

# SIEMENS

Maxum, MicroSAM

Gas Chromatograph  
Gas Chromatograph Portal

Getting Started

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indicates that death or severe personal injury <b>may</b> result if proper precautions are not taken.
<b>⚠ CAUTION</b>
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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# Introduction

## 1.1 Introduction

This manual is intended to give the user an introduction to the Siemens Gas Chromatograph Portal software. The Gas Chromatograph Portal is a user interface workstation software that is used to communicate with and control various Siemens devices, including the Maxum and MicroSAM gas chromatographs, the Advance Network Access Unit, and Optichrom Advance Plus.

The information in this manual is intended to be a basic introduction to familiarize the user with the operation and navigation within the Gas Chromatograph Portal software. More detailed information on the various functions and features of the Gas Chromatograph Portal can be found in the online help that is part of the software.

## 1.2 Overview of Maxum User Interfaces

Maxum has two types of user interface as shown in the figure below. These two interfaces have two different purposes.



Figure 1-1 Overview of Maxum User Interfaces

The first user interface is the built-in maintenance panel. This panel addresses the analyzer "immediately" and in real time. It is intended for routine field maintenance, including:

- calibration and validation
- checking status and alarms
- looking at current measurements and results

If a user makes a change with the maintenance panel, it is immediately implemented in the analyzer directly.

The maintenance panel does not perform all possible functions. For example, if a user wants to make a significant change to the analyzer set up, configuration, hardware or application programming, the second user interface is necessary, the workstation software which runs on a personal computer.

## 1.3 Workstation Introduction

The workstation user interface software that runs on the PC is intended to enable users to do three things:

1. Make large or significant changes to the programming, hardware or application set up of the device.
2. Perform maintenance without stopping the analyzer itself. With the workstation, it is possible to calibrate the analyzer or make changes to the method without disturbing the analyzer. For example, if a user wants to change a gating method, they can make changes and run the changes in the memory of the PC in order to test the changes. This can be done without waiting for the analyzer to complete a cycle and without disturbing the analyzer.
3. Perform background and utility functions including: data logging; capturing chromatograms in quantity; and backing up the memory of the analyzer itself.

While the workstation user interface is different than the maintenance panel, Siemens also provides an additional special software feature that will emulate the Maintenance Panel on the workstation PC. Therefore, anything that a user can do from the Maintenance Panel can also be done at the PC.

Two versions of workstation user interface software exist for use with Siemens gas chromatography devices. The original version was a software bundle that included a System Manager program, EZChrom analysis software, and other utilities. The newest version is an integrated software package called Gas Chromatograph Portal, which is the subject of this manual.

The Gas Chromatograph Portal, or GCP, is cross compatible to communicate with any device currently connected to the original System Manager workstation. No changes to the device are necessary. The new software is designed to be easier to use and, in turn, make the Siemens Gas Chromatographs easier to use and maintain.

The GCP software has two primary parts, a Network View window and an Analyzer View window. The Network View is used to view and manage multiple devices on the network. The Analyzer View window is used to manage and control individual devices.

## Network Portal Software description

### 2.1 Introduction to Gas Chromatograph Portal Network View

The Gas Chromatograph Network View is the part of the Gas Chromatograph Portal workstation software that is used to view and manage devices on the network. This window allows the user to perform the following functions:

- Monitor the statuses of devices on the network
- Sort and group the displays of various devices
- Connect to devices by launching the Gas Chromatograph Portal window
- Launch the Human Machine Interface (maintenance panel) emulator for devices
- Execute backups of devices
- Restore devices from saved backups

	Symbol	Alarm Level	Name	IP Address	Type	Last Update	Network State
1		OK	M1217 (Virtual)	127.0.0.1	Maxum	2/27/2012 12:01 AM	Alive
2		OK	OF-??-LT-HRVOC-Flare-CTW	161.218.54.61	Maxum	2/27/2012 12:01 AM	Alive
3		OK	OF-MB-ST-1app_TCD-FID	161.218.54.6	Maxum	2/27/2012 12:01 AM	Alive
4		OK	OF-MB-ST_PulseDO_SYSCON2	161.218.54.22	Maxum	2/27/2012 12:01 AM	Alive
5		OK	LT_Verif&PINA_1App	161.218.54.140	Maxum	2/27/2012 12:01 AM	Alive
6		OK	OF-MB-ST_PulseDO_SYSCON1	161.218.54.131	Maxum	2/27/2012 12:01 AM	Alive
7		OK	OF-MB-ST-TotalSulfur	161.218.54.54	Maxum	2/27/2012 12:01 AM	Alive
8		OK	HT-2appTCD-FPD-FuelGasAnalyzer	161.218.54.139	Maxum	2/27/2012 12:01 AM	Alive
9		OK	OF-MB-ST_PulseDO_SYSCON2	161.218.54.141	Maxum	2/27/2012 12:01 AM	Alive
10		OK	SL-??-ST-2appTCD-BTU	161.218.54.37	Maxum	2/27/2012 12:01 AM	Alive
11		OK	CAC_SH4	161.218.54.137	Maxum	2/27/2012 12:01 AM	Alive
12		Alarm	OF-??-ST-1app-FID	161.218.54.32	Maxum	2/27/2012 12:01 AM	Alive
13		Warning	SW-FG-LT-5.0-HRVOC-Modbus Tester	161.218.54.150	Maxum	2/27/2012 12:01 AM	Alive

Figure 2-1 Gas Chromatograph Portal Network View

## 2.2 Action Buttons

The action buttons allow the user to execute the primary functions provided by the Gas Chromatograph Portal Network window. These include:

- Adding a new device to the device list.
- Removing a device from the device list
- Connect to a device using the Gas Chromatograph Portal
- Backup a device database to the PC
- Restore a device using a saved database on the PC
- Connect to a device using the Human Machine Interface (HMI) Emulator
- Configure a view (only available for group views other than the All view)

These functions will be described in the next sections

## 2.3 Menu Options

The following options are available from menus at the top of the window:

- System Exit
- File - Open Local Database (with or without scripts enabled)
- File - Close Local Database
- Tools - Start Data Logger Service
- Tools - Import Groups from System Manager
- Help - Launch online help
- Help - About GCP
- Help - License Information



## 2.4 Analyzer List Window

The device list window seen below allows the user to easily see the basic information and status for each device on the network. This list will populate automatically for any analyzer that broadcasts on the network.

	Symbol	Alarm Level	Name	IP Address	Type	Last Update	Network State
		OK	M1217 (Virtual)	127.0.0.1	Maxum	2/27/2012 12:01 AM	Alive
2		OK	OF-??-LT-HRVOC-Flare-CTW	161.218.54.61	Maxum	2/27/2012 12:01 AM	Alive
3		OK	OF-MB-ST-1app_TCD-FID	161.218.54.6	Maxum	2/27/2012 12:01 AM	Alive
4		OK	OF-MB-ST_PulseDO_SYSCON2	161.218.54.22	Maxum	2/27/2012 12:01 AM	Alive
5		OK	LT_Verif&PIna_1App	161.218.54.140	Maxum	2/27/2012 12:01 AM	Alive
6		OK	OF-MB-ST_PulseDO_SYSCON1	161.218.54.131	Maxum	2/27/2012 12:01 AM	Alive
7		OK	OF-MB-ST-TotalSulfur	161.218.54.54	Maxum	2/27/2012 12:01 AM	Alive
8		OK	HT-2appTCD-FPD-FuelGasAnalyzer	161.218.54.139	Maxum	2/27/2012 12:01 AM	Alive
9		OK	OF-MB-ST_PulseDO_SYSCON2	161.218.54.141	Maxum	2/27/2012 12:01 AM	Alive
10		OK	SL-??-ST-2appTCD-BTU	161.218.54.37	Maxum	2/27/2012 12:01 AM	Alive
11		OK	CAC_SH4	161.218.54.137	Maxum	2/27/2012 12:01 AM	Alive
12		Alarm	OF-??-ST-1app-FID	161.218.54.32	Maxum	2/27/2012 12:01 AM	Alive
13		Warning	SW-FG-LT-5.0--HRVOC-Modbus Tester	161.218.54.150	Maxum	2/27/2012 12:01 AM	Alive

Figure 2-2 Network Device List

The information in the list includes the following:

- Alarm Level - Indicates whether the device is in a normal or alarmed state
- Name - The name of the device
- IP Address - The IP address used to connect to the device.
- Type - The type of the device such as Maxum, NAU, or MicroSAM
- Last Update - The last time that an automatic update broadcast was received from the unit.
- Network State - Shows whether or not the network connection to the device is in operation.

Note: In the previous System Manager software the user was required to enter information including the device name and the device type. With the Gas Chromatograph Portal software these fields are automatically populated.

## 2.5 Group Tabs

In addition to allowing the user to connect to and view multiple analyzers at one time, the Gas Chromatograph Portal Network window allows the user to sort these analyzers into user defined sub-lists called groups or views. For example, groups may be defined according to sections of a plant or any other criteria desired.

This feature is similar to the Groups feature in the prior workstation software, System Manager. For prior users of System Manager, GCP has a feature which allows users to import groups from System Manager to the GCP Network view. The import feature is described below.

### Adding Groups:

To add a view, click on the tab with the + symbol. This will populate a new group tab.

### Customizing Group Views:

Groups are automatically named with a group number when they are created. To customize a group name simply click on the name of the group and then type the desired name.

The device list for a group can be customized using the "Configure View" button (this button is not visible on the All tab) as shown below. To add or remove devices on the list for a group click the Add button or the Remove button in the Configure window when the desired device is selected.

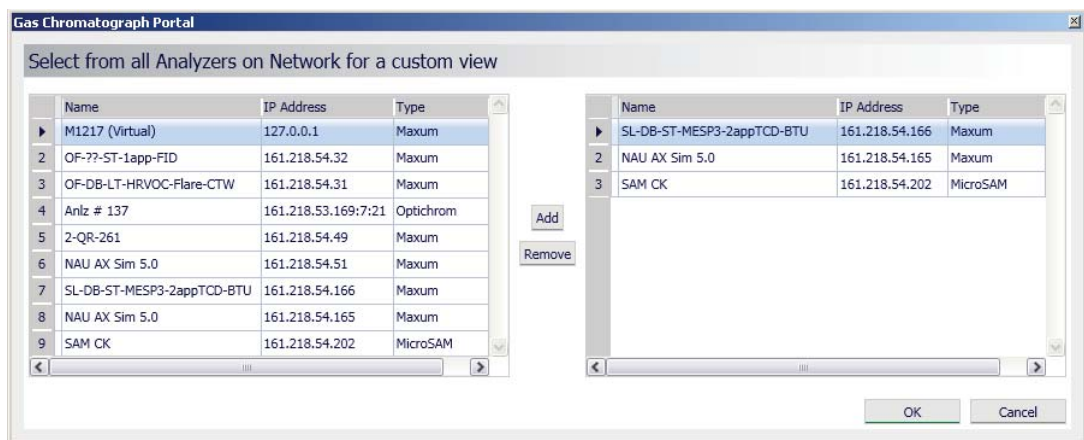


Figure 2-3 Customizing a Group View

### Deleting Groups:

To delete a group simply click the X next to the name of the group. A verification message will appear before the group is deleted. Click Yes to confirm.

### Importing Groups from System Manger:

The prior workstation software, System Manager, also has a Group feature. Because groups may include large numbers of analyzers, rebuilding those groups could be a lengthy process. For this reason, the GCP software is equipped with a feature to allow prior users of System Manager to import Group and Analyzer information.

To import group and analyzer data from System Manager:

- Select "Import Groups from System Manager" from the Tools menu in the Network view.
- A browse menu box will appear. Choose the menu path for System Manager and then click OK.
- When the import is complete, a message is displayed indicating the number of groups and analyzers that were imported. Click OK to remove the message.

## 2.6 Connect to Analyzer/HMI

### Connecting to an Analyzer:

To connect to an analyzer using the GCP Network window, click on the line for the desired device and then click the Connect button. Alternatively, it is possible to double-click on the line for the device to open the Gas Chromatograph Portal for that device.

Alternatively, you may connect while in the GCP Analyzer window. This is done using the toolbar "Connect" feature. Refer to the Analyzer Portal Chapter (Toolbar Icons section) for more information.

### Connecting to a Virtual Analyzer:

A virtual analyzer is created by the Gas Chromatograph Portal software when a user opens an .amd file on disk as if it were a physical analyzer. The virtual analyzer is created in the computer memory by a process that the GCP software launches. In this way, the virtual analyzer is treated as a separate device much as an actual hardware device works. This allows the user to test out different configurations without making changes to working hardware.

The first line of the "All" Analyzer List window is reserved for the Virtual Analyzer. Before connecting to a virtual analyzer using the Network Portal, it is necessary to have a local database loaded. If no database is loaded, then the virtual analyzer line in the analyzer list will show "<No Local DB Running>".

#### *Opening a Local Database and Virtual Analyzer in GCP Network:*

- If a local database is not open, open one by selecting the "Open Local Database..." selection from the File menu (or, alternately, choose the "Open Local Database (scripts disabled)..." selection).
- A file selection window will open. Choose the desired file (navigating to the correct folder, if necessary) and click "Open".

## 2.7 Adding/Deleting a Device

- The file is opened as the "virtual analyzer", which is by default the first selection of the All group tab. The name of the analyzer is followed by the "(Virtual)" identification.
- The user may now connect to the database using the Analyzer Window as if it were a physical analyzer. To do so either choose the line and click the Connect button, or double click the line.

Alternatively, you may connect to a virtual analyzer while in the GCP Analyzer window. This is done using the toolbar "Open" feature. Refer to the Analyzer Portal Chapter (Toolbar Icons section) for more information.

### Connecting to the HMI Emulator

To connect to the HMI emulator for an analyzer using the GCP Network window, click on the line for the desired device and then click the "Start HMI" button.

Alternatively, you may connect while in the GCP Analyzer window. This is done using the toolbar "Start HMI" feature. Refer to the Analyzer Portal Chapter (Toolbar Icons section) for more information.

## 2.7 Adding/Deleting a Device

### Adding a Device:

Analyzers that can be seen on the network by the software should be automatically added to the list. To add a device that is not already populated to the list, click the Add button and then enter the IP address for the device and click OK.

### Deleting a Device:

To delete a device from the list select the desired device in the list and click the Delete button.

## 2.8 Backup an Analyzer

To backup a device, select the device in the list and then click the Backup button. In the resulting window choose the desired folder and enter the desired file name. Then click Save. A message dialog box will show the status of the backup and will disappear when complete.

## 2.9 Restore an Analyzer

To restore a device using a saved database use the following steps:

<b>CAUTION</b>
----------------

Restoring a device involves destroying all information on that device. Selecting an incorrect device or an incorrect file will make a device inoperable.
--

1. Select the device in the list
2. Click the Restore button
3. Select the desired database
4. Click Open
5. A caution message will display asking the user to verify the operation. If you wish to proceed, click Yes. If not, click No.
6. The restore will execute with a dialog box showing progress. When the restore operation is done, the device will reboot. After the device returns to service, restoration is complete.



## Analyzer Portal Software description

### 3.1 Gas Chromatograph Portal Analyzer Window Introduction

Gas Chromatograph Portal is the primary part of the workstation software. It is used to control and configure devices.

- Monitor the statuses of devices on the network
- Manage alarms
- View and modify device information
- View either stored or real-time chromatograms
- Modify a method
- Launch various system utilities and programs, including Maxum Utilities, EZChrom, HMI Emulator, MaxBasic, and also the original System Manager.

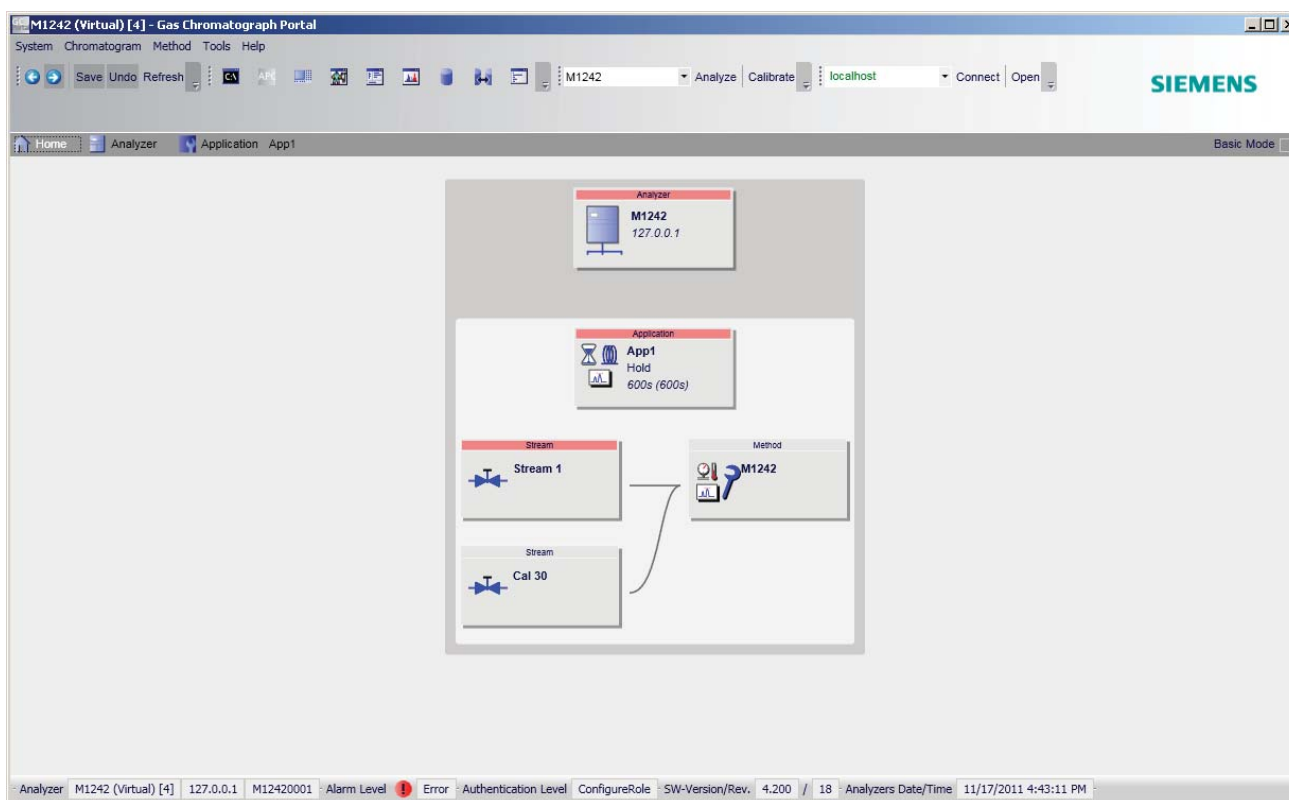


Figure 3-1 Gas Chromatograph Portal - Analyzer Window

The following section describes the basics of what the Gas Chromatograph Portal Analyzer Window looks like and how to navigate through it. For further details refer to the online help within the program.

## 3.2 Menu Options

### System Menu

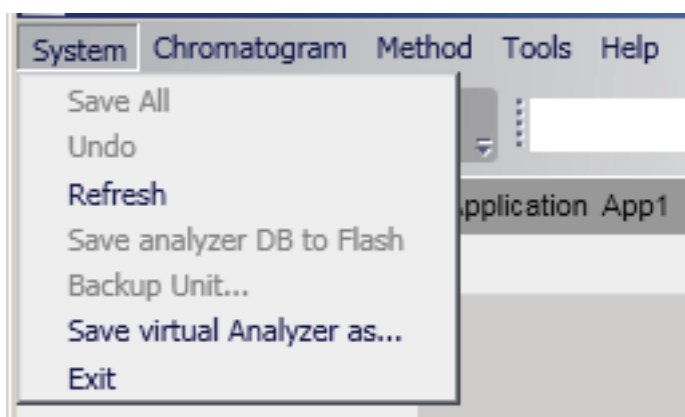


Figure 3-2 System Menu

Save All - Save Changes

Undo - Undo action

Refresh - Reload data from the analyzer

Save to Flash - Save database to flash

Backup Unit - Perform a backup (same as in network window)

Save Virtual Analyzer As - For saving changes to a virtual analyzer

Exit - Exit the program



### Chromatogram Menu

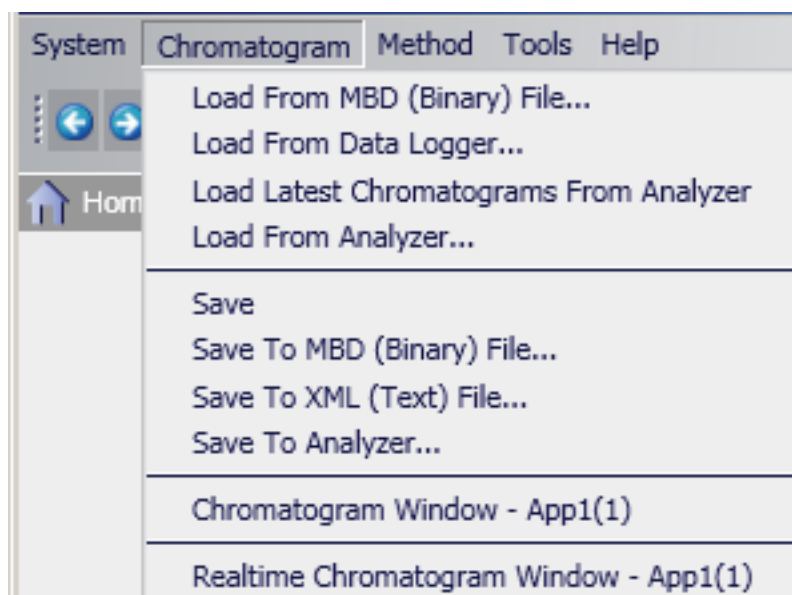


Figure 3-3 Chromatogram Menu

Load From MBD (Binary) File - Select and load chromatograms from the PC

Load From Data Logger - Load chromatograms from Data Logger

Load From Analyzer - Select chromatograms to load from analyzer

Load Latest Chromatograms From Analyzer - Load the most current stored results from the analyzer.

