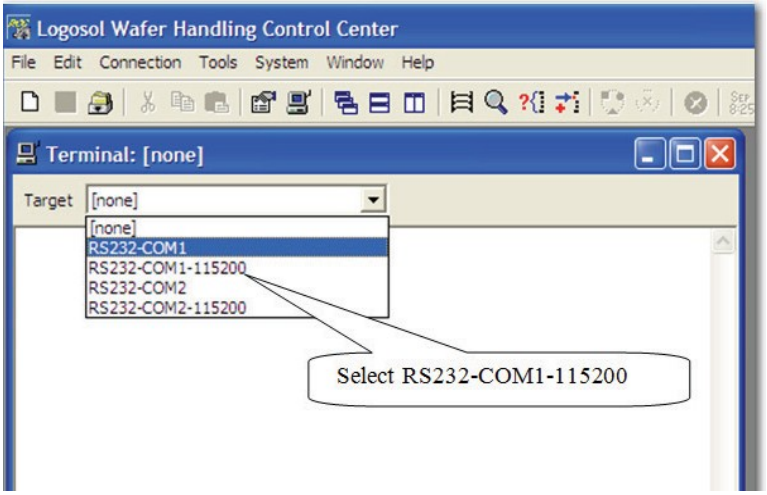


FIGURE 6-2: Connecting to the Robot via the Terminal

6. When the Robot returns the > prompt, enter the following commands (see Figure 6-14):
   - `>SOF` (Turn off the Robot servo)
   - `>.QUIT` (Quit the run mode)
7. From the Logosol Wafer Handling Control Center window, click **File** and then **File Manger**. See Figure 6-3.

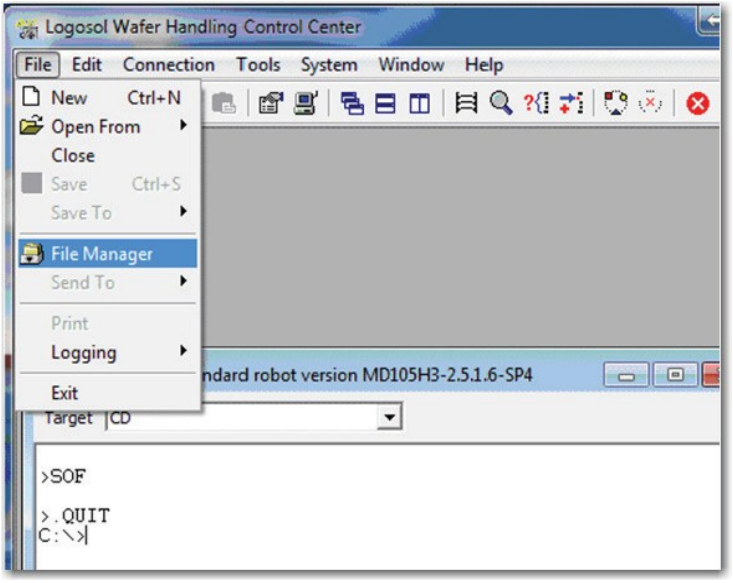


FIGURE 6-3: Opening the File Manager

8. In the File Manager window, right-click in the right pane and then click **New Folder** from the pop-up menu. See Figure 6-4.

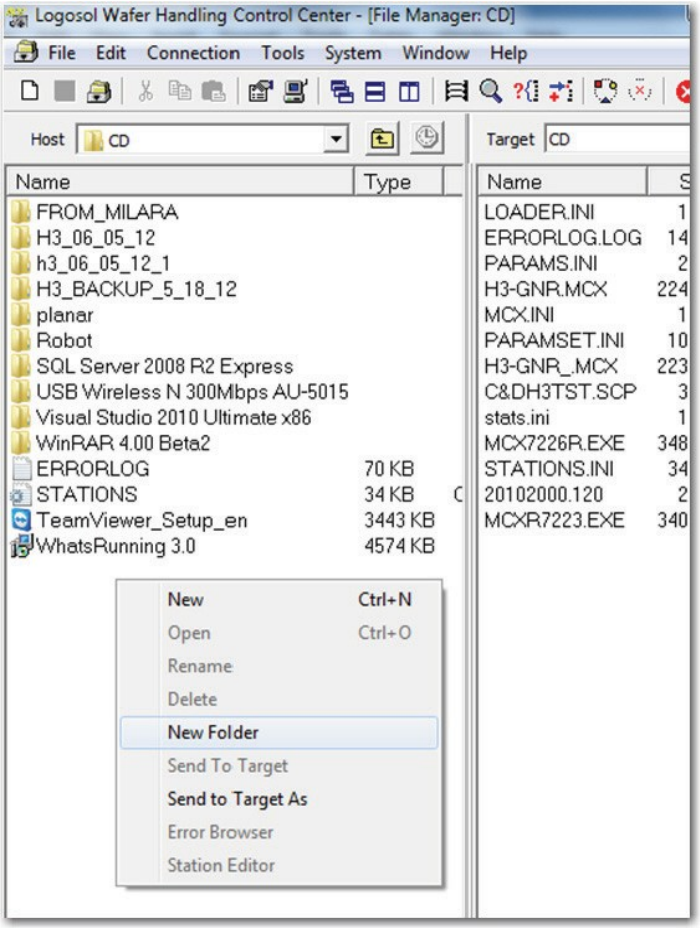


FIGURE 6-4: Creating a backup folder

9. In the Create new folder dialog box, enter a unique name, e.g., `BACKUP`, for the folder and click **OK.**
10. Drag and drop the `STATION.INI` file from the Target directory to the BACKUP directory. See Figure 6-5.

