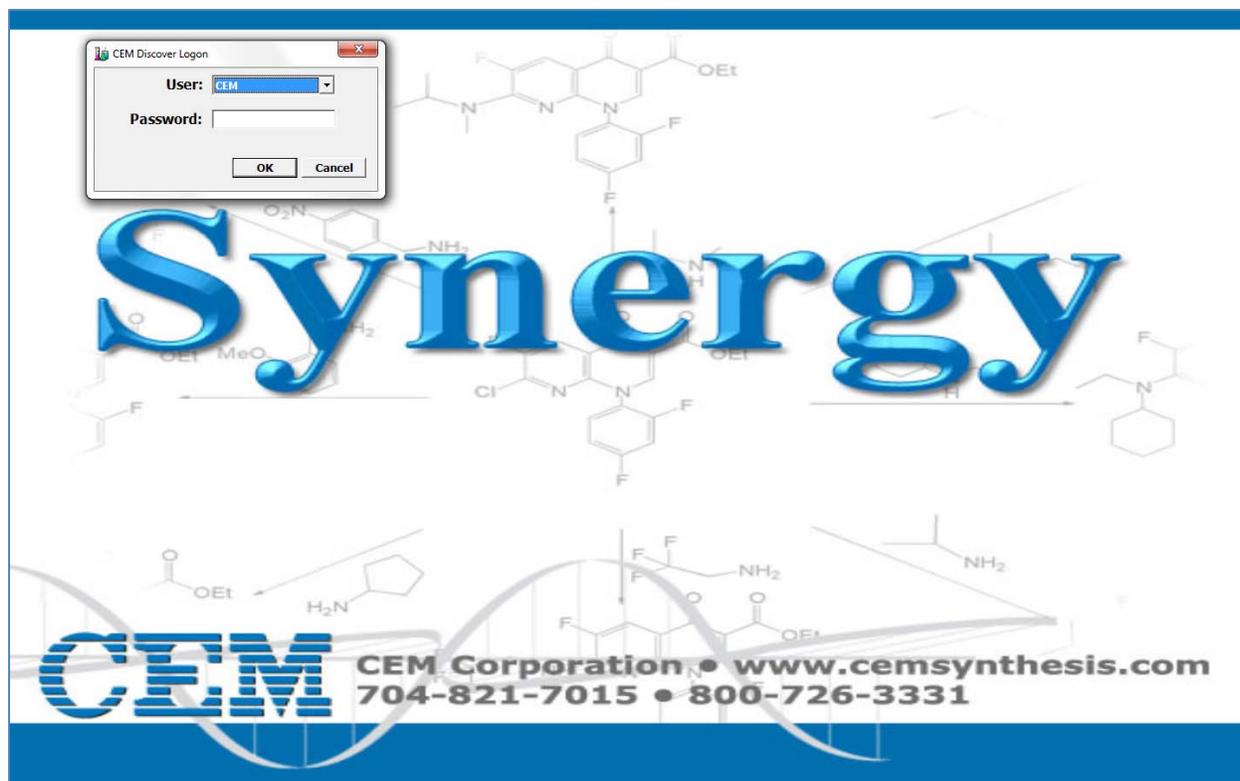


Synergy™ Application Software

This document is written to provide an overview of the Synergy Application Software that controls the Discover Systems and their accessories. The information for the initial set up is detailed while the overview will highlight key useful features of the Synergy application software. For detailed discussion of other features, please refer to the “Help” section contents titled “For an overview of how to use the Synergy Applications software” located within the drop down menu of the main screen.



Personal Computer/Laptop Requirements

The software program may be installed on any PC or laptop that meets the minimum system specifications for the software. The minimum system specifications are:

Desktop

Base Unit: Pentium 4 2.80GHz or higher

Memory: 1G

Hard Drive: 40GB

Operating System: Windows XP or Windows 7, English Version

Laptop

Base Unit: Pentium M 1.6GHz or higher

Memory: 1G

Hard Drive: 40GB

Operating System: Windows XP or Windows 7, English Version

Installation of the Synergy software

NOTE: If a version of Synergy is installed on the computer it will need to be deleted before installing the current version. Deleting the software does not delete the current users, method, or data. That information will automatically be imported in to the new version of the software.

1. Turn on the main power to the computer
2. If any applications or dialogue boxes are open, close them.
3. Insert the Synergy compact disc into the CD-ROM drive. The installation should start immediately. If the installation process does not begin automatically, click on the Windows Start button, choose Run, then in the Open list box type D:\setup.exe. (This assumes D is the CD-ROM drive. If not, substitute the appropriate letter for your CDROM drive in the list box text).
4. Follow the instructions displayed on the computer screen.
5. After the Synergy software has been installed for the first time, a new user with “Administrative” privileges is required. To create a new user:
 - a. Open the Synergy software. If this is the first time logging in to the software a pop will appear titled “Manage Users”.
 - b. Input the “Username”, “password”, and set the “User Type” to “Administrator”.
 - c. Select “ok” to save.

NOTE: Multiple users can be created at this time.

- d. Log out of the Synergy software.
6. Log in to the Synergy software as a User that you have created.

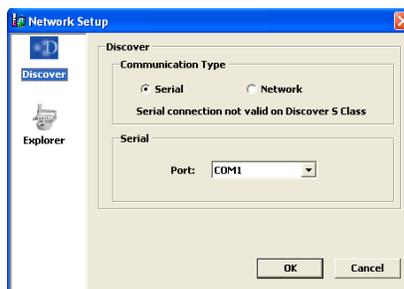
A short cut will be automatically created with the Synergy icon and placed on the computer desktop. After the software installation, remove the CD from the CD-ROM drive, return it to its original holder and store in an appropriate location for future reference.