Save - Save chromatograms

Save to MBD (Binary) File - Save chromatograms to a binary file (format that can be opened later)

Save to XML (Text) File - Save chromatograms to a text file

Save to Analyzer - Save chromatograms to analyzer

Chromatogram Window - Open the window for stored chromatograms

Realtime Chromatogram Window - Open the window for real time chromatograms

### Tools Menu

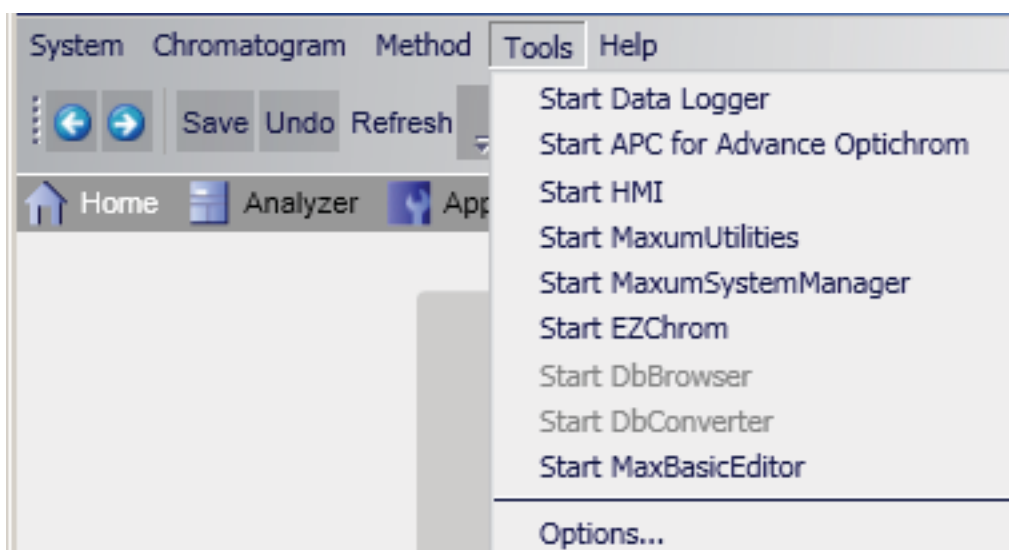


Figure 3-4 Tools Menu

- Start Data Logger Service - Start the Data Logger
- Start APC for Advance Optichrom - Launch the control software for the Optichrom Advance
- Start HMI - Start the Human Machine Interface Emulator
- Start MaxumUtilities - Start the Maxum Utilities program
- Start MaxumSystemManager - Launch the System Manager Software (older version workstation)
- Start EZChrom - Start EZChrom analysis and method development software
- Start MaxBasicEditor - Start the program editor for MaxBasic
- Options - Edit options, such as preferred units and program paths for executable programs.

### Help Menu

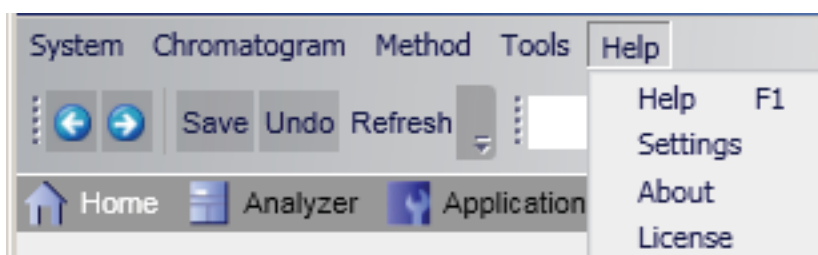


Figure 3-5 Help Menu

- Help - Online Help
- Settings - Color Settings for the Gas Chromatography Portal
- About/License - Information about the program and user license

### 3.3 Tool Bars

The Toolbars, shown below allow the user to execute common functions easily.

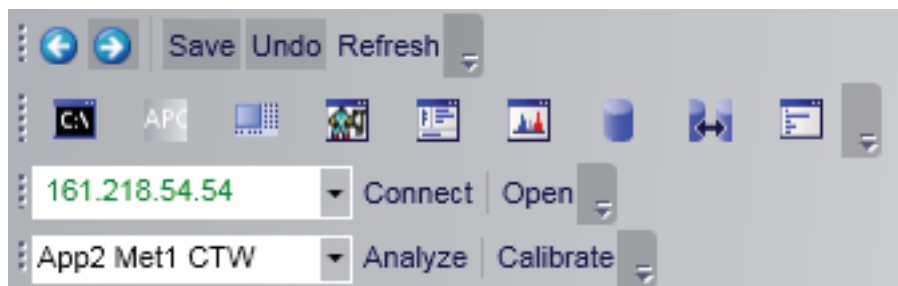


Figure 3-6 Toolbars in the Gas Chromatograph Portal

The available functions are as follows:

- - Go to previous/next page viewed
- Save/Undo - Undo last operation
- Refresh - Refresh all information from analyzer
- - Start DataLogger Service
- - Start APC for Optichrom Advance
- - Start HMI Emulator
- - Start Maxum Utilities
- - Start Maxum System Manager
- - Start Maxum EZChrom Software
- - Start MaxBasic Program Editor
- - IP Address of connected analyzer (or "localhost" if connected to a local database). Drop-down box of available devices.
- Connect/Open - Connect to device or open a device from an existing .amd file
- - Current selected method. Drop-down box of available application methods.
- Analyze - Analyze currently opened chromatograms with selected method
- Calibrate - Calibrate selected method with currently opened chromatograms

### 3.4 View Selector Bar

The Gas Chromatograph Portal allows the user to switch between viewing a basic Analyzer Home screen, an Analyzer Details Screen, or Application Screens. These are selected by choosing the relevant tab as seen below.



Figure 3-7 View Selection Bar

Clicking the relevant tab takes you to the screen. More information regarding these screens is available in later sections, or refer to the online help available within the program.

### 3.5 Viewing Basic Mode

On the far right side of the Gas Chromatograph Portal window there is a checkbox titled, Basic Mode. This checkbox toggles between a simplified version of the available information. One of the primary differences of Basic Mode is that the Navigation section of the window has a different format and fewer choices. See below.

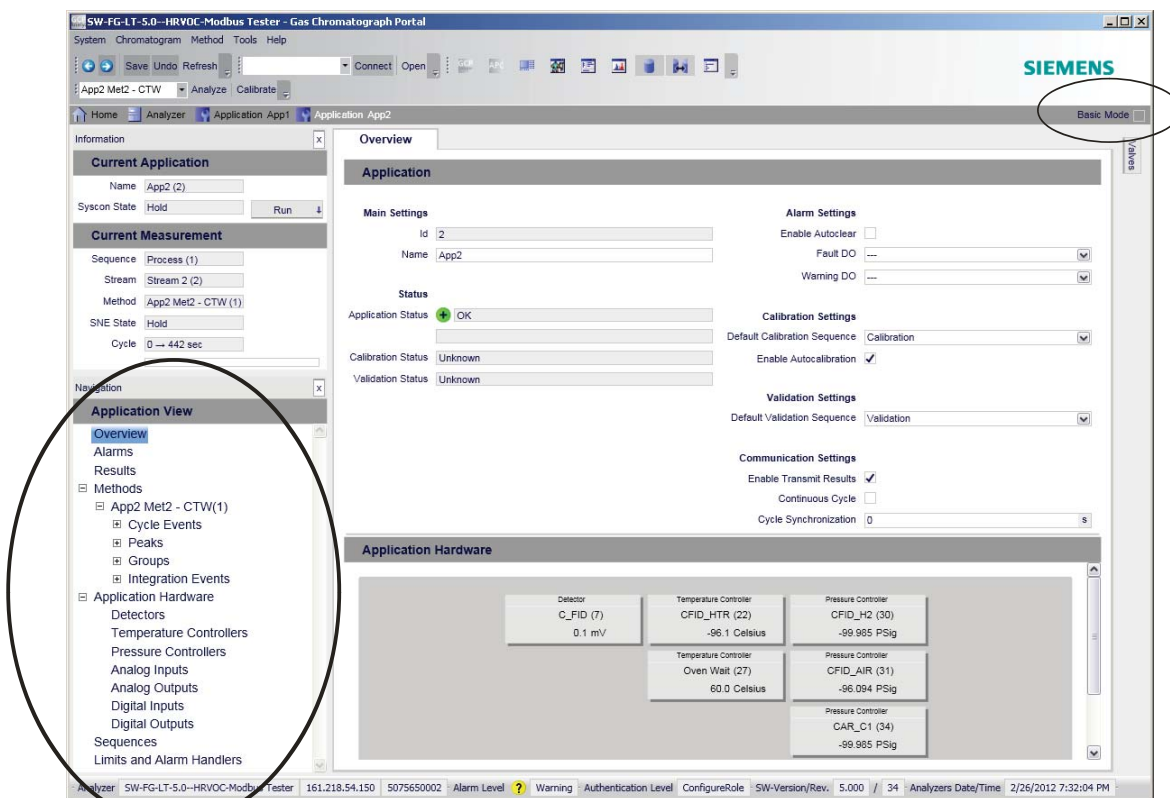


Figure 3-8 View with Basic Mode Off

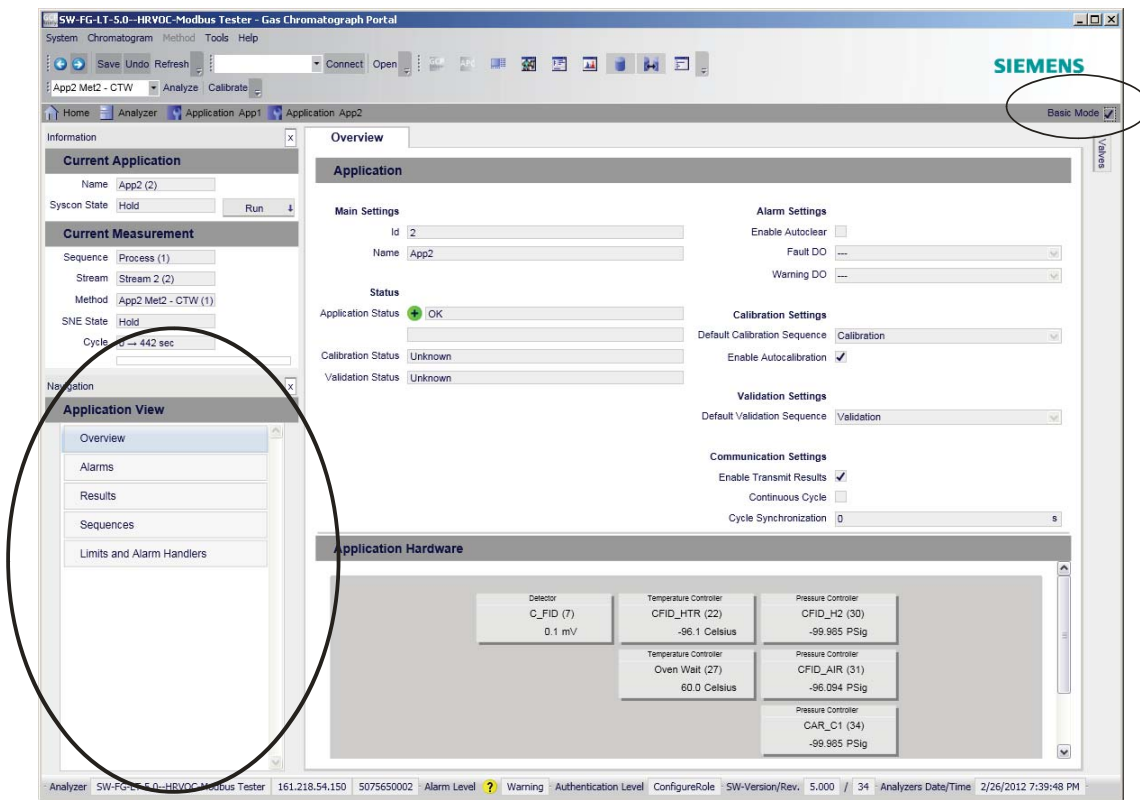


Figure 3-9 View with Basic Mode On

### 3.6 Analyzer Information Bar

The Analyzer Information Bar, below, is located at the bottom of the Gas Chromatograph Portal window. This part of the window provides basic information concerning the device. This information is provided for user reference and is visible from all screens. The information cannot be changed directly from the information bar. Included is:

- Analyzer - Device name, device IP address, and device serial number
- Alarm Level
- Authentication level (level of current password access)
- Software version/Revision
- Date/Time as set in the device



Figure 3-10 Analyzer Information Bar

### 3.7 Analyzer Home Page - Overview

The analyzer "home" page provides full details about the setup and operating status of the analyzer. Get to the "home" page any time by clicking the "HOME" tab.

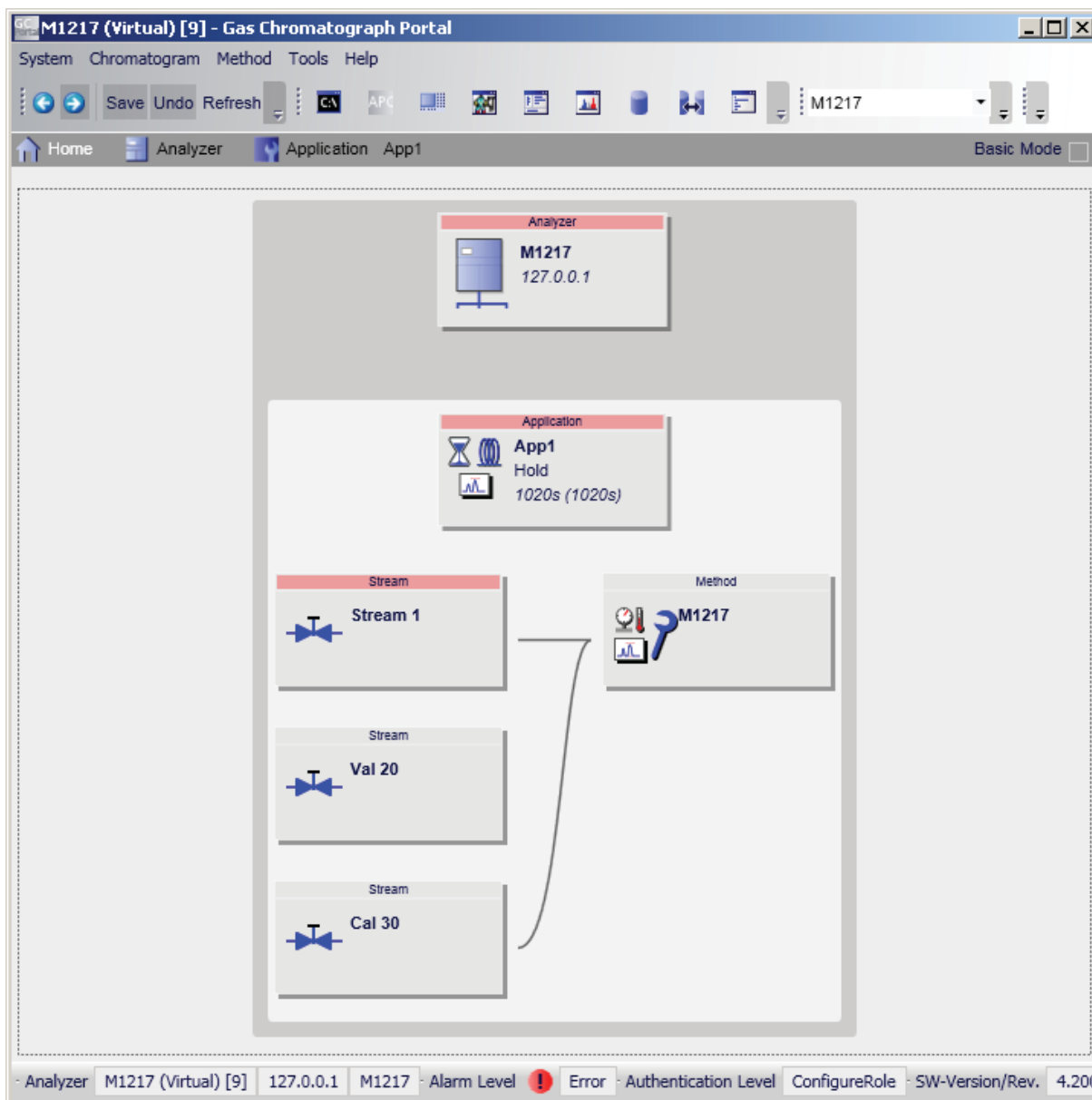


Figure 3-11 Analyzer Home Page

In the image above, the analyzer is the "Propylene GC". It's IP address is 127.0.0.1. The analyzer is running a single application with a single method, one process stream and one calibration stream. Clicking anywhere on the analyzer structure takes you directly to information about that aspect of the analyzer.

### 3.8 Application Setup and Control Page - Overview

Clicking the Application tab takes the user directly to an overview of information about that application as shown below. Multiple applications may exist for a given analyzer, and each will have a tab. This screen allows the user to manage and modify settings relating only to the selected application.

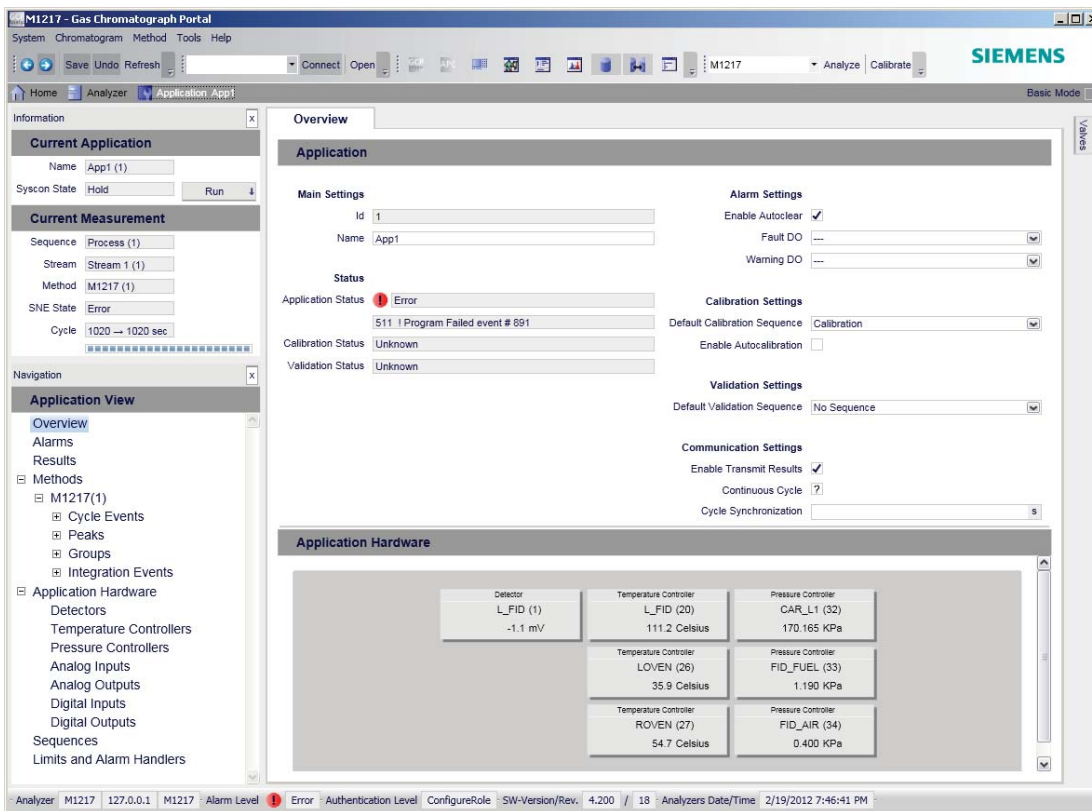


Figure 3-12 Application Setup and Control Page

The layout of the Application Page is similar to the Analyzer Page, with Application information boxes and a Navigation menu on the left, as well as detailed information windows on the right. Choosing different selections on the Navigation menu changes the information displayed in the information windows on the right.

### 3.9 Viewing Chromatograms

Starting from any screen, the user can bring up the chromatogram window, shown below. The user can select from:

- previously saved (filed) chromatograms
- data logged chromatograms from history

### 3.9 Viewing Chromatograms

- a selection of any chromatogram in the analyzer
- loading the most recent chromatograms the analyzer

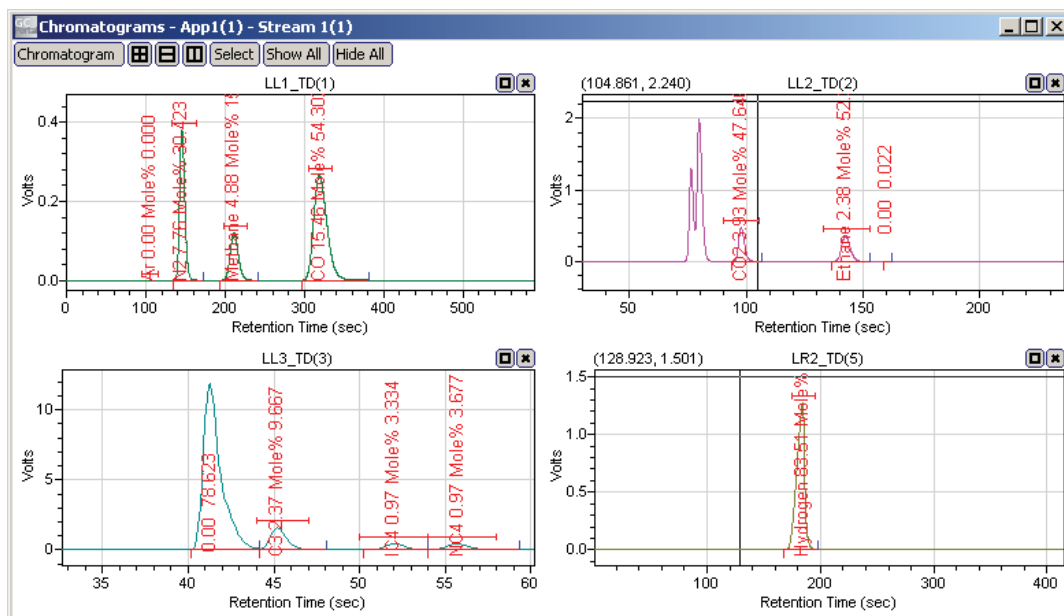


Figure 3-13 Chromatogram View and Control Window

The buttons in the upper left corner allow the user to display and arrange the chromatograms, or load different chromatograms. In addition, a right mouse click allows access to several additional functions. The analyzer window is a powerful display tool that allows the user to view chromatograms in many different ways including:

- Selecting specific chromatograms to view
- Zooming in on specific areas
- Overlaying multiple chromatograms on the same graph
- Modifying the method while viewing chromatograms



## Software installation

### 4.1 Installation of Gas Chromatography Portal Software

#### Minimum System Requirements:

- *Operating System:*
  - Windows XP (Service Pack 3 required)
  - Vista (Service Pack 2 required)
  - Windows 7 (Service Pack 1 recommended)
- *System Memory:* Minimum 2 GB of RAM (4GB recommended)
- *Free Hard Disk Space:*
  - 2.5 GB on 64-bit OS versions or 1.5 GB on 32-bit OS version  
Note: This includes possible additional Microsoft support packages. Actual software is less than 500 MB if Microsoft .Net 4.0 is already installed on the computer.
  - In addition: For use of the GCP data logger at least 1 GB of hard disk space per monitored Gas Chromatograph is recommended.
- *Processor:* Minimum 1.8 GHz (2.5 GHz recommended)

#### Driver Information:

The Windows XP security patch MS11-011 (KB2393802) has a known incompatibility with not up to date chip drivers for some AMD and Intel graphics chips. This incompatibility might cause a Windows stop error (Blue screen) in conjunction with use of Gas Chromatograph Portal software. Please use latest graphic card drivers to avoid this problem. Detailed information relating to the incompatibility is provided by Microsoft at <http://support.microsoft.com/kb/2393802>.

