RATAmation v2.0 User Manual

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RATAmation v2.0 User Manual

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Thank you for choosing RATAmation RATA Data Collecting & Reporting Software from Perma Pure LLC.

General Description

The software consists of two parts, the software or program and a Microsoft Excel spreadsheet. The program communicates with the flow drawer, displays data, records test data and controls gas flow for calibration. The Excel spreadsheet, RATAmationmaster.xls, is used to calculate values and generate reports for the RATA.

There are two modes of operation, Manual and Automatic, for the RATAmation program.

Manual Mode

Manual mode allows the operator to choose the start/stop timing, the calibration gases, and the specific 15 second average to represent the result of a calibration.

Automatic Mode

Automatic mode of operation will allow an operator to start the test and leave the equipment unattended for the duration of testing. The Automatic mode will perform a calibration error test, a pre-run calibration sweep, a run and a post-run calibration sweep. The Run – Post-run cycle is continued until the number of runs requested has been completed, followed by a final calibration error test.

User Interface

Most operations during testing are preformed in a single screen, the Main screen, which contains three panels.

The Test Panel contains the data aquired during the test.

The Live Display Panel displays the actual data received from the flow drawer and the status of the cal gas valves.

The Graph Panel displays a strip chart like graph containing the live data.

The Live Display and the Graph Panels can be displayed or hidden from view to offer the operator the ability to customized the display to suit the current requirements of the test.

The Main screen with only the Test Panel displayed maximizes the area for the test data. The data displayed in all of the test screens is 15 second-average data.
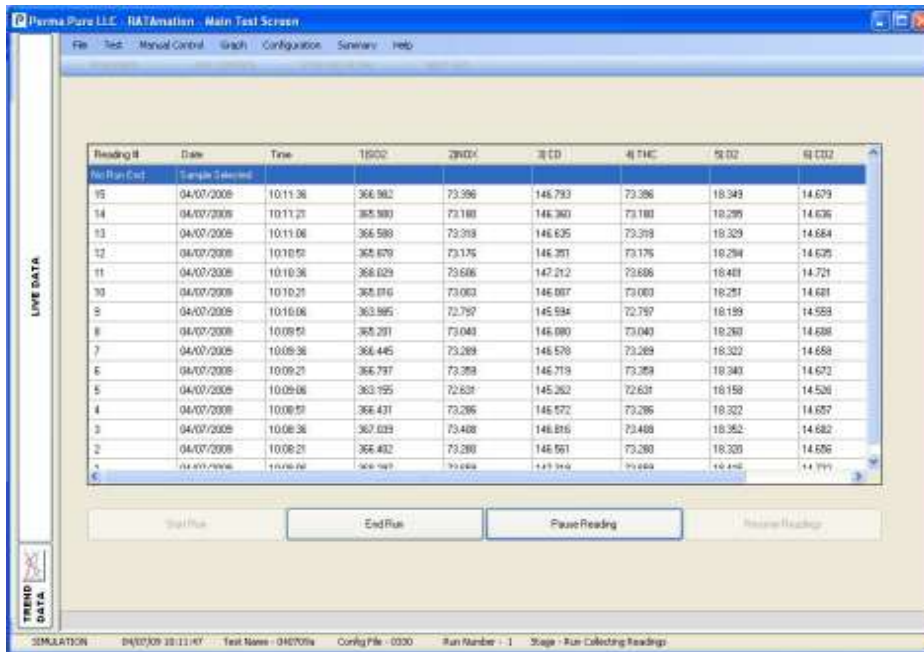
Figure 1

The Main screen with the Live Panel opened allows the operator to view raw data before the average. The Live Panel data is displayed in color to show the stability of the reading by testing the deviation in each 15 second average: stable readings are displayed in green, unstable readings are shown in yellow. The cal gas valve status is also displayed in color, red for inactive (closed) and green for active (open). The valve indicators contain a text description of status.

Clicking the long button labeled "LIVE DATA" (Figure 1) will display or hide the panel. (The Live Panel width can be adjusted but the layout of the data and the size of the indicators does not change so there is no advantage to enlarging the panel beyond the standard size.)
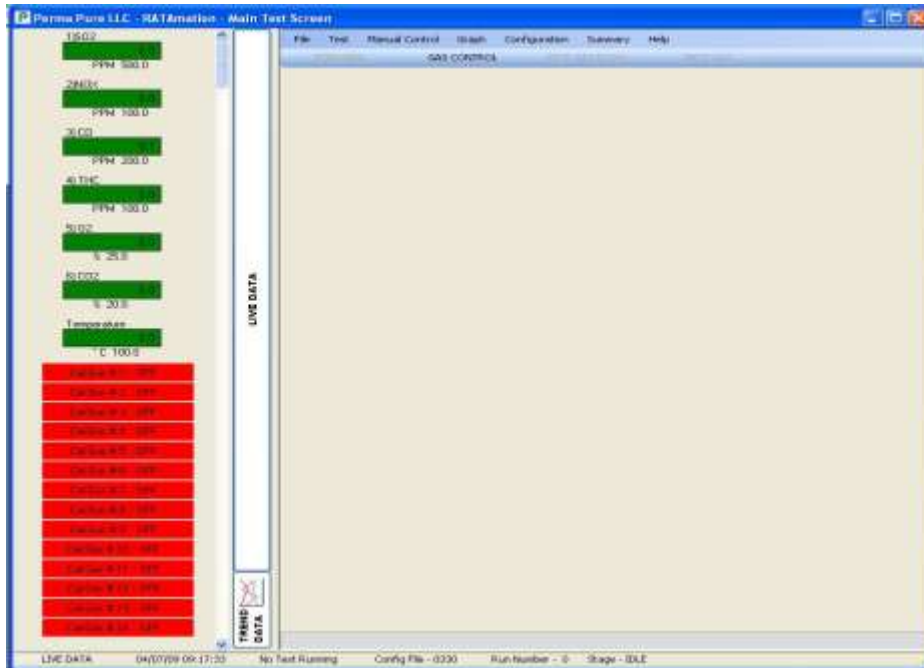
Figure 2

The Main screen with the Graph Panel opened allows the operator to view the historical data that has been recorded for the test. The Graph Panel data is displayed for each analyzer as 0 to 100%. The graph displays an hour of data with the newest data toward the right and can be scrolled to view all data. The graph contains a total of up to 7 days of data, With data stored to disk after every 15 second average.

Clicking the button labeled "TREND DATA" (Figure 2) will display or hide the panel. The Graph Panel height can be adjusted and the size of the graph adjusts to fill the available space of the panel.

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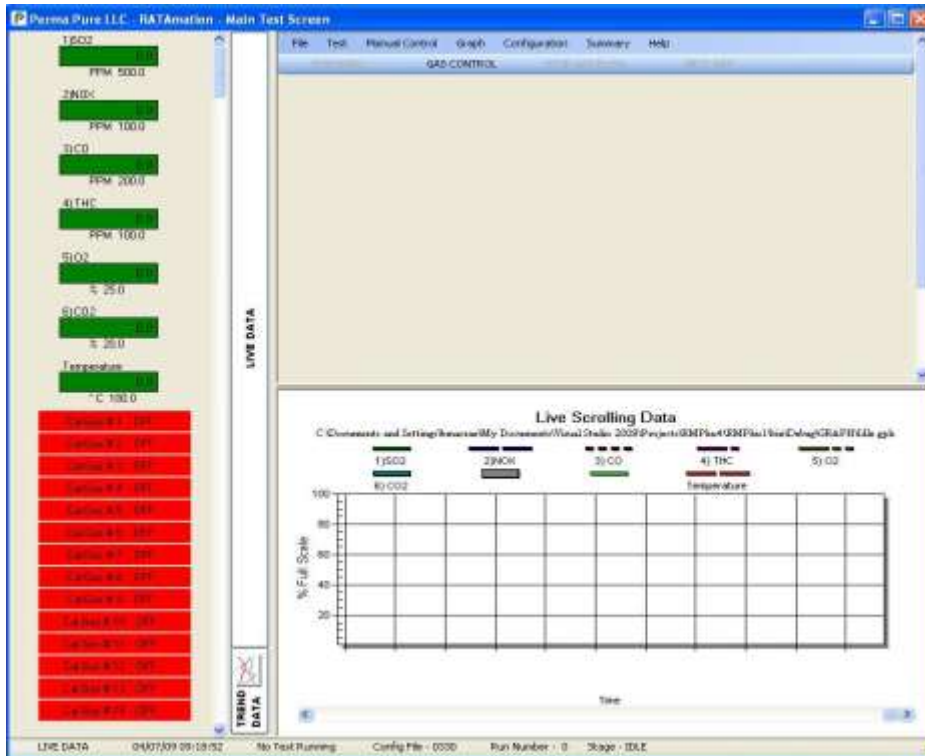
Figure 3

The other tool of the Main screen is the multiline status display across the bottom of the screen. (Figure 4)
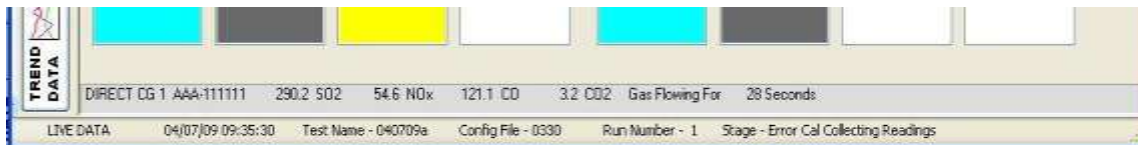
Figure 4

The top line of the status display contains information about the current cal gas.

Displayed on this line from left to right;
1) The type of gas flow - System or Direct
2) The Cylinder ID of the cal gas
3) The Composition of the cal gas
4) The total time in seconds the cal gas has been flowing

The line is blank when no gas is flowing.

The lower line of the status display contains information about the system and test.

Displayed on this line from left to right;
1) Status of the communication link – LIVE DATA or SIMULATION. LIVE DATA will be displayed in gray when the communication link is working correctly, yellow when the

communication link has missed a small number of readings, and red when there is a communication problem.

2) Current Date and Time.
3) The file name of the test. Clicking on the test name will display a message box containing the full path and name of the test files.
4) The file name of the configuration. Clicking on the configuration name will display a message box containing the full path and name of the configuration file.
5) The run number.
6) A description of the current stage of the test.

Test Screens

There are three test screens used during a RATA: Error Calibration, Run, and Pre/Post Calibration.

The Error Calibration screen (Figure 5) is used for the initial and final direct gas calibration of the analyzers. The screen contains four list boxes for each analyzer, employing an indictator with multiple lines of data, one of which can be highlighted. Only analyzers that have been configured in the 'Analog Input Configuration' screen will be displayed in this test screen. The visible items on the screen are adjusted in size to fill the available space in the Test Panel.

Figure 5

The four list boxes for each analyzer are used for the Zero, Low, Mid and High calibrations. The analyzers that do not require a Low calibration will have that list box grayed-out. Prior to a calibration the list box contains "Waiting For Cal". In Manual mode the operator will control the gas flow. In Automatic mode the computer controls the gas flow. While the specified cal gas is flowing the list box will display "None Selected" at the top with 15 second average readings adding just below "None Selected". The newest reading is at the top of the list. The time of the reading is displayed next to the 15 second average along with the letter "c"(cal error) if the reading does not match the cal requirement. In Manual mode the operator will select the value to be recorded for the calibration. In Automatic mode the computer will record the last reading after a specified period of time. When the calibration value is selected the list box will be colored blue if the reading meets the specified requirements, yellow if the reading is outside of the specifed requirements.