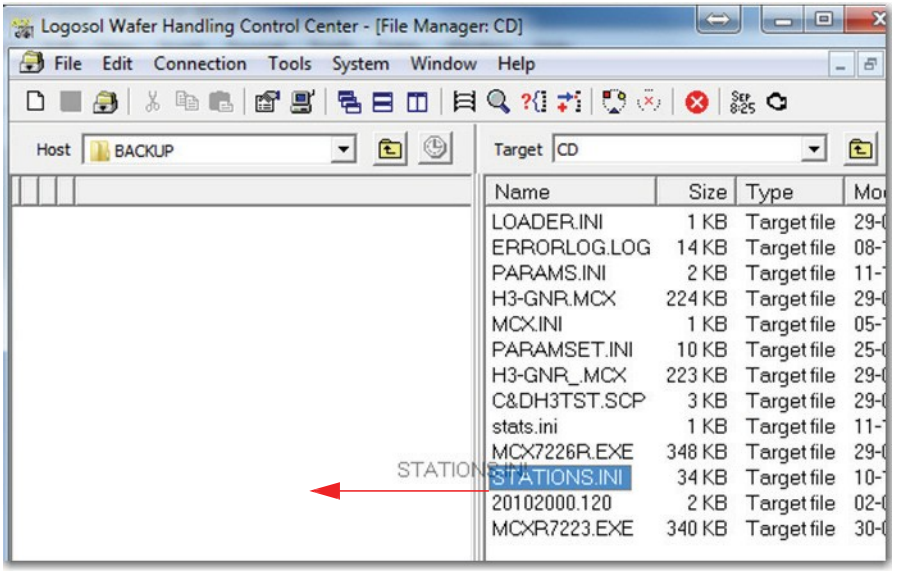


FIGURE 6-5: Dragging STATION.INI file from Target to BACKUP directory

Restoring Robot Configuration

You can use the following steps to restore the Robot configuration:

1. From the File Manager window, drag and drop the `STATION.INI` file from the BACKUP directory to the Target directory, as shown in Figure 6-6.

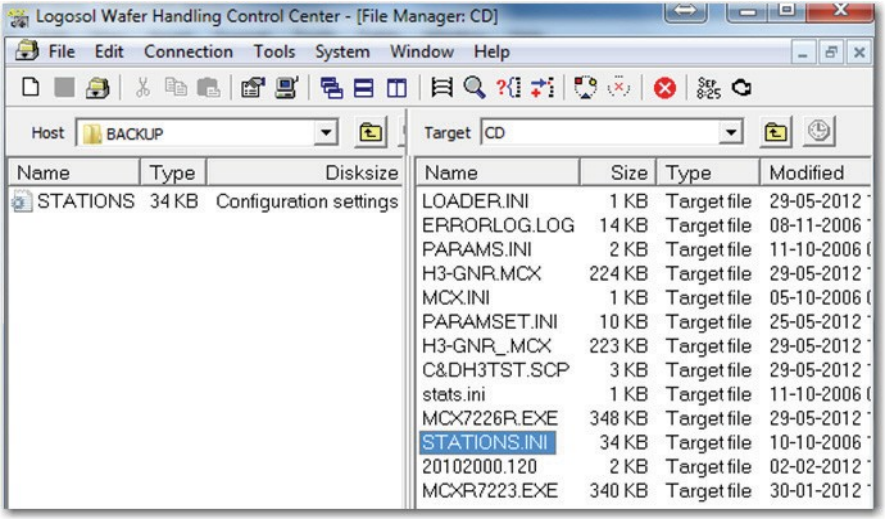


FIGURE 6-6: Restoring Robot configuration

2. Close the File Manager Window.
3. Execute the following commands (see Figure 6-7):
    - `>RUN` (Return the Robot to the Run mode)
    - `1549` (Wait until the Robot returns 1549)
    - `>SON` (Turn the servo on)
    - `>HOM` (Move the Robot to Home position)

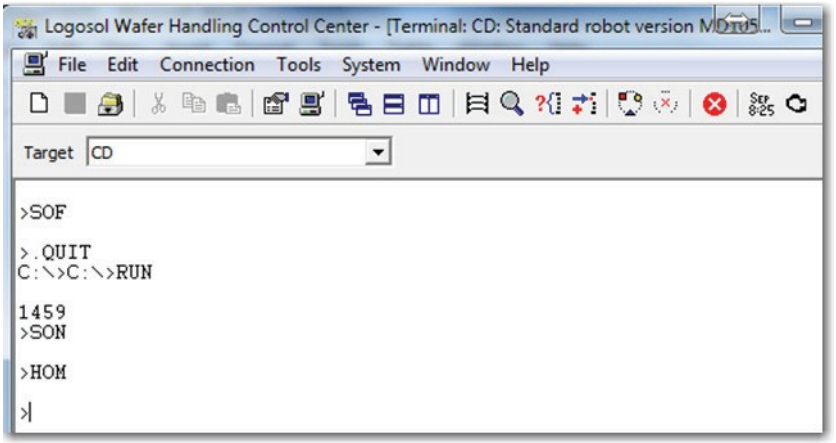


FIGURE 6-7: Returning the Robot to Home position

4. After the Robot configuration backup is restored, close the Logosol Wafer Handling Control Center window.
5. Disconnect the RS232 cable from the V3000 PC and connect it back to the Indexer CPU board.

Testing the Robot After Restore

Once you have restored the Robot backup data, the next step is to test the Robot against all the modules individually before putting it into production. The goal is to make sure that the Robot can work smoothly with all the modules. This is especially the case when you have just installed a replacement Robot or when the Robot's configuration is responding incorrectly.

Note that you must test both arms of the Robot individually against all the modules.

To calibrate the Robot:

1. Place a cassette with a wafer in it on the Indexer 1.
2. From the navigation bar, click System. The System (Robot) page opens.
3. On the cassette, select the slot in the Cassette with the wafer in it.
4. For Module, select **Indexer1.**

5. For Arm, select an arm, e.g., Cold/Top. *(Note: You can start with either arm, but you do need to test both arms with Indexer 1 separately.)*
6. Under Control, click **Get, Put,** and **Centering,** one at a time.
7. Observe the operation of the Robot at each action to see if it works properly.
8. If the Robot works smoothly with Indexer 1, move on to test other modules, one by one, by repeating Steps 4 through 7; if the Robot does not work well with Indexer 1 as desired, calibrate it using the procedures discussed earlier in this chapter, test it again until you have achieved the desired result, and then move on to test other modules.