#### Security information:

Siemens offers IT security mechanisms for its automation and drive product portfolio in order to support the safe operation of the plant/machine. Our products are also continuously developed further with regard to IT security. We therefore recommend that you keep yourself informed about updates and upgrades for our products and always use the latest version of each product. You can find information on this at <http://support/automation.siemens.com>. You can register for a product-specific newsletter here.

For the safe operation of a plant/machine, however, it is also necessary to integrate the automation components into an overall IT security concept for the entire plant/machine, which corresponds to the state-of-the-art IT technology. You can find information on this at <http://www.siemens.com/industrialsecurity>. Products used from other manufacturers should also be taken into account here.

4.1 Installation of Gas Chromatography Portal Software

**Installation:**

1. Insert installation disc. The Installer should start automatically.
2. From the menu select the GCP entry. This will launch the GCP Setup Wizard.
3. The Setup Wizard will determine if any additional windows packages are necessary and install them automatically. If system prompts for reboot, then do so before continuing. Otherwise, the GCP installation may not complete properly.
4. After reboot, if required, continue installation, answering prompts from the screen.
5. By default, the Setup Wizard installs all features. However, it is possible to select custom setup of desired features. To select or exclude specific components click the small down-arrow next to the component.

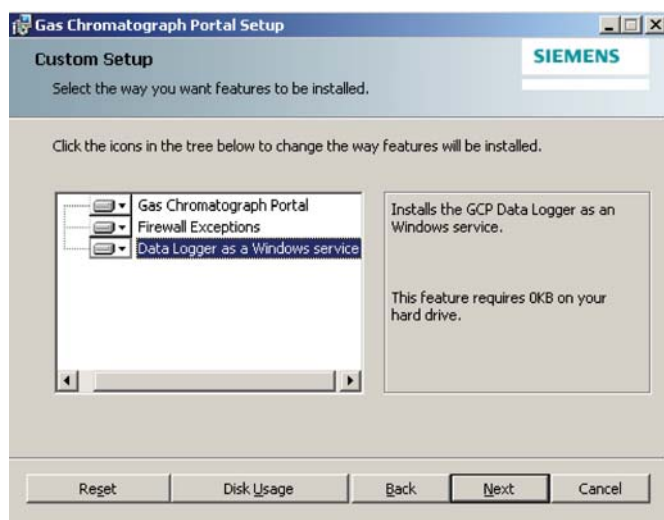


Figure 4-1 GCP Custom Installation

6. After installation, the software may indicate that a reboot is required. If so, then reboot before continuing.
7. The software installer menu also has options for System Manager, EZChrom, MaxBasic, and OPC Server. For full functionality, GCP requires System Manager and EZChrom. If these are not already installed on the system, go back to the menu and install them now.
8. MaxBasic and OPC Server are software features that can be purchased separately. If those were purchased and not installed, go back and install them at this time.

## User Examples

### 5.1 Examples Introduction

The examples in this section are intended to familiarize the user with navigating the Siemens Gas Chromatograph Portal and the way common tasks are completed using the Portal. The examples shown are representative examples and are not intended to instruct the user on all possible tasks. For more information on specific tasks and screens refer to the online help files included in the GCP Software.

### 5.2 Managing Alarms

Analyzer alarms are managed via the Alarm Log screen, which is available from either the Analyzer tab or any Application tab in the GCP Analyzer view screen. The Alarm Log screen displays information regarding all errors, warnings, and informational messages that exist in the analyzer. The information on this screen is updated automatically when new information is received via broadcast message.

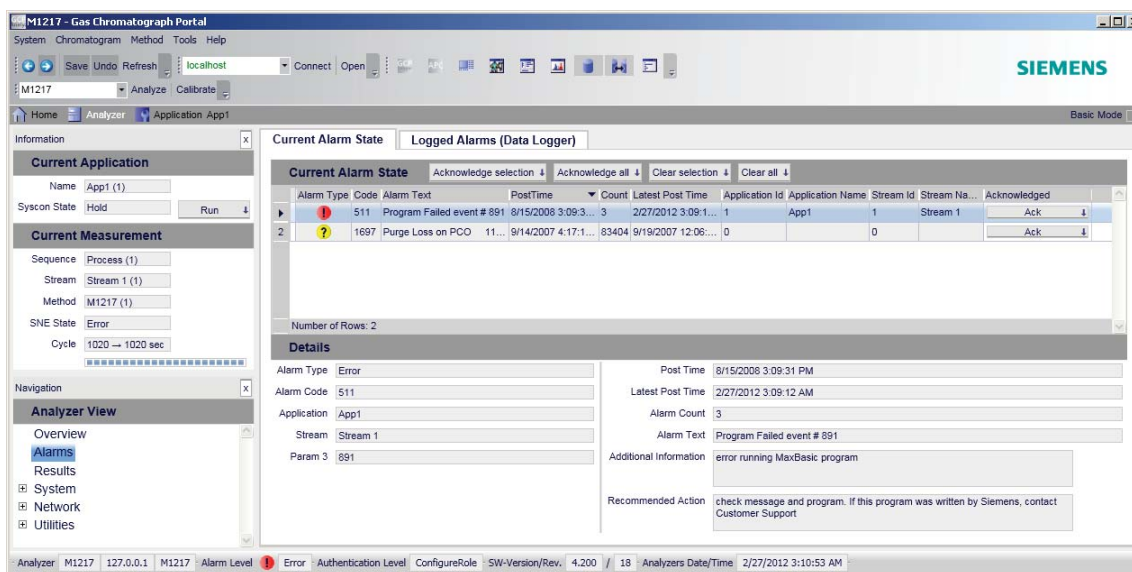



Figure 5-1 Alarm Log Screen


**Interpreting the Display:**


*Alarm Table -*

The top pane of the Alarm Log screen is a table of all alarms currently existing in the device. Included in each table line is information regarding the alarm, such as alarm level, time received, alarm text, etc. Alarms in this table may be sorted by clicking the desired column by which to sort. They may also be acknowledged or cleared, by using the relevant button (refer to the User Actions below).

Alarm Types - Different types of alarm status messages may be received from a device. Each message received must be assessed by the user to determine what, if any, further action is required.

 Information - When a message is received from an analyzer that does not indicate a fault situation with that particular device, then it is typically classified as an informational message. Informational messages may be purely or information, such as noting that an application has been placed in service, or may indicate that an error situation exists other than in the device, such as a communication error on the network.

 Warning - Warning messages typically indicate an abnormal situation with a device that does not usually affect analytical results. Depending on the message, this may be a minor error or a service affecting error.

 Error - Error messages indicate faults with a device that are likely to affect analytical results.

*Alarm Details -*

The bottom pane of the Alarm Log screen includes detailed information regarding the alarm that is currently highlighted from the alarm table. The Gas Chromatograph Portal provides the user with a unique troubleshooting tool in its detailed explanation of alarms and suggestions for recommended actions.

On the left side of the Details pane are the information received from the analyzer. This includes the type, code, applicable application and stream (if any), and any relevant parameters. Parameters are variables that identify specific information about an alarm, such as which device is affected.

The information on the left side of the Details pane is used by Gas Chromatograph Portal to populate the right side of the Details pane. Gas Chromatograph Portal uses this information to build the Alarm Text as well as to populate the Additional Information and Recommended Action fields. The additional information is an extended description of the message. The recommended action provides the user with guidance for troubleshooting. Note that the recommended action is intended to be a brief suggestion to point the user to the most likely cause. It is not intended to be a detailed troubleshooting procedure. Refer to the relevant Maxum documentation for more details regarding troubleshooting, including relevant safety precautions.

*Logged Alarms Tab -*

Viewing logged alarms is covered in the Data Logger chapter of this manual.

**Common User Functions:**

*Acknowledging Alarms* - To acknowledge an alarm the user may click the "Ack" button on the far right of the alarm line (the Acknowledged column). Alternately, the user may select the line and click the Acknowledge Selection button at the top of the table. When an alarm is acknowledged, the "Acknowledged" column for that line changes from the "Ack" button to Yes. To acknowledge all alarms, click the Acknowledge All button.

*Clearing Alarms* - To clear an alarm, select it in the alarm table and click the Clear Selection button. The alarm should disappear from the list. To clear all alarms in the list click the Clear All button. An alarm that is permanently occurring (such as a purge alarm) may clear and then reappear immediately.

**Note**

Note that on the buttons to Acknowledge and Clear alarms, there are blue arrows pointing down. This arrow icon denotes changes that are sent immediately to the analyzer. If a button does not have a blue arrow, then it is used for a change or function that does not go immediately to the analyzer (although it might create a change to the database loaded in GCP).

**Example of Managing an Alarm Using GCP:**

In the image below, a message has been received in the Alarm Log.

The screenshot shows the 'Logged Alarms (Data Logger)' tab. At the top, there are buttons for 'Acknowledge selection', 'Acknowledge all', 'Clear selection', and 'Clear all'. Below these is a table with the following data:

Alarm Type	Code	Alarm Text	PostTime	Count	Latest Post Time	Application Id	Application Name	Stream Id	Stream Name	Acknowledged
Warning	1697	Purge Loss on PCO 11:3-3.1-1	9/14/2007 4:17:13 PM	83404	9/19/2007 12:06:38 PM	0		0		Ack

Below the table, it says 'Number of Rows: 1'. The 'Details' pane shows the following information:

- Alarm Type: Warning
- Alarm Code: 1697
- Application:
- Stream:
- Param 3: 20000861
- Param 4: PCO 11:3-3.1-1
- Post Time: 9/14/2007 4:17:13 PM
- Latest Post Time: 9/19/2007 12:06:38 PM
- Alarm Count: 83404
- Alarm Text: Purge Loss on PCO 11:3-3.1-1
- Additional Information: PECM PIC: Purge failure in the EC enclosure. The pressure differential between the interior and exterior of the EC is not high enough.
- Recommended Action: Depending of the environment classification where the analyzer is used, this may be an alarm that requires immediate action to correct the situation or an alarm that can be totally ignored

Figure 5-2 Alarm Log Example

From the image, we can see that the message is a Warning (yellow question mark). We can also see other information such as the time the message was reported and the alarm text of "Purge Loss on PCO". We can also see that the alarm is not acknowledged.

From the bottom Details pane, we can see the following extended description and recommended action.

- Additional Information - PECM PIC: Purge failure in the EC enclosure. The pressure differential between the interior and exterior of the EC is not high enough."
- Recommended Action - Depending of the environment classification where the analyzer is used, this may be an alarm that requires immediate action to correct the situation or an alarm that can be totally ignored.

From this we can tell that the Maxum Electronics Enclosure has experienced a loss of purge pressure. This may be due to an opened enclosure door, a failed seal, or some other cause. The urgency of this message depends on a number of factors, including the environmental classification where the analyzer is installed.

In this case, factors indicate that you need to check out the alarm immediately. However, first you choose to acknowledge the alarm by hitting the acknowledge button on the list. This tells other users that the alarm is being worked on.



Figure 5-3 Acknowledging Alarms

After correcting the fault (an open door), you return to the GCP computer. The original alarm still needs to be cleared. Select the alarm line and click the "Clear Selection" button (in this case with only one alarm "Clear All" would have the same effect). The alarm will disappear from the list.

### 5.3 Changing a Method

Method development and modification is a common maintenance function. For Gas Chromatograph Portal, method development is integrated into the analyzer interface for ease of use.

#### Overview of Changing a Method:

In GCP, methods are changed using the Application Tab for the analyzer. The Method selection on the navigation menu has several sub-topics. Changes can be made to a variety of Cycle Events as well as Peaks, Groups, and Integration Events for each configured detector.

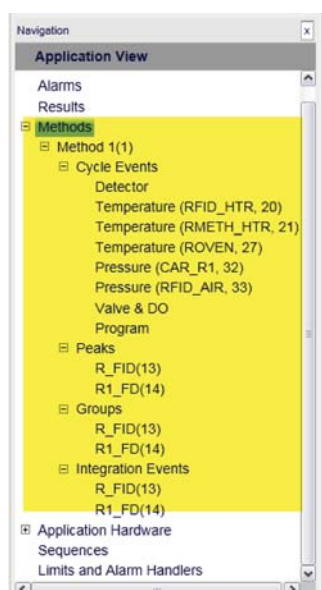


Figure 5-4 Method Tree on Navigation Menu

Methods can be changed and tested offline on the PC without affecting the live analyzer. When a particular setting is changed, the related tree topics turn blue to indicate unsaved information. Multiple changes can be made to the method without saving. After changes are made the user can run an offline analysis and then save, if ready.

The example below is intended to show the user how methods can be easily changed and tested offline and then incorporated into the analyzer.

#### Example Scenario:

A new column has been installed and minor changes to the method are needed to adjust for the change. You have already installed the hardware and adjusted flow rates by modifying pressure settings using the Maintenance Panel at the analyzer. The application is running and chromatograms are being acquired, but are shifted due to the new column.

You now need to tweak the peak retention times, valve timing, and integration events. To do this, you will connect to the analyzer, look at the current chromatograms, make changes, run an offline analysis and make sure it is correct, and then save the changes. These steps are detailed below.

#### Connect to Analyzer:

Use the GCP Network Window to connect to the desired analyzer. Select the analyzer and click "Connect".

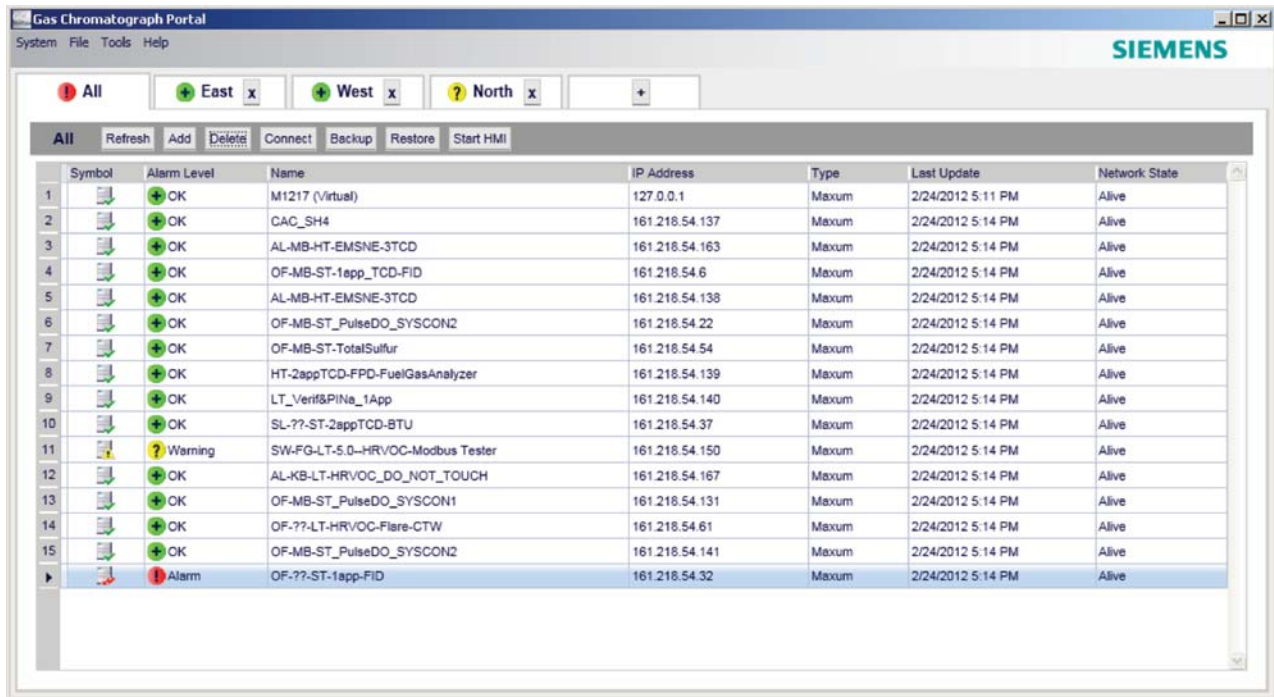


Figure 5-5 GCP Network View - Connecting to an Analyzer

**Save Database:**

Before attempting to make changes to a method, it is important to make a backup of the database. To backup the analyzer choose "Backup Unit" from the System menu. Enter a file name for the backup and hit "Save". The status window will show the progress until the save completes.

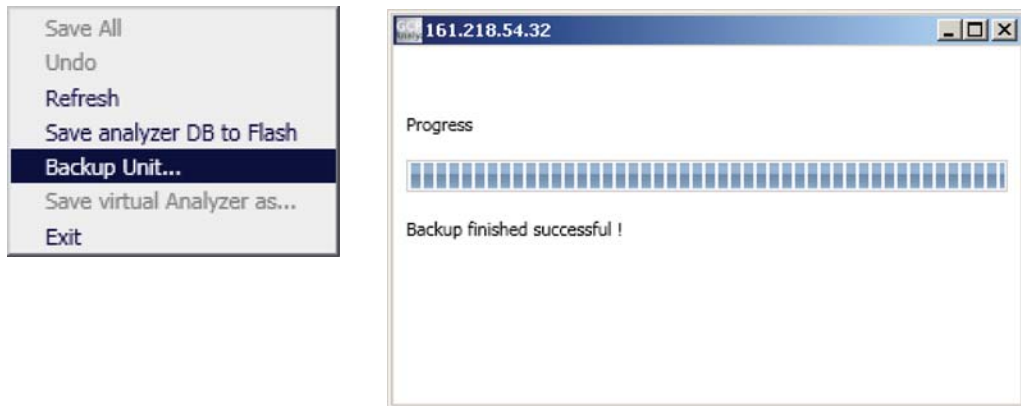


Figure 5-6 Saving an Analyzer Database

**Load Chromatograms:**

Chromatograms can be loaded using the Chromatogram menu. In this case, choose "Load from Analyzer" and then select the desired stream from the resulting menu.



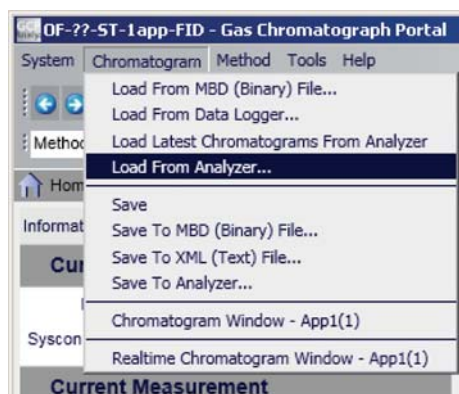


Figure 5-7 Load Chromatogram from Analyzer

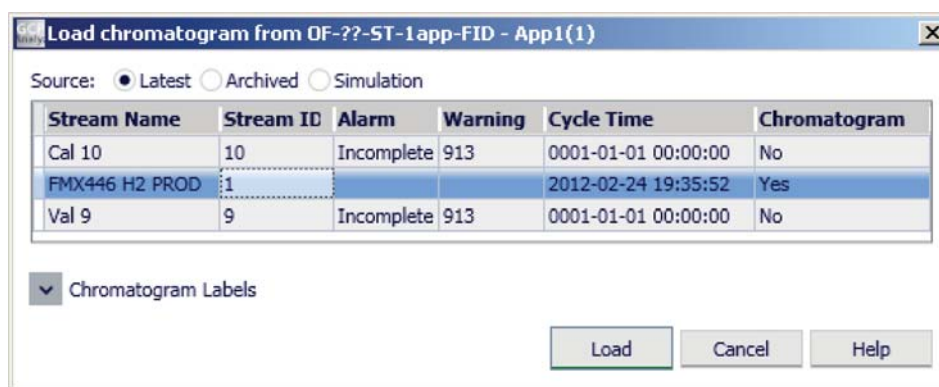


Figure 5-8 Select Chromatogram to Load

### View Chromatogram:

When Chromatograms are loaded, the chromatogram viewer will open in a new window. Several functions are available. Some of these include:

- Expand specific chromatograms by clicking the box in the upper right corner of the chromatogram.
- Remove certain chromatograms from the view by clicking the X in the upper right corner of the chromatogram.

5.3 Changing a Method

- Zoom by holding down the left mouse button and dragging to define the zoom area.
- Click the right mouse button to see multiple functions, including the Zoom Toolbar selection. Selecting the Zoom Toolbar displays several zoom function buttons at the top of the chromatogram.

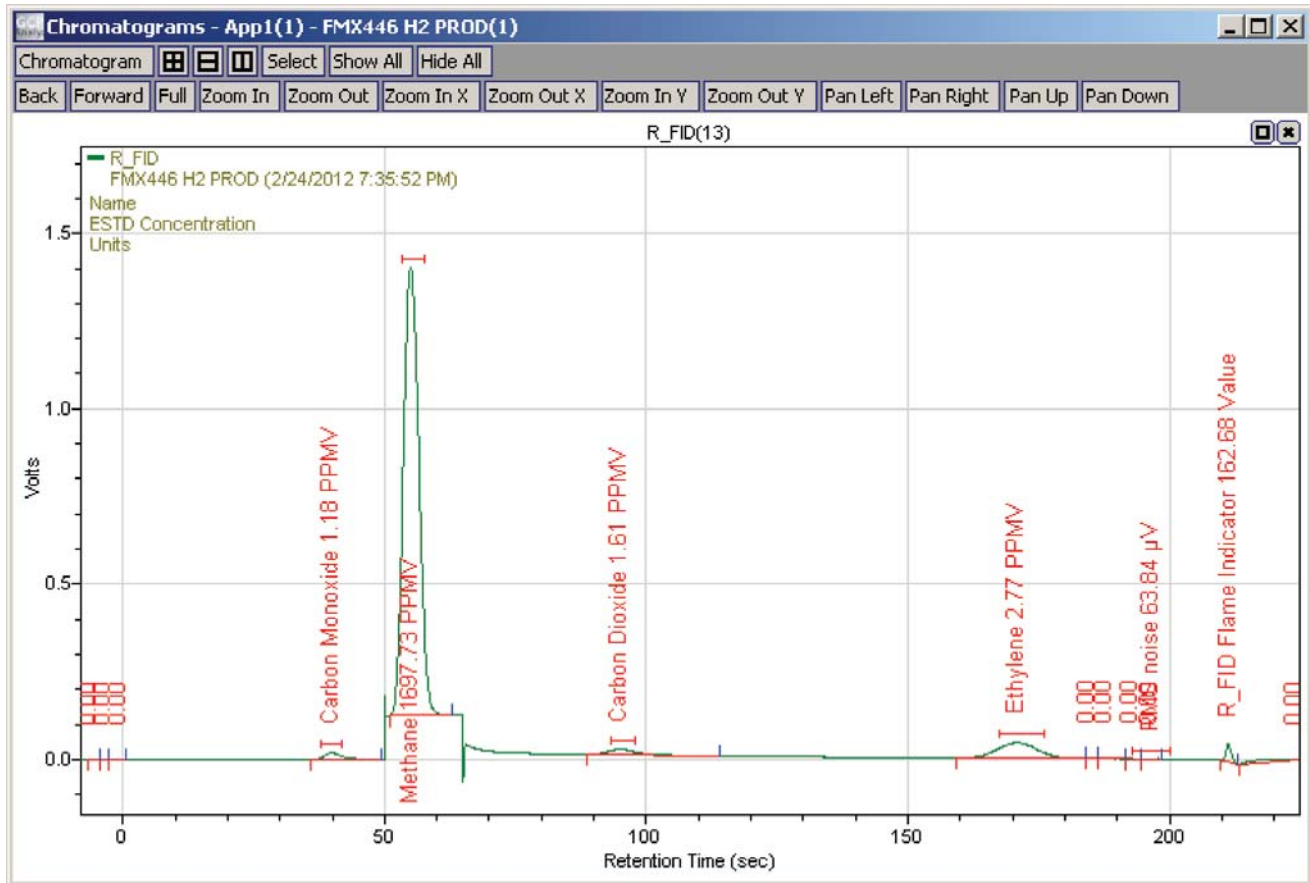


Figure 5-9 The Chromatogram Window

You can also view a chromatogram by selecting a specific detector on the Peaks screen on the navigation menu. To view the chromatogram for the detector, make sure that the chromatogram box at the top of the screen is checked. Clicking the right mouse button on this chromatogram results in a menu of several user functions.