The Run screen (Figure 6) is used to collect data for run. The screen contains one grid with a column for each analyzer and other analog inputs. Only items that have been configured in the 'Analog Input Configuration' screen will be displayed in this test screen. The visible items on the screen are adjusted in size to fill the available space in the Test Panel.
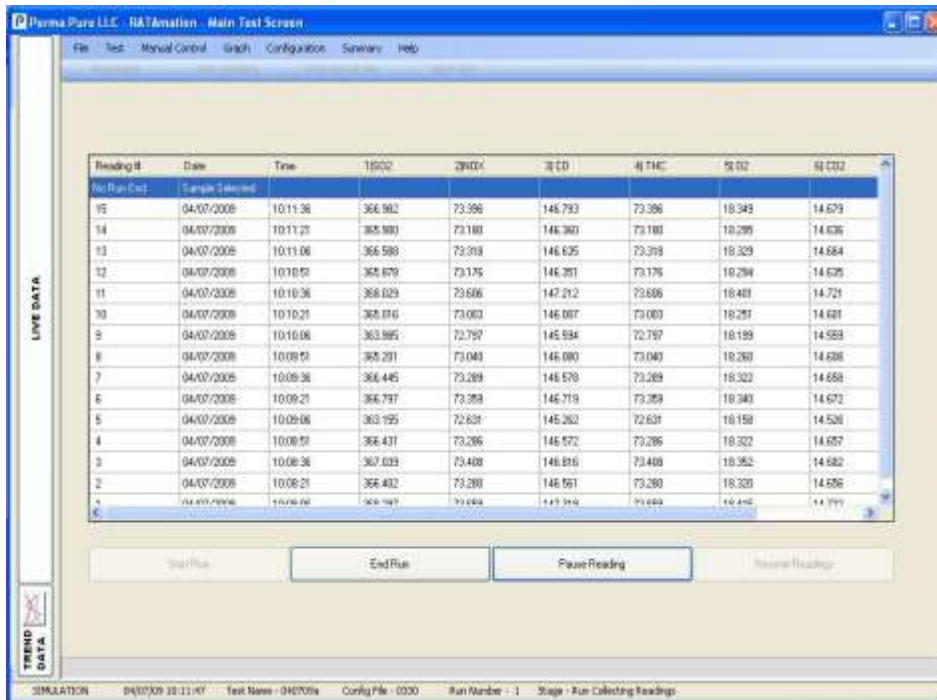
Figure 6

When the Run screen is initally displayed the program assumes that cal gas has just begun flowing so there is a built in delay equal to the System Response Time to allow the analyzers to stabilize. In Manual mode the operator will control the start of the run. In Automatic mode the computer will start the run immediately following the System Response Time delay. The top line of the grid will display "No Run End Sample Selected" at the top with 15 second average readings adding just below "No Run End Sample Selected". The newest reading is at the top of the list. The program will collect readings for the time period specified in the 'Program Set Up' screen. In Manual mode the operator will select the end point for the run (the end point is used to determine the readings used to calculate the run average.) In Automatic mode the computer will record the last reading after a specified period of time.

The Pre/Post Run Calibration screen (Figure 7) is used for the system calibration before and after a run. The screen contains two list boxes for each analyzer. Only analyzers that have been configured in the 'Analog Input Configuration' screen will be displayed in this test screen. The visible items on the screen are adjusted in size to fill the available space in the Test Panel.
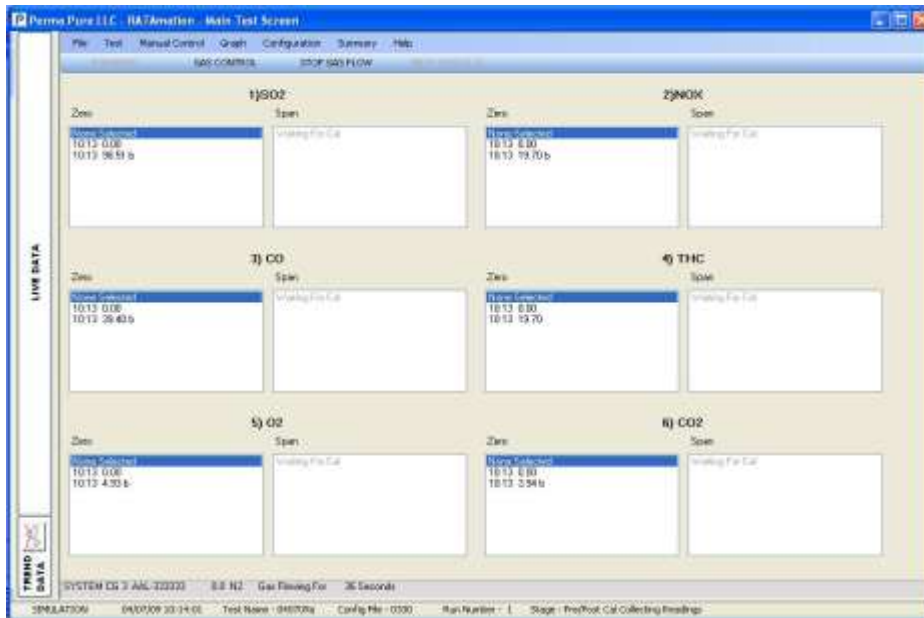
Figure 7

The two list boxes for each analyzer are used for the Zero and Span calibrations. Prior to a calibration the list box contains "Waiting For Cal". In Manual mode the operator will control the gas flow. In Automatic mode the computer controls the gas flow. While the specified cal gas is flowing the list box will display "None Selected" at the top with 15 second average readings adding just below "None Selected". The newest reading is at the top of the list. The time of the reading is displayed next to the 15 second average along with the letter "b"(bias) or "d"(drift) if the reading does not match the cal requirements. In Manual mode the operator will select the value to be recorded for the calibration. In Automatic mode the computer will record the last reading after a specified period of time. When the calibration value is selected the list box will be colored blue if the reading meets the specified requirements, yellow if the reading is outside of the specifed requirements.

Menu Summary

Across the top of the Test Screen is the Main Menu. (Figure 8)
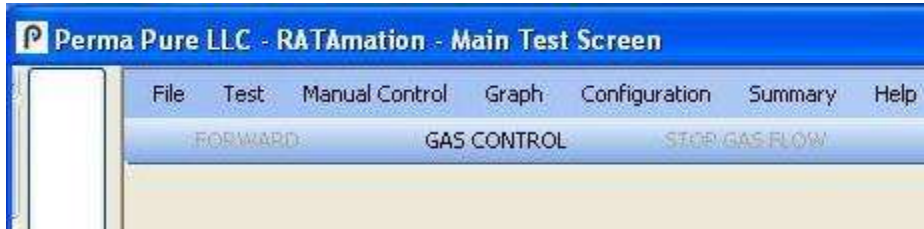
Figure 8

Main Menu Selections

File – Open, Save and Print configuration information

Test – Operations to control the testing procedure

Manual Control – Manual control of flow drawer outputs

Graph – Save, Load and Print graph information

Configuration – Modify configuration of all program settings

Summary – Display summary report of current and saved tests

Help – Display information about the program
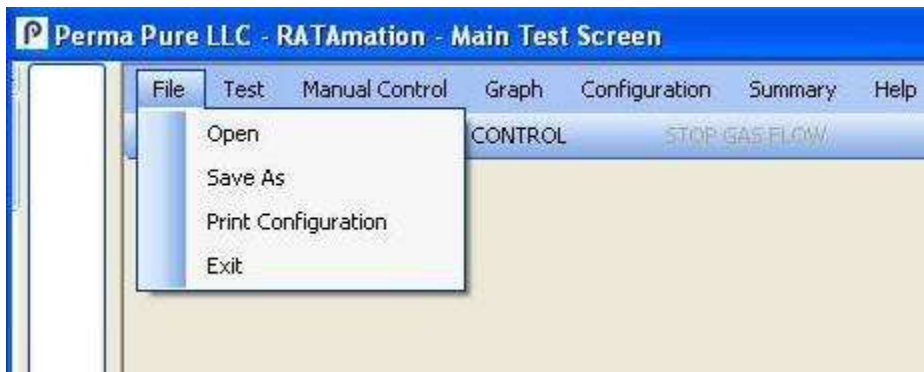
Figure 9

"File" Sub Menu from Main Menu (Figure 9)

Open – Select and load a configuration for testing that was previously saved
Save As – Save the current configuration to a new file for later use

Print Configuration – Generates a report showing of all settings in 'Notepad'

Exit – Quits Program
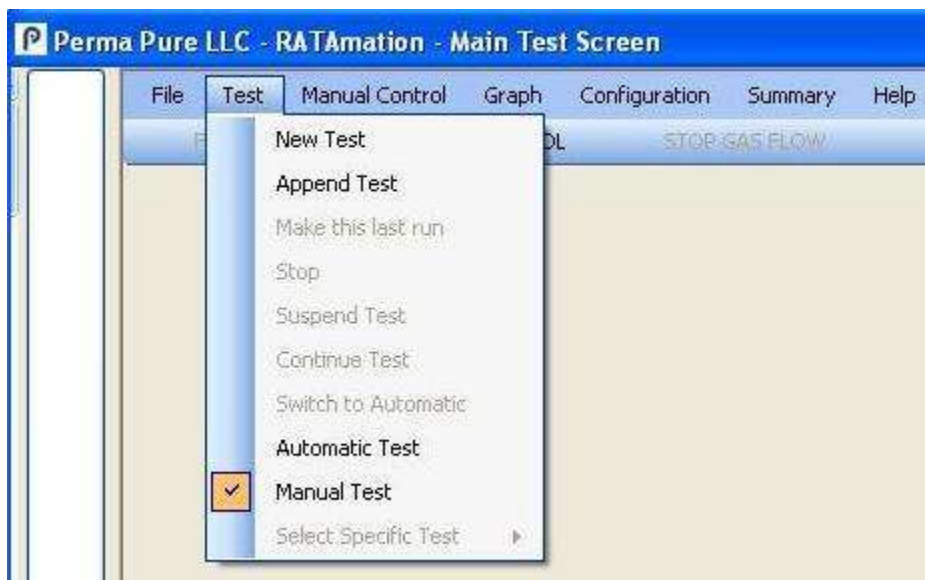
Figure 10

"Test" Sub Menu from Main Menu (Figure 10)

New Test – Starts a new test series of runs.

Append Test – Opens a previously saved test to continue testing.

Make this last run – Available while test loaded/running. Overrides 'Last Test Sequence Run' value. Program will perform a Post Run Cal and the Final Error Cal after current Run to complete a series of runs

Stop – Available after 'Suspend Test' selected. Program will close test and return to an idle state (Idle is when no test is loaded and running)

Suspend Test – Available while test loaded/running. Pauses test sequence.

Continue Test – Available while test is paused. Returns test to normal run state.

Switch to Automatic (Manual) - Available while test is paused. Will switch test from Automatic to Manual operation or Manual to Automatic operation. The menu item label changes depending on the current mode.

Automatic Test – Available when no test is loaded. When checked the program will run the next test loaded in Automatic mode. The choices 'Automatic Test' or 'Manual Test' are frozen while test is running. To change operation to Automatic mode after a test is loaded the 'Suspend Test' must be selected to pause the test. Then 'Switch to Automatic' must be selected and finally 'Continue Test' is selected to restart test in Automatic mode.

Manual Test - Available when no test is loaded. When checked the program will run the next test loaded in Manual mode. The choices 'Automatic Test' or 'Manual Test' are frozen while test is running. To change operation to Manual mode after a test is loaded the 'Suspend Test' must be selected to pause the test. Then 'Switch to Manual' must be selected and finally 'Continue Test' is selected to restart test in Manual mode.

Select Specific Test - Available when a test is loaded and running in Manual mode. Opens a submenu to that allows operator to select the item calibration or run to perform.
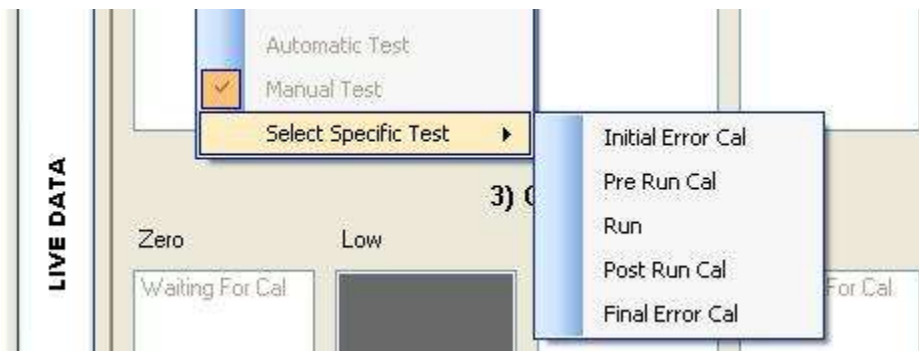
Figure 11

"Specific Test" from Test Sub Menu from Main Menu (Figure 11)

Initial Error Cal – Displays screen to perform the direct analyzer calibration.
Summary report data is stored as the initial error calibration.

Pre Run Cal - Displays screen to perform the system analyzer calibration.
Summary report data is stored as the Pre Run Cal for the next run.

Run – Displays screen to perform run.

