Rosemount MON2020™

Software for Gas Chromatographs

ROSEMOUNT™

EMERSON™

Notice

EMERSON ("SELLER") SHALL NOT BE LIABLE FOR TECHNICAL OR EDITORIAL ERRORS IN THIS MANUAL OR OMISSIONS FROM THIS MANUAL. SELLER MAKES NO WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THIS MANUAL AND, IN NO EVENT, SHALL SELLER BE LIABLE FOR ANY SPECIAL OR CONSEQUENTIAL DAMAGES INCLUDING, BUT NOT LIMITED TO, LOSS OF PRODUCTION, LOSS OF PROFITS, ETC.

PRODUCT NAMES USED HEREIN ARE FOR MANUFACTURER OR SUPPLIER IDENTIFICATION ONLY AND MAY BE TRADEMARKS/REGISTERED TRADEMARKS OF THESE COMPANIES.

THE CONTENTS OF THIS PUBLICATION ARE PRESENTED FOR INFORMATIONAL PURPOSES ONLY AND, WHILE EVERY EFFORT HAS BEEN MADE TO ENSURE THEIR ACCURACY, THEY ARE NOT TO BE CONSTRUED AS WARRANTIES OR GUARANTEES, EXPRESSED OR IMPLIED, REGARDING THE PRODUCTS OR SERVICES DESCRIBED HEREIN OR THEIR USE OR APPLICABILITY. WE RESERVE THE RIGHT TO MODIFY OR IMPROVE THE DESIGNS OR SPECIFICATIONS OF SUCH PRODUCTS AT ANY TIME.

SELLER DOES NOT ASSUME RESPONSIBILITY FOR THE SELECTION, USE, OR MAINTENANCE OF ANY PRODUCT. RESPONSIBILITY FOR PROPER SELECTION, USE, AND MAINTENANCE OF ANY SELLER PRODUCT REMAINS SOLELY WITH THE PURCHASER AND END-USER.

Warranty

1. LIMITED WARRANTY: Subject to the limitations contained in Section 2 herein and except as otherwise expressly provided herein, Emerson ("Seller") warrants that the firmware will execute the programming instructions provided by Seller and that the Goods manufactured or Services provided by Seller will be free from defects in materials or workmanship under normal use and care until the expiration of the applicable warranty period. Goods are warranted for twelve (12) months from the date of initial installation or eighteen (18) months from the date of shipment by Seller, whichever period expires first. Consumables and Services are warranted for a period of 90 days from the date of shipment or completion of the Services. Products purchased by Seller from a third party for resale to Buyer ("Resale Products") shall carry only the warranty extended by the original manufacturer. Buyer agrees that Seller has no liability for Resale Products beyond making a reasonable commercial effort to arrange for procurement and shipping of the Resale Products. If Buyer discovers any warranty defects and notifies Seller thereof in writing during the applicable warranty period, Seller shall, at its option, promptly correct any errors that are found by Seller in the firmware or Services, or repair or replace F.O.B. point of manufacture that portion of the Goods or firmware found by Seller to be defective, or refund the purchase price of the defective portion of the Goods/Services. All replacements or repairs necessitated by inadequate maintenance, normal wear and usage, unsuitable power sources, unsuitable environmental conditions, accident, misuse, improper installation, modification, repair, storage or handling, or any other cause not the fault of Seller are not covered by this limited warranty, and shall be at Buyer's expense. Seller shall not be obligated to pay any costs or charges incurred by Buyer or any other party except as may be agreed upon in writing in advance by an authorized Seller representative. All costs of dismantling, reinstallation and freight, and the time and expenses of Seller's personnel for site travel and diagnosis under this warranty clause shall be borne by Buyer unless accepted in writing by Seller. Goods repaired and parts replaced during the warranty period shall be in warranty for the remainder of the original warranty period or ninety (90) days, whichever is longer. This limited warranty is the only warranty made by Seller and can be amended only in a writing signed by an authorized representative of Seller. Except as otherwise expressly provided in the Agreement, THERE ARE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESSED OR IMPLIED, AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, OR ANY OTHER MATTER WITH RESPECT TO ANY OF THE GOODS OR SERVICES. It is understood that corrosion or erosion of materials is not covered by our guarantee.