Instrument Connection

Depending on which Discover is being used, Legacy or SP/S-class, use the procedure below to connect to the Synergy software.

Legacy

1. Connect one end of the RS232 cable to the Discover and the opposite end to the computer. If applicable, follow the instructions outlined in the Explorer manual to connect the systems.
2. Turn the Discover system on.
3. If applicable, turn the Explorer system on.
4. Using the computer, select the Synergy icon to activate the Synergy software.
5. Using the pull-down menu, select the proper user name and enter the appropriate password.
6. Select “OK” to log-in.
7. To set up the network connections:
 - a. Select “Options” from the Menu bar.
 - b. Select “Network Setup”. The following screen will appear.



8. Select the “Serial” radio button.

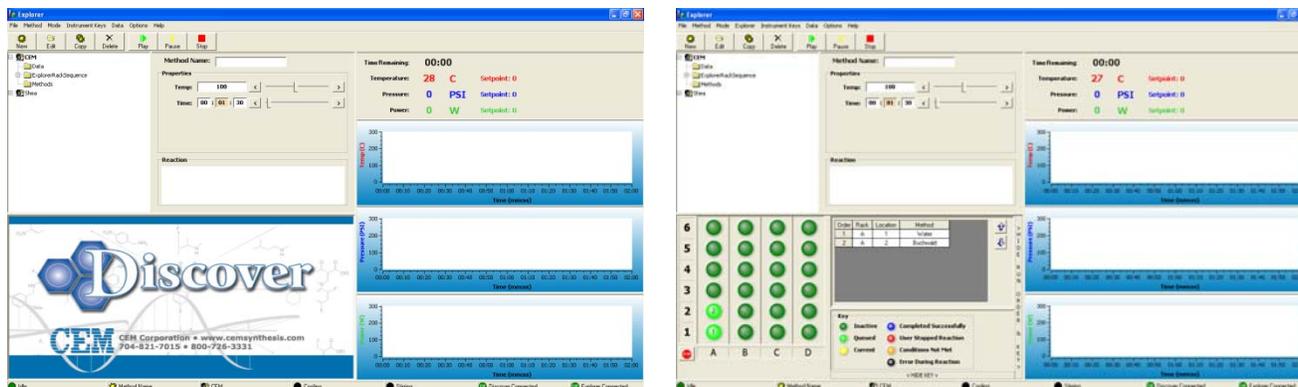
9. Select the appropriate COM port.

NOTE: Typically the COM will be the lowest numbered COM.

10. Select “OK” to save the network connection.

11. If applicable, follow the instructions below to set the Synergy software in Explorer mode:

- a. Select “Mode” from the Menu bar.
- b. Select “Explorer.”



NOTE: The lower left hand corner screen will change to the Explorer Setup.

SP/S-Class

The PC/laptop requires configuration with a Fixed IP Address if the Discover System is going to be connected to the Synergy software using a network connection (DSL Cable). All Discover S-class and Discover SP Systems require a Fixed IP address for operation with Synergy software.

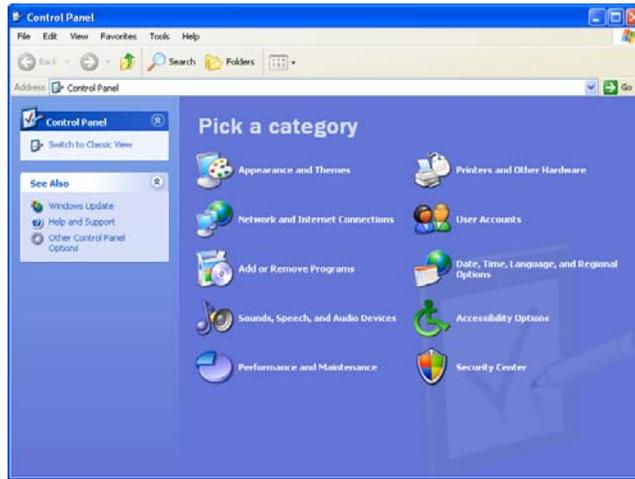
1. Assign a fixed IP Address to the computer by following either “Windows XP” or “Windows 7”.

Windows XP

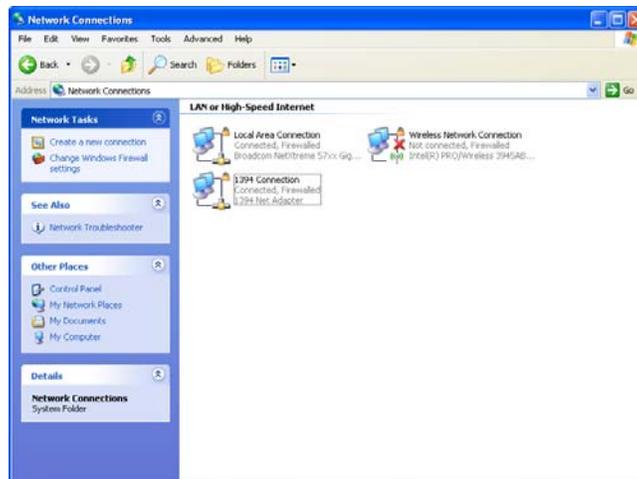
- a) From the computer’s desktop, select “Start” (located in the lower left corner of the screen).
- b) Select “Control Panel.”
 - If “Classic View” is selected, the following screen will appear.