Post Run Cal – Displays screen to perform the system analyzer calibration.
Summary report data is stored as the Post Run Cal for the current run and the Pre
Run Cal for the next run.

Final Error Cal – Displays screen to perform the direct analyzer calibration.
Summary report data is stored as the final error calibration.
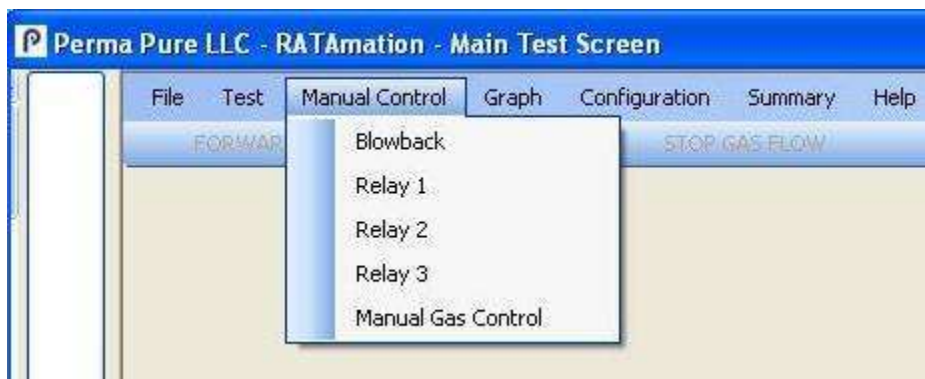
Figure 12

"Manual Control" Sub Menu from Main Menu (Figure 12)

Blowback – Switches on Blowback relay of the flow drawer for 30 seconds.
The relay turns off automatically.

Relay 1 - Toggles Relay 1 On and Off. Menu item checked when relay on.

Relay 2 - Toggles Relay 2 On and Off. Menu item checked when relay on.

Relay 3 - Toggles Relay 3 On and Off. Menu item checked when relay on.

Manual Gas Control – Opens the 'Manual Gas Control' screen to select cal gas and "Direct" or "System" for gas flow.
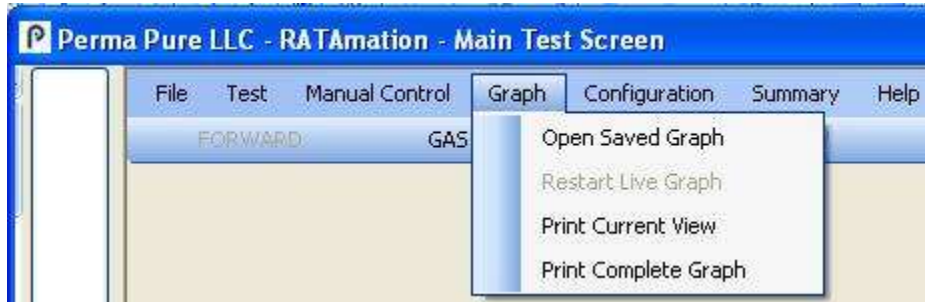
Figure 13

"Graph" Sub Menu from Main Menu (figure 13)

Open Saved Graph - Available when no test is loaded. Opens a dialog box to allow user to select a stored graph from a previous test to view or print results.

Restart Live Graph - Available only after 'Open Saved Graph' selected to restore graph to update with live values.

Print Current View – Output current displayed graph to a picture (jpg) file for printing or viewing. The file is saved to the default graph directory with the current test file name (or "idle" when no test running) followed by the date and time.(Formatted as 2 digit year, 2 digit month, 2 digit day, military hour, minutes, seconds)

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Print Complete Graph - Output current complete graph to Picture (jpg) files for printing or viewing. The files are saved to the default graph directory with the current test file name (or "idle" when no test is running) followed by a number. The numbers correspond to the reverse sequential hours of the graph so 1 is the most recent data and 168 is the oldest data.
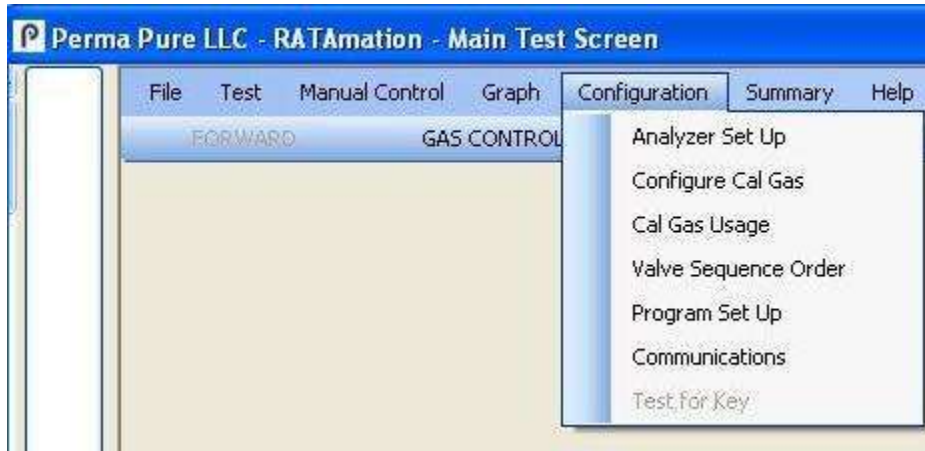
Figure 14

"Configuration" Sub Menu from Main Menu (figure 14)

Analyzer Set Up – Opens the "Analog Input Configuration" screen to set the configuration for the analog inputs and analyzers for the flow drawer.

Configure Cal Gas - Opens the "Calibration Gas Configuration" screen to set the configuration for the calibration gases.

Cal Gas Usage - Opens the "Calibration Gas Usage Configuration" screen to set the relationship between the analyzers and the calibration gases.

Valve Sequence Order – Opens the "Valve Sequence Order" screen to set the sequencing order of the calibration gases during operation in automatic mode The order established in this screen is also used as a prompt during Manual mode operation.

Program Set Up – Opens the "Program Set Up" screen to set the testing configuration

Communications - Available when Marx USB Key is present. Opens the 'Communications' screen to select, open and test or close the serial communications port between the computer and the flow drawer.

Test for Key – Available when Marx USB Key is initially not detected. Tests to see if key is
present and program can run in live mode.

Figure 15

"Summary" Sub Menu from Main Menu (Figure 15)

Current Test Summary – Available when a test is loaded and running.
Creates a summary report from current test data of calibration results and run
averages. Displays the report in 'Notepad' for printing.

Saved Test Summary - Available when no test is loaded. Opens a dialog box to select
previously stored test data. Creates a summary report from selected test data of
calibration results and run averages. Displays the report in 'Notepad' for printing.

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Program Operation

The program requires that changes need to be saved or they will be lost on exiting of each set up screen. To avoid overwiting important configuration the user should use the 'Save As' function to create a new file to work with prior to making any changes to the settings.. The old configuration file will remain on the drive under the old name.

The program has been developed with an emphysis on minimizing any unnecessary information from being displayed on the screens. Where possible the unused analyzers, cal gases and calibration boxes are not displayed.

When initially operating the program the user should first configure the analog inputs and analyzers for the system. This can be done through the 'Analog Input Configuration' screen.

The next most important item to be set up is the calibration gases. This can be done through the 'Calibration Gas Configuration' screen.

The cal gas usage is one the last items to be configured. The cal gas usage screen only displays the items that have been configured for both analyzers and cal gases. If there are no analyzers or cal gases set up the screen will not open. The configuration of the usage is done in the 'Cal Gas Usage' screen.

Manual Test Operation

The Manual mode for testing has been created to simplify some of the standard operations preformed during the calibrations and runs

During a calibration there are three active buttons below the menu bar, GAS CONTROL, STOP GAS FLOW and NEXT GAS. These buttons have been added to the screen to ease the calibration.

> The 'GAS CONTROL' button opens the 'Manual Gas Control' screen to operate the flow drawer valves and flow of gases.
> The 'STOP GAS FLOW' button forces the cal gas valves to close and stops the gas flow.
> The computer looks at the valve sequence list and the cal gas usage to determine the next gas that needs to be used. The 'NEXT GAS' button will change text to show the cal gas that should flow next. The operator can just click the 'NEXT GAS' button to start the flow of gas.
> The 'FORWARD' button will move to the next step in the test. The operator needs to take care to not inadvertantly click the button because data can be lost.

Automatic Test Operation

The Automatic mode is designed to operate without operator intervention. The test begins immediately after the data file has been selected. The test can be interrupted by the operator by selecting the 'Suspend Test' from the 'Test' menu. Once the test is paused the mode can be changed to Manual for operator control or resumed in Automatic mode.

The Automatic mode uses the parameters set in the 'Program Set Up' screen to establish the timing for the calibrations and runs. In Automatic mode the timing for the calibration gas flow is established from the 'Direct Response', 'System Response' and 'Long Response' times. During a calibration the cal gas will be supplied to the analyzer for a period of time equal to two times the appropriate response time plus one reading average (15 seconds). The last reading taken while cal gas is flowing is the recorded calibration value. Prior to a Run beginning, Automatic mode waits for time period equal to the 'System Response' time to insure uncorrupted sample is analyzed for the readings.

New Test

Before starting a new test check that the mode is correctly set for either Automatic or Manual. Start a new RATA test from the Main Menu by selecting the 'Test' menu item and then selecting 'New Test' from the submenu. A window will be displayed (Figure 16) to enter information about the company performing and receiving the test. Fill in the appropriate information in to the form and click the 'OK' button. The information for the Tester and Client will be stored in the computer. Only information that has changed from the previous test will need to be edited.

Figure 16

A dialog box will open to enter a file name for the test data. The file name selected can not be a duplicate of any previous test files, as the software will not allow the operator to overwrite

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existing files. The computer will generate three files, *Test File Name*.csv , *Test File Name*.gph and *Test File Name*.dat. The *Test File Name*.csv is a text file that can be opened in Excel. This file will contain the test data that is to be imported into the RATAmationmaster.xls spreadsheet. The *Test File Name*.dat file is a data file that contains the Calibration and Run summary data. The *Test File Name*.gph file is the graph data file. Any time you look to backup or copy the data from one computer all three files should be copied.

The Initial Error Calibration screen will then be displayed.

Append Test

Before opening a test to append, check that the mode is correctly set for either Automatic or Manual. Open an existing RATA test to add more data from the Main Menu by selecting the 'Test' menu item and then selecting 'Append Test' from the submenu. A dialog box will open to select the file with the test data. The configuation should be set the same as when the original test was run. A window will be displayed to select the test restarting point; the choices are Error Cal, Pre Run Cal or Run. The selected screen will be displayed for use, or started in automatic mode.

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Manual Gas Control

"Manual Gas Control" is a screen used to control the cal gas valves of the flow drawer. (Figure 17)

Open this screen from the Main Menu by selecting the 'Manual Control' menu item and then selecting 'Manual Gas Control' from the submenu.

This screen can also be opened from the Main screen by clicking the 'Gas Control' button just below the menu bar.
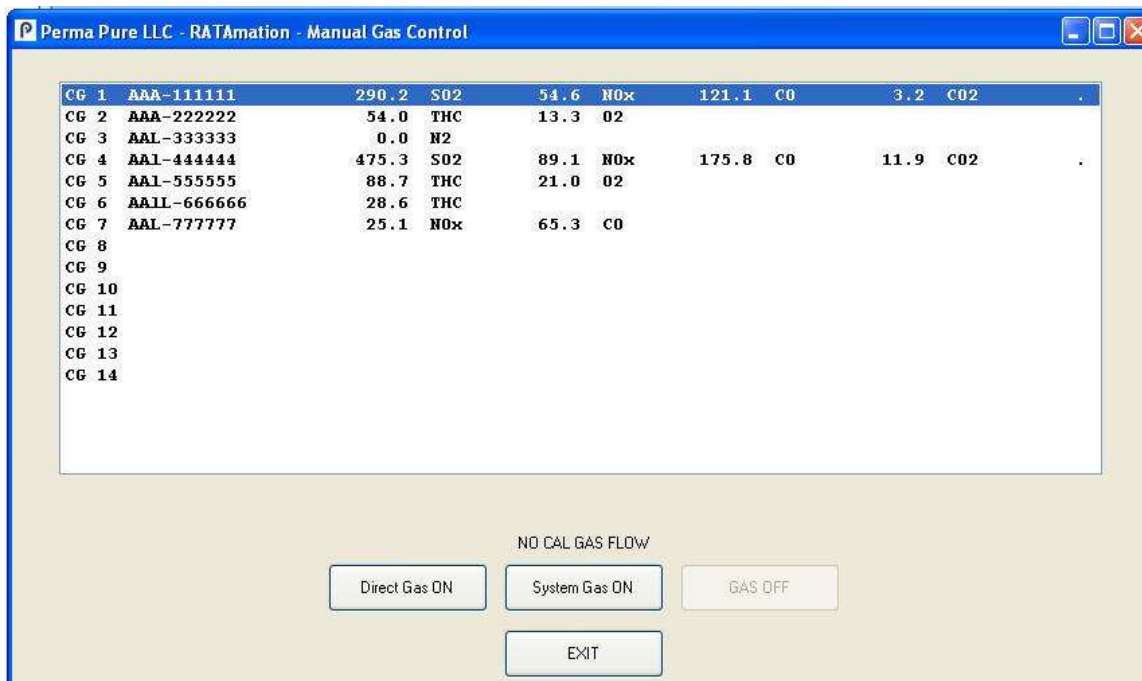
Figure 17

This screen displays all 14 calibration gases labeled as CG 1 though 14 even if no configuration has been entered for the cal gas. The divided gases labeled DG 1 through 28 will only be displayed if there at least 1 component gas set.