Centering Coaters/Developers

The procedures for centering Coater and Developer modules are the same. The P9000 comes with multiple Coater and Developer modules, each of which must be centered individually using the following procedures. The goal of centering the Coater and Developer modules is to make sure that wafers are properly centered on the chuck while being processed.

The procedures for centering the Coater or Developer involve both the Robot and the Coater or Developer. For illustration purposes, the following instructions use Coater 1 as an example.

To center the Coater:

1. Place a cassette with wafers on the Indexer station.
2. From the navigation bar, click **System**.
3. Click **OK** on the message. The default System (Robot) page opens. See Figure 6-1.
4. For Module, select **Indexer 1** (or **Indexer 2**), depending on which one you want to use.
5. For Arm, select **Cold** or **Hot,** depending on which one you want to use.
6. Select a wafer size, e.g., **Big Wafer.**
7. Select **Mechanical Centering**.
8. On the Cassette, select a slot with a wafer in it.

9. Under Control, click **Get.** The Robot moves to the Get position to pick up the wafer from the selected slot on the cassette. Figure 6-8 illustrates Steps 1 through 9

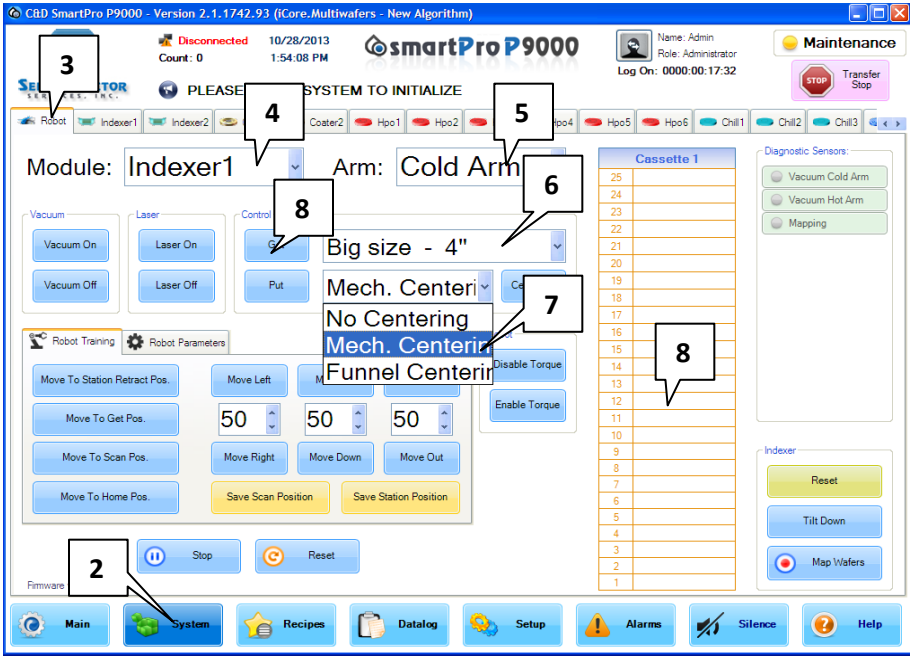


FIGURE 6-8: Centering the Coater module

10. From the top of the screen, click the Coater 1 tab.
11. Under Control, click **Put.** The Robot moves the wafer to the Centering and then Coater 1.
12. Under Training, click **Move to Get Position.**
13. Under Vacuum, click **Vacuum On.**
14. Under Training, click **Move Up** to move the arm upward until the wafer clears the top of the three pins.
15. From the top of the System page, click the Coater1 tab to open the Coater 1 page.
16. Under Support Pins, click **Bottom.**
17. Place the centering tool on top of the Coater 1 chuck.
18. Insert the three diagnostic pins into the holes in the top of the centering tool.

19. Click the Robot tab.
20. Move the arm down slowly until the wafer fits inside the perimeter of the three pins. If necessary, move the arm in or out, or left or right until the wafer does not touch any of the pins.
21. When everything is clear, move down until the wafer is inside the three pins and touches them all.
22. Move the wafer up to get the centering tool out.
23. Click the Coater1 tab to open the Coater 1 page.
24. Under Support Pins, click **Top.** See Figure 6-9.

FIGURE 6-9: Centering the Coater

25. Click the Robot tab to move back to the Robot page.
26. Under Training, click **Move Down** until the wafer sits on top of the support pins.
27. Under Vacuum, click **Vacuum Off.**
28. Click **Save Station Position.**
29. Click **Yes** on the message.
30. Remove the wafer from Coater 1.
31. Repeat the above steps to calibrate the other Coater modules and the Developer modules.

Centering Chill Plates

Unlike the centering of Coater and Developer modules which requires that you center each module individually using the same procedures, the centering of the Chill Plate only requires the centering of Chill Plate 1. Because the Chill Plate modules come as a stack, once Chill Plate 1 is properly centered, the system will automatically apply the settings to the rest of the Chill Plate modules.

To center the Chill Plates:

1. On the System page, make sure the Robot tab is selected.
2. For Module, select **Chill1.**
3. For Arm, select **Hot/Bot** or **Cold/Top,** depending on which one you prefer.
4. Under Training, click **Move to Get Position**.
5. Click **Disable Torque** so that you can manually move the arm out.
6. From the top of the page, click the Chill1 tab to open the Chill 1 page. See Figure 6-10.
7. Under Move 3Pins, click **Bottom** to move the three support pins to the bottom position.