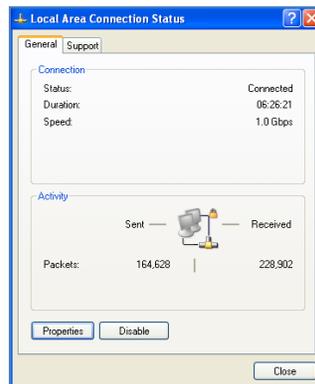
- If “Category View” is selected, the following screen will appear.



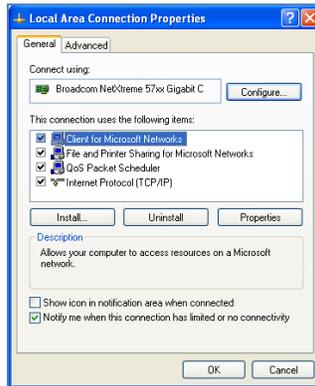
- c) If using the “Classic View,” select “Network Connections.” If using the “Category view,” select “Network and Internet Connections” and then select “Network Connections.” The following screen will appear.



- d) Select “Local Area Connection.” The following screen will appear.



- e) Select “Properties.” The following screen will appear.



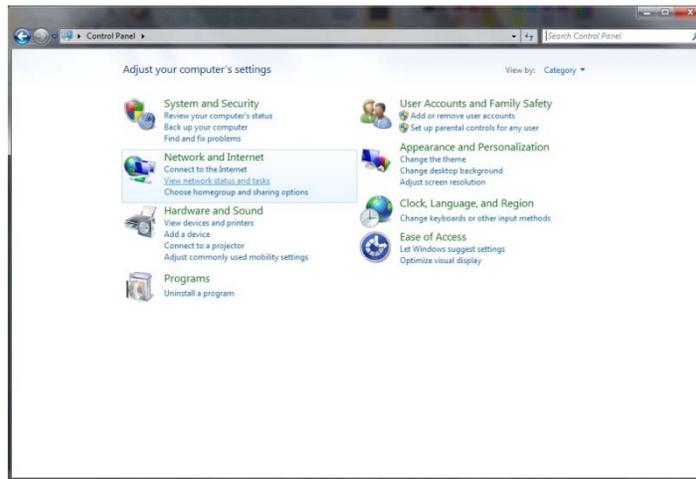
- f) Highlight "Internet Protocol (TCP/IP)".
- g) Select "Properties." The following screen will appear.



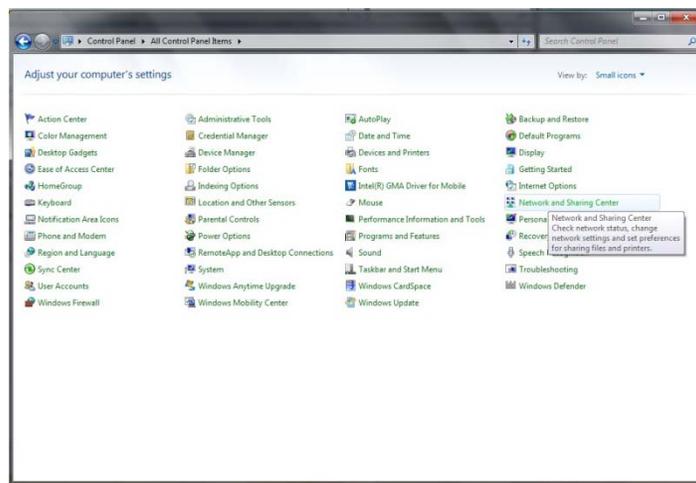
- h) Select "Use the following IP address."
- i) Enter "192.168.1.10" for the IP address.
- j) Enter "255.255.255.0" for the subnet mask.
- k) Select "OK."
- l) Close all open windows to return to the desktop.
- m) Restart the computer.

Windows 7

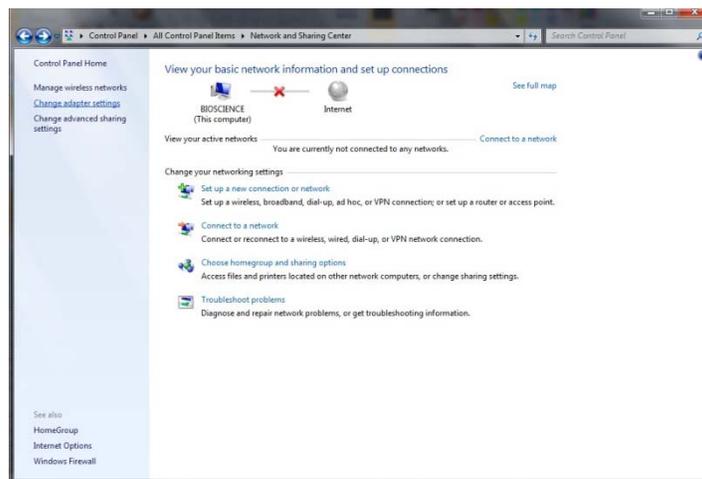
- a) From the computer's desktop, select "Start" (located in the lower left hand corner of the screen).
- b) Select "Control Panel."
 - If "Category View" is selected, the following screen will appear.