The available cal gases are displayed in a list containing the Cylinder ID and up to 4 component gases showing type and quantity.

If no cal gas flowing, selecting a line of the list will highlight the cal gas.

Click on either 'Direct Gas ON' button to supply cal gas directly to the analyzer or 'System Gas ON' button to supply cal gas to the system.

The gas should begin flowing within a second, with any delay due to communication to the flow drawer.

The highlighted item of the cal gas list can not be changed once gas is flowing.

The 'Direct Gas ON' and the 'System Gas ON' buttons will become unavailable.

The 'GAS OFF' button will become enabled.

Click the 'GAS OFF' button to stop the flow of cal gas.

The will also respond to the computer automatic control of the cal gas sequence. The 'Manual Gas Control' screen will display the current cal gas flow status and although not recommended can override the computer control. For example turning the cal gas off when the computer has started a calibration.

The screen will disappear from view when the 'Exit' button, the "X" on the screen or the Main screen is clicked.

Analog Input (Analyzer) Configuration

"Analog Input Configuration" is a screen to define the inputs to the flow drawer. (Figure 18)

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Analyzer Set Up' from the submenu.

Figure 18

This screen will allow configuration of up to 12 analog inputs labeled as Chan 1 though 12 (abbreviation for channel).

Chan 1 through 8 can be configured as 'Analyzers' for use in testing.

Chan 1 through 12 can be configured as 'Other Data' for additional information or data for the test.

Only Chan 1 through 8 inputs that are configured as 'Analyzer' will be displayed on the Error Calibration and the Pre/Post Calibration screens. All of the inputs that are configured for use, either 'Analyzer' or 'Other Data', will be displayed on the Run, Live Data and Graph displays.

The configurations for all channels are displayed in a spreadsheet type grid.

The screen is initially displayed with the stored setup information used by the program in the main grid and with Chan 1 selected.

Selecting a line of the grid will copy the data to fields where the info can be edited.

There are two buttons, OK and Undo, near the editing fields.

"OK" Button - will replace the current grid information with the data currently in the edit fields. The new data will be placed into the grid but not stored to the configuration file.

"Undo" Button - will discard changes and replace the values with the information in the grid for the current line being edited.

The following information can be set for each of the analog inputs of the flow drawer.

Input Type –   Unused / Analyzer / Other Data   Chan 1-8
              Unused / Other Data   Chan 9-12
              The value defaults to Unused.
              Unused is not displayed on any screen
              Analyzer is displayed on all cal and live data screens
              Other Data is displayed on all live data screens

Channel Name – descriptive text to be used for data display

Gas Type-   SO2 6c /NOx 7e/ NOx 20/ CO2 3a/ CO2 20/
              O2 3a/ O2 20/ CO 10/ THC 25a
              The default value is SO2 6c.
              Used only when Input Type is set to Analyzer.
              The value is ignored otherwise.

Analyzer SN- descriptive text of the serial number for the analyzer.
              Used for reference only

Offset Value – the scaling factor to adjust the zero of the input
              This value is subtracted from the scaled input to obtain the final displayed and recorded value.

Full Scale –   Full scale input of the Analyzer or Other Data.
              The value is used for display only.

The calibration limits are based on the span gas used for cal.

Analog Span- Engineering value of the highest analog input for the analog input module at 100% input. A 4/20 mA module will display this value at 20mA input, 0/10 VDC. at 10 VDC, 0/5 VDC at 5 VDC. For example: an analyzer has an output of 0 to 5 VDC that represents 0 to 500 PPM and is connected to a 5VDC input module. The value 500 is entered as the Full Scale Value. In the same application except the module accepts 10 VDC then Full Scale Value will be 1000ppm.

Units – descriptive text of the scale units.
> The field will accept Alt character codes. For example to display the degree symbol (°), hold the 'ALT' key and enter 248 on the numeric keypad. When the 'ALT' key is released the symbol will be displayed.
> Alt character code values are available from many reference sources.

Train – Train 1 / Train 2
> The default value is Train 1.
> Allows for multiple streams.

Long Cal Time- When checked the time periods and readings required are calculated using the long response time instead of the direct or system response times. This value is evaluated for each analyzer separately. When multiple analyzers are active at the same time, any analyzer in the group with 'Long Cal Time' checked will set the time for the entire group. The response times are set in the Program Set Up screen. The Long Cal Time is checked only when analyzer requires a longer response period to obtain an accurate result.

There are three buttons below the grid.

Cancel – Restores the information shown in the grid to the last values stored as the configuration information on a disk drive.

Accept – Saves the current information contained in the grid to the configuration file store on the disk drive

Exit – Closes the Analyzer Input Configuration screen.

The "X" on the screen will also close the screen

When the screen closes the grid information will be compared to the current configuration information stored on the disk drive. If there are any differences the program will prompt to save or discard changes.

Calibration Gas Configuration

"Calibration Gas Configuration" is a screen to define the gases used by the flow drawer for calibration. (Figure 19)

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Configure Cal Gas' from the submenu.
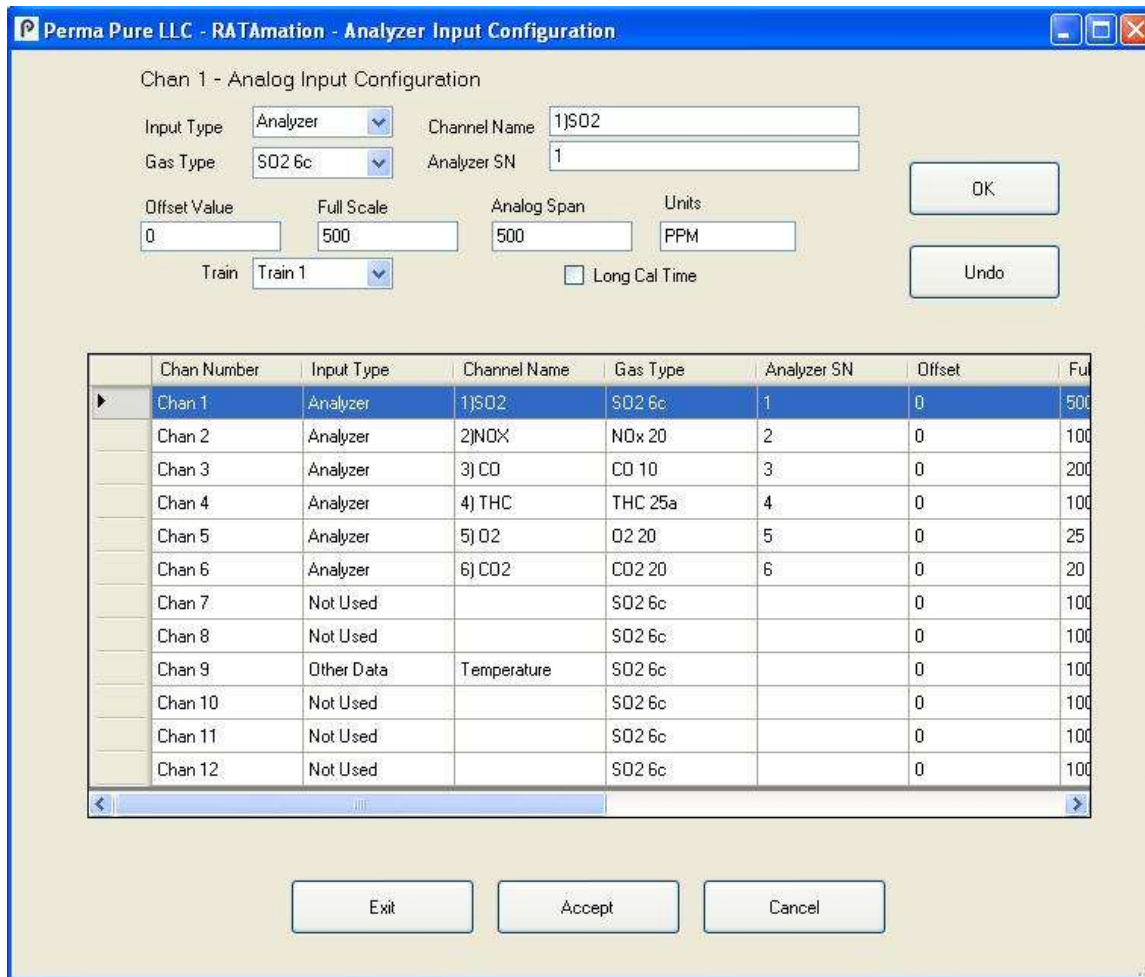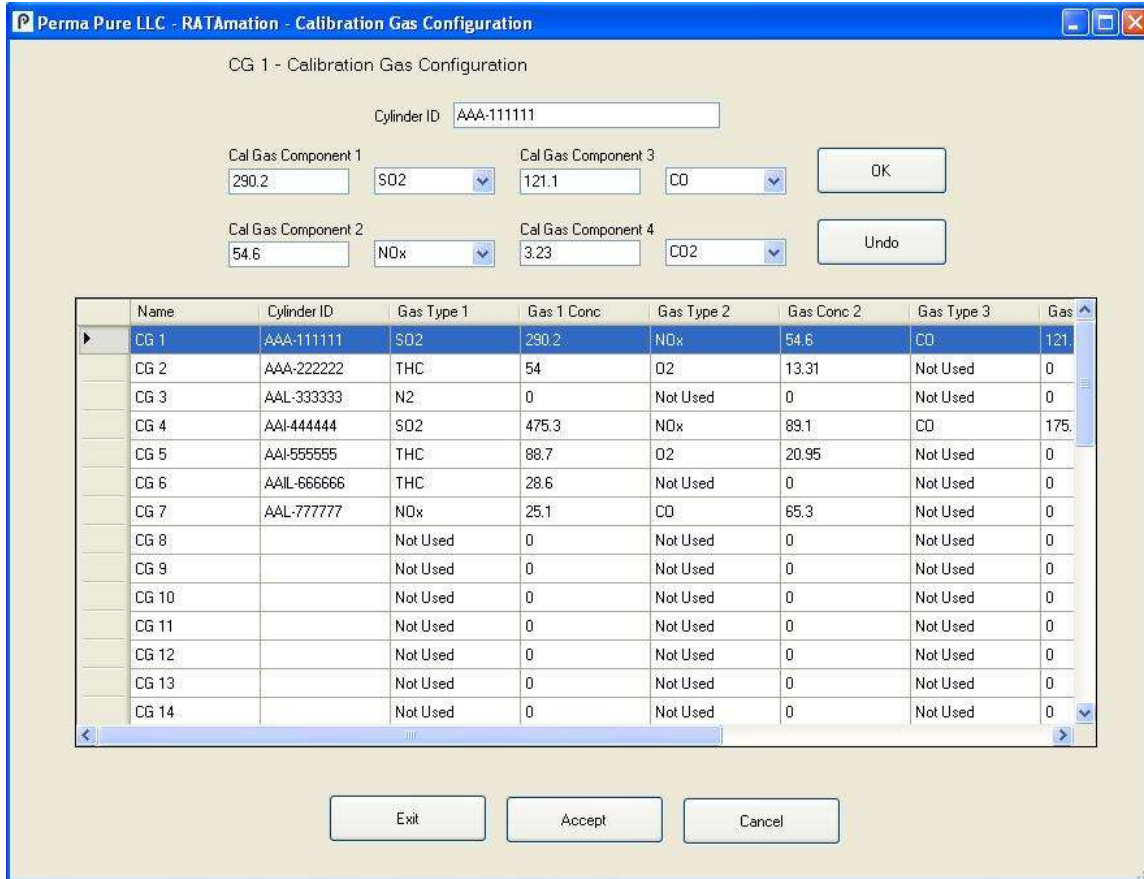

Figure 19

This screen will allow configuration of up to 14 calibration gases labeled as CG 1 though 14 (abbreviation for calibration gas) and 28 divided gases labeled DG 1 through 28.