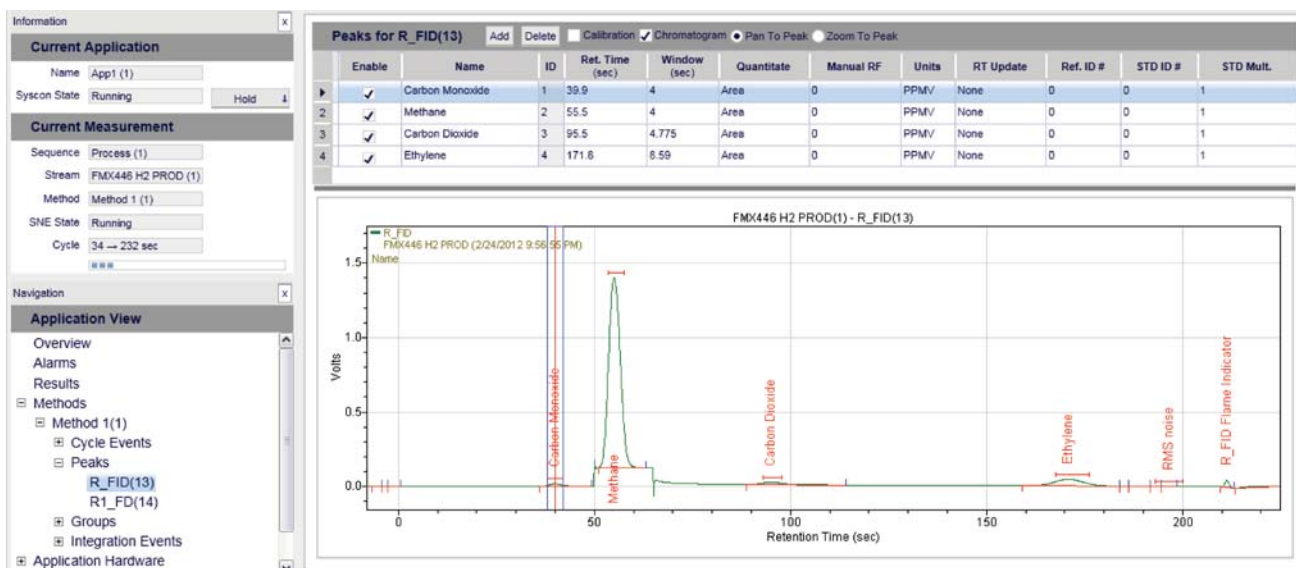


Figure 5-10 The Peak Screen - with Pan To Peak Selected

This way of viewing chromatograms has some advantages over the chromatogram window. Only the chromatogram for the selected detector is shown. There are also two special features that allow the user to view a particular peak. In the above image, the Methane peak is selected. The "Pan To Peak" circle is selected at the top of the window. This highlights the Methane peak on the chromatogram using blue bars.

5.3 Changing a Method

There is also a "Zoom To Peak" feature. When Zoom To Peak is used, the chromatogram zooms in on the selected peak as shown below. For both Pan To Peak and Zoom to Peak, the blue bars represent the Retention Time and Window attributes

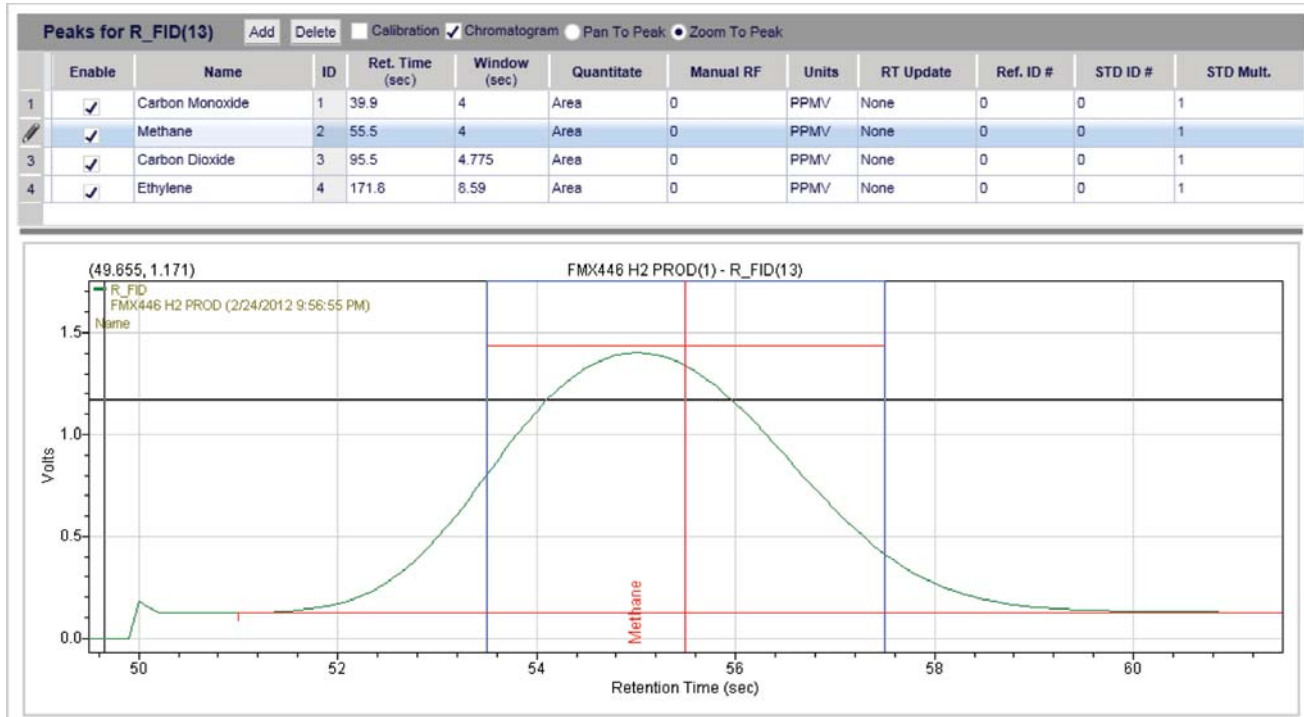


Figure 5-11 The Peak Screen - with Zoom To Peak Selected

### Modifying a Peak

To change settings for a peak, simply click on the setting and make the desired change. As soon as a change is made, the blue bars in the chromatogram are updated.

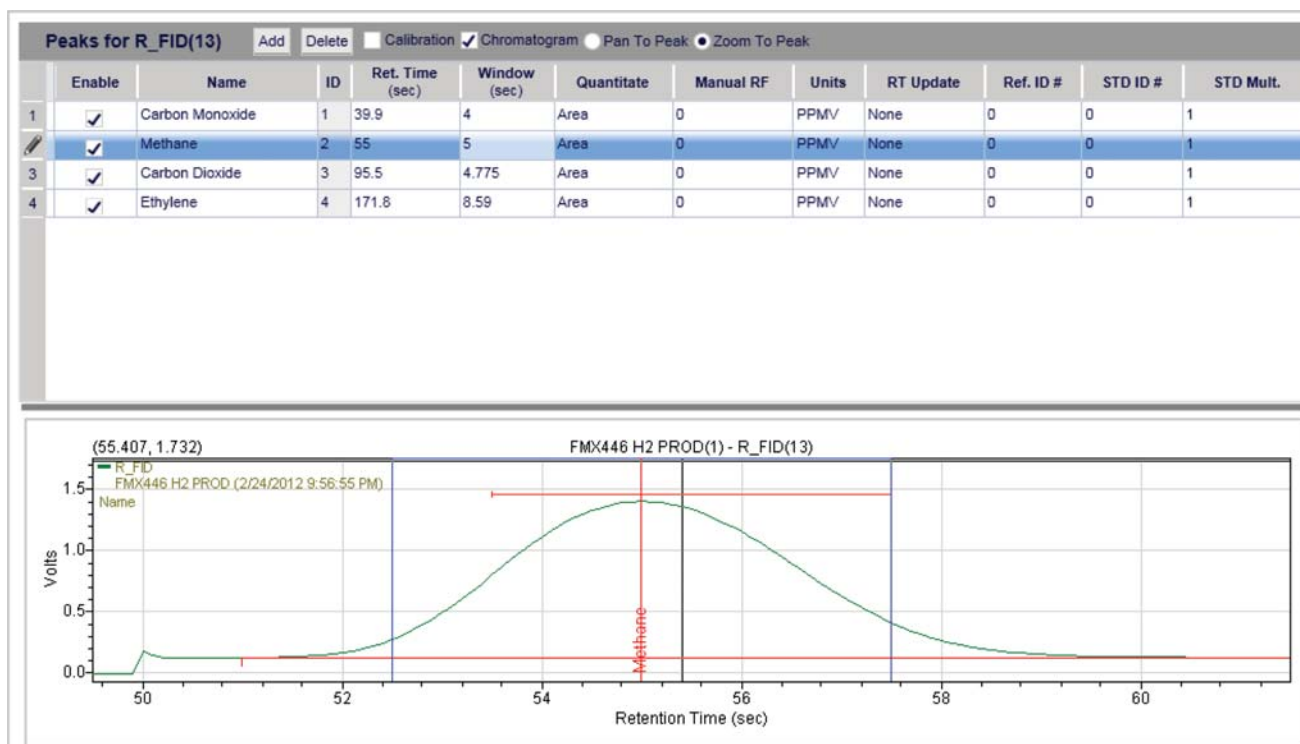


Figure 5-12 The Changed Peak

### Modifying Valve Timing

To change valve timing, select the Valve & DO menu item under Cycle Events (you can also choose the main Cycle Events screen to see all events, including Valve timing). At the top of the Valve & DO screen there will be a "Cycle Graph" box. Check this box to see the cycle events in an overlay with the chromatograms. The cycle graph feature is useful to help visualize how valve timing (and other cycle events) will affect the chromatograms. In the Cycle Graph you can reduce the amount of information in the graph in different ways, such as using the Select buttons to select specific detectors or events.

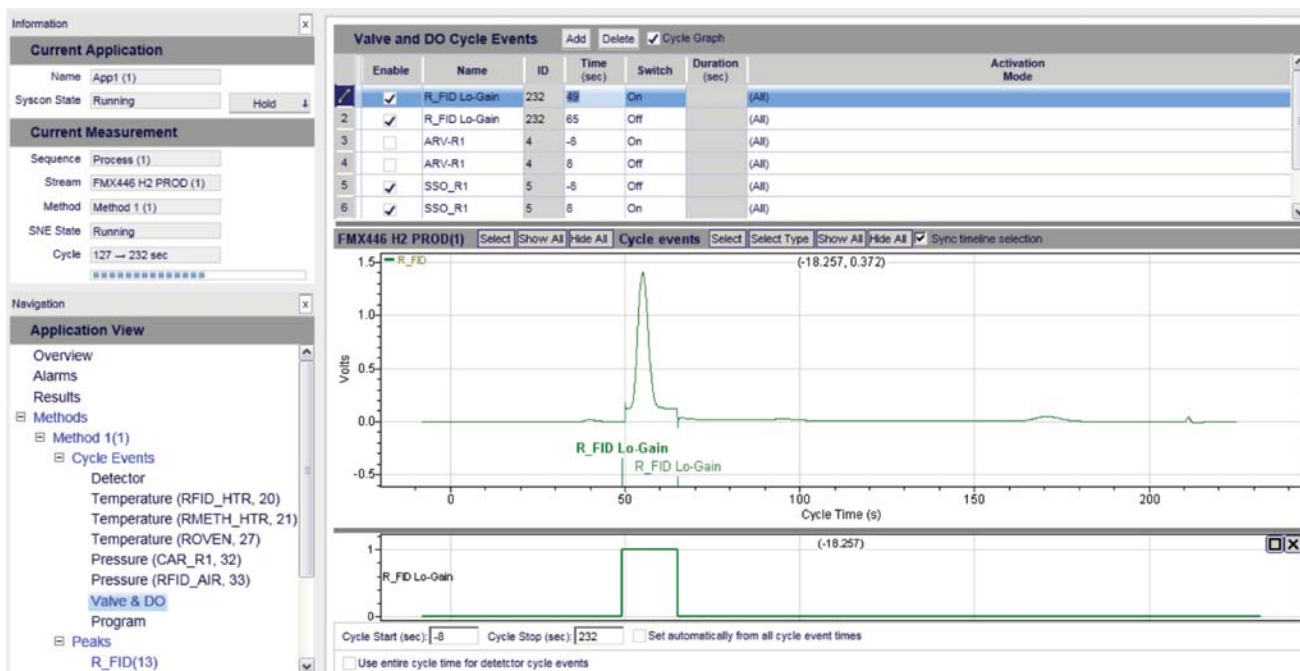


Figure 5-13 Changing a Valve Event - With Cycle Graph Shown

To change valve timing, select the setting and make the desired change. Modifying the valve timing (or other cycle event) immediately changes the cycle graph.

### Modify Integration Events:

To change integration events click on Integration Events and the desired detector. As with the Peak screen, the Integration Events screen has a selection box to show the chromatogram at the bottom of the screen.

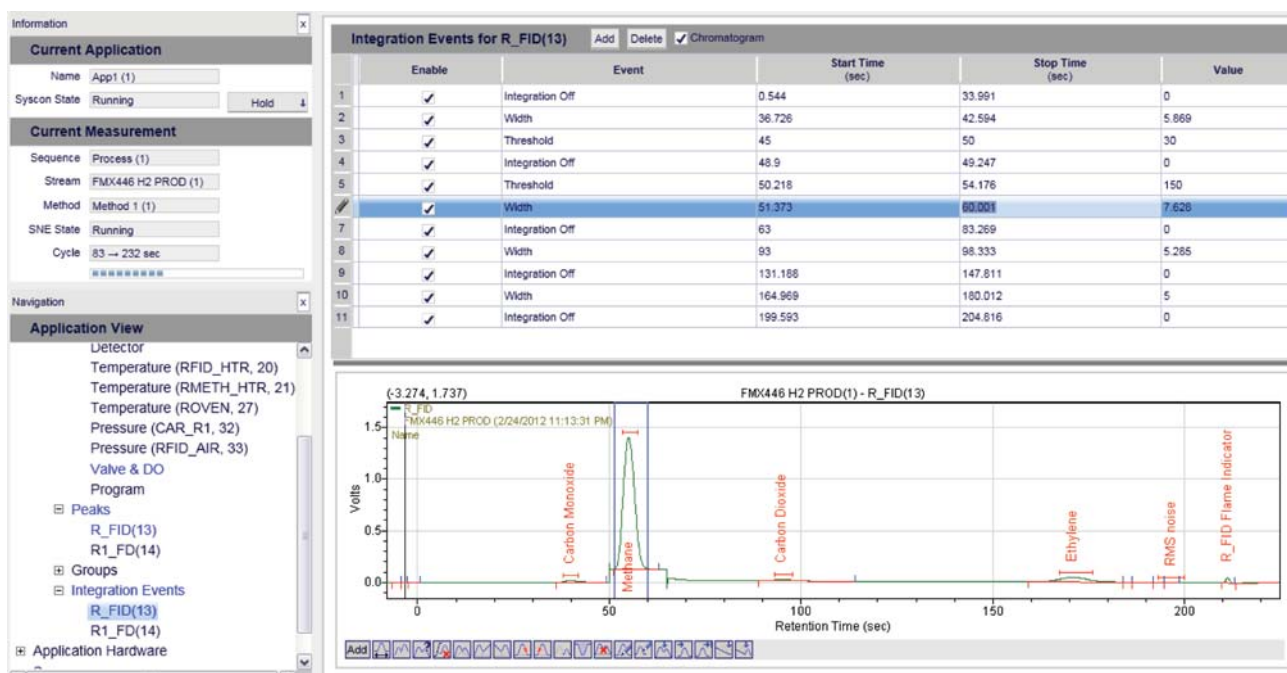


Figure 5-14 Changing Integration Events

When an integration event is selected, the timing for that event is noted by blue lines on the chromatogram. Changing timing for an event immediately changes the location for the bars.

**Testing the Changes:**

After all desired changes are complete you can click the Analyze button on the toolbar to perform an offline analysis. Choose the "Chromatogram" menu and then "Chromatogram Window" to view the chromatogram that has now been analyzed with the new changes.

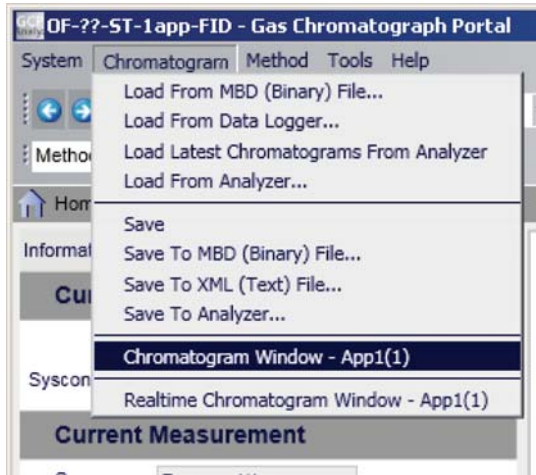


Figure 5-15 Opening the Chromatogram Window

**Saving Changes to the Analyzer:**

If the changes are satisfactory, then you can save by clicking the Method menu at the top of the GCP window and then "Save To Analyzer". This will save all method changes to the analyzer. After this, the changes will be live.

Note that saving the method to analyzer is a change to RAM. If the analyzer is rebooted, then changes will be lost. Perform Save To Flash, from the GCP System menu if you wish to make changes permanent.



## 5.4 Calibrating a Method

### Overview:

Calibration is another change to the method similar in many ways to the changes described in the previous example for changing a method. Calibration is accessed from the Method Peaks screen described in the previous section. Calibration functions are accessed on this screen by clicking the box labeled "Calibration".



Figure 5-16 Peak Screen - Calibration

As each peak is selected on the left pane, the calibration settings for that peak are displayed on the right. The example below is designed to give the user a basic idea of modifying a calibration and performing an offline calibration based on the modified settings.

### Example Scenario:

A new calibration standard has been installed with slightly different concentrations than the previous standard. You need to change the calibration levels and recalibrate the current method.

**User Actions:**

Perform the following actions to change the calibration levels:

- Select Peaks from the Method on the Navigation Menu and then select the first detector. This displays peaks for the first detector.
- Click the Calibration checkbox to see calibration settings.
- Select the first peak (in this case Carbon Monoxide).
- In the Calibration Level settings, change the Amount attribute to match the new calibration standard.
- Select the next peak for the detector and change the Amount attribute. Repeat for each peak.
- Select the next detector under the Method Peaks menu and change settings for each peak. Repeat for all detectors in the method.

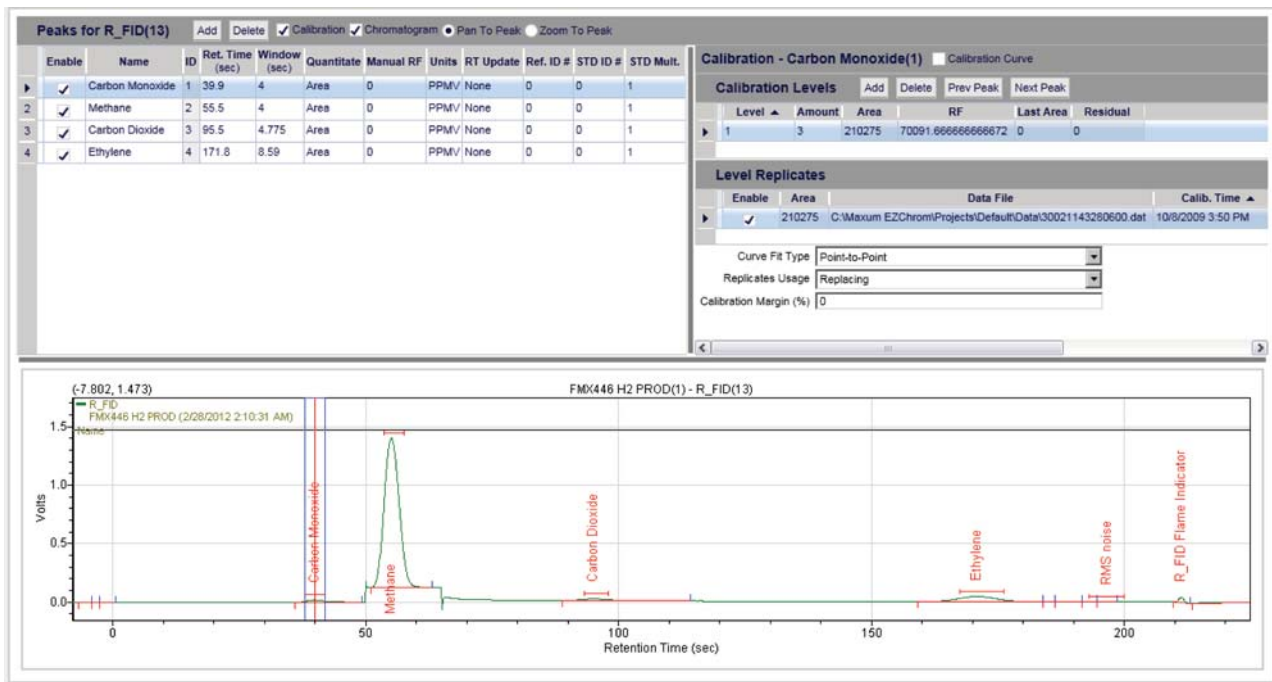


Figure 5-17 Changing Calibration Level Settings

- When all calibration level settings have been modified, then you can calibrate using the currently opened chromatograms.
- You can now save the method to the analyzer.