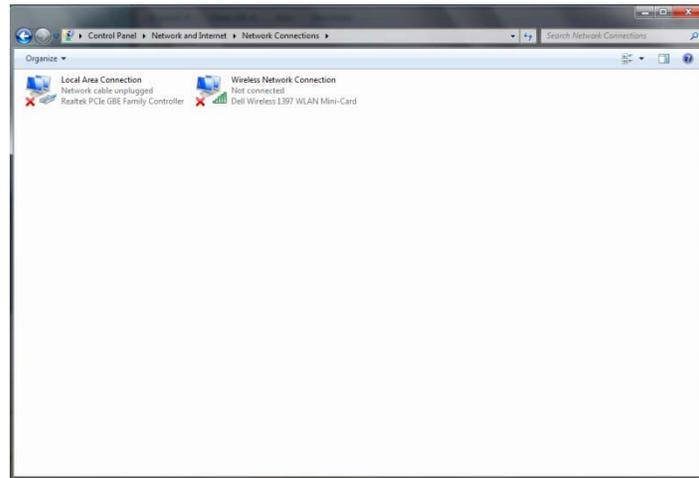
- If using the large or small icon view, the following screen will appear.



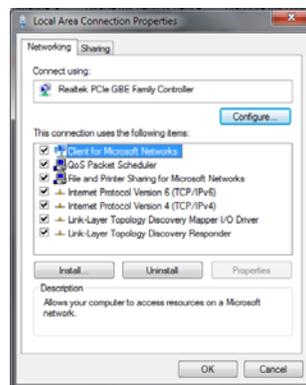
- c) If using "Category View," select "View network status and tasks" within the "Network and Internet" section. If using "large icons" or "small icons" view, select "Network and Sharing Center." The following screen will appear.



- d) Select "Change adapter settings" located in the upper left corner of the window. The following screen will appear.

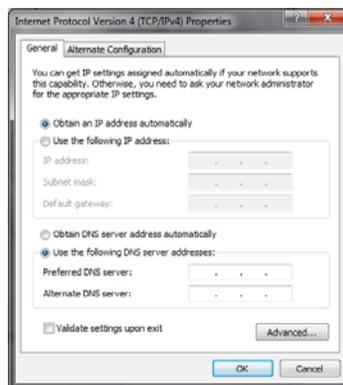


e) Select "Local Area Connection."



f) Highlight "Internet Protocol Version 4 (TCP/IPv4)."

g) Select "Properties." The following screen will appear.



h) Select "Use the following IP address."

i) Enter "192.168.1.10" for the IP address.

j) Enter "255.255.255.0" for the subnet mask.

k) Select "OK."

l) Close all open windows to return to the desktop.

m) Restart the computer.

2. Using the computer, select the Synergy icon to activate the Synergy software.



- a. Using the pull-down menu, select the proper user name and enter the appropriate password.
- b. Select "OK" to log-in.
3. Select "Options" from menu bar.
4. Select "Network Setup". A new screen will appear.
5. With "Discover" highlighted on the left side of the screen, select the "Network" radio button.

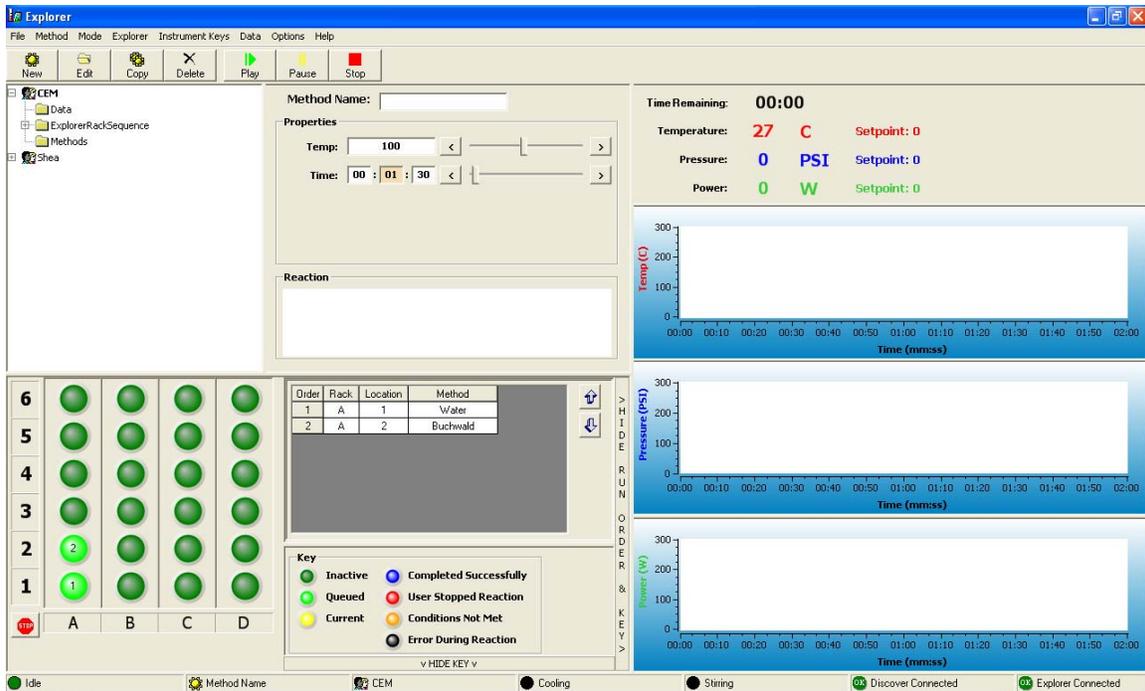
NOTE: Typically the "IP Address" is set to 192.168.1.60 unless it is being assigned to a network. If a network is being used, the IP address on the Discover and the IP Address on the computer will need to be reconfigured as well.

6. If the Explorer automation is being used, highlight "Explorer" on the left side of the window and select the "Active" box.

NOTE: Typically the "IP Address" is set to 192.168.1.25 unless it is being assigned to a network. If a network is being used, the IP address on the Explorer and the IP Address on the computer will need to be reconfigured as well.