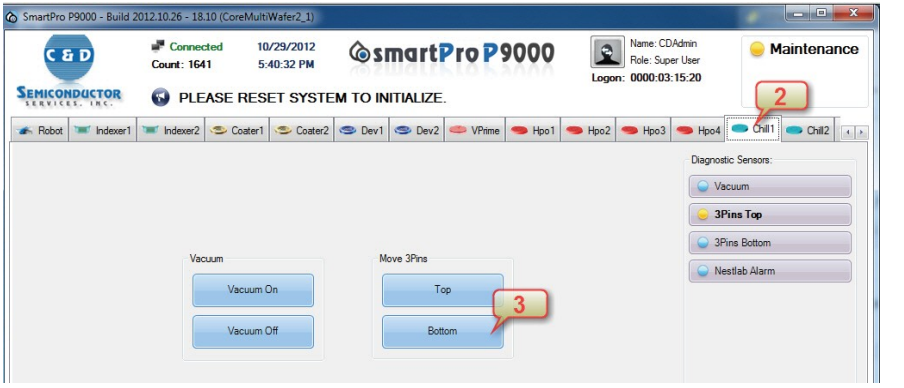


FIGURE 6-10: Centering the Chill Plate

8. Place the centering tool on top of the Chill Plate chuck, making sure that the tool and the top of the chuck engage with each other.
9. Manually move the arm in until it touches the back of the centering tool. (If the arm hits the centering tool, move the arn up.)
10. From the top of the page, click the Robot tab to return to the Robot page. Refer to Figure 6-8.
11. Click **Enable Torque.** This will make the system remember the position of the centering tool.
12. Move the arm up to remove the centering tool from the Chill Plate.
13. Place a wafer on top of the arm.
14. From the top of the page, click the Chill 1 tab to return to the Chill 1 page.
15. Under Move 3Pins, click **Top.**

16. From the top of the page, click the Robot tab to return to the Robot page.
17. Under Training, click **Move Down** until the wafer touches the support pins.
18. Click **Save Station Position.**
19. Click **Yes** on the message.

Centering the Hot Plate Ovens

The P9000 can come with multiple Hot Plate Oven modules, which must be centered individually using the same procedures described below.

For illustration purposes, the following procedures use Hot Plate Oven 1 as an example.

To center the Hot Plate Oven 1:

1. From the navigation bar, click System.
2. Click **OK** on the message. The System page opens.
3. From the top of the System page, click the Hpo1 tab.
4. Under Support Pins, select **3 Pins Bottom**. Figure 6-11 illustrates Steps 1 through 4.

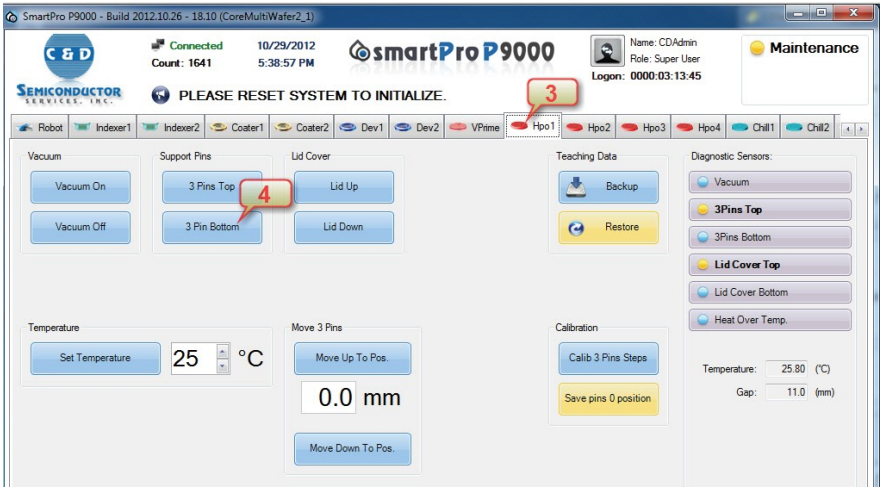


FIGURE 6-11: Centering the Hot Plate Oven

5. From the top of the System page, click the Robot tab to open the Robot page. Refer to Figure 6-8.
6. For Module, select **Hpo1.**
7. For Arm, select **Top/Hot** or **Cold/Bot.**
8. Under Training, click **Move to Get Position.**
9. Click **Disable Torque.**
10. Place the centering tool on top of Hot Plate 1.
11. Manually move the arm in until it touches the back of the centering tool. (Note: If the arm hits the centering tool, move the wafer up.)
12. Click **Enable Torque.**
13. Under Training, click **Move Up** until the arm clears the centering tool enough to take it (centering tool) out.
14. From the top of the page, click the Hpo1 tab.
15. Under Support Pins, click **3 Pins Up**.
16. From the top of the page, click the Robot tab.
17. Place a wafer on the arm.
18. Under Training, click **Move Down** until the top of the pins levels with the arm.
19. Click **Save Station Position.**
20. Repeat the above steps to calibrate Hpo2, Hpo3, and Hpo4.

Centering the Mechanical Centering

The Mechanical Centering is used to align wafers to make sure that wafers are properly centered and aligned with the arm. It is important to note that you must use the smallest- sized wafer to center the Mechanical Centering.

To center the Mechanical Centering:

1. From the navigation bar, click System.
2. Click **OK** on the message. The Robot page opens. Refer to Figure 6-8.
3. For Module, select **Mechanical Centering.**
4. For Arm, select an arm of your choice, e.g., **Cold/Bot.**
5. Select the smallest wafer size.
6. Place a smallest-sized wafer on the Mechanical Centering you are centering.
7. Under Training, click **Move to Get Position.**

8. From the top of the page, click the Mechanical Centering tab to open the Mechanical Centering page.
9. Click **Centering In.** See Figure 6-62.