## 5.5 Checking Results and Creating an Alarm Limit

### Results and Limits:

Chromatographic results can be viewed on the "Results" screen on the Navigation menu. It is possible to view and compare results in different ways. It is also possible to automatically monitor results in other ways, such as using a Limit associated with a user defined Alarm.

### Results Overview:

Chromatographic results can be viewed on the "Results" screen on the Navigation menu. Results are available either from the Analyzer view or from the Application view, although the features available from these views are somewhat different.

*Results from the Analyzer view* - A table of all current results is shown. The information available on this screen is more limited than from the Application view. On this screen there are tabs for viewing external results and for viewing logged results from the Data Logger archive.

*Results from the Application view* - Only current results for the selected application are shown. This view has several extra tabs for displaying additional information and changing some information.

The example in this section will use the Application view results screen.

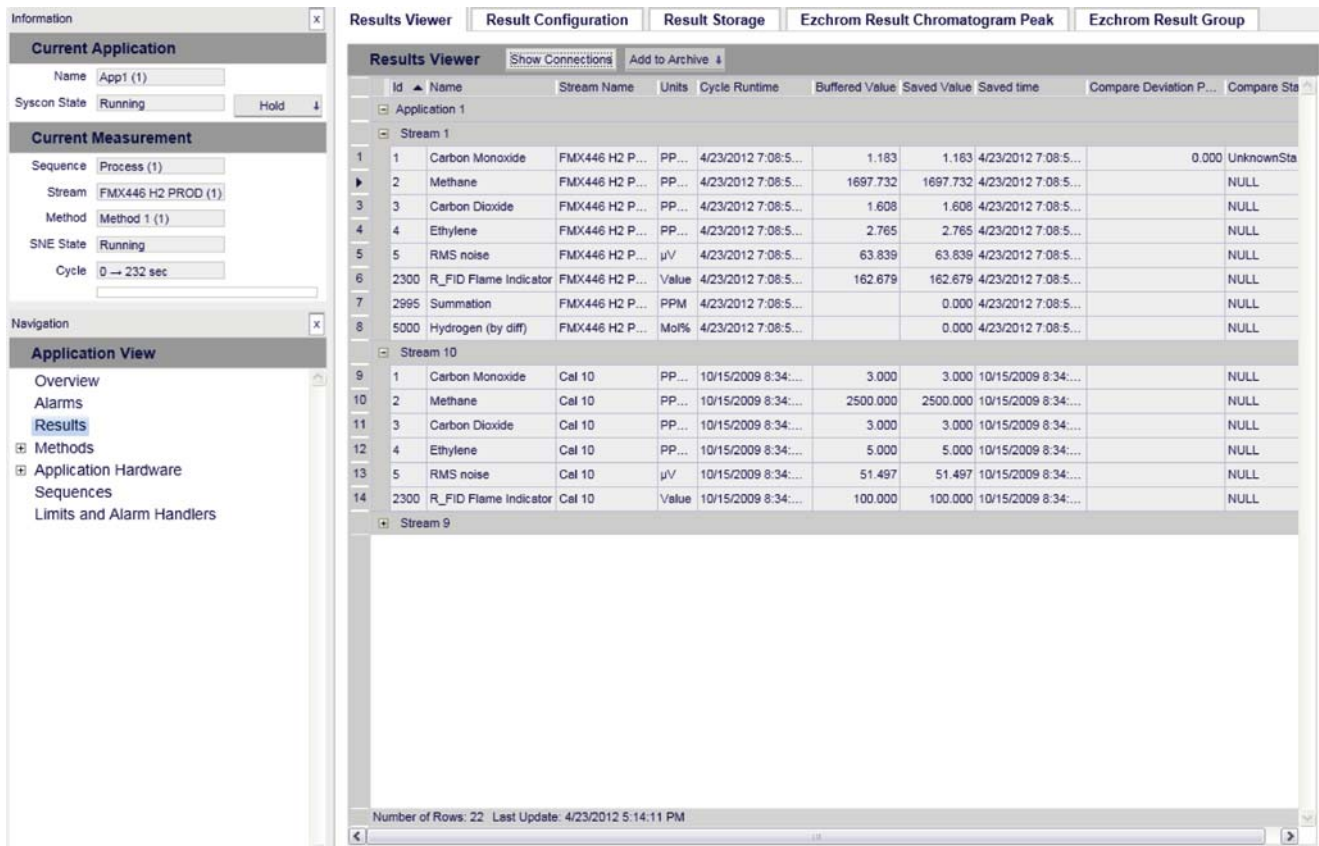


Figure 5-18 Result Viewer

**Interpreting the Results Display:**

*Results Viewer Tab:*

The display pane shows results for each stream. When first opened, the results for each stream are collapsed. Click the small "+" icon next to the stream to expand results for that stream. Click the "-" icon to collapse the list again. Various data relating to the results are shown in the table. Note that clicking on a column will sort results according to that column. Columns can also be resized by clicking and holding the left mouse button over the space between the column names and then dragging left or right to resize.

There are two buttons on the main Results Viewer screen.

- "Show Connections" - Displays a diagram of connected database elements, such as which detector the result relates to or whether the result is sent to Modbus. This is shown at the bottom of the display window.
- "Add to Archive" - This button adds the current results for the selected stream to the archive stored on the analyzer. The blue down-arrow indicates that this information is transmitted to the analyzer immediately.

*Result Configuration Tab:*

The second tab can be used for changing various properties related to the selected result. When a change is made the relevant fields turn blue. This indicates unsaved database information. If you wish to keep changes, then the database must be saved using the Save function. Navigating to a screen other than Results forces the user to either save or discard changes.

*Result Storage Tab:*

This tab accesses the archive on the analyzer. Results are added to the archive using the "Add to Archive" button on the Results Viewer. Results are shown in a table similar to the Results Viewer. One useful feature of this table is the ability to sort by column (which can be done with most any screen). Sorting by Result Name allows the user to easily compare the same result as archived over time.

*EZChrom Result Chromatogram Peak:*

This tab is used to show detailed information related to the peaks that are defined within the method for the results.

*EZChrom Result Group:*

This tab is used to show result information for any groups that are defined within the method.

**Limits and Alarm Handler Overview:**

A limit is used by the analyzer database detect certain conditions for I/O, results, or external results, and create certain outputs based on those conditions. An example is setting a limit to check for an abnormally high value on a result, and outputting an alarm in response.

Limits are created and administered using the "Limits and Alarm Handlers" screen on the Navigation Menu for the Application view. To implement a limit, two database entries must be created. The first is the entry to the Limit table. The second is the Alarm Handler entry to the alarm table (creating the user alarm, setting the text, and setting other optional attributes for the alarm). After the Limit and Alarm Handler are created, then they must be attached to each other. To make the process as easy as possible, the GCP software integrates these changes all on one Navigation menu item, Limits and Alarm Handlers.

**Interpreting the Limits and Alarm Handler Displays:***Limits Tab:*

The upper left part of the display pane shows the limits that have been created and allows the user to create or delete limits. The upper right part of the display pane allows the user to attach a limit to a source (I/O, results, or external results). Adding an item to the "Used By" list causes a dialog box to be displayed. This dialog is described in the example later in this section.

The bottom half of the display pane is used to associate the created limit with an existing entry in the alarm handler table. Four types of alarm associations are available as shown below. The user may activate any combination of the four with a different threshold for each.

5.5 Checking Results and Creating an Alarm Limit

- High - Creates an alarm warning message when the value goes above the threshold specified.
- High High - Creates an alarm fault message when the value goes above the threshold specified.
- Low - Creates an alarm warning message when the value goes below the threshold specified.
- Low Low - Creates an alarm fault message when the value goes below the threshold specified.

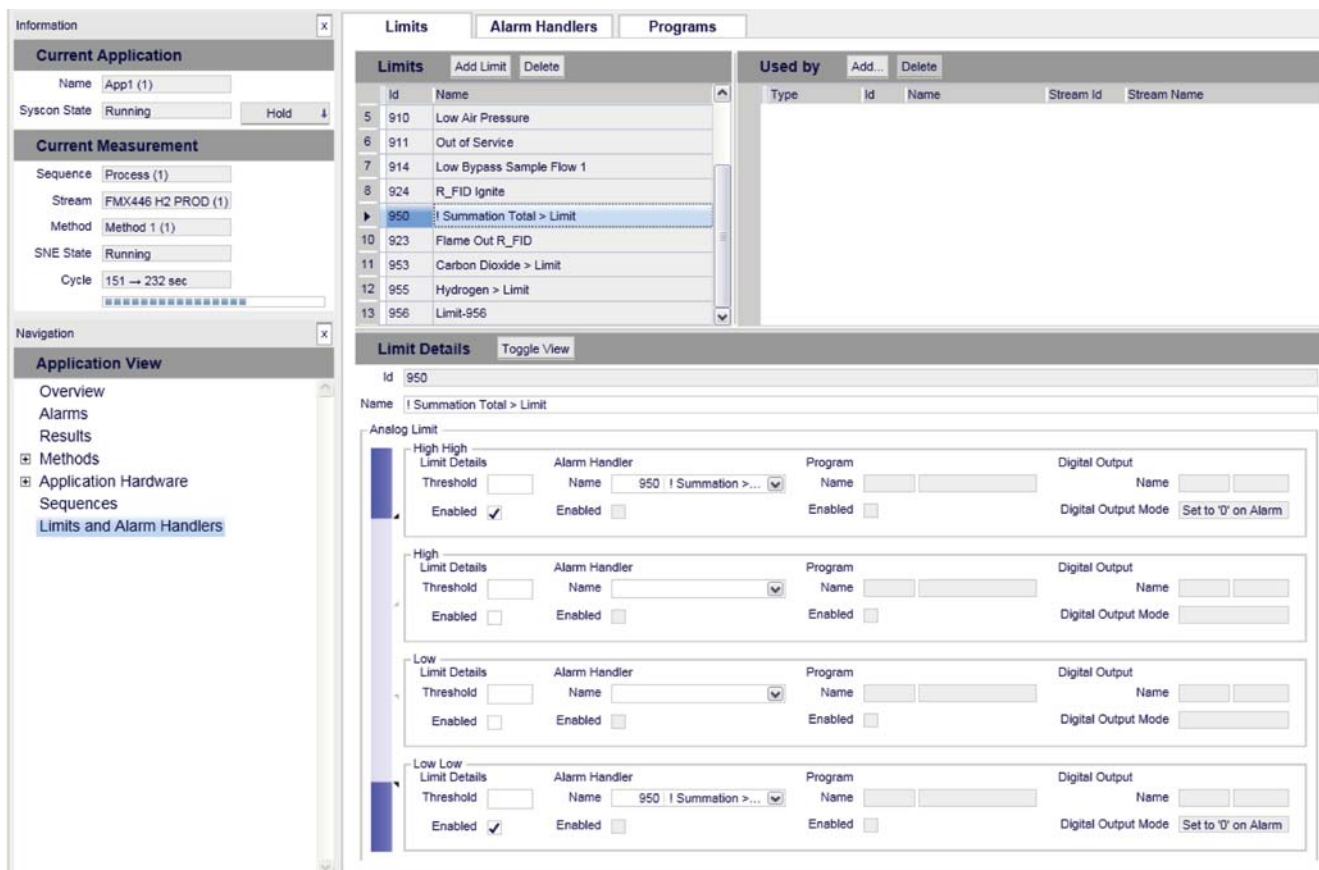


Figure 5-19 The Limits Screen

*Alarm Handler Tab:*

The alarm handler tab is for creating user defined alarm messages. This alarm information can be associated with a limit from the Limit table as described for the Limits tab.

The left part of the display pane shows the list of existing Alarm Handlers and allows the user to add and delete Alarm Handlers. The right part of the display pane shows the configuration details for the selected alarm handler.

Information in the Configuration is as follows:

- Alarm Code - This is the automatically assigned code. At the time of creation a new code can be selected. Alarm codes 900-996 are for user defined alarms.
- Text - This is the user defined alarm text.
- Enabled - Identifies whether the Alarm Handler is active or not.
- Digital Output - It is possible when the limit criteria is true, to have the alarm handler trigger a Digital Output (DO). The "Digital Output" box reveals a drop-down menu of available DOs. This works in addition to the alarm function.
- Digital Output Mode - This identifies whether the selected DO will be either 0 or 1 when the alarm is active.
- Program - It is possible when the limit criteria is true, to have the alarm handler trigger the execution of a program. The Program attribute is a drop-down menu of available programs.
- Program Enabled - This checkbox enables the Program attribute. It must be checked for the program to run when the limit is true.

Alarm Code	Text
1 907	I Low Valve Gas Pressure
2 908	? Low Carrier Pressure
3 913	? Low Analyzer Sample Flow
4 910	? Low Air Pressure
5 911	? Out of Service
6 912	- In Service
7 914	? Low Bypass Sample Flow 1
8 939	? Sample Pressure 1 > limit
9 950	I Summation > Limit
10 923	I Flame Out R_FID
11 951	I Carbon Monoxide > Limit
12 952	I Methane > Limit
13 953	I Carbon Dioxide > Limit
14 954	I Ethylene > Limit
15 955	I Hydrogen > Limit
16 924	I R_FID Ignition Initiated
17 901	Methane Low
18 956	Methane High

Figure 5-20 The Alarm Handler Screen

*Programs Tab:*



5.5 Checking Results and Creating an Alarm Limit

The Programs tab can be used for accessing functions related to user defined programs. This includes the ability to add and delete programs and edit programs using the MaxBasic editor. This tab is provided for easy access to programs that can be triggered by a limit. The main menu for programs, with more functions, is found under the System settings in the Analyzer view.

Example Scenario:

You wish to view details about the latest methane result from your process stream (stream 1) and compare it to archived data. You also wish to set up a function to detect when in the future this result exceeds an upper range.

User Actions (Results):

First, from the Results Viewer, select the line for methane. To see additional information, click the "Show Connections" button.

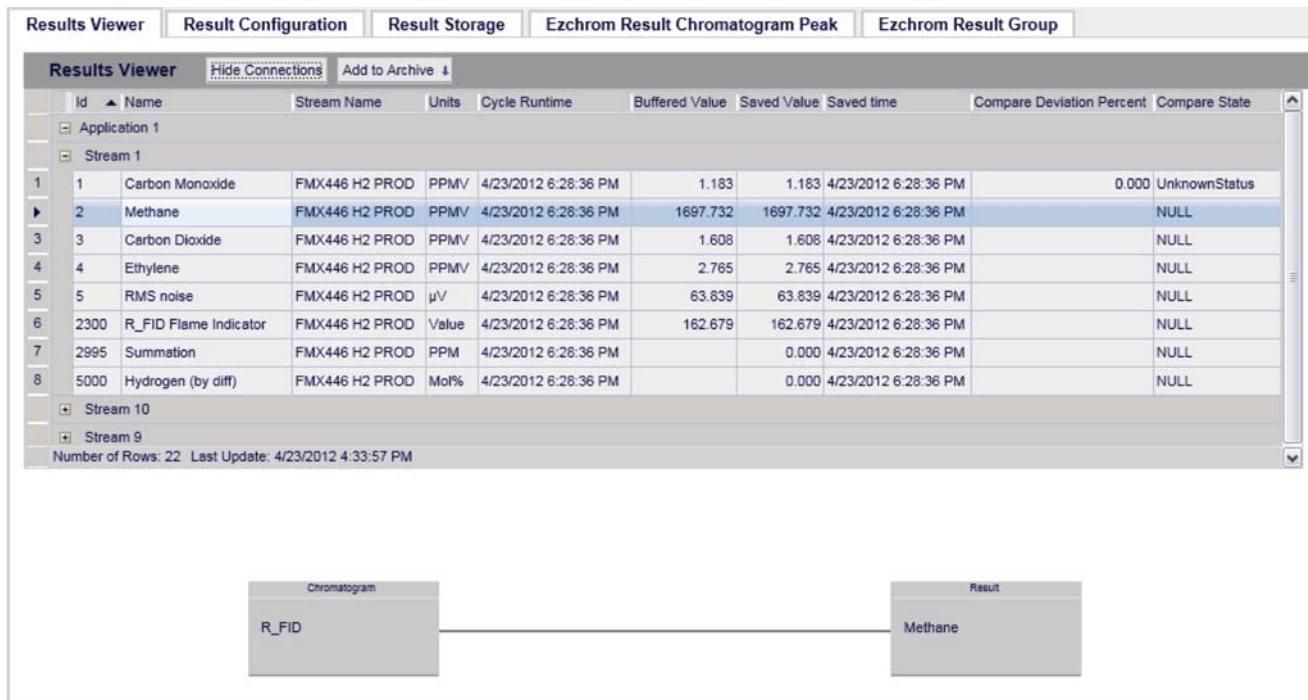


Figure 5-21 Result Viewer Showing Connected Elements

We can see that the value is 1697.732 and we can also see that the result comes from the R\_FID detector. To compare to already archived data, add this data to the archive by clicking "Add to Archive". There is no confirmation message. However, going to the Result Storage tab shows that the data is now in the archive. Click the Name column to sort by name and see the Methane results that are stored.



Result Storage										
	Id	Name	Cycle Runtime	Channel	Type	Method Id	Program Id	Value Units	Saved Value	Buffered Value
steCaption_Result_CycleRuntimeFormat										
14	5000	Hydrogen (by diff)	2/26/2012 10:56:24 PM	0	Adh	0	0	Mol%	0.000	0.000
15	5000	Hydrogen (by diff)	2/27/2012 12:45:10 AM	0	Adh	0	0	Mol%	0.000	0.000
16	5000	Hydrogen (by diff)	4/23/2012 6:24:34 PM	0	Adh	0	0	Mol%	0.000	0.000
17	2	Methane	2/26/2012 10:48:21 PM	13	Adh	1	0	PPMV	1697.732	1697.732
18	2	Methane	2/26/2012 10:56:24 PM	13	Adh	1	0	PPMV	1697.732	1697.732
19	2	Methane	2/27/2012 12:45:10 AM	13	Adh	1	0	PPMV	1697.732	1697.732
▶	2	Methane	4/23/2012 6:24:34 PM	13	Adh	1	0	PPMV	1697.732	1697.732
21	2300	R_FID Flame Indicator	2/26/2012 10:48:21 PM	13	Adh	1	0	Value	162.679	162.679
22	2300	R_FID Flame Indicator	2/26/2012 10:56:24 PM	13	Adh	1	0	Value	162.679	162.679
23	2300	R_FID Flame Indicator	2/27/2012 12:45:10 AM	13	Adh	1	0	Value	162.679	162.679
24	2300	R_FID Flame Indicator	4/23/2012 6:24:34 PM	13	Adh	1	0	Value	162.679	162.679
25	5	RMS noise	2/26/2012 10:48:21 PM	13	Adh	1	0	µV	63.839	63.839
26	5	RMS noise	2/26/2012 10:56:24 PM	13	Adh	1	0	µV	63.839	63.839
27	5	RMS noise	2/27/2012 12:45:10 AM	13	Adh	1	0	µV	63.839	63.839
28	5	RMS noise	4/23/2012 6:24:34 PM	13	Adh	1	0	µV	63.839	63.839
29	2995	Summation	2/26/2012 10:48:21 PM	0	Adh	0	0	PPM	0.000	0.000
30	2995	Summation	2/26/2012 10:56:24 PM	0	Adh	0	0	PPM	0.000	0.000
31	2995	Summation	2/27/2012 12:45:10 AM	0	Adh	0	0	PPM	0.000	0.000
32	2995	Summation	4/23/2012 6:24:34 PM	0	Adh	0	0	PPM	0.000	0.000

Number of Rows: 32 Last Update: 4/23/2012 4:32:56 PM

Figure 5-22 Result Storage Viewer

You can see that the result value has not changed over time.

#### User Actions (Limits):

Rather than regularly comparing results, you wish to set up an automatic comparison to alert when the value is out side of the desired range. To accomplish this, you decide to create a limit for the methane result and associate it with an alarm.

To do this, you will create the limit and edit the "Used By" field to reference the limit to the Methane result. You will then create Alarm Handlers with text. After this is done, you will edit the Limit Details to set threshold values for high and low alarms and connect these to the Alarm Handlers.

First, go to the Limits and Alarm Handlers screen at the bottom of the Application View Navigator menu and then click the "Add Limit" button at the top left of the display screen. A new limit is created. Click the newly created limit line. Limits may be digital or analog. If the limit details are for a Digital Limit, click the Toggle View button to make the limit an Analog Limit.

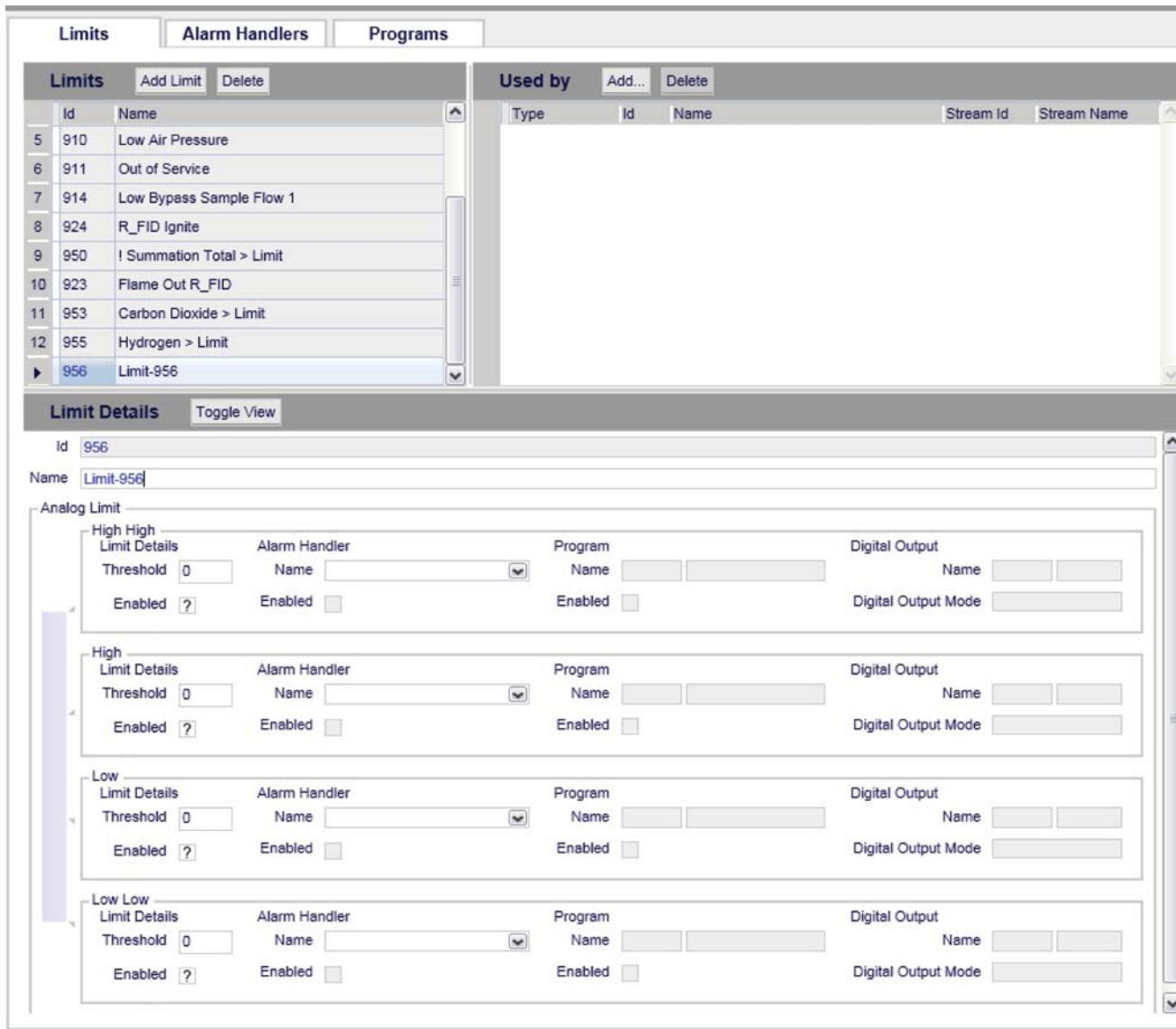


Figure 5-23 New Limit Created

You will change the name later. Click "Add" under the "Used By" pane. This will display a dialog box for selecting the Type and ID. You are associating to the Methane Result on Stream 1, so from the drop down menus select "Result" and then "Methane (Stream 1)". Then click OK.