7. Select "OK" to save the connection. The radio button in the lower corners of the screen should turn green. If the buttons are not green, the Synergy software is not connected to the Discover/Explorer system. Please contact CEM Corporation at (800) 726-3331 or (704) 821- 7015.

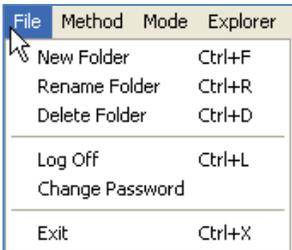
Synergy Overview



Menu Bar

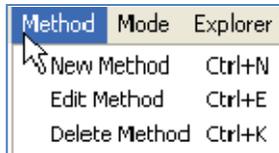
File Method Mode Explorer Instrument Keys Data Options Help

File



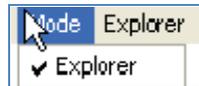
Create, rename or delete folders, user logoff or change password.

Method



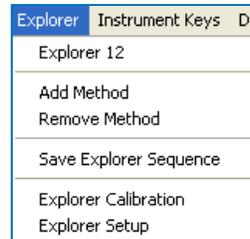
Create, edit or delete a method

Mode



Select the instrument mode of operation: Explorer or camera

Explorer



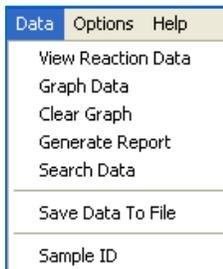
Add or remove a method, save the rack sequence, perform adapter and rack calibration, and set up the Explorer

Instrument Keys



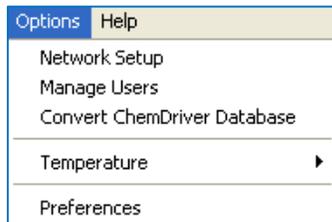
Start, pause or stop a method

Data



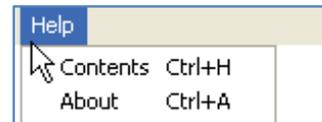
Search, view or graph data, generate

Options



Network setup, user management, convert

Help



Access Synergy Help topics

a data report, save
data to a file or
create a sample ID

ChemDriver database,
temperature sensor selection,
and system setup preferences

File

New Folder

The “New Folder” function allows a user to create a new folder to store methods under. To create a new folder, select “New Folder” from the “File” drop-down menu, enter the name you wish to use for the new folder, and then click “OK”. Click “Cancel” to exit without creating a new folder. A new folder can only be created within an existing folder.

Rename Folder

The “Rename Folder” function allows the user to change the name of the currently highlighted folder. After selecting the “Rename Folder” option from the “File” drop-down menu, the user must enter the new folder name, then click “OK”. Clicking “Cancel” will exit without renaming the folder.

Delete Folder

The “Delete Folder” function allows the user to permanently erase the highlighted folder. After selecting the “Delete Folder” option from the “File” drop-down menu, the user must click “OK” to confirm the deletion. Clicking “Cancel” will exit without deleting the folder.

Log Off

The “Log Off” function allows the current user to be logged out and takes the user to the log-in screen.

Change Password

The “Change Password” function allows the user to change the password used to log into the current user's profile. The user must enter their current password, then enter the new password twice for confirmation.

Exit

The “Exit” function closes the Synergy software and returns the user to the desktop.

Method

New Method

The “New Method” function allows the user to create a new, customizable method. To create a new method, select “New Method” from the “Method” drop-down menu. When creating a new method, there are four method types to choose from: Standard, Dynamic, Power Cycling, Fixed Power and SPS. The user must select a method type from the icons on the left-hand side of the dialogue box before inputting the desired settings for the method being created. A new method may also be created with the  button.

Edit Method

The “Edit Method” function allows the user to change the name and parameters of the currently highlighted method. After selecting “Edit Method” from the “Method” drop-down menu, the user can adjust the settings they wish to change in the new window, then click “OK” to accept the edits. This can also be done with the  button.

Delete Method

The “Delete Method” function allows the user to permanently erase the currently highlighted method, by selecting “Delete Method” from the “Method” drop-down menu. This can also be done with the  button.

Mode

Explorer

This function allows the user to control the Explorer™ automation module with the Synergy software. When using an older Explorer™ system, if the program does not automatically detect it and open the display, go to the “Mode” drop-down menu and select “Explorer”. A check mark should appear next to the “Explorer” option. Selecting “Explorer” again will close the display and remove the check-mark. For Explorer systems built on S-class technology, the Synergy

software will automatically detect the automation module and reconfigure the interface to match the capacity of the automated module (12-, 48-, 72-, and 96-position capacities). Racks can flip to provide 10mL or 35mL options, and the automation deck senses the vial used by the rack.

Camera

This function allows the user to control the Camera module with the Synergy software.

Explorer

Explorer 12

The “Explorer 12” function allows the user to switch between the Explorer 12 or the Explorer 48-, 72-, 96-.

Add Method

The “Add Method” function allows the user to add a method to the ordered list of methods in the Explorer Control Window. After highlighting both the desired cell on the Explorer deck in the Explorer Control Window and the desired method in the Object Viewer, the user must then select “Add Method” from the “Explorer” drop-down menu. This can also be done by highlighting the method and double clicking the desired cell on the Explorer deck. Methods do not need to be added in order.

If the user selects **A B C D** or **1 2 3 4 5 6**, then the entire column or row will be highlighted and "Add Method" can be selected to add the method to multiple cells.

Right-clicking the cell will open a menu that includes an "Add Method" option.