CG 1 through 14 are connected to the flow drawer at cal gas valves in the rear of the unit. DG 1 through 28 can be connected to any of the 14 cal gas valves. The valve used for the divided gas is set in the Program Set Up screen. The software only allows for the passage of the divided gas. The gas divider itself must be controlled externally from this software.

The configurations for all cal gases are displayed in a spreadsheet type grid.

The screen is initially displayed with the stored setup information used by the program in the main grid and with CG 1 selected.

Selecting a line of the grid will copy the data to fields where the info can be edited.

There are two buttons, "OK" and "Undo", near the editing fields.

"OK" Button - will replace the current grid information with the data currently in the edit fields. The new data will be placed into the grid but not stored to the configuration file.

"Undo" Button - will discard changes and replace the values with the information in the grid for the current line being edited.

The following information can be set for each of the calibration gases of the flow drawer.

Cylinder ID – descriptive text for the cylinder of blended gas
          Used for reference only

A blended gas can consist of up to 4 components. The type and quantity for each component must be entered. Below each of the labels Component Gas 1 though 4 is an entry box to enter the quantity and a selection list of gas types

Quantity -   Quantity of the specific type of gas selected below must be in same units as analyzer.

Gas Type-   Not Used / SO2 / NOx / CO2 / O2 / CO / THC / TRS / N2
              The default value is Not Used.

There are three buttons below the grid.

Cancel –   Restores the information shown in the grid to the last values stored as the configuration information on a disk drive.

Accept –   Saves the current information contained in the grid to the configuration file stored on the disk drive

Exit –Closes the Analyzer Input Configuration screen.

The "X" on the screen will also close the screen

When the screen closes the grid information will be compared to the current configuration information stored on the disk drive. If there are any differences the program will prompt to save or discard changes.

Calibration Gas Usage Configuration

"Calibration Gas Usage Configuration" is a screen (Figure 20) to associate the analyzers configured in the "Analog Input Configuration" screen and the gases configured in the "Calibration Gas Configuration" screen. This screen will determine the gas used to calibrate each analyzer.

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Cal Gas Usage' from the submenu.
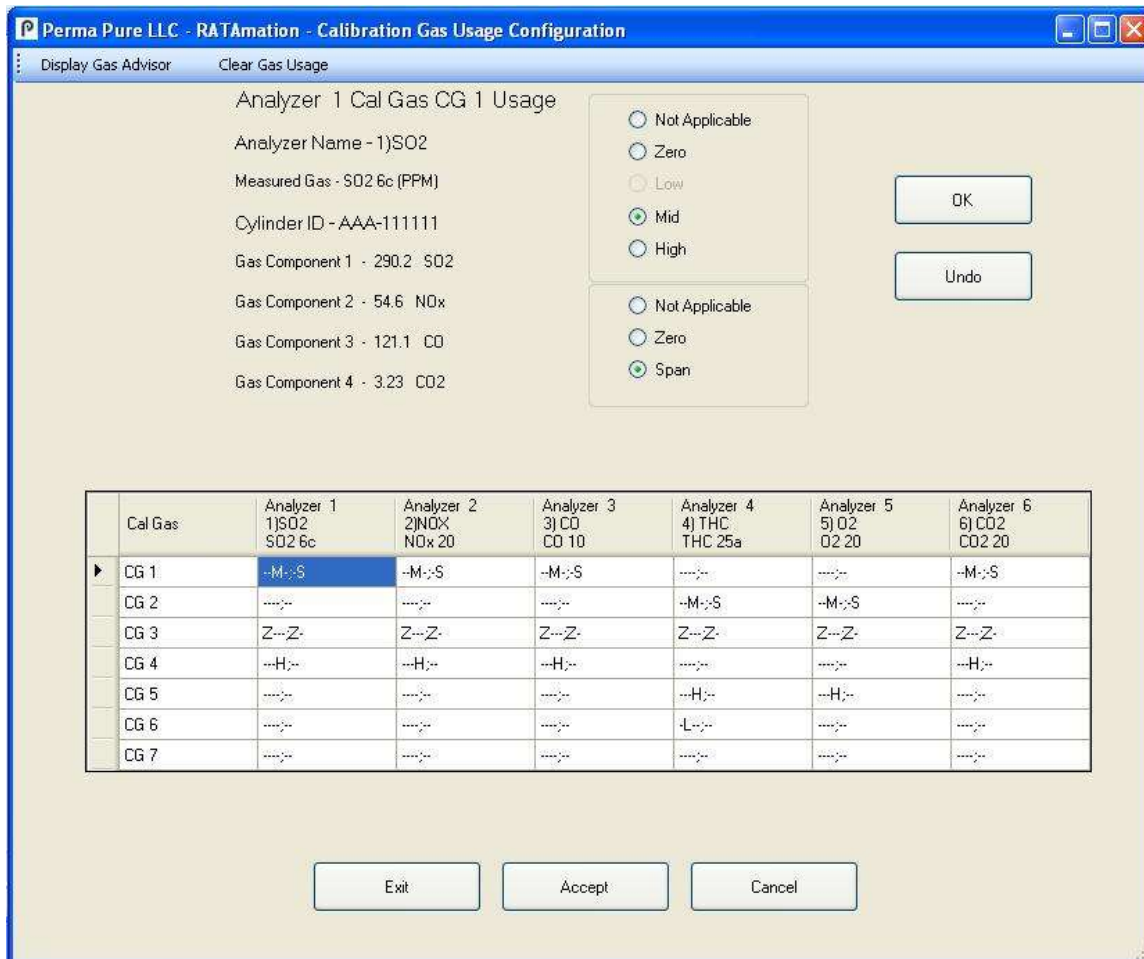
Figure 20

This screen will display all configured analyzers versus all configured cal gas to allow the selection of specific gases for the different calibrations of the analyzers, Zero, Low, Mid, High and Span.

When the screen is opened the current cylinder/analyzer information used in the program will be used to populate the grid.

Each column will represent each of the analyzers. Each row will represent each of the calibration cylinders. Each cell of the grid will contain a series of letters to represent the calibration usage. The following letter code is used:

Z –Zero	Direct Calibrations
L – Low	
M – Mid Range	
H – High Range	
Z – Zero	System Calibrations
S – Full Span	

Each cell contains a combination the above letters or "-"marks. For example if cylinder 1 is used for the High Range and Full Span then the cell would contain
"---H ;-S"

Selecting a cell of the grid will copy the data to fields where the info can be edited.

There are two sets of radio buttons in the edit area of the screen. Only 1 button of each set can be chosen at a time, selecting an item will clear the other buttons of the set. The upper set specifies the Error (Direct) Calibrations and consists of

N/A	Not used for calibration of this analyzer
Zero	Used for the zero calibration point
Low	Used for the low cal point, may be not available depending on the analyzer gas measured
Mid	Used for the mid cal point
High	Used for the high cal point

The lower set specifies the Pre/Post (System) Calibrations and consists of

N/A	Not used for calibration of this analyzer
Zero	Used for the zero calibration point
Span	Used for the span cal point

The range and type input of the corresponding analyzer and the components of the corresponding cal gas for the selected cell are displayed next to the radio buttons.

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The EPA specified ranges are used to show warnings for selection of calibration gas that may not be in the correct range for the selected calibration. Warnings are also displayed when the High cal gas is changed due to the fact that the High Cal gas sets the span value for measurements.

There are two buttons, "OK" and "Undo", near the editing fields.

> "OK" Button - will replace the current grid information with the data currently in the edit fields. The new data will be placed into the grid but not stored to the configuration file.

> "Undo" Button - will discard changes and replace the values with the information in the grid for the current line being edited.

There are three buttons below the grid.

Cancel –   Restores the information shown in the grid to the last values stored as the configuration information on a disk drive.

Accept –   Saves the current information contained in the grid to the configuration file stored on the disk drive.

Exit –   Closes the Analyzer Input Configuration screen.

The "X" on the screen will also close the screen.

When the screen closes the grid information will be compared to the current configuration information stored on the disk drive. If there are any differences the program will prompt to save or discard changes.

Located at the top of the screen are two buttons.

The 'Display Gas Advisor' opens a screen that will display the EPA specified calibration ranges for each analyzer at the required levels. The 'Gas Advisor' screen creates the information for the ranges from the data stored on the disk. The ranges required will not reflect changes made in the 'Cal Gas Usage' screen until the changes are saved to the disk through the 'Accept' button.

The 'Clear Gas Usage' will clear all cal gas verse analyzer correlations.

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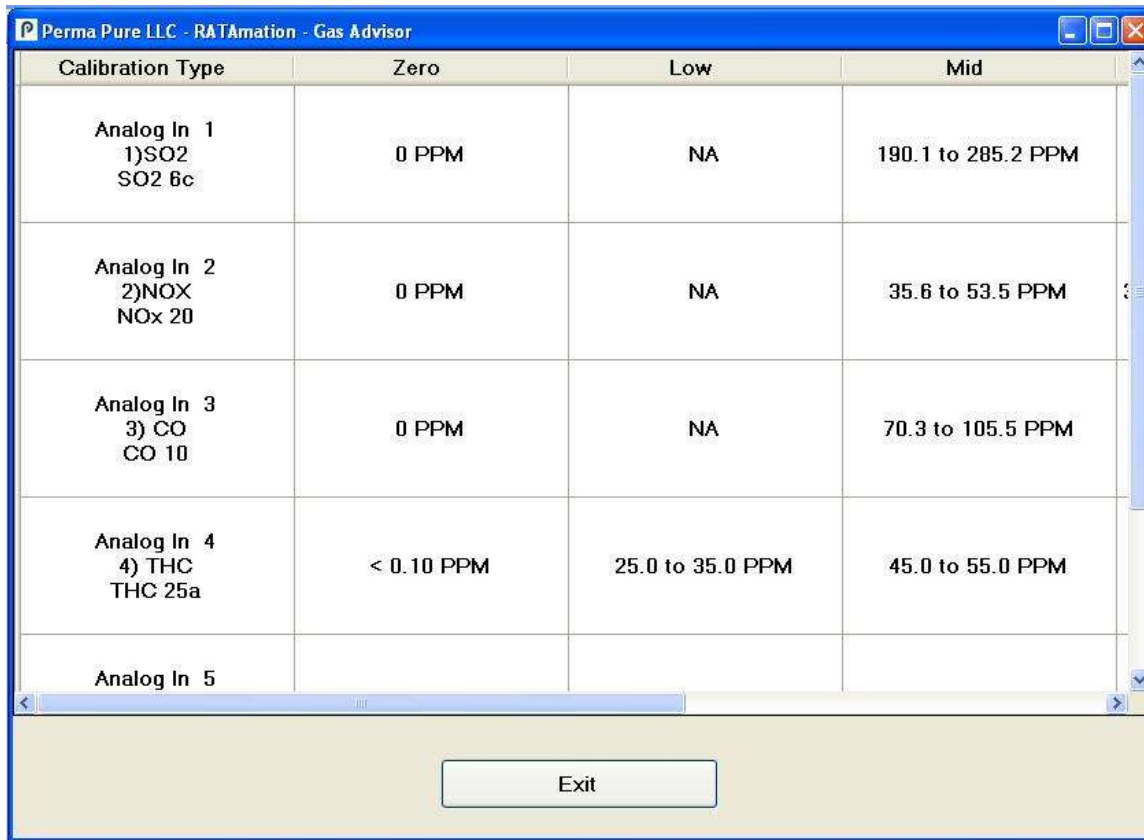
The operator will receive a warning before proceeding and the operation can be canceled from the warning message box. The operation will clear the usage in this screen only. Any change is not permanently stored until the 'Accept' button is pressed or saved on exiting this screen.