FIGURE 6-12: Centering the Mechanical Centering

10. From the top of the page, click the Robot tab to return to the Robot page.
11. Under Training, click **Move Up** until the arm touches the wafer.
12. Under Vacuum, click **Vacuum On.**
13. From the top of the page, click the Mechanical Centering tab to move to the Mechanical Centering page.
14. Click **Home.** The wafer now sits on the arm because of the suction of the vacuum.
15. From the top of the page, click the Robot tab to return to the Robot page.
16. Under Training, click **Move Up** until the wafer clears the Mechanical Centering.
17. Click **Disable Torque**.
18. Manually move the arm out to see if the wafer is centered.
19. If the wafer is not centered, make a note of the amount of deviation and continue with Steps 20 thorough 25.
20. Remove the wafer from the arm.
21. Click **Enable Torque.**
22. Click **Move to Home Position.**
23. Click **Move to Get Position.**
24. Put the wafer back on the Mechanical Centering and center it by clicking **Move In, Move Out, Move Left,** and/or **Move Right** as needed until the wafer is perfectly centered.
25. Click **Save Station Position.**

Calibrating the Centering

Calibration of the Centering module is to ensure that wafers are properly centered when they are being processed. It is important to note that calibrating the Centering module must be done using the smallest-sized wafer.

To calibrate the Centering module:

1. Place a smallest-sized wafer on the Centering module.
2. From the navigation bar, click System.
3. Click **OK** on the message. The Robot page opens.
4. For Module, select **Centering.**
5. For Arm, select an arm option, e.g., **Cold/Bot.**
6. Select the smallest wafer size.
7. Under Training, click **Move to Get Position.**
8. Under Vacuum, click **Vacuum On.**
9. Under Training, click **Move Up** until the wafer clears the centering tool.
10. Select **Centering.**
11. Click **Disable Torque.**
12. Manually move the arm out to check the result: If the dot in the center of the testing wafer matches the dot on the arm, then it is centered; otherwise, continue calibrating the Centering module using the above procedures until the two dots meet.
13. Click **Save Station Position.**

Calibrating Support-Pin Height

The height of the support pins on the Hot Plate Oven and the Vapor Prime modules must be properly calibrated. The goal is to set the support pins' 0 (zero) position.

For illustration purposes, the following instructions use Hot Plate Oven 1 (Hpo1) as an example. You can use the same procedures to calibrate the support-pin height on the other Hot Plate Oven and the Vapor Prime modules.

To calibrate the height of the support pins on Hot Plate Oven 1:

1. From the navigation bar, click System.
2. Click **OK** on the message. The System page opens.

3. From the top of the System page, click the Hpo1 tab.
4. Under Support Pins, click **3 Pins Bottom**.
5. Inspect the height of the pins in reference to the surface of the Hot Plate Oven.
6. If the pins stick out (higher than the surface of the module), click **Move Down to Position** until the top of the pins levels with the surface of the Hot Plate Oven.
7. Click **Save Pins 0 Position.**
8. Click **Yes** on the message. See Figure 6-13.

FIGURE 6-13: Calibrating height of support pins

Checking Vapor Prime Operations

From time to time, you need to check the function of the vacuum gauge and the HMDS to ensure the proper operation of the Vapor Prime module. The procedures involve the Chamber Vacuum (the Vacuum Gauge and the Regulator) and the HMDS Canister.

At all times, the HMDS canister pressure must be above the pre-configured settings. You can adjust the HMDS Canister pressure by turning the Regulator knob (clockwise or counter-clockwise).

To check the function of the Vapor Prime:

1. From the navigation bar, click the System button.
2. Click **OK** on the message. The Robot page opens.
3. For Module, select **Indexer 1** or **Indexer 2,** depending on which one you want to use.
4. For Arm, select **Cold/Top**.
5. Select a wafer size.
6. On the cassette, select a slot in the Indexer with a wafer in it
7. Under Control, click **Get.**
8. For Module, select **VPrime**
9. Select **Centering** or **Mechanical Centering.**
10. Under Control, click **Put.**
11. From the top of the page, click the VPrime tab.
12. Click **Download Program.**
13. Select the program of interest.
14. Click **Download.**
15. Click **Start.** See Figure 6-14.

FIGURE 6-14: Checking Vapor Prime operations

16. Verify the achieved vacuum levels during the pump down cycle. Systems with proximity pin hotplates should achieve 8 to 12 inches of vacuum; systems with vacuum contact hotplates should achieve 15 to 18 inches of vacuum. Contact the factory immediately if the vacuum levels fall outside these ranges.
17. Turn on the HMDS and check if the vacuum level is rising. *(Note: Normally, the vacuum level should be rising due to the pressure of the HMDS.)*
18. From the top of the page, click the Robot tab.
19. Under Control, click **Get.**
20. For Module, select I**ndexer1.**
21. Under Control, click **Put.**

Checking Hot Plate Oven Exhaust

Checking the exhaust level on a Hot Plate Oven requires the use of a manometer. The goal is to ensure that the module can discharge the appropriate amount of exhaust.

To check the exhaust on a Hot Plate Oven:

1. Remove the plug on the exhaust.
2. Connect the Manometer by inserting the tube into the exhaust vent.
3. Adjust the butterfly valve until an ideal exhaust volume has been reached.
4. Remove the manometer.
5. Put the plug back in.

Checking Coater/Developer Exhaust with Controller

You can check the exhaust on a Coater or a Developer with a controller using the procedures discussed below. For illustration purposes, the following instructions use Coater 1 as an example.

To check the Coater exhaust with the controller:

1. From the navigation bar, click System.
2. Click **OK** on the message. The System page opens.
3. From the top of the System page, click the Coater1 tab.
4. Under Support Pins, click **Bottom**.
5. Place the Manometer on top of the Developer or Coater to cover the entire exhaust.
6. From the navigation bar, click Recipe. The Programs & Recipes page opens.
7. On the Programs & Recipes page, click the Module Options tab.
8. From the left side of the page, click Coater 1.
9. For Exhaust Control On/Off, set the value to 1 (i.e., On).
10. For Idle Exhaust Value, first set the low value for the exhaust band, e.g., 10.
11. Click **Save.**
12. Click **Yes** on the message.
13. Click **Download** and check the Manometer to see if the reading matches the value you set.