Remove Method

The “Remove Method” function allows the user to remove an assigned method from the ordered list of methods in the Explorer Control Window. After highlighting the position on the Explorer deck in the Explorer Control Window, the user must then select “Remove Method” from the “Explorer” drop-down menu.

If the user selects **A B C D** or **1 2 3 4 5 6**, then the entire column or row will be highlighted and "Remove Method" can be selected to remove the methods from multiple cells.

Right-clicking the cell will open a menu that includes an "Remove Method" option.

Save Explorer Sequence

The “Save Explorer Sequence” function allows the user to save the ordered list of methods and positioned assignments currently shown in the Explorer Control Window. This sequence can then be easily recalled at a later date for ease and speed of programming.

Explorer Calibration

The “Explorer Calibration” function allows the user to automatically align the X, Y, and Z axis coordinates.

Explorer Setup

The “Explorer Setup” function allows the user to set up and modify the details of their Explorer™ module. This function should only be used by trained personnel.

Camera

Please see the instructions included in the camera option for use and operation with the Synergy software.

Instrument Keys

Start

The “Start” function initiates the method operation. To run a method, the user must select a method from your user profile, then select “Start” from the “Instrument Keys” drop-down menu. A method can also be started by using the



button on the Discover™ reactor module.

Pause

The “Pause” function interrupts the currently processing method. To pause a method, the user may select “Pause” from

the “Instrument Keys” drop-down menu. A method can also be paused by using the



the  button on the Discover™ reactor module must be pressed.

Stop

The “Stop” function immediately stops the currently running method and initiates the quenching function. To stop a method, the user may select “Stop” from the “Instrument Keys” drop-down menu. A method can also be stopped by

using the  button.

Data

View Reaction Data

The “View Reaction Data” function allows the user to see the data for the selected record. To use this function, the user **must** already have a record highlighted in the Object Viewer. The user may then either select “View Reaction Data” from

the “Data” drop-down menu or click on the  button to see the data. Double-clicking on the selected record will also bring up this screen.

Graph Data

The “Graph Data” function allows the user to see the graphs of your selected data record in a separate screen. To use this function, the user **must** already have a record highlighted in the Object Viewer. The user may then either select

“Graph Data” from the “Data” drop-down menu or click on the  button to see the data.

Generate Report

The “Generate Report” function will create a complete, printable report of the user's selected data record, which can then be saved as a PDF file. To use this function, the user **must** already have a record highlighted in the Object Viewer. The

user may then either select “Generate Report” from the “Data” drop-down menu or click on the  button to generate a report.

Search Data

The “Search Data” function allows the user to search the data records on the Synergy software to locate reactions that have been run. When the records matching the search parameters have been found, the user can select a record from the search list to display the accompanying graphs on the right-hand side of the Data Search dialogue box.

Save Data to File

The “Save Data To File” function will save a selected data record to the selected location on the user's hard drive. To save a reaction, the user **must** first highlight the selected record in the Object Viewer, then select “Save Data To File” from the “Data” drop-down menu, select the destination drive and output file format, and enter a name for the file.

Sample ID

The “SampleID” function allows the user to assign an identity to a cell before the cell has run. Sample ID can be incremented by selecting the “Increment SampleID Values” check box. Sample ID is a searchable field. To assign a sample ID to a reaction, the user must first highlight the selected reaction in the Object Viewer, then select “SampleID” from the “Data” drop-down menu.

Options

Network Setup

The “Network Setup” function allows the user to connect the Synergy software to a Discover® or Explorer™. To connect a unit, the user must select “Network Setup” from the “Options” drop-down menu.

Manage Users

The “Manage Users” function is **only** available to users with Administrator access to the Synergy software. Anyone with an Administrator account can add, alter, and delete other users’ accounts. It is advised to reserve Administrator accounts to a select few users. To manage user accounts, select “Manage Users” from the “Options” drop-down menu.

Convert ChemDriver Database

The “Convert Chemdriver Database” function allows the user to copy the records from an old Chemdriver database, for use with the Synergy software.

After selecting “Convert Chemdriver Database” from the “Options” drop-down menu, the user must input the filename and location of the Chemdriver database to be converted, or use the  button to browse their hard drive for the database. Then the user may click the  button to begin the import process.

The Chemdriver data records will be added to the Synergy database, and can be found in the user's Data folder in the Object Viewer. From there, the user can view the records and generate reports.

Open Vessel

The “Open Vessel” option allows the user to run a Discover™ unit in open vessel mode for Rxns at atmospheric pressures. Choosing the “Open Vessel” option disengages the Pressure Sensor System. Newer Discover systems, based on S-class technology, automatically detect and configure the Open Vessel option through recognition of the attenuator installed.

Temperature

The "Temperature" function is only useable when a fiber optic temperature sensor is attached to the instrument that is connected to the Synergy software. If a fiber optic sensor is attached, the user may select "Infrared" or "Fiber Optic" from the "Temperature" function to choose between using the infrared sensor or the fiber optic sensor. If a fiber optic sensor is **not** attached, only the "Infrared" option is available.

Preferences

The “Preferences” function allows the user to alter their personal settings within the Synergy software. To adjust their preferences, the user must select “Preferences” from the “Options” drop-down menu. To save their adjustments after the program is closed, the user must check “Save As Defaults” at the bottom of the dialogue box before clicking “OK” or “Apply”.

Help

Contents

Allows the user to view the help topics of the Synergy software.

About

The “About” function allows the user to view the current version of Synergy software, Discover Firmware and serial number.