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Gas Advisor Screen

"Gas Advisor" is a screen to display calculated acceptable ranges of gas for each of the required calibration levels for the configured analyzers. (Figure 21)

Open this screen from the "Calibration Gas Usage Configuration" screen by clicking on the button near the top left corner of the window labeled 'Display Gas Advisor'.

Calibration Type	Zero	Low	Mid
Analog In 1 1)SO2 SO2 6c	0 PPM	NA	190.1 to 285.2 PPM
Analog In 2 2)NOX NOx 20	0 PPM	NA	35.6 to 53.5 PPM
Analog In 3 3) CO CO 10	0 PPM	NA	70.3 to 105.5 PPM
Analog In 4 4) THC THC 25a	< 0.10 PPM	25.0 to 35.0 PPM	45.0 to 55.0 PPM
Analog In 5			

Figure 21

The 'Gas Advisor' screen creates the information for the ranges from the analyzer, cal gas and gas usage data stored on the disk. Any changes to the gas usage must be saved before entering the 'Gas Advisor' screen for them to be reflected in the information grid. The screen uses the EPA requirements to display ranges for cal gas.

This screen is intended as a recommendation only. Using gases that are different than the ones shown in the 'Gas Advisor' will not cause any issues with the testing portion of this software.

EPA Specifications used for the 'Gas Advisor'

Perma Pure LLC
Phone (732) 244-0010
www.permapure.com

Parameter	GAS	
	O2 3a/CO2 3a/SO2 6c/	THC 25a
	NOx 7e/CO 10/NOx 20	
	CO2 20/O2 20	
Zero Gas	Zero Gas	<0.1PPM or 0.001xSPAN
Low Gas Lower Limit	Zero Gas	0.25 x SPAN
Low Gas Upper Limit	<0.2 x SPAN	0.35 x SPAN
Mid Gas Lower Limit	0.4 x SPAN	0.45 x SPAN
Mid Gas Upper Limit	0.6 x SPAN	0.55 x SPAN
High Gas Lower Limit		0.80 x SPAN
High Gas Upper Limit	SPAN	0.90 x SPAN
Cal Error Limit	0.02 x SPAN	<0.05 x SPAN
Bias Limit	0.05 x SPAN	n/a
Drift Limit	0.03 x SPAN	0.03 x SPAN
Span Value	Mid or High Gas	Mid Gas

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Valve Sequence Order

'Valve Sequence Order' is a screen to adjust the order of use for the cal gas valves of the flow drawer and the sequencing order of the calibration gases introduced during operation in Automatic mode The order established in this screen is also used as a prompt during Manual mode operation.

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Valve Sequence Order' from the submenu.

Figure 22

This screen will display all possible calibration gases including the divided gases in a scrollable list. The list is shown in order from top to bottom with the cal gas valves as they will be used during a calibration.

To adjust the valve order; highlight the valve to be moved and click the 'Move Up' or 'Move Down' buttons. The highlighted valve will swap position with the valve directly above or below respectively. Repeated clicks of the 'Move Up' or 'Move Down' buttons will continue to shift the position of the highlighted valve.

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The Cal Gas Valve Number 1 through 14 refer to the cal gas passed by the valve of the same number, not the valve itself. Although the divided gases are all connected to a single valve the order of use can be set individually and is completely independent of the setting for Cal Gas Valve Number 1 through 14.

There is only an 'Exit' button on the screen. The 'Exit' button closes the 'Valve Sequence Order' screen. The "X" on the screen will also close the screen

When the screen closes the information will be compared to the current configuration information stored on the disk drive. If there are any differences the program will prompt to save or discard changes.

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Program Set Up

"Program Set Up" is a screen to define the information required for testing. (Figure 23)

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Program Set Up' from the submenu.
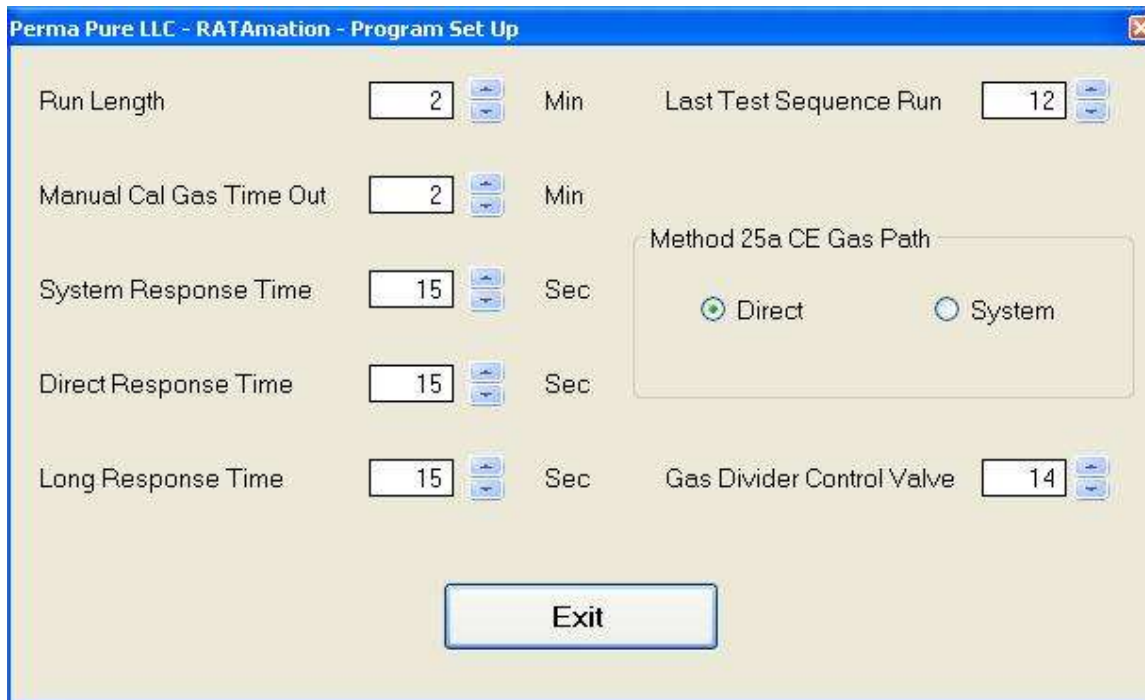
Figure 23

Run Length -   Range is 1 minute to 1440 minutes (24 hrs), the minimum time in minutes required for a valid run.

The 'Run Length' is used to determine the length of a run in both automatic and manual modes. Automatic mode will take readings for the time specified as the 'Run Length' plus 1 * 15 second average before recording the value and proceeding to the Post Run Calibration. In Automatic mode the run consists of: the second reading taken marked as the start of the run and the last reading taken marked as the end of the run. Manual mode will take a minimum of readings specified by the 'Run Length' before a run end point can be selected. The selection of a run end point will set the range of reading considered to be the run including the start and end readings.

Manual Cal Gas Time Out- Range is 1 minute to 240 minutes, the maximum time in minutes that a cal gas valve can remain open. A timer starts when the cal gas is opened. The software will automatically close the valve if the time specified is exceeded.

System Response Time- Range is 15 seconds to 600 seconds in 5 second increments, the amount of time required for the measurement system to display 95% of a step change in gas concentration on the data recorder. The System Response Time cannot be shorter than the Direct Time. The System Response Time is adjusted automatically when the Direct Response Time is adjusted to greater than the System Response Time.

Direct Response Time- Range = 15 seconds to 600 seconds in 5 second increments, the time period set by the operator to allow the automatic gas sequence to inject any cal gas directly into the analyzer train. This function should be set to a time period equal to the time required by the slowest analyzer on line in the train to reach steady state during direct calibration.

Long Response Time- Range is 15 seconds to 600 seconds in 5 second increments, this is a special response time for exceptionally slow responding analyzers to reach a steady state reading during calibrations. Used as a mechanism to remove the necessity to lengthen the system response time for all analyzers to accommodate a small number of very slow analyzers. The Long Response Time cannot be shorter than the System Response Time. The Long Response Time is adjusted automatically when the System Response Time is adjusted to greater than the Long Response Time.

Last Test Sequence Run- Range is 1 to 12 runs, this number is set by the operator to be equal to the number of runs he intends to collect data from in the full Automatic mode.

Method 25a CE Gas Path – Sets the calibration path for the direct cal of the THC analyzer.

Gas Divider Control Valve- Range is Valve #1 to Valve #14. The valve is opened to flow gas when the calibration sequence calls for any divided gas.

There is only an 'Exit' button on the screen. The 'Exit' button closes the 'Program Set Up' screen. The "X" on the screen will also close the screen

When the screen closes the information will be compared to the current configuration information stored on the disk drive. If there are any differences the program will prompt to save or discard changes.

Communication

'Communication' is a screen to select, open and test or close the serial port for communication to the flow drawer.

Open this screen from the Main Menu by selecting the 'Configuration' menu item and then selecting 'Communications' from the submenu.
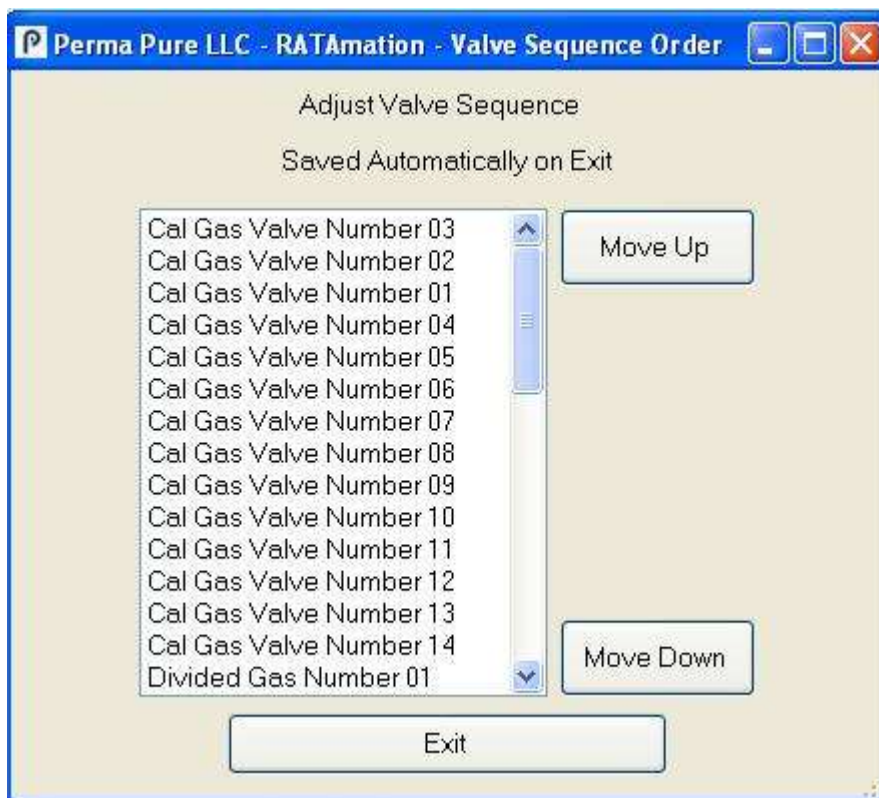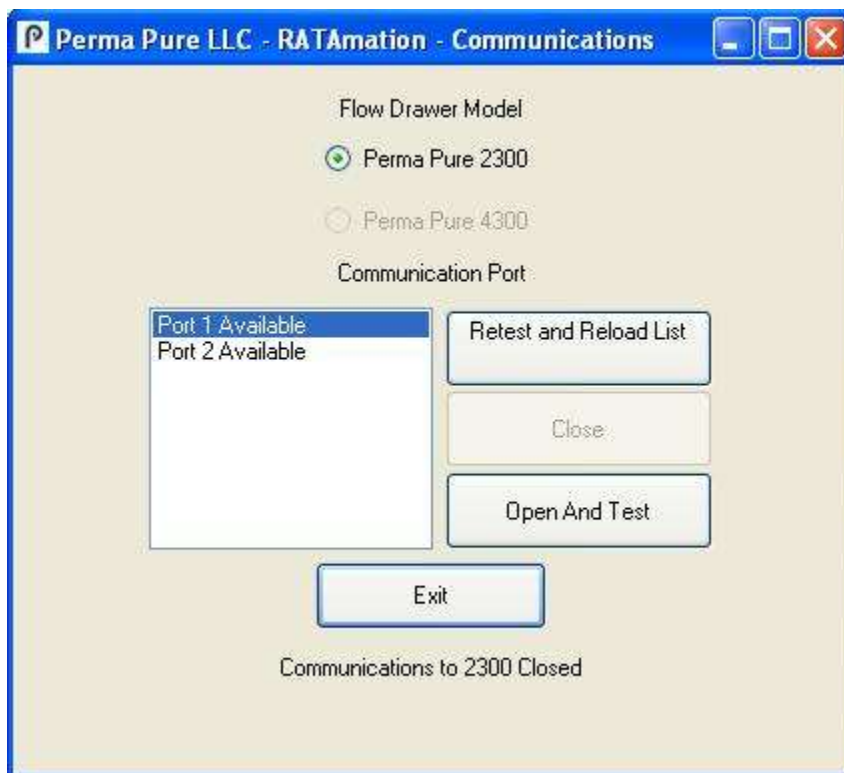

Figure 24

This screen will display all available serial ports for the computer.