14. Repeat Steps 9 through 13, with Idle Exhaust Value set to a high value of 80.
15. If the exhaust is out of band, re-calibrate the exhaust controller until you have reached the desired value.

Checking Coater/Developer Exhaust Without Controller

You can also check the exhaust on a Coater or a Developer without a controller using the instructions outlined below. An Anemometer is required in order to perform the procedures.

For illustration purposes, the following instructions use Coater 1 as an example.

To check the Coater exhaust without the controller:

1. From the navigation bar, click System.
2. Click **OK** on the message. The System page opens.
3. From the top of the System page, click the Coater1 tab.
4. Under Support Pins, click **Bottom**.
5. Seal the Coat/Develop bowl in such a way that an Anemometer can be used to reliably measure the air flow.
6. Adjust the butterfly valve until you have got the ideal exhaust volume.
7. Repeat the same procedures to check the exhaust on all Coater and Developer modules.

Checking Coater/Developer Low Spin Speed

For Coaters and Developers, the low spin speed is 100 RPM. Checking the low spin speed of a Coater or a Developer requires the use of a spin-test wafer and an optical Tachometer. The spin-test wafer comes with a reflector that allows the Tachometer to read the spin speed. The following instructions use Coater 1 as an example, but the same procedures can be applied to all Coater and Developer modules.

To check the low spin speed of Coater 1:

1. Place a cassette with the spin-test wafer it on the Indexer station.
2. From the navigation bar, click System.
3. Click Yes on the message. The System (Robot) page opens.

4. For Module, select **Indexer1** or **Indexer2**, depending on which has the cassette with the spin-test wafer in it.
5. For Arm, select an arm of your choice.
6. Select a wafer size that matches the size of the spin-test wafer.
7. Select **Mechanical Centering** or **Centering.**
8. On the cassette, select the slot that contains the spin-test wafer.
9. Under Control, click **Get.**
10. For Module, select **Coater1.**
11. Under Control, click **Put.** The system first puts the spin-test wafer into the Centering (or Mechanical Centering) module and then onto Coater 1.
12. From the top of the page, click the Coater1 tab.
13. Under Vacuum, click **Vacuum On.**
14. Under Support Pins, click **Bottom.**
15. Under Spindle Spin, set the value to 100.
16. Click **Spin.**
17. Place the Tachometer on top of the spin-test wafer to check the spin speed: If the reading is less than or equal to +/- 3 RPM, it is acceptable; if the reading is greater than +/ -3 RPM, contact C&D Semiconductor for correction.
18. Click **Stop.** Figure 6-15 highlights Steps 12 through 16 and 18.
19. Remove the spin-test wafer and the Tachometer.

FIGURE 6-15: Checking Coater 1 low spin speed

Checking Coater/Developer High Spin Speed

For Coater or Developer modules, any spin speed greater than 3,000 RPM is considered a high spin speed. Checking the high spin speed of a Coater or Developer also requires the use of a spin-test wafer, which has a reflector that allows the Tachometer to read the spin speed. The following instructions use Coater 1 as an example, but the same procedures can be applied to all Coater and Developer modules.

To check the high spin speed of Coater 1:

1. Place a cassette with the spin-test wafer it on the Indexer station.
2. From the navigation bar, click System.
3. Click Yes on the message. The System (Robot) page opens.
4. For Module, select **Indexer 1** or **Indexer 2**, depending on which has the cassette with the spin-test wafer in it.
5. For Arm, select an arm of your choice.
6. Select a wafer size that matches the size of the spin-test wafer.
7. Select **Mechanical Centering** or **Centering.**
8. On the cassette, select the slot that contains the spin-test wafer.
9. Under Control, click **Get.**
10. For Module, select Coater 1.
11. Under Control, click **Put.** The system first puts the spin-test wafer into the Centering (or Mechanical Centering) module and then onto Coater 1.
12. From the top of the page, click the Coater 1 tab.
13. Under Vacuum, click **Vacuum On.**
14. Under Support Pins, click **Bottom.**
15. Under Spindle Spin, set the value to 3,500.
16. Click **Spin.**
17. Place the Tachometer on top of the spin-test wafer to check the spin speed: If the reading is less than or equal to +1 or - 1, it is acceptable; if the reading is greater than +1 or -1, contact C&D Semiconductor for correction.
18. Click **Stop.**
19. Remove the wafer and the Tachometer.

Checking the Developer Air Ring Gap

The air ring refers to the white raised circular lip around the chuck of a Developer module, as illustrated in Figure 6-16. The air ring gap is the distance between the bottom of a wafer and the air ring. Measuring the air ring gap requires the use of a feeler gauge. You can check the air ring gap on every Developer using the procedures discussed below. The goal is to make sure that the air ring gap is within the manufacturer's specification. For illustration purposes, the following instructions use Developer 1 as an example.