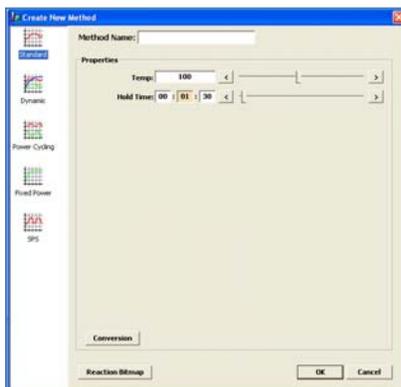
Method Control Types

Standard Control

The Standard Control is a fast and simple reaction method. The user programs

- a temperature control point and
- a run time (time held at the specified temperature).

All other method parameters are controlled by the instrument defaults. All method parameters can be edited with the “hot keys.”



Dynamic Control

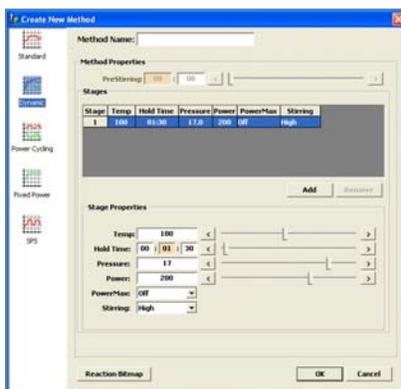
The Dynamic Control option provides more flexibility in how the user programs a reaction method and makes greater use of the feedback control data from the temperature and pressure systems. It applies a specified amount of power, defined by the user, to reach the control point. It modulates this set power automatically, based on the sensor feedback data, to ensure the control point is reached rapidly, but with limited error (temperature or pressure “overshooting”). The user programs

- the maximum amount of microwave power that can be applied to the method,
- a temperature control point,
- a pressure control point,
- a hold time (the time the system maintains the control parameters),
- a stirring function with speed control and a pre-stir option, and
- PowerMAX (simultaneous cooling).

The Dynamic Control option can be programmed for five (5) stages for multiple irradiation steps and is a general control method for maintaining critical control points.

NOTE: Ramp time can also be programmed in a dynamic method if selected in the user’s preferences.

NOTE: The ActiVent Technology can be used with a Dynamic method. The ActiVent technology can be enabled in the user’s “preferences” under the “Method” tab.

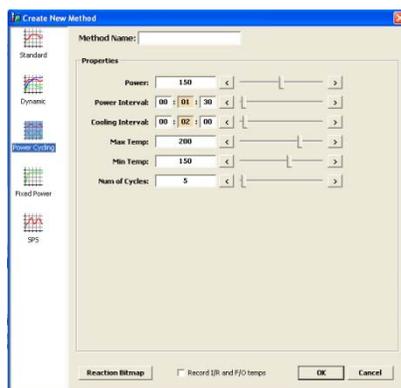


Power Cycling Control

The Power Cycling Control option can only be used with the Discover S and Discover SP series. The Power Cycling Control option is the control with which the user can irradiate at a defined power to bring the reaction to the maximum temperature, then cool the sample until the minimum temperature is reached. This cycle is repeated for a user-defined number of times. The user can also program the method to cycle between two different powers instead of a user defined temperature. The user programs:

- the maximum amount of microwave power applied,
- the maximum temperature (power interval),
- the minimum temperature (cooling interval)
- the maximum amount of time allowed to reach the maximum and minimum temperature, and the number of cycles.

NOTE: The ActiVent Technology can be used with a Dynamic method. The ActiVent technology can be enabled in the user's "preferences" under the "Method" tab.



Fixed Power Control

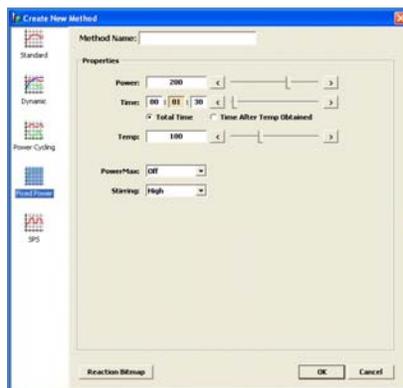
The Fixed Power Control option allows the user to apply the desired power from the beginning of the reaction without a ramping time. It provides the user the most direct method to energize reaction systems. This option applies a specified amount of energy for a specified amount of time. Maximum temperature and pressure limits alter instrument operation, either by ending the irradiation cycle or by adjusting the power, if either is reached. The user programs

- the amount of constant microwave power applied,
- a maximum run time (the total time the system applies microwave energy),
- a maximum temperature (a temperature above which the system will not apply microwave energy), and PowerMAX.

The Fixed Power Control option can be programmed in two options - Control and Safe.

- Control Fixed Power applies programmed power until the temperature setpoint is reached, then switches to a feedback loop which modulates the amount of power applied to maintain the setpoint temperature.
- Safe Fixed Power applies programmed power until the end of the programmed reaction time or until the temperature setpoint is reached.

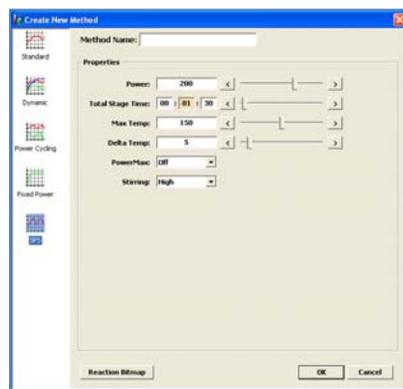
NOTE: The ActiVent Technology can be used with a Fixed Power method. The ActiVent technology can be enabled in the user's "preferences" under the "Method" tab.