The program will automatically open the saved serial port and test communications with the flow drawer when it starts.

If communication with the flow drawer has been established the active port will be highlighted and only the 'Close' and 'Exit' buttons will be available.

If communication to the flow drawer has failed the first port will be highlighted and the 'Retest and Reload List', 'Open and Test' and 'Exit' buttons will be available.

The 'Retest and Reload List' button will retest the computer for any new available communication ports added to the computer while this screen has been open. This button should be used in situations where USB serial port adapters are used and can be added to the computer on-the-fly.

The 'Close' button will close the communications port and the link to the flow drawer.

The 'Open and Test' button will open the serial port highlighted and send a series of commands to flow drawer. If successful the screen will be adjusted to reflect the change. The program will automatically change to reading live data when this screen is closed.

The 'Exit' button closes the 'Communications' screen. The "X" on the screen will also close the screen

The port selection is saved automatically.

Test Summary Report

A test summary can be created from either live data of the current test or stored data from a test previously completed. The same configuration files used to perform the test must be loaded to create the report correctly.

Create the report from the Main Menu by selecting the 'Summary' menu item and then selecting 'Current Test Summary' or 'Saved Test Summary' from the submenu.

'Current Test Summary' will be available while a test is running.
'Saved Test Summary' will be available when there is no test loaded or running.
'Saved Test Summary' will open a dialog box to select the test file to use to create the report.

Clicking either menu item will create a text file for the report named
"*Test file name* Summary.txt" that will be saved to current directory where the test data is stored.

After file is created, MS Notepad is open and the file is displayed. Notepad can be used to view, edit and print the report.

Following is an example of the test summary report

```
Current run number is 09

Initial Error Calibration

     Analyzer          Zero            Low             Mid             High
1)SO2                  0.00          ********         283.69          463.29

2)NOX                  0.00          ********          53.37           86.85

3) CO                  0.00          ********         118.38          171.36

4) THC                 0.00           27.98           53.09           86.58

5) O2                  0.00          ********          13.09           20.45

6) CO2                 0.00          ********           3.16           11.55



Run Data for Run Number 01

                  Pre Run Cal                Run              Post Run Cal
     Analyzer      Zero        Span         Average       Zero         Span
1)SO2              0.00       283.33         365.91        0.00        282.68
2)NOX              0.00        53.31          73.18        0.00         53.18
3) CO              0.00       118.24         146.36        0.00        117.96
4) THC             0.00        52.44          73.18        0.00         52.61
5) O2              0.00        12.93          18.30        0.00         12.97
6) CO2             0.00         3.15          14.64        0.00          3.15
Temperature                                   73.18


Run Data for Run Number 02

                  Pre Run Cal                Run              Post Run Cal
     Analyzer      Zero        Span         Average       Zero         Span
1)SO2              0.00       282.68         365.12        0.00        280.75
2)NOX              0.00        53.18          73.02        0.00         52.82
```

```
3) CO                     0.00            117.96          146.05       0.00          117.16
4) THC                    0.00             52.61           73.02       0.00           52.49
5) O2                     0.00             12.97           18.26       0.00           12.94
6) CO2                    0.00              3.15           14.60       0.00            3.12
Temperature                                               73.02


Run Data for Run Number 03

                      Pre Run Cal                    Run            Post Run Cal
       Analyzer       Zero          Span          Average        Zero          Span
1)SO2                 0.00            280.75        365.74         0.00          283.16
2)NOX                 0.00             52.82         73.15         0.00           53.27
3) CO                 0.00            117.16        146.29         0.00          118.16
4) THC                0.00             52.49         73.15         0.00           52.21
5) O2                 0.00             12.94         18.29         0.00           12.87
6) CO2                0.00              3.12         14.63         0.00            3.15
Temperature                                         73.15


Run Data for Run Number 04

                      Pre Run Cal                    Run            Post Run Cal
       Analyzer       Zero          Span          Average        Zero          Span
1)SO2                 0.00            283.16        365.52         0.00          282.43
2)NOX                 0.00             53.27         73.10         0.00           53.14
3) CO                 0.00            118.16        146.21         0.00          117.86
4) THC                0.00             52.21         73.10         0.00           52.88
5) O2                 0.00             12.87         18.28         0.00           13.03
6) CO2                0.00              3.15         14.62         0.00            3.14
Temperature                                         73.10


Run Data for Run Number 05

                      Pre Run Cal                    Run            Post Run Cal
       Analyzer       Zero          Span          Average        Zero          Span
1)SO2                 0.00            282.43        365.90         0.00          283.75
2)NOX                 0.00             53.14         73.18         0.00           53.39
3) CO                 0.00            117.86        146.36         0.00          118.41
4) THC                0.00             52.88         73.18         0.00           52.59
5) O2                 0.00             13.03         18.29         0.00           12.96
6) CO2                0.00              3.14         14.64         0.00            3.16
Temperature                                         73.18


Run Data for Run Number 06

                      Pre Run Cal                    Run            Post Run Cal
       Analyzer       Zero          Span          Average        Zero          Span
1)SO2                 0.00            283.75        364.96         0.00          281.95
2)NOX                 0.00             53.39         72.99         0.00           53.05
3) CO                 0.00            118.41        145.98         0.00          117.66
4) THC                0.00             52.59         72.99         0.00           52.28
5) O2                 0.00             12.96         18.25         0.00           12.89
6) CO2                0.00              3.16         14.60         0.00            3.14
Temperature                                         72.99


Run Data for Run Number 07

                      Pre Run Cal                    Run            Post Run Cal
       Analyzer       Zero          Span          Average        Zero          Span
1)SO2                 0.00            281.95        364.99         0.00          283.12
2)NOX                 0.00             53.05         73.00         0.00           53.27
3) CO                 0.00            117.66        146.00         0.00          118.15
4) THC                0.00             52.28         73.00         0.00           52.88
5) O2                 0.00             12.89         18.25         0.00           13.03
6) CO2                0.00              3.14         14.60         0.00            3.15
Temperature                                         73.00
```

```
Run Data for Run Number 08

                    Pre Run Cal              Run          Post Run Cal
      Analyzer     Zero        Span        Average     Zero        Span
1)SO2              0.00      283.12        365.43      0.00      283.53
2)NOX              0.00       53.27         73.09      0.00       53.34
3) CO              0.00      118.15        146.17      0.00      118.32
4) THC             0.00       52.88         73.09      0.00       52.43
5) O2              0.00       13.03         18.27      0.00       12.92
6) CO2             0.00        3.15         14.62      0.00        3.16
Temperature                                 73.09


Run Data for Run Number 09

                    Pre Run Cal              Run          Post Run Cal
      Analyzer     Zero        Span        Average     Zero        Span
1)SO2              0.00      285.63        365.96      0.00      283.86
2)NOX              0.00       53.74         73.19      0.00       53.41
3) CO              0.00      119.19        146.38      0.00      118.46
4) THC             0.00       52.84         73.19      0.00       52.61
5) O2              0.00       13.02         18.30      0.00       12.97
6) CO2             0.00        3.18         14.64      0.00        3.16
Temperature                                 73.19


Run Data for Run Number 10

                    Pre Run Cal              Run          Post Run Cal
      Analyzer     Zero        Span        Average     Zero        Span
1)SO2           ********    ********     ********    ********    ********
2)NOX           ********    ********     ********    ********    ********
3) CO           ********    ********     ********    ********    ********
4) THC          ********    ********     ********    ********    ********
5) O2           ********    ********     ********    ********    ********
6) CO2          ********    ********     ********    ********    ********
Temperature                              ********


Run Data for Run Number 11

                    Pre Run Cal              Run          Post Run Cal
      Analyzer     Zero        Span        Average     Zero        Span
1)SO2           ********    ********     ********    ********    ********
2)NOX           ********    ********     ********    ********    ********
3) CO           ********    ********     ********    ********    ********
4) THC          ********    ********     ********    ********    ********
5) O2           ********    ********     ********    ********    ********
6) CO2          ********    ********     ********    ********    ********
Temperature                              ********


Run Data for Run Number 12

                    Pre Run Cal              Run          Post Run Cal
      Analyzer     Zero        Span        Average     Zero        Span
1)SO2           ********    ********     ********    ********    ********
2)NOX           ********    ********     ********    ********    ********
3) CO           ********    ********     ********    ********    ********
4) THC          ********    ********     ********    ********    ********
5) O2           ********    ********     ********    ********    ********
6) CO2          ********    ********     ********    ********    ********
Temperature                              ********


Final Error Calibration

      Analyzer     Zero         Low          Mid         High
1)SO2              0.00      ********       283.98      461.20
```

2) NOX	0.00	********	53.43	86.46
3) CO	0.00	********	118.51	170.58
4) THC	0.00	27.92	52.54	86.79
5) O2	0.00	********	12.95	20.50
6) CO2	0.00	********	3.16	11.50

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Print Configuration

A complete report of the current configuration can be created.

Create the report from the Main Menu by selecting the 'File' menu item and then selecting 'Print Configuration' from the submenu.

Clicking the menu item will create a text file for the report named "*Configuration file name* Report.txt" that will be saved to current directory where the configuration file is located.

After file is created, MS Notepad is open and the file is displayed. Notepad can be used to view, edit and print the report.