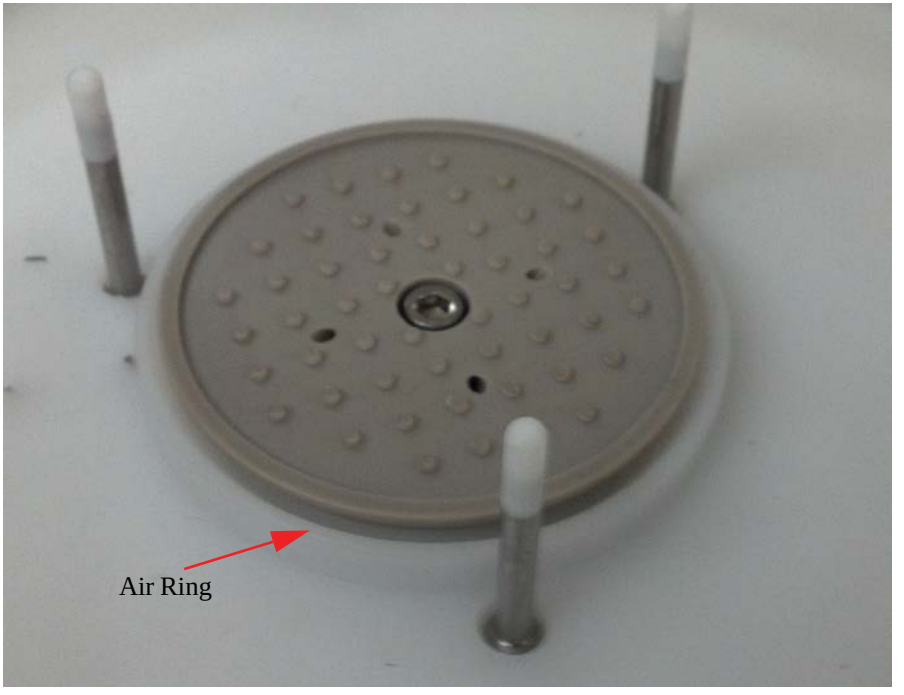


FIGURE 6-16: Checking Developer air ring gap

To check the air ring gap on a Developer module:

1. Place a cassette with wafers in it on an Indexer module.
2. From the navigation bar, click System.
3. Click Yes on the message. The System (Robot) page opens.

4. For Module, select **Indexer 1** or **Indexer 2**, depending on which Indexer you have chosen to use in Step 1.
5. For Arm, select an arm of your choice.
6. Select a wafer size, making sure that it matches the size of wafer in the cassette.
7. Select **Mechanical Centering.**
8. On the Cassette, select the slot with a wafer in it.
9. Under Control, click **Get.**
10. For Module, select Developer 1.
11. Under Control, click **Put.**
12. From the top of the page, click the Developer 1 tab.
13. Under Support Pins, click **Bottom.**
14. Under Vacuum, click **Vacuum On.**
15. Use a feeler gauge or other similar devices to measure the gap between the wafer and the air ring. *(Note: It must measure 0.030 inches (0.762 mm), +/- 0.005 inches (0.127 mm).*
16. Once you have finished checking the air ring gap, click **Vacuum Off.**
17. For Support Pins, click **Top.**
18. Remove the wafer from Developer 1.

Checking Hot Plate Oven/Vapor Prime Temperature

The operation of Hot Plate Oven and Vapor Prime modules has strict temperature requirements. To ensure the proper performance of these modules, you must make sure that current temperature match the set temperature on the WATLOW using the following procedures, which can be applied to all Hot Plate Oven and Vapor Prime modules.

For illustration purposes, the following instructions use Hot Plate Oven 1 as an example.

To check Hot Plate Oven 1 temperature:

1. From the navigation bar, click System.
2. Click Ok on the message. The System (Robot) page opens.
3. From the top of the page, click the Hpo1 tab.
4. Under Support Pins, click **3 Pins Bottom.**

5. Place the thermometer on Hot Plate Oven 1.
6. Check the readings on the thermometer.
7. Look at the temperature readings on the WATLOW, as shown in Figure 6-17.

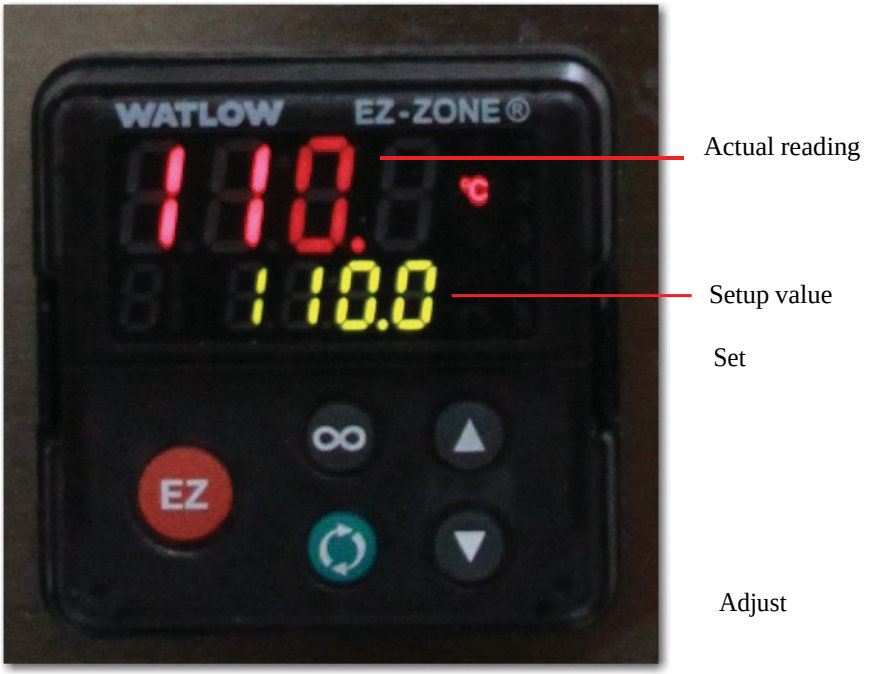


FIGURE 6-17: Temperature readings on WATLOW

8. If the reading on the thermometer is above the set value on the WATLOW, adjust upward; if the reading on the thermometer is below the set value on the WATLOW, adjust downward.

Calibrating the WATLOW

The WATLOW must be properly configured to function well. The WATLOW panel comes with a number of control buttons for configuring the WATLOW, as highlighted in Figure 6-18.

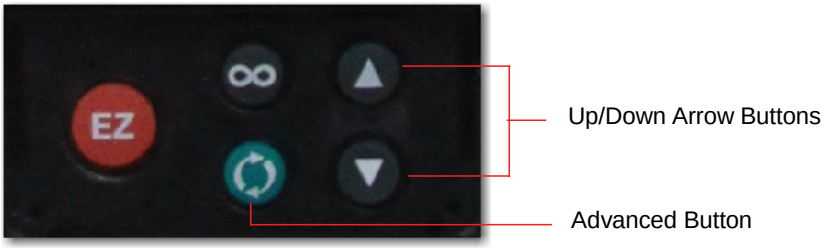


FIGURE 6-18: WATLOW control buttons

To set up the WATLOW:

1. Hold down the up and down arrow buttons simultaneously for six seconds to enter the SETUP page: `[A1][SET]`
2. Press the Advance button once: `[XX][SEn]`, where XX= input type (tc = thermocouple).
3. Calibrate the offset input to compensate for lead wire resistance by holding down the arrow buttons simultaneously for approximately three seconds to enter the OPERATION page: `[Ai][oPEr]`
4. Press the Advance button three times: `[X.X][1.CA]`, where X.X = offset value, e.g., -1.0 degree or 0.6 degree.