OF-??-ST-1 app-FID - Gas Chromatograph Portal

### Add Limited Item

Limit

Id

Name

Object To Limit

Type

Id

Current Limit

OK Cancel

Figure 5-24 Add Limited Item Dialog Box

The Limit is now created. You now need to create the Alarm Handler. Use the following steps:

- Click the Alarm Handler tab
- Click the Add button on the Alarm Handler screen. This creates a blank Alarm Handler entry.
- Fill out the Alarm Text field (in this case, we use "Methane High").
- Click the Enable box for the Alarm Handler.

5.5 Checking Results and Creating an Alarm Limit

- Since this affects the stream, you may wish to click the drop down box to identify the alarm as being connected to the stream.
- Follow the same steps to create another alarm handler for "Methane Low".

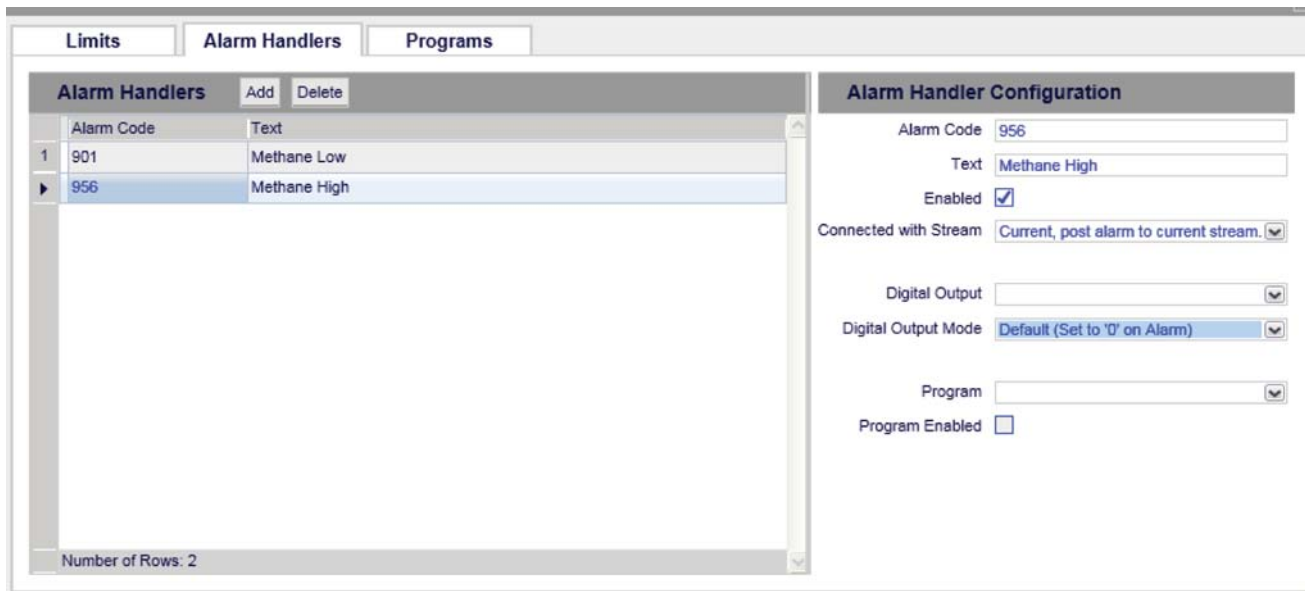


Figure 5-25 Alarm Handlers Created

Now that both the Limit and the Alarm Handlers are created, you can connect them so that the correct alarm will be associated with the correct limit. Use the following steps. The final result is shown below.

- First you need to save so that the new Alarm Handler will be seen by the Limits tab. Click the Save button in the toolbar. The blue entries, denoting modifications, will change to black.
- Next, return to the Limits tab. Under Limit Details, enter a name for the limit ("Methane Stream 1").
- You will now set the thresholds. In this case you want a Warning to be displayed so you use High and Low (High High and Low Low are used to create fault messages). Since the expected result value is 1697.732, you choose the low limit to be 1675 and the high value to be 1725. Values outside of this range will trigger a Warning message.
- Next, connect to the Alarm handlers. To do this, for both the High and Low limits click the drop-down menu for the Alarm Handler and choose "Methane High" and "Methane Low" handlers that were created.

- Finally, click Enabled for the High and Low limits. Note that as you enable the limits, the blue bar on the left side of the display window changes color. This denotes that the range is set.
- Click save again

The screenshot displays the 'Limits' configuration interface. At the top, there are tabs for 'Limits', 'Alarm Handlers', and 'Programs'. The 'Limits' tab is active, showing a list of limits with columns for Id, Name, and a status indicator. Limit 956, 'Methane Stream 1', is selected. Below the list is the 'Limit Details' section for limit 956, which includes fields for Name, Threshold, Enabled status, Alarm Handler, Program, and Digital Output. The 'High' and 'Low' limits are both enabled. The 'High' limit has a threshold of 1725 and is enabled. The 'Low' limit has a threshold of 1675 and is enabled. To the right, the 'Used by' table shows that this limit is used by a 'Result' with ID 2, Name 'Methane', Stream ID 1, and Stream Name 'FMX446 H2 PROD'.

Id	Name	Type	Id	Name	Stream Id	Stream Name
5	910	Low Air Pressure	2	Methane	1	FMX446 H2 PROD
6	911	Out of Service				
7	914	Low Bypass Sample Flow 1				
8	924	R_FID Ignite				
9	950	! Summation Total > Limit				
10	923	Flame Out R_FID				
11	953	Carbon Dioxide > Limit				
12	955	Hydrogen > Limit				
▶	956	Methane Stream 1				

Figure 5-26 Alarm Limit Screen - Example Complete

The limit is now created and active. If a result value outside the range is detected, then the associated Warning message will be triggered in the Alarms table.

## 5.6 Modifying Hardware - I/O

### System and Application Hardware:

Hardware in an analyzer can be modified in two different areas of the GCP software, System Hardware and Application Hardware. System Hardware is a system level listing of configured hardware including I/O, SNE Controllers, SNE PICs, and Advance+ Detectors. Application Hardware is hardware that is configured and used within an application including detectors, temperature and pressure controllers, and application I/O.

Hardware is accessed using the Navigation Menu on either the Analyzer tab (System Hardware) or the Application tab (Application Hardware). Several changes can be made depending on which type of hardware is selected. The example in this section shows how to create a new I/O board and assign an I/O on that board to an application.

### Example Scenario:

In the previous section, an example was described of creating a limit on a result and then assigning an alarm handler to trigger if the limit on the result is exceeded. An additional step that a user may want is to assign a Digital Output to trigger if the limit is exceeded. This can be used, for example, to create an automatic external alert when a critical value is exceeded. This example shows the creation and assigning of new I/O to accomplish this task.

### User Actions:

First, the hardware must be added. Using approved safe methods, a new DIO board is installed and plugged into the I<sup>2</sup>C bus. This hardware is automatically detected and configured by the Maxum using the detected I<sup>2</sup>C bus information and board ID switch settings. To see the updated hardware, click the Refresh button on the GCP toolbar. The System Hardware table for Digital Outputs, shown below, now displays the newly configured hardware.

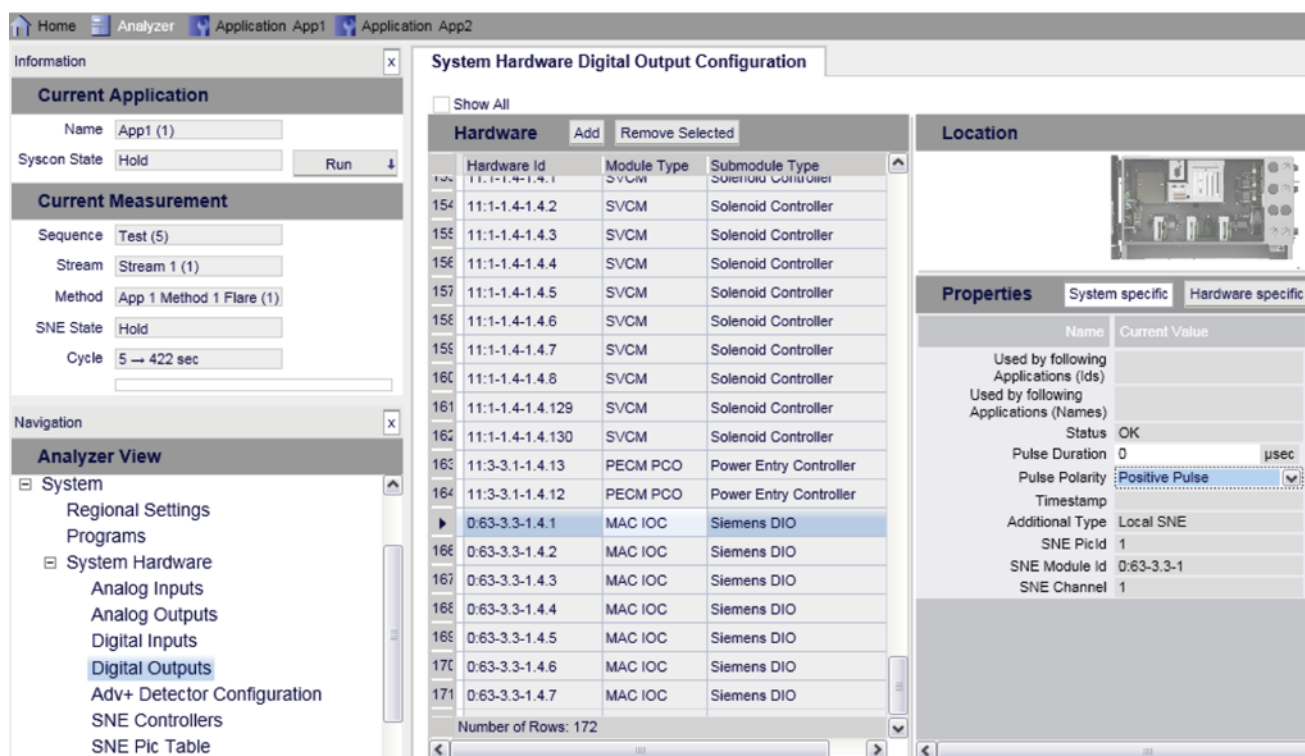


Figure 5-27 Digital Output System Hardware

This same I/O hardware will also appear on the Application Hardware assignment screen. To access this screen click on the desired Application tab, and then expand the Application Hardware menu selection by clicking the + symbol next to it. Next select Digital Output to see the DOs assigned to the application. To see the new hardware and assign it, click the Digital Output Assignment tab in the display window.



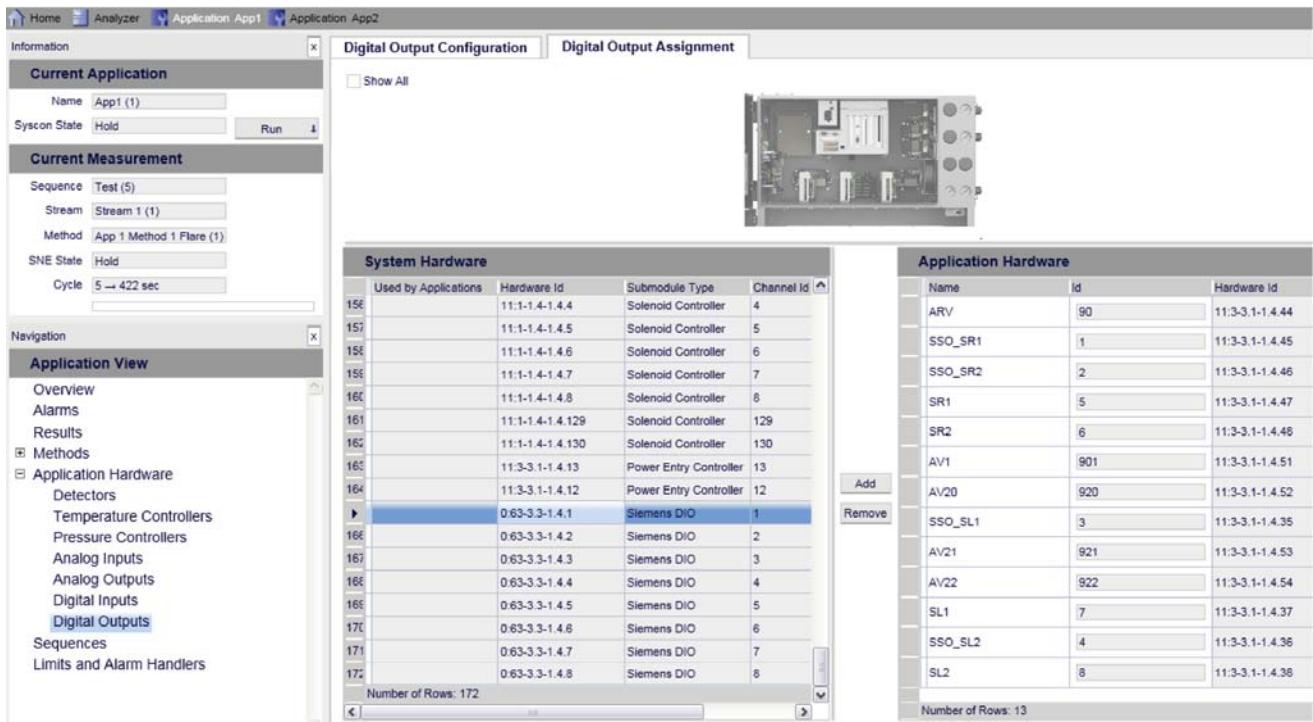


Figure 5-28 Assigning a Digital Output to the Application

The new hardware shows in the System Hardware window on the display pane. To assign the new DO to the application, select it and click the Add button. The DO is added to the Application Hardware window in the display pane and the entry under the System Hardware is modified to indicate that the hardware is now used by the application.

The name can be changed on Application Hardware line as shown below. Also, the automatically chosen reference ID can be changed if desired. Once the IO is assigned, the user can click Save in the toolbar to accept the change before completing the DO configuration.



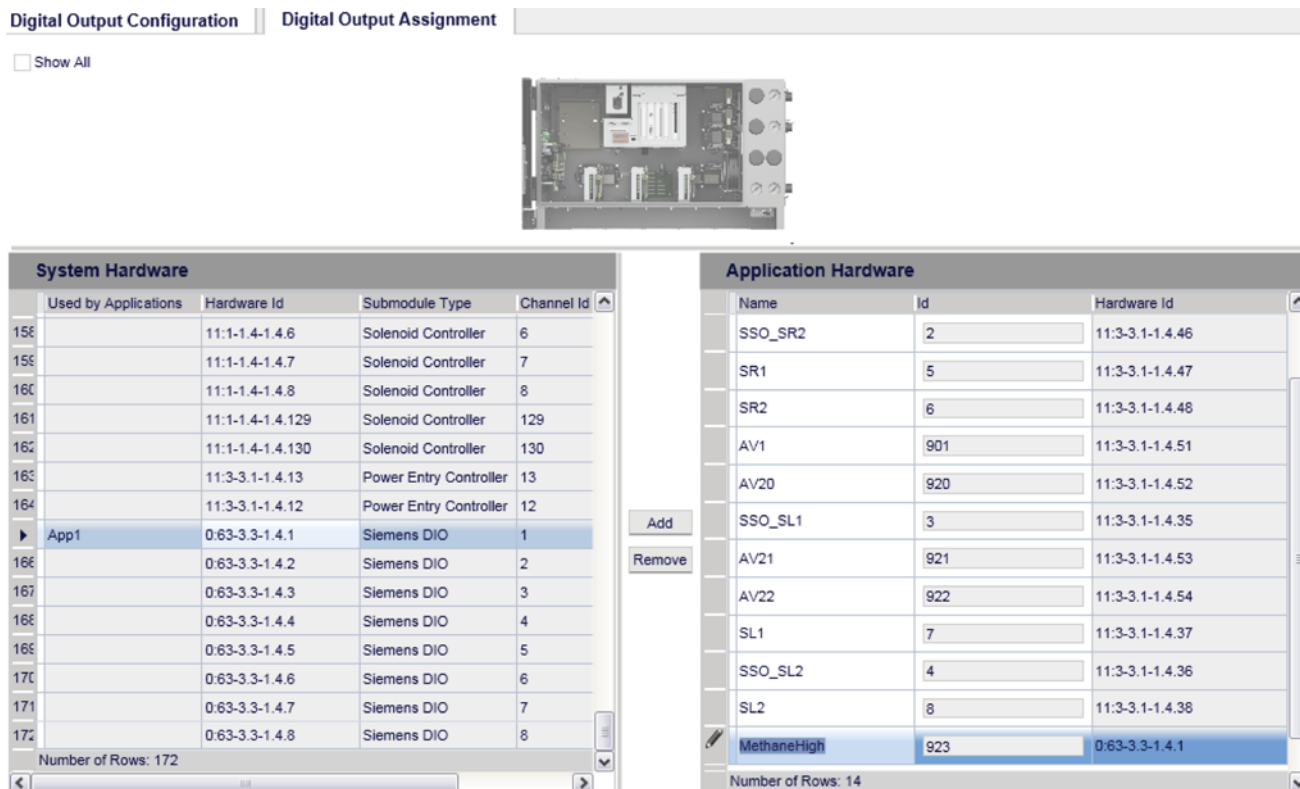


Figure 5-29 Assigning a Digital Output to the Application

After saving the user may configure the by clicking the "Digital Output Configuration" tab and then clicking on the line for the new DO. The various properties can now be set. Hovering the mouse pointer over each property displays a tooltip to explain the use of that property. In the case of the DO the following are available.

- Name - The name was already set when the DO was created, but it can be changed here as well
- Enabled - Use to activate the created. The True/False value of the Enabled attribute is not to be confused with changing the value of the DO.
- Text 0/Text 1 - These are to determine the text that will display when the value of the DO is either 0 or 1. Common values are Off/On or False/True.
- Injection Valve - Used to indicate whether the DO is used to control

It is also possible to display system specific and hardware properties related to the DO by clicking on the relevant buttons for these properties. After editing the properties, the DO looks as below.

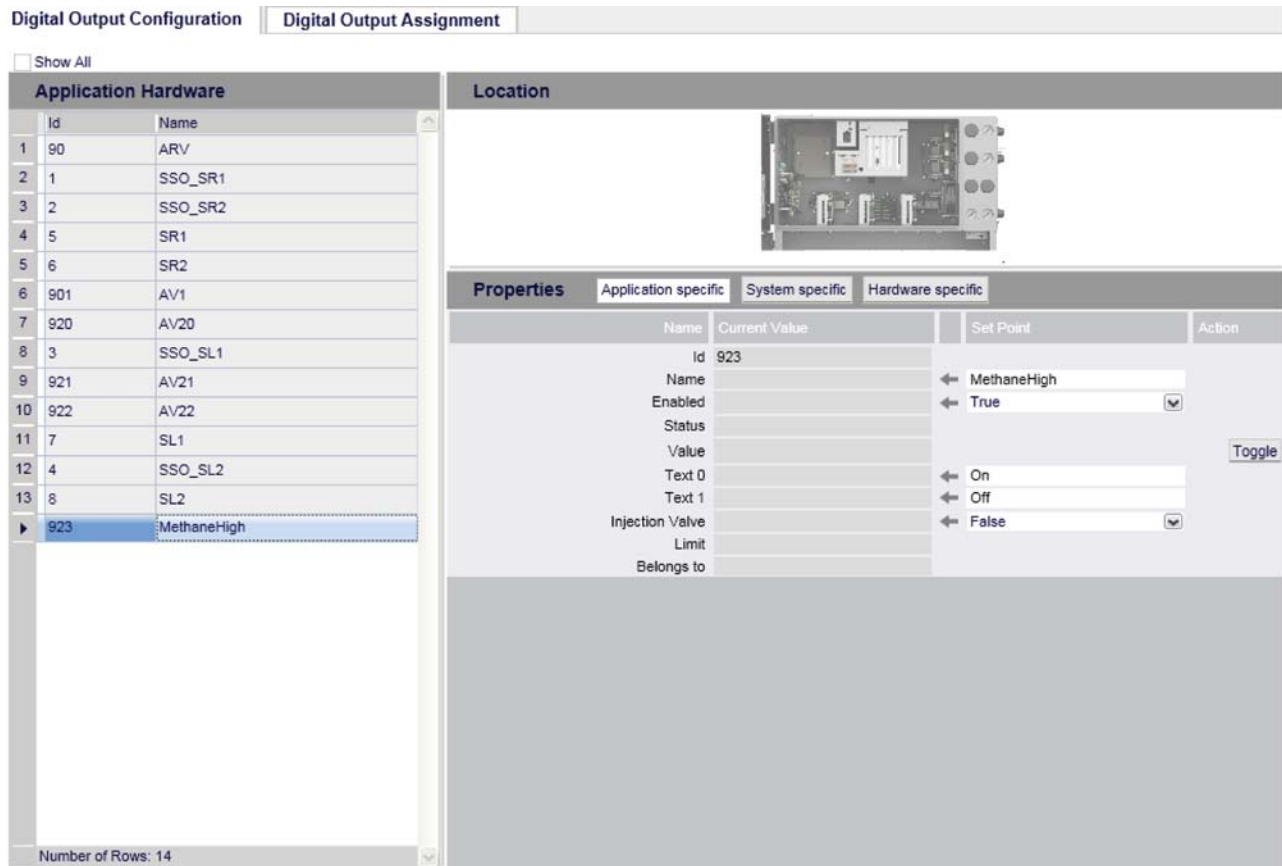


Figure 5-30 Configuring the Assigned Digital Output

It is now possible to associate the DO with the Alarm Handler that was mentioned previously.