Following is an example of the configuration report

```
Report of Configuation used in RATAmation software

Apr 6, 02009  17:02 PM

File Name - 0330.RMC

Full Path - C:\Documents and Settings\bmacrae\My Documents\Visual Studio 2008\Pr
ojects\RMPlus4\RMPlus1\bin\Debug\CONFIG\0330.RMC


ANALOG INPUT SET UP

Analog Input  1          Analyzer
     Channel Name        1)SO2
     Gas Input Type      SO2 6c
     Analyzer SN         1
     Offset Value        0.00
     Full Scale          500.00
     Analog Factor       500.00
     Units               PPM
     Train Number         1

Analog Input  2          Analyzer
     Channel Name        2)NOX
     Gas Input Type      NOx 20
     Analyzer SN         2
     Offset Value        0.00
     Full Scale          100.00
     Analog Factor       100.00
     Units               PPM
     Train Number         1

Analog Input  3          Analyzer
     Channel Name        3) CO
     Gas Input Type      CO 10
     Analyzer SN         3
     Offset Value        0.00
     Full Scale          200.00
     Analog Factor       200.00
     Units               PPM
     Train Number         1
```

```
Analog Input  4         Analyzer
    Channel Name        4) THC
    Gas Input Type      THC 25a
    Analyzer SN         4
    Offset Value        0.00
    Full Scale          100.00
    Analog Factor       100.00
    Units               PPM
    Train Number         1

Analog Input  5         Analyzer
    Channel Name        5) O2
    Gas Input Type      O2 20
    Analyzer SN         5
    Offset Value        0.00
    Full Scale          25.00
    Analog Factor       25.00
    Units               %
    Train Number         1

Analog Input  6         Analyzer
    Channel Name        6) CO2
    Gas Input Type      CO2 20
    Analyzer SN         6
    Offset Value        0.00
    Full Scale          20.00
    Analog Factor       20.00
    Units               %
    Train Number         1

Analog Input  7         Not Used

Analog Input  8         Not Used

Analog Input  9         Other Data
    Channel Name        Temperature
    Offset Value        0.00
    Full Scale          100.00
    Analog Factor       100.00
    Units               ° C
    Train Number         1

Analog Input 10         Not Used

Analog Input 11         Not Used

Analog Input 12         Not Used
```
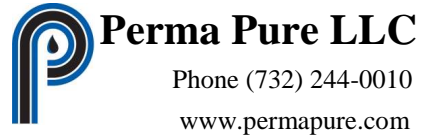
Sept. 2012

```
Report of Configuation used in RATAmation software

Apr 6, 02009  17:02 PM

File Name - 0330.RMC

Full Path - C:\Documents and Settings\bmacrae\My Documents\Visual Studio 2008\Pr
ojects\RMPlus4\RMPlus1\bin\Debug\CONFIG\0330.RMC


CALIBRATION GAS SET UP

CG  1
Cylinder ID          AAA-111111
     Component 1     290.20  SO2
     Component 2     54.60  NOx
     Component 3     121.10  CO
     Component 4     3.23  CO2

CG  2
Cylinder ID          AAA-222222
     Component 1     54.00  THC
     Component 2     13.31  O2

CG  3
Cylinder ID          AAL-333333
     Component 1     0.00  N2

CG  4
Cylinder ID          AAl-444444
     Component 1     475.30  SO2
     Component 2     89.10  NOx
     Component 3     175.80  CO
     Component 4     11.85  CO2

CG  5
Cylinder ID          AAl-555555
     Component 1     88.70  THC
     Component 2     20.95  O2

CG  6
Cylinder ID          AAlL-666666
     Component 1     28.60  THC

CG  7
Cylinder ID          AAL-777777
     Component 1     25.10  NOx
     Component 2     65.30  CO

DG 22
Cylinder ID          New Name Here
     Component 1     1.00  SO2
     Component 2     3.33  O2
     Component 3     2.20  NOx
     Component 4     4.44  CO
```

```
Report of Configuation used in RATAmation software

Apr 6, 02009  17:02 PM

File Name - 0330.RMC

Full Path - C:\Documents and Settings\bmacrae\My Documents\Visual Studio 2008\Pr
ojects\RMPlus4\RMPlus1\bin\Debug\CONFIG\0330.RMC


CALIBRATION GAS USAGE SET UP


         AI 1      AI 2      AI 3      AI 4      AI 5      AI 6      AI 7      AI 8      Sequence
         SO2 6c    NOx 20    CO 10     THC 25a   O2 20     CO2 20    N/A       N/A


 CG01   --M-;-S   --M-;-S   --M-;-S   ----;--   ----;--   --M-;-S   ----;--   ----;--       03
 CG02   ----;--   ----;--   ----;--   --M-;-S   --M-;-S   ----;--   ----;--   ----;--       02
 CG03   Z---;Z-   Z---;Z-   Z---;Z-   Z---;Z-   Z---;Z-   Z---;Z-   ----;--   ----;--       01
 CG04   ---H;--   ---H;--   ---H;--   ----;--   ----;--   ---H;--   ----;--   ----;--       04
 CG05   ----;--   ----;--   ----;--   ---H;--   ---H;--   ----;--   ----;--   ----;--       05
 CG06   ----;--   ----;--   ----;--   -L--;--   ----;--   ----;--   ----;--   ----;--       06
 CG07   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       07
 CG08   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       08
 CG09   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       09
 CG10   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       10
 CG11   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       11
 CG12   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       12
 CG13   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       13
 CG14   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       14
 DG01   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       15
 DG02   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       16
 DG03   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       17
 DG04   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       18
 DG05   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       19
 DG06   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       20
 DG07   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       21
 DG08   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       22
 DG09   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       23
 DG10   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       24
 DG11   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       25
 DG12   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       26
 DG13   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       27
 DG14   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       28
 DG15   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       29
 DG16   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       30
 DG17   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       31
 DG18   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       32
 DG19   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       33
 DG20   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       34
 DG21   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       35
 DG22   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       36
 DG23   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       37
 DG24   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       38
 DG25   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       39
 DG26   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       40
 DG27   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       41
 DG28   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--   ----;--       42
```

```
Report of Configuation used in RATAmation software

Apr 6, 02009  17:02 PM

File Name - 0330.RMC

Full Path - C:\Documents and Settings\bmacrae\My Documents\Visual Studio 2008\Pr
ojects\RMPlus4\RMPlus1\bin\Debug\CONFIG\0330.RMC


PROGRAM SET UP

Run Length                2  Minutes

Last Test Sequence Run    8

Manual Cal Gas Time Out   2  Minutes

System Response Time      15  Seconds

Direct Response Time      15  Seconds

Long Response Time        15  Seconds

Method 25a CE Gas Path    DIRECT

Gas Divider Control Valve 14
```

Help and Feedback

For Technical Assistance Please Contact;

Perma Pure LLC
8 Executive Drive
Toms River, New Jersey 08754
Phone: (732)244-0010
Fax: (732)244-8140

Bob MacRae   email: bmacrae@parmapure.com
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Perma Pure is dedicated to continuing improvement to the RATAmation product. Your experience and knowledge is invaluable in this effort. We welcome all suggestions in an effort to improve the use and productivity of RATAmation.

Please send any suggestions to;

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Toms River, New Jersey 08754
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APPENDIX

Ethernet Communications Configuration

Install RATAmation software onto the computer. Put the supplied software Crypto-Key in any USB port. Your computer should recognize the key device and show up as 'CBUSB' if the computer is seeing it. The software for the key should install automatically. There is nothing else that needs to be done with the key.

1. If you are connecting a Model 4P-4300 Flow Control Drawer (FCD) to a computer that is on a network with a DHCP server, the TCP/IP settings on the computer AND the flow control drawer must be set so that they are obtained automatically. For direct connection of the computer to the 4300FCD, skip to step 2.

    a. *Turn off Windows Firewall until communications have been established.*

    b. To set the computer's TCP/IP settings to automatic, go to **Start,** Select **Control Panel**, select **Network and Sharing Center**, in the upper left corner select **Change Adapter Settings** and a window will open displaying your network connections. Right click on local area connection and select **Properties**. A dialogue box will open. Select **Internet Protocol Version 4 (TCP /IPv4)** and click on the **Properties** button. Another dialogue box window will open.

    c. There are two selection points. Select them both to so that the IP address and the DNS Server are selected automatically as in the screen shot below. Click **OK** and close out of all windows.
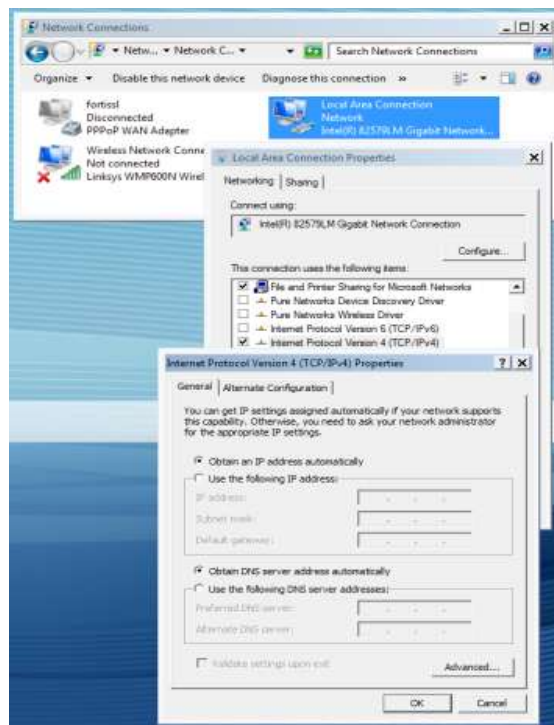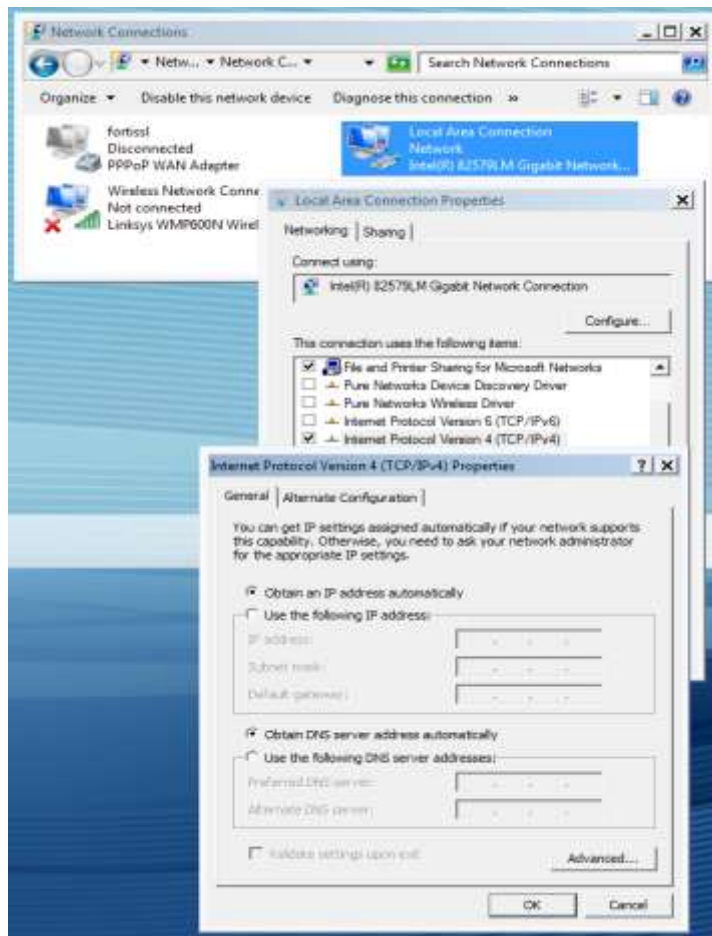

    d. On the RATAmation software disc there is a program called **SetupNE3.exe**. Click to install and follow directions to complete installation.

e. Connect an Ethernet cable directly between the FCD and the computer. Power must be on for the FCD.

f. Go to **Start**, select **AutomationDirect Tools**, select **NetEdit 3**.

g. Click on the **Scan Network** button at the top. A line of data will fill the top line indicating connection to the FCD.

h. Right click on the top line. A menu will open. Select **General**. Make sure that **Obtain IP address automatically** is selected. Click **OK**.

i. Turn off power to the FCD. Turn on power to the FCD and restart the computer.

j. Skip to step 3

2. If you are connecting a Model 4P-4300 Flow Control Drawer to a dedicated computer, the TCP/IP settings must be set explicitly. This must be done for the settings on the computer AND the flow control drawer.

   a. *Turn off Windows Firewall until communications have been established.*

   b. To set the TCP/IP settings to automatic, go to **Start,** Select **Control Panel**, select **Network Sharing Center**, in the upper left corner select **Change Adapter Settings** and a window will open displaying your network connections. Right click on local area connection and select **Properties**. A dialogue box will open. Select **Internet Protocol Version 4 (TCP /IPv4)** and click on the **Properties** button. Another dialogue box window will open.

   c. There are two selection points. Select **Use the following IP address:** The DNS server address can be left blank.

      i. Enter the IP Address as   192.168.135.10
      ii. Enter the Subnet Mask as   255.255.255.0
      iii. Enter the Default Gateway as 192.168.135.9

   d. Click **OK** and close out of all windows.

   e. On the RATAmation software disc there is a program called **SetupNE3.exe**. Click to install and follow directions to complete installation.

f. Connect an Ethernet cable directly between the 4300 FCD and the computer. Power must be on for the FCD.

g. Go to **Start**, select **AutomationDirect Tools**, select **NetEdit 3**.

h. Click on the **Scan Network** button at the top. A line of data will fill the top line indicating connection to the FCD.

i. Right click on the top line. A menu will open. Select **General**. There are two selection points. Select **Use the following IP address:** Notice that the IP address and Default Gateway addresses are swapped as compared to the computer settings.

  i. Enter the IP Address as   192.168.135.9

  ii. Enter the Subnet Mask as   255.255.255.0

  iii. Enter the Default Gateway as 192.168.135.10

j. Click **OK** to exit.

k. Turn off power to the FCD. Connect both the computer and the FCD to the network. Turn on power to the FCD and restart the computer.

3. Configure RATAmation program

   a. Open RATAmation.

   b. Open the **Configuration** menu at the top. Select **Communications**. The words **Test Key** should be grayed out indicating that the program is seeing the Crypto-Key. If the lettering is black, click on it and a window should open saying the program is unlocked.

   c. Open **Configuration** again and select **Communications**. Clicking on this will open a window. If necessary click on **Retest and Reload List** and then **Open and Test**. If the configuration was successful, it will say **4300 Communications OK**. Click Exit.

   d. In the lower left of the window you should see **LIVE DATA**. This indicates that the FCD and the computer are communicating properly.