Note:

For more information, refer to the WATLOW User's Manual (PM PID J. pdf).

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APPENDIX A

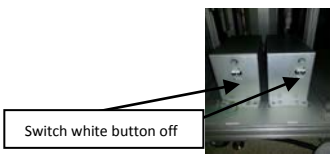
Energy Isolating Devices-

1	DC P.S 1 OUTPUT 24VDC 14 AMP
2	CIRCUIT BREAKER 1 POLE DIN MOUNT AIC/5,000 A
3	TRANSFORMER, DUAL PRI 24V SEC
4	CIRCUIT BREAKER, 3POLE 15 AMP AIC/5,000 A @ 277 VAC
5	FUSE 3 AG 1/2 AMP SLO BLO
6	CIRCUIT BREAKER 2P 7AMP AIC/5,000 A @ 277 VAC

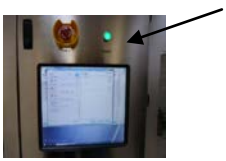
FOR REFERENCE ONLY

Hazardous Energy Isolation

De energize AC at the Spindle Controller On/Off White Button
De energize DC Power –this can be done by the Green Power Button



Spindle Controller



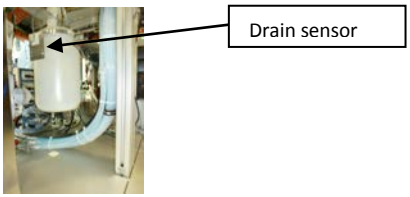
Green Power Button

Solid Waste

As a result of the operation of the P9000 System, solid waste can be captured in the Drain Jar located in the bottom portion of the tool and requires Pumping out or Draining depending on the customer's application or preference. There are sensors which inform the user if the capture is too high. It is the responsibility of the end user to respond to the alarms appropriately and timely for the safety of the tool and operators.

The image below shows the location and the Containment method. Refer to the Preventive Maintenance Manual for further information.

Drain Jar



APPENDIX B

SYSTEM INTERLOCKS REFERENCE TABLE

INTERLOCKS

MODULE	DESCRIPTION(INTERLOCK)	PURPOSE	ACTION TAKEN	SAFETY
SYSTEM				
	SYSTEM N2 SENSOR	TO MONITOR PROPER N2 IS SUPPLIED TO TOOL	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
	DOOR INTERLOCK(OPTIONAL)	TO MONITOR ALL DOORS ARE CLOSED	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
	SySTEM EXHAUST SENSOR	TO MONITOR PROPER SYSTEM MODULE EXHAUST	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	AUDIBLE ALARM SOUNDS,DISPLAY IDENTIFIES EXHAUST OUT OF BAND
ROBOT				
	ROBOT VACUUM SENSOR	MONITORING OF BOTH END-EFFECTORS	NO TRANSFERING OF WAFERS ARE POSSIBLE	
COATER				
	DRAIN HI-LEVEL SENSOR	MONITORING OF COATER WASTE	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	NO FURTHER DISPENSING OCCURS UNTIL DRAIN JAR IS EMPTIED
	WAFER CHUCK VACUUM SENSOR	MONITORING OF PROPER VACUUM ON WAFER	IMMEDIATE STOP ON COATER,	
	EBR CANISTER LEVEL LOW SENSOR	MONITORING OF EBR LEVEL	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
	PHOTO-RESIST LEVEL LOW SENSOR	MONITORING OF LEVEL ON P/R BOTTLES	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
DEVELOPER				
	WAFER CHUCK VACUUM SENSOR	MONITORING OF PROPER VACUUM ON WAFER	IMMEDIATE STOP OF DEVELOPER FUNCTION	
	DEVELOP CANISTER LEVEL LOW SENSOR	MONITOR PROPER LEVEL OF CANISTER	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
HPO PLATE OVEN				
	TEMP. OUT OF BAND	TO MONITOR CURRENT TEMP. IS IN ALLOWED BAND	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	OVER TEMP SWITCH ENGAGES SHUTTING DOWN WATLOW HEATER
VAPOR PRIME				
	V/P CANISTER LOW LEVEL SENSOR	MONITORING OF HMDS LEVEL IN CANISTER	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
	TEMP. OUT OF BAND	TO MONITOR CURRENT TEMP. IS IN ALLOWED BAND	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	OVER TEMP SWITCH ENGAGES SHUTTING DOWN WATLOW HEATER
	HMDS FLOW SENSOR	VERIFICATION OF VAPOR FLOW	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	
CHILL PLATE				
	WAFER VACUUM SENSOR	MONITORING OF VACUUM ON CHILL PLATE	FINISH CURRENT WAFER, NO NEW WAFER WILL BE PROCESSED	

12

REVISIONS PAGE

REVISION	AUTHOR	REASON /CHANGES	APPROVALS	DATE RELEASED
A		INITIAL RELEASE		11/12/2012
B	MPR/L.TRUONG	COMPLY WITH SEMI S2,CHGS. REGARDING SAFETY, SYSTEM ON/OFF PROTOCOLS, ADD ALARMS TABLE, ADD APPENDIX, A/B, SCREEN CAPTURES UPDATED AND TERMINOLOGY OF MECH /FUNNEL CENTERING ESTABLISHED. ADDED NOTE: MANDATORY WFR ON CHUCK, VERIFY AIR RING LEVEL.	C&D Review Board (Proxy)	2/4/2014