Click on the "Limits and Alarm Handlers" menu item and then the Alarm Handlers tab.

Next, select the desired Alarm Handler and click the "Use Digital Output" checkbox. This causes a new field to appear for entering the desired Digital Output.

Click the drop-down menu and select the DO that was created above.

Click Save on the toolbar.

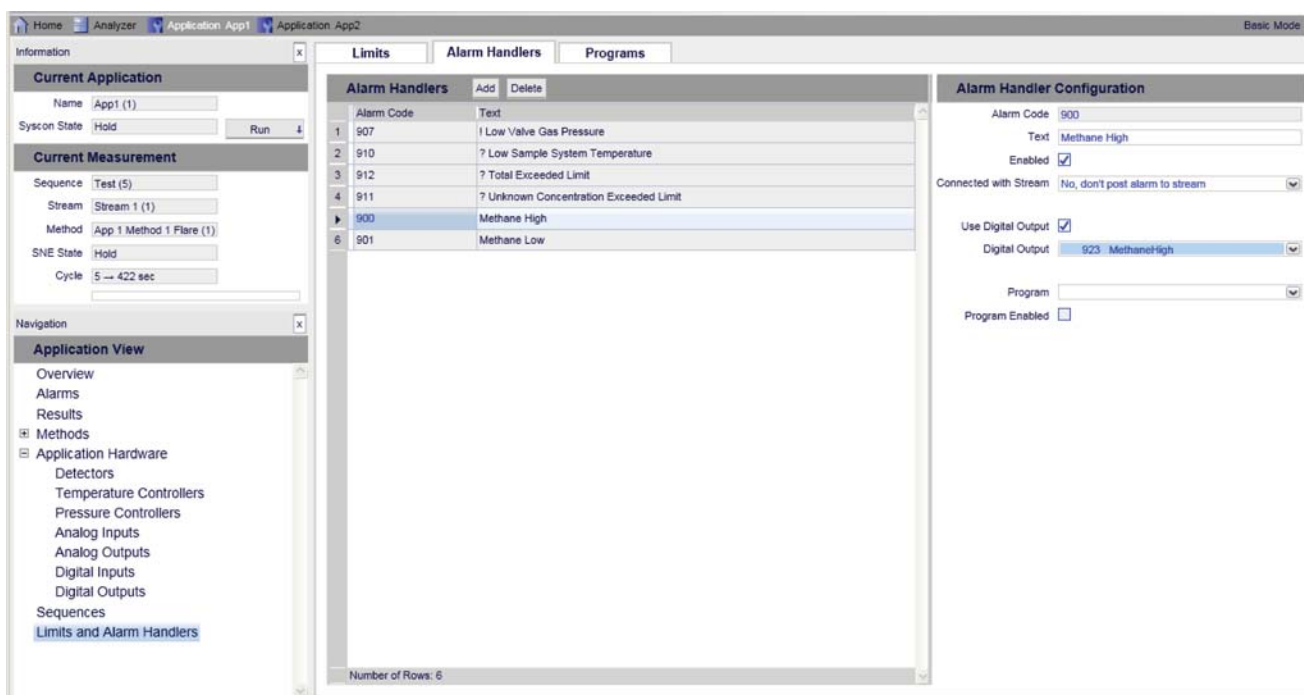


Figure 5-31 Assigning a Digital Output to the Alarm Handler

The DO is now associated with the alarm handler and as a result with alarm limits that use that alarm handler.

The screenshot displays a configuration window for limits. At the top, there are tabs for 'Limits', 'Alarm Handlers', and 'Programs'. The 'Limits' tab is active, showing a table of limits. The selected limit is 'Methane Stream 1' (Id: 913, Type: Analog Limit). To the right, the 'Used by' table shows that this limit is used by 'Result' (Id: 8, Name: Methane) for 'Stream 1' (Stream Id: 1, Stream Name: Stream 1). Below this, the 'Limit Details' section for 'Methane Stream 1' (Id: 913) is shown. It includes fields for 'High High', 'High', and 'Low' limits. The 'High' limit is currently selected and highlighted in yellow. Its details are: Threshold: 1725, Alarm Handler Name: 900 (Methane High), Program Name: (empty), and Digital Output Name: MethaneHigh 923. The 'Enabled' checkbox for the High limit is checked. The 'High High' and 'Low' limits are currently disabled.

Id	Name	Type	
1	907	Low Valve Gas Pressure	Digital Limit
2	910	Low Sample System Temperature	Digital Limit
3	912		Analog Limit
4	911		Analog Limit
▶	913	Methane Stream 1	Analog Limit

Type	Id	Name	Stream Id	Stream Name
▶ Result	8	Methane	1	Stream 1

**Limit Details**

Id: 913  
Name: Methane Stream 1

Analog Limit

Limit Details	Alarm Handler	Program	Digital Output
High High Threshold: 0 Enabled: <input type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>
High Threshold: 1725 Enabled: <input checked="" type="checkbox"/>	Name: 900 Enabled: <input checked="" type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>	Name: MethaneHigh 923 Enabled: <input checked="" type="checkbox"/>
Low Threshold: 1675 Enabled: <input type="checkbox"/>	Name: 901 Enabled: <input type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>	Name: <input type="text"/> Enabled: <input type="checkbox"/>

Figure 5-32 The Alarm Limit is Now Associated with the Digital Output





## Data Logger Overview

### 6.1 Introduction to the Data Logger

#### Overview:

The Data Logger is a part of the Gas Chromatograph Portal (GCP) Software that is used to poll and store data for multiple Maxum/MicroSAM analyzers on a network. The user may choose to store alarms, results, or chromatograms. Retrieval of the stored information is integrated into the GCP software.

The Data Logger is designed to run as a separate service on the workstation computer, regardless of whether the GCP Network or GCP Analyzer executable programs are running. Data is stored in an SQL database for later access via GCP screens.

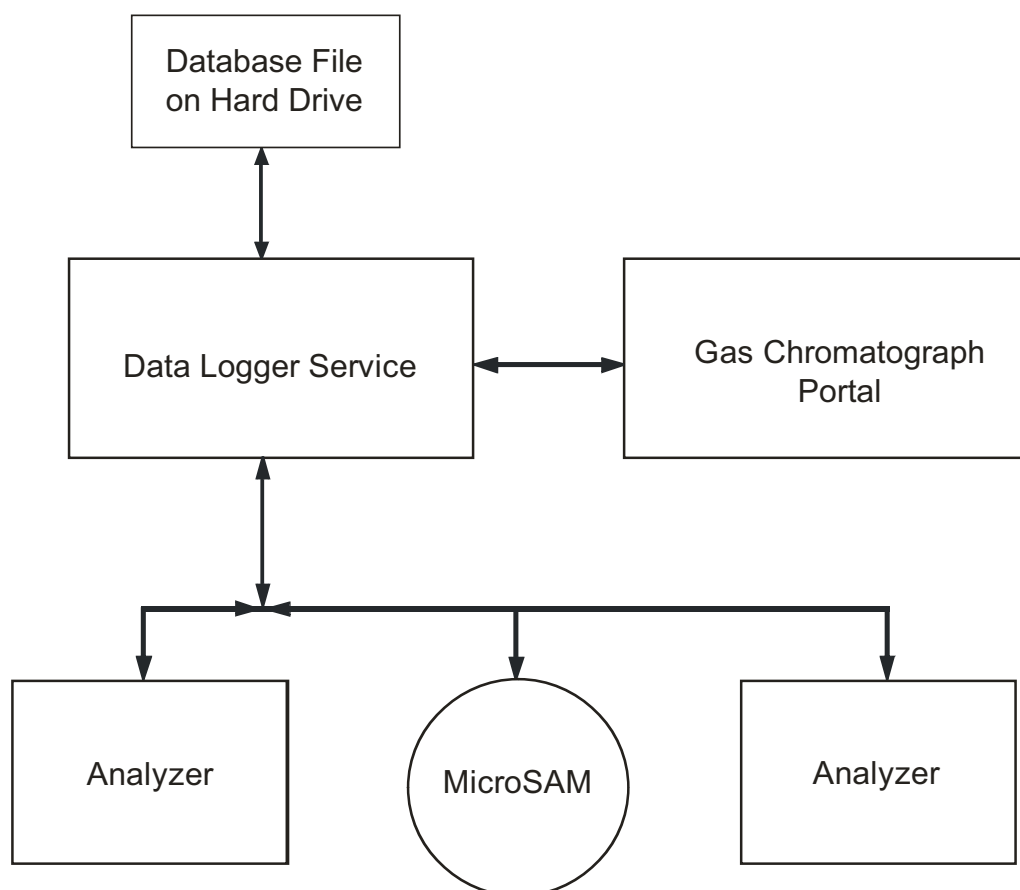


Figure 6-1 Flow of Data Logger Information

#### Data Logger Basics:

6.1 Introduction to the Data Logger

Since, by default, the Data Logger runs as a service, this allows for the most reliable logging of results. For example, if the computer is rebooted the service restarts and continues to log data as before, even if the Windows account is not logged in.

The Data Logger service collects data as specified by the user during configuration. For each analyzer on a network, the user may choose to log alarms, results, chromatograms, or a combination of the three. For chromatograms, the user may choose to always log chromatograms, or only on alarm.

When the user configures the Data Logger to log information from a particular analyzer, a query is set up to automatically transmit the desired data from the analyzer whenever new data is available.

Once transmitted, data is stored in an SQL database file. The maximum file size is 3.5 gigabytes. Once the maximum size has been reached, the current database file is closed out and a new one is opened. The name of each file is automatically selected based on the timestamp of the first data stored in the file.

Once data has been stored, the user may retrieve it by accessing the various GCP screens related to the stored data for a particular analyzer. See more information under "Accessing Logged Data" below.

Results and alarm data can be further filtered by date and time. Chromatograms can be selected from a list of available stored data. Finally, stored data that has been accessed via GCP screen can be exported to a text file for use/analysis outside of GCP.

---

**Note**

Although Data Logger is designed to run as a separate service, it is configured and accessed via the Analyzer Tab on the GCP Analyzer window. Note that this tab is not available unless the GCP Analyzer window is connected to an analyzer. For configuration of the Data Logger this can be any analyzer.

Although Data Logger configuration information as well as stored data are accessed while connected to an analyzer, this information is not part of an analyzer database. Data Logger configuration information is stored separately and does not change when a new analyzer is connected. The stored data that is available from related GCP screens is the information from the data archive file which is specific to the selected analyzer.

---

Depending on customer needs, multiple computers within the same network can be configured with Data Logger. For example, this can be for redundancy of data or split up a large network by functional area.

**Accessing Logged Data:**

Many analyzers can be logged at one time, and the database file stores all of this. However, using GCP, only data for the current connected analyzer can be accessed. Access of this data is integrated into the program. For example, the Results screen has a tab labeled "Logged Results (Data Logger)". Accessing this tab will query the results from the archive file which are specific to the current analyzer.

The serial number of the analyzer is the unique identifier used by Data Logger to access data for the connected analyzer. For this reason, a virtual analyzer that is loaded from a file with the same serial number as a physical analyzer will give access to any stored data for that physical analyzer.



Also, because the serial number is used to retrieve data, then old data for that analyzer can no longer be retrieved if the serial number for an analyzer is changed. For this reason it is not recommended to change the serial number, even though it is possible to do so under the System screen on the Navigation Menu.

## 6.2 Installing/Configuring the Data Logger as a Windows Service

### Data Logger Installation:

By default, the Data Logger service installs as part of the Gas Chromatograph Portal installation. Installation as a service is preferable because it allows data to be logged regardless of whether the GCP software is running. In addition, if the computer is rebooted, the Data Logger service will be restarted even if the Windows account is not logged in.

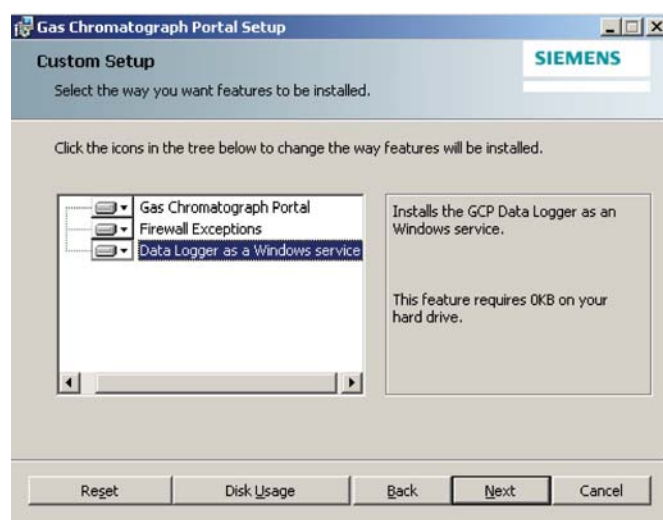


Figure 6-2 GCP Installation Setup Screen

It is also possible choose not to install the service or to install the Data Logger service separately. To deselect installation of Data Logger in the installation wizard, click the small down-arrow next to the menu item labeled "Data Logger as a Windows service". This will display a menu from which the user can choose an "X" to prevent installation of the feature.

If installation of Data Logger as a Windows service was skipped, it is always possible to reinstall it at a later date by running the setup again. To do so, go to the Windows Control Panel and choose Add/Remove Programs. From the list, select "Gas Chromatograph Portal" and then click "Change". This will bring up the GCP Installation Setup wizard.

### Stopping the Data Logger Service:

If needed, it is possible to deactivate the Data Logger service manually. To do so, go to the Windows Control Panel and choose Administrative Tools and then Services. Under the list of services there will be GasChromPortalDataLoggerService. It is possible to choose Stop or Restart. It is also possible to right-click on the service and edit properties, including disabling the service.

**CAUTION**

Changes to Windows services can adversely affect the operation of either GCP or the computer.

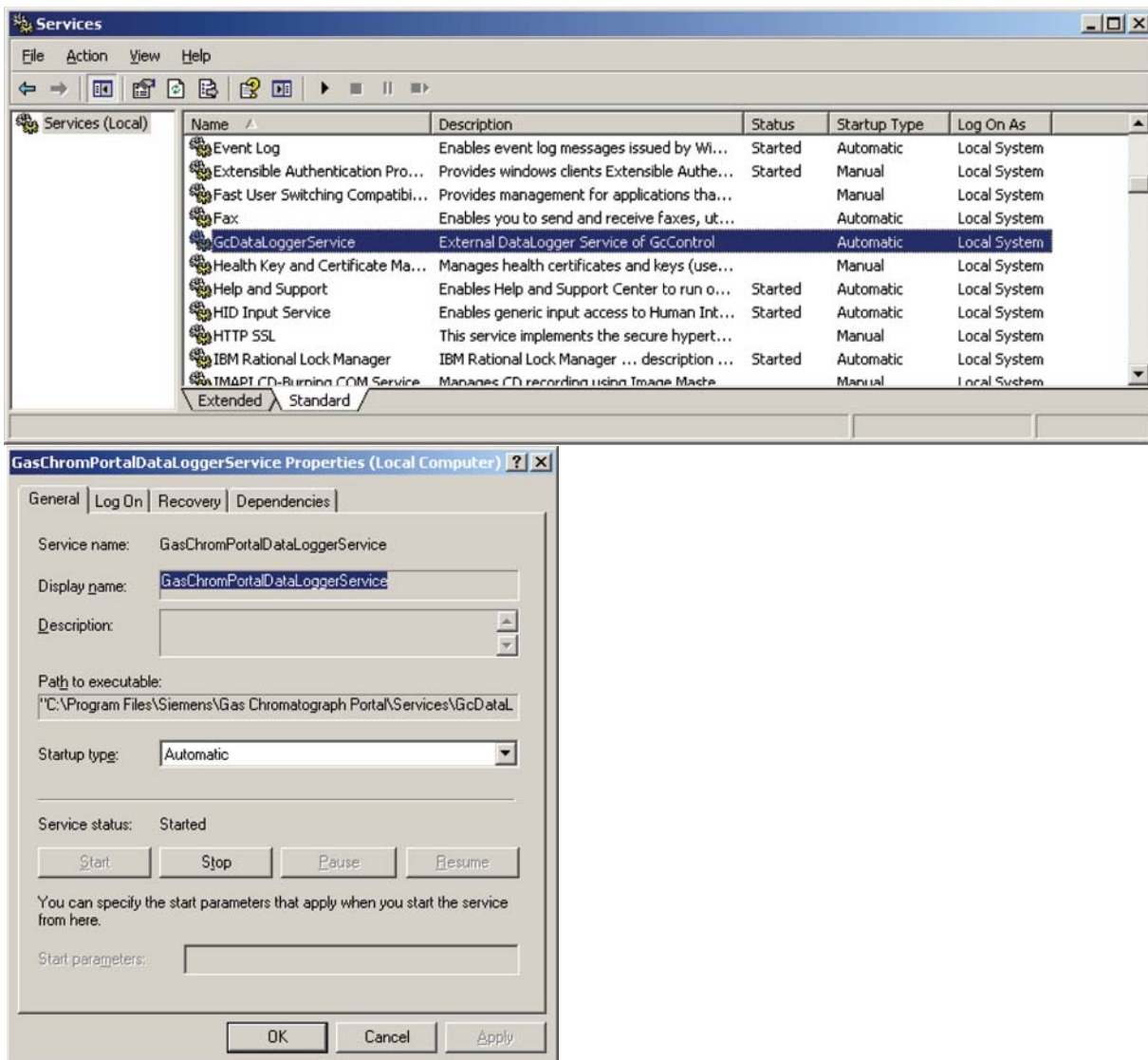


Figure 6-3 Data Logger as a Windows Service

**Uninstalling the Data Logger Service:**

The Data Logger service cannot be uninstalled without uninstalling the GCP software. If necessary, a complete uninstall can be done and then just the GCP software can be reinstalled. To uninstall go to Windows Control Panel and choose Add/Remove Programs. From the list, select "Gas Chromatograph Portal" and then click "Remove".

## 6.3 Using the Data Logger as a Windows Application

If the Data Logger service is not installed as part of the GCP installation, then it can still be run manually as a Windows application. This is done by choosing "Start Data Logger" from the Tools menu of either the GCP Network window or the GCP Analyzer window.

When opened manually from GCP, a small GCP Data Logger window (see below) will appear in the bottom right corner of the screen. As long as this window is open, the Data Logger will collect information if it is configured to do so.



Figure 6-4 Data Logger Application as Opened Manually from GCP

To stop logging data in this manner, close the small window by clicking the X on the right-hand side.

## 6.4 Configuring the Data Logger Using GCP

Data Logger is configured using the "Data Logger Configuration" screen in the GCP Analyzer window. This screen is on the Analyzer View tab at the bottom of the Navigation menu under Utilities. See the image below. For this screen to be available, the GCP window must be connected to an analyzer (either a physical or virtual analyzer).

Note that even though it requires connection to an analyzer in order to use the "Data Logger Configuration" screen, this screen is not related to the analyzer. It is a direct connection to the Data Logger software.

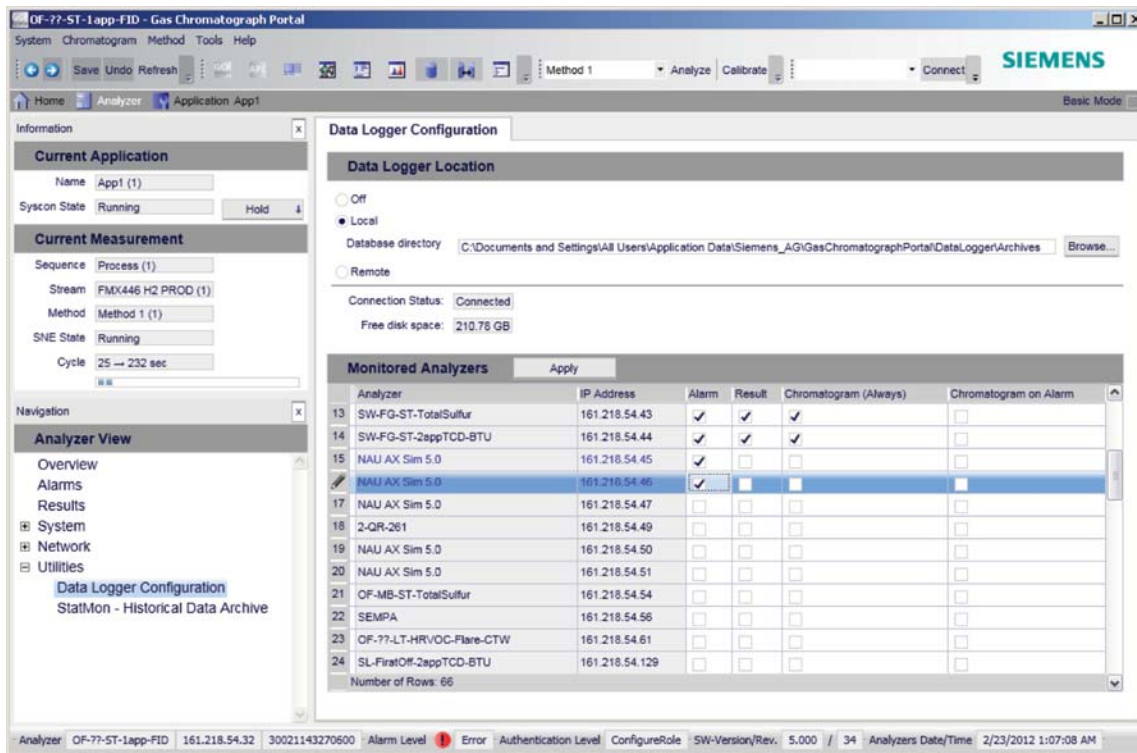


Figure 6-5 Data Logger Configuration

**Setting the Location:**

Any computer that is loaded with the Data Logger can serve as a Data Logger host. More than one computer in a network can be configured. If more than one Data Logger is configured, then each runs independently. When configuring a Data Logger using GCP, the first step is to connect to the correct Data Logger software. It is possible to connect to the Data Logger on the local computer or to one on a remote computer.

The upper section of the display window is used for defining the desired location. To connect to the Data Logger on the local computer, select "Local". The directory for the database file will be shown (here it is possible to change the location for storing database files). To connect to a Data Logger on a different computer, select "Remote" and then enter the IP address of the computer that has the Data Logger configured.

After setting the location, the Connection Status field should read "Connected". If it does not, then verify that the Data Logger service or application is running on the specified computer. For a remote connection, it may be necessary to verify operation of the network. For a remote connection, it may also be necessary to configure the firewall to allow communication between the two computers (allowing TCP traffic on port 8004 as described in the section titled "Enabling Access to Remote Data Logger with Firewall").

**Defining the Information to be Logged:**

Once connected to either a local or remote Data Logger, the bottom half of the page is populated with a list of monitored analyzers that are known to the GCP software. If the desired analyzer is not on the list, then it will need to be added using the Add function on the GCP Network view.