SPS Control

The SPS Control option is the control type for the solid phase peptide synthesis applications which will irradiate at the defined power to bring the reaction mixture to the control temperature, then cycles the power on and off for the remainder of the run time as the temperature varies between the control temperature and a user defined deviation - usually 5 °C below the control temperature. The user programs

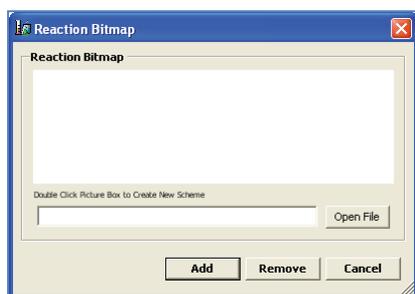
- the input power level,
- a control temperature (the temperature at which the magnetron will turn off),
- a run time (the maximum run time for a stage of the method), and
- a delta temperature (the maximum that the temperature can fall below the control temperature before the microwaves turn on).



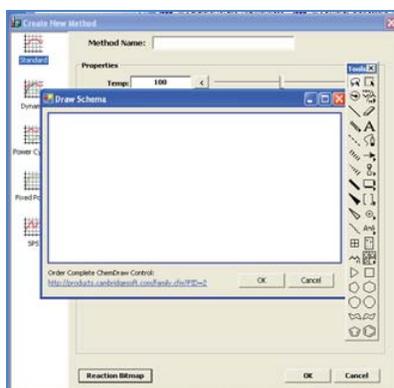
Create Method

1. Select the “New” button located in the top corner of the Synergy software. A new window will appear.
2. On the left side of the “Create New Method” screen, select the method type - Standard, Dynamic, Fixed Power, Power Cycling or SPS.
3. Enter the method name (13 characters maximum).
4. Based on method type selected, enter the desired method parameters (power, time, temperature, etc.).
5. If desired, the reaction scheme can be added to method.
 - a. select “Reaction Bitmap” located in the lower left corner of the “Create New Method” screen.

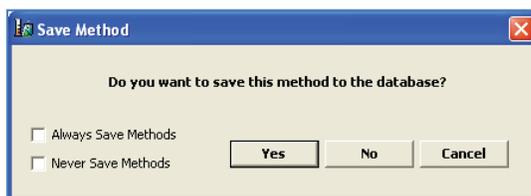
NOTE: “Reaction Bitmap” connects the user to ChemDraw or another installed drawing application, permitting the user to create a scheme of the reaction. Once created, the bitmap cannot be edited without either the purchase of the ChemDraw software package or installing a complete application for another drawing package.



- b. Double click the blank area (picture box) to create the reaction scheme.



- c. Using the ChemDraw tools, create the reaction scheme applicable to the method.
 - d. Once the scheme is complete, select “OK.” The “Reaction Bitmap” screen will reappear.
 - e. Select “Add” to add the image to the method. Each time the method is performed, the image will be displayed on the screen.
6. Once all information has been input, select “Ok” to save the method.



7. To save the programmed method, select “Yes.” If the method is not to be saved, select “No.”

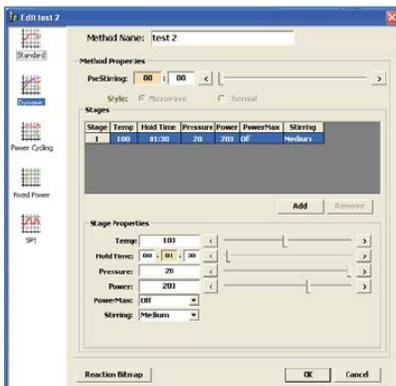
NOTE: If “Cancel” is selected, the “Create New Method” will appear with the previously entered parameters.

NOTE: If the method is saved, the new method will be added to the data tree under the current user’s methods. Folders can be added to group methods by right clicking “method” and selecting “New Folder.” The folder will then need to be named.

NOTE: To save all programmed methods without the above screen being displayed, select “Always Save Methods.” If programmed methods are not to be saved in the system software, select “Never Save Methods.”

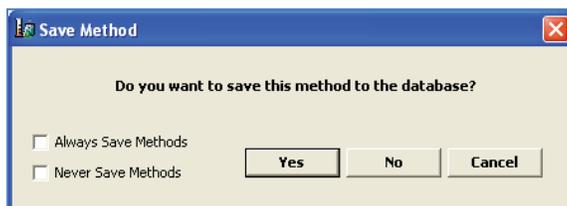
Edit Method

1. Select (highlight) the method to be edited.
2. Select the “Edit” button located in the top left hand corner of the Synergy software.



NOTE: The method shown above is for a “Dynamic” method.

3. Edit the required parameters, name, method type, etc.
4. Select “OK.”



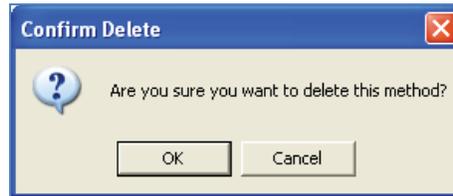
5. To save the edited method, select “Yes.” If the method is not to be saved, select “No.”

NOTE: If the method name is edited, the original method name and parameters as well as the new method and parameters will be saved.

NOTE: To save all programmed methods without the above screen being displayed, select “Always Save Methods.” If programmed methods are not to be saved in the system software, select “Never Save Methods.”

Delete Method

1. Select (highlight) the method to be deleted.
2. Select the "Delete" button located in the top left corner of the Synergy software.



3. Select "OK." The method will be permanently deleted from the user file tree.

NOTE: Deleting a method will not affect previously performed methods by that name or their data.