There is no set limit on the number of analyzers that can be logged. However, it is possible that for some busy networks, monitoring a very large number of analyzers accompanied by short cycle times could create slow network conditions. This is dependent on network traffic and configuration.

For each analyzer in the list there are a line of check boxes that identify the data to be logged. Checking the Alarm, Result, and/or Chromatogram boxes identifies that the data will be collected for that analyzer. Two choices are available for logging chromatograms. Chromatograms may either always be logged or only on cycles when an alarm that affects the relevant stream occurs (only one of the chromatogram boxes may be checked at a time).

Each time a line is changed, the Analyzer name turns blue, indicating that the information is changed but not saved yet. After all desired boxes have been checked, hit the "Apply" button at the top of the "Monitored Analyzers" list in order to save changes. Changes are saved to the configuration file for the Data Logger software.

As soon as the Apply function is complete, the changes take effect and data logging is occurring.

## 6.5 Enabling Access to Remote Data Logger with Firewall

It is possible to configure the data logger running on one computer to be accessed as a server for other computers running GCP. The administrator can grant access to an individual computer or all computers in a network by defining appropriate firewall rules.

When a firewall exists, it is necessary to allow incoming connections for TCP traffic on port 8004 on the server running the GCP Data Logger and allow corresponding outgoing traffic on the computer that needs to access this GCP Data Logger remotely. In addition, ICMP messages must not be blocked on the respective computers. Refer to the following screen images for examples of Windows settings.

<b>CAUTION</b>
Changes to firewall security settings could compromise the network security. Any changes must only be done with the approval of relevant IT support.

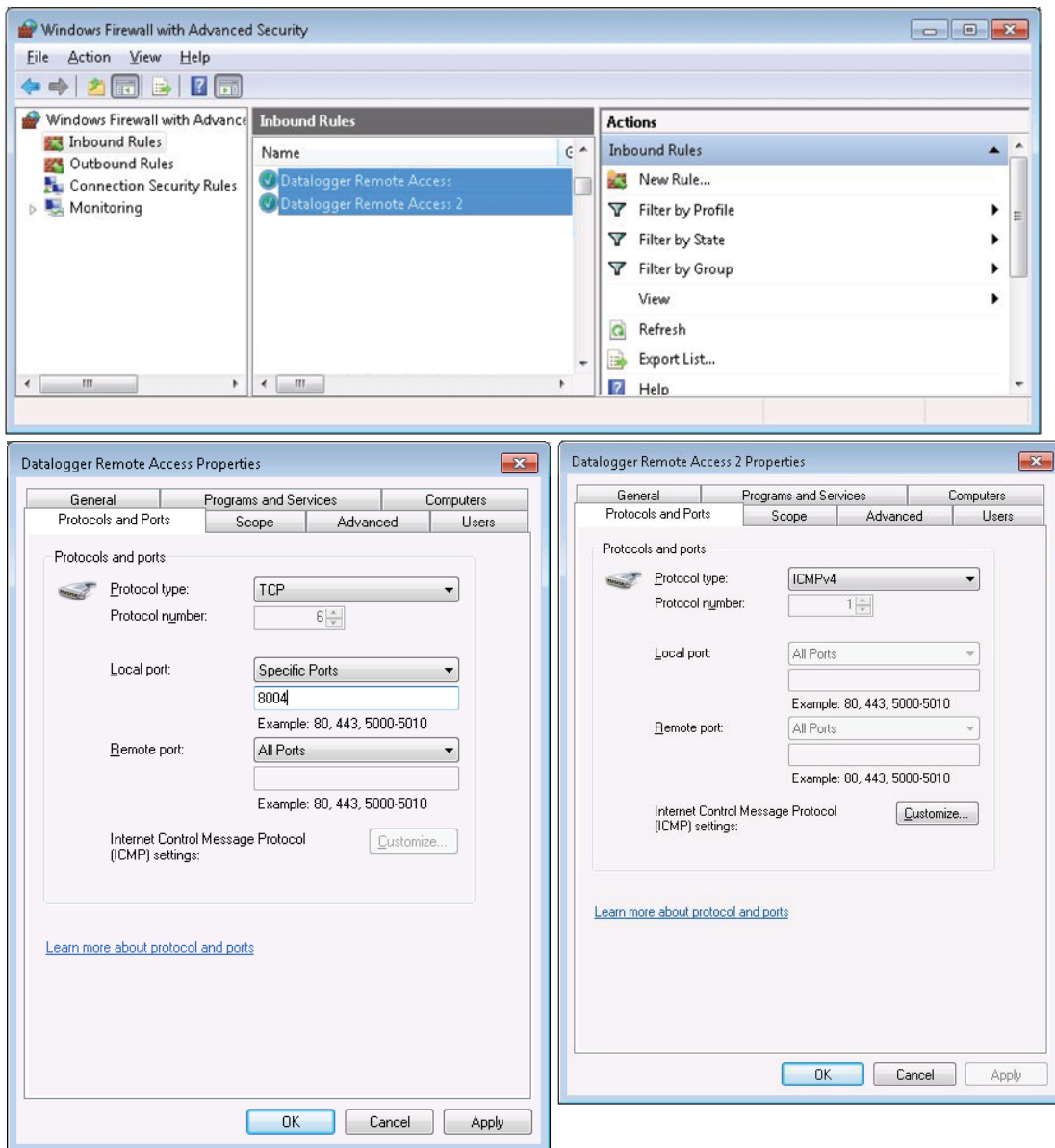


Figure 6-6 Windows Settings for Remote Access

Once firewall settings have been confirmed, it should be possible to access data on a remote computer using GCP on a different computer. To do this, set the data logger location to "Remote" and enter IP Address of computer running GCP data logger. After the IP Address is entered, the window will display the configuration of monitored analyzers on the remote data logger.

If the connection status shows disconnected, then there may still be a network configuration issue.



## 6.6 Accessing Logged Alarms

Logged Alarms for an analyzer can be found in either the Analyzer view or the Application view by choosing "Alarms" from the Navigation menu and then choosing the "Logged Alarms (Data Logger)" tab on the display window. See below.

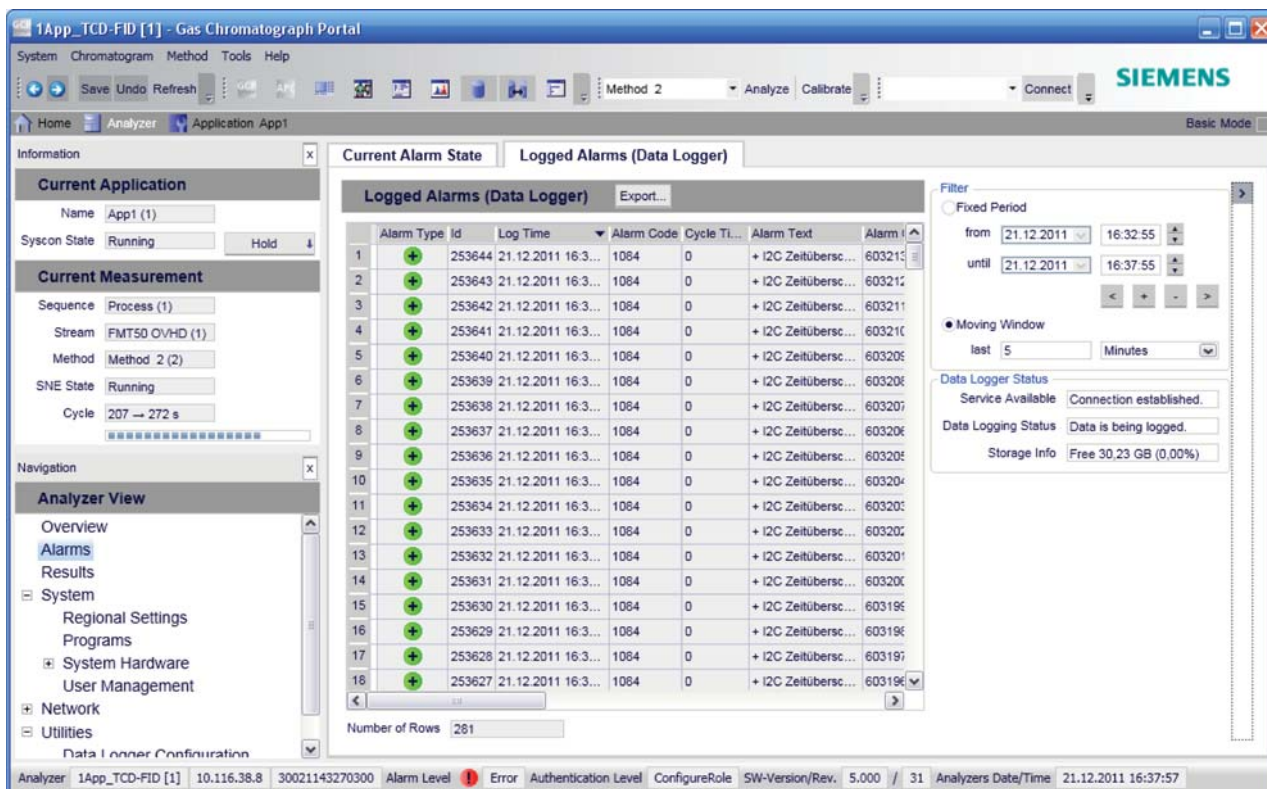


Figure 6-7 Logged Alarms Screen

Action is limited to viewing logged alarms. It is possible to use the filter on the right hand side of the window to see results for a particular time period. Results may either be displayed for a fixed period of time or a moving window of time.

When choosing a fixed period, use the drop down arrows to select a day and time to search. The icons below the period fields (<, +, -, >) are used to zoom and move forward and backward through the data. The zoom (+, -) reduces the overall interval. The arrows (<, >) go forward and backward in time.

When choosing a moving window, select the time units (days, hours, or minutes) and the amount of time. This will show all results from the present time back for the specified amount of time. This window of time is always advancing with the current system clock.

Filter

Fixed Period

from 02.02.2010 20:24:47

until 04.02.2010 00:00:00

< + - >

Moving Window

last 10 Days

Data Logger Status

Service Available Connection established.

Data Logging Status Data is being logged.

Storage Info Free 26,85 GB (45,82%)

Figure 6-8 Time Based Data Filter

**Export:**

The Export button is used to save the data to a text file. Click the Export button and then enter the file name (or keep the default file name) and then click Save.



## 6.7 Accessing Logged Results

Logged Results for an analyzer can be found in the Analyzer view by choosing "Results" from the Navigation menu and then choosing the "Logged Results (Data Logger)" tab on the display window. See below.

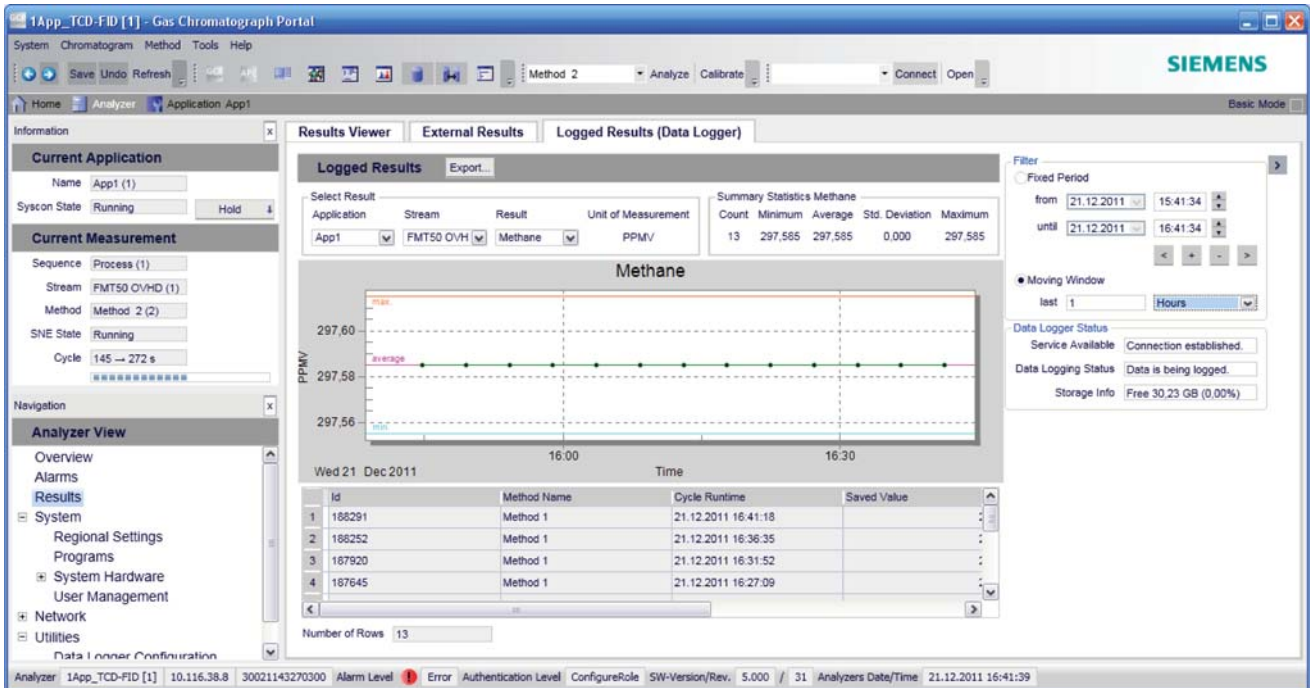


Figure 6-9 Logged Results Screen

### Interpreting the Display:

One result can be shown at a time. To select a result, use the "Select Result" area at the top of the screen. First choose the Application from the drop-down menu and then the Stream. Then choose the desired Result from the list (note the selection must be done in that order, otherwise the Stream and Result fields will not have any options).

Instances of the selected Result will be displayed on the graph for the specified time period shown in the time filter. Also, statistics relating to the displayed data are shown in the Summary Statistics area at the top of the screen. These statistics are for the shown data points. If the time filter is changed to show more or fewer results, then the statistics may change.

Clicking holding the mouse button while over the graph allows the user to zoom in on a part of the graph. Right clicking allows the user to un-zoom the graph.

At the bottom of the display is a table of all the stored results, including the timestamp and value.

**Time Filter:**

It is possible to use the filter on the right hand side of the window to see results for a particular time period. Results may either be displayed for a fixed period of time or a moving window of time.

When choosing a fixed period, use the drop down arrows to select a day and time to search. The icons below the period fields (<, +, -, >) are used to zoom and move forward and backward through the data. The zoom (+, -) reduces the overall interval. The arrows (<, >) go forward and backward in time.

When choosing a moving window, select the time units (days, hours, or minutes) and the amount of time. This will show all results from the present time back for the specified amount of time. This window of time is always advancing with the current system clock.

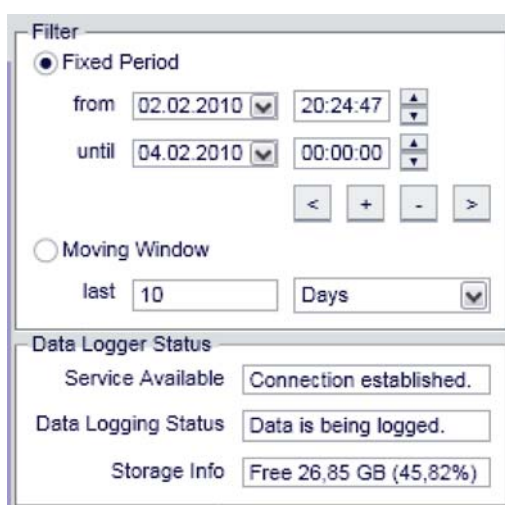


Figure 6-10 Time Based Data Filter

**Export:**

The Export button is used to save the data to a text file. Click the Export button and then enter the file name (or keep the default file name) and then click Save.

## 6.8 Accessing Logged Chromatograms

Logged chromatograms are accessed from the Chromatogram menu by choosing "Load From Data Logger"

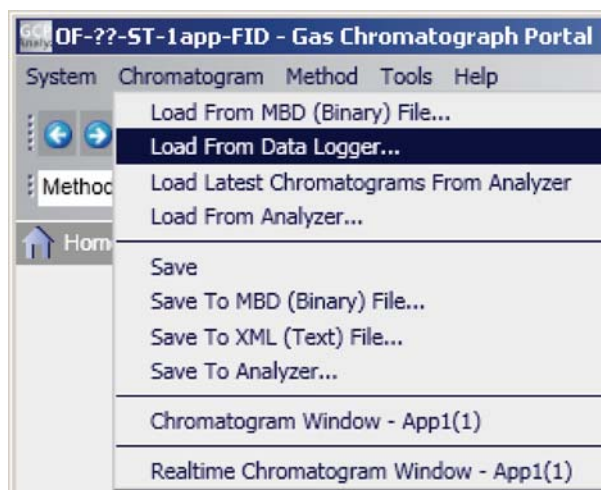
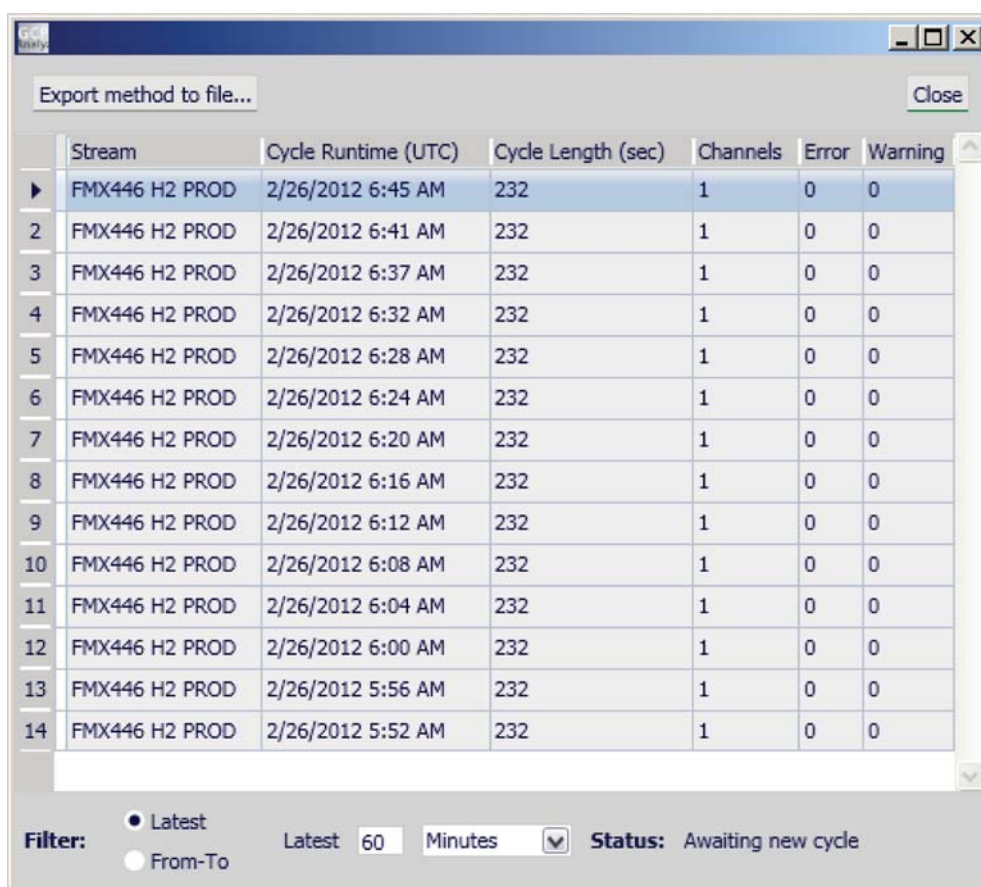


Figure 6-11 Loading Chromatograms from Data Logger

This function will load a list of all logged chromatograms for the current analyzer. This list will be displayed in a separate window as shown below. The filter at the bottom of the window allows the user to sort over a range of time or to see the most recent list going back to a specified point.



	Stream	Cycle Runtime (UTC)	Cycle Length (sec)	Channels	Error	Warning
▶	FMX446 H2 PROD	2/26/2012 6:45 AM	232	1	0	0
2	FMX446 H2 PROD	2/26/2012 6:41 AM	232	1	0	0
3	FMX446 H2 PROD	2/26/2012 6:37 AM	232	1	0	0
4	FMX446 H2 PROD	2/26/2012 6:32 AM	232	1	0	0
5	FMX446 H2 PROD	2/26/2012 6:28 AM	232	1	0	0
6	FMX446 H2 PROD	2/26/2012 6:24 AM	232	1	0	0
7	FMX446 H2 PROD	2/26/2012 6:20 AM	232	1	0	0
8	FMX446 H2 PROD	2/26/2012 6:16 AM	232	1	0	0
9	FMX446 H2 PROD	2/26/2012 6:12 AM	232	1	0	0
10	FMX446 H2 PROD	2/26/2012 6:08 AM	232	1	0	0
11	FMX446 H2 PROD	2/26/2012 6:04 AM	232	1	0	0
12	FMX446 H2 PROD	2/26/2012 6:00 AM	232	1	0	0
13	FMX446 H2 PROD	2/26/2012 5:56 AM	232	1	0	0
14	FMX446 H2 PROD	2/26/2012 5:52 AM	232	1	0	0

Filter:  Latest    Latest 60 Minutes  From-To    Status: Awaiting new cycle

Figure 6-12 List of Chromatograms from Data Logger

At the same time the list is displayed, the chromatogram viewer is also opened, showing the first chromatogram in the list. The chromatogram viewer is described in other sections. Clicking on a line in the list window loads that chromatogram in the chromatogram viewer.

Note that the chromatogram loaded into the chromatogram viewer is also loaded into GCP, so that it can be used for functions such as method development.

If the method was saved with the chromatogram, then the button at the top of the list, titled "Export method to file", can be used to save the method to disk.

## 6.9 Managing Logged Data

As noted in previous sections, logged data is stored in an SQL database file. This file has a maximum size of 3.5 GB. When a file reaches this size, it is closed and a new one is opened. The files are stored in the location defined when the data logger is setup on the local computer.

### Deleting Logged Data:

There is no option for selectively deleting logged data from existing files. The SQL database is designed such that deleting data in this way would not reduce the file size and would also adversely affect performance.

If it is necessary to recover hard drive space, then old files can be deleted (archiving elsewhere if required). The file names are automatically selected and based on the date of creation, as seen in the example names below.

- DataLoggerArchive\_2011\_11\_20\_\_08\_16\_31.sdf
- DataLoggerArchive\_2012\_01\_12\_\_14\_32\_46.sdf
- DataLoggerArchive\_2012\_03\_01\_\_12\_14\_09.sdf

The second file above was created on January 12, 2012 at 2:32:46 PM. If it is no longer necessary to keep information from prior to this time (or all data from prior to this time has been archived elsewhere, then the first file (created on November 20, 2011) can be deleted. Do not delete the most recent file.