2. LIMITATION OF REMEDY AND LIABILITY: SELLER SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE. THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF WARRANTY HEREUNDER SHALL BE LIMITED TO REPAIR, CORRECTION, REPLACEMENT, OR REFUND OF PURCHASE PRICE UNDER THE LIMITED WARRANTY CLAUSE IN SECTION 1 HEREIN. IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT, OR OTHERWISE), SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE TO BUYER OF THE SPECIFIC GOODS MANUFACTURED OR SERVICES PROVIDED BY SELLER GIVING RISE TO THE CLAIM OR CAUSE OF ACTION. BUYER AGREES THAT IN NO EVENT SHALL SELLER'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXTEND TO INCLUDE INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES. THE TERM "CONSEQUENTIAL DAMAGES" SHALL INCLUDE, BUT NOT BE LIMITED TO, LOSS OF ANTICIPATED PROFITS, LOSS OF USE, LOSS OF REVENUE, AND COST OF CAPITAL.

⚠ WARNING

Physical access

Unauthorized personnel may potentially cause significant damage to and/or misconfiguration of end users' equipment. This could be intentional or unintentional and needs to be protected against.

Physical security is an important part of any security program and fundamental to protecting your system. Restrict physical access by unauthorized personnel to protect end users' assets. This is true for all systems used within the facility.

Contents

1 Cybersecurity recommendations for Rosemount XA gas chromatograph (GC) and MON2020 users

Install XA GC in a secure environment with physical protection

- Install the XA GC in a secure environment with physical protection.

- Scan the USB shipped with the XA GC with anti-virus software before use.

- Store all the GC related files including application files, drawings, and documents, in a secure network/drive with restricted access.

Install MON2020 on a secure personal computer (PC)

- Access to PC protected by adequate username/password

- With restricted admin privileges on PC - operating system (OS) configuration, install software, etc.

- Restricted network ports and connection of mass storage devices/removable media

- Resides on a private local area network (LAN) with firewall and network access control list configured for blocking illegitimate access

- With anti-virus software kept current on PC

- With Microsoft® Windows® automatic updates enabled on PC

- PC updated with Windows security patches

- With physical access controls - locked room, key-card entry, etc.

Use XA GCs in secure network

This product is designed to be used in an industrial environment with appropriate defense-in-depth security measures and compensating controls effective against cyber-attacks. This product is not designed to be connected directly to the Internet or Internet facing networks. Security measures should include, but are not limited to:

- Ethernet set up in a private LAN with firewall and network access control list configured for blocking illegitimate access

- Network devices stored with physical access controls - physical locks, ID verification, etc.

- Network devices updated with all available security patches.

- Anti-virus software kept current on all computers in the network.

- Other industry best practices for secure network.

Control access to XA GC using password of sufficient complexity

- The password length should be at least eight alphanumeric characters.

- Remove all default users after XA GC commissioning or password upgrade to comply with the password complexity guidelines.

- Set password policy level after GC commissioning by accessing **Tools → Users → User Administration**.

- Use a unique password for each user.

- Avoid sharing passwords with other users.

Control access to user profile for XA GC using admin password of sufficient complexity

- The admin password length should be at least 10 alphanumeric characters.

- The admin password should include at least one number, mix of upper/lower case characters, and at least one special character (!@#$%^&*_-+=:?)

- Change the default admin password after GC commissioning by using the password complexity guidelines.

- Avoid sharing the password with non-admin users.

Upload/download files of the approved types to/from XA GC
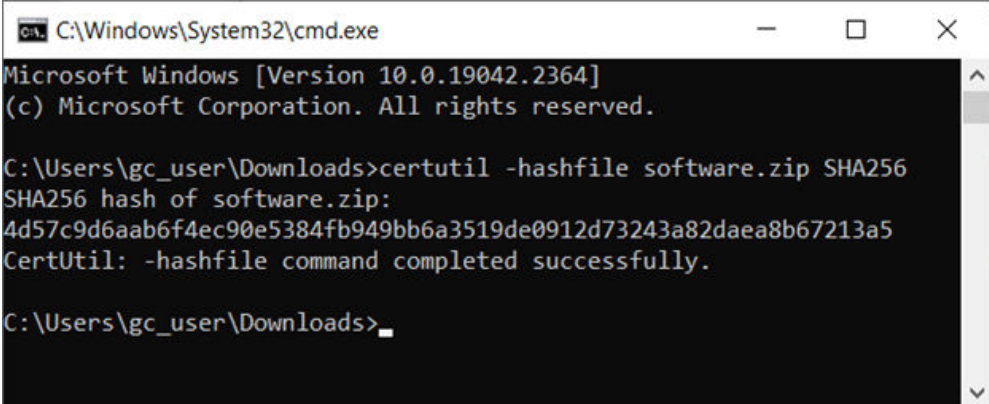
- Upload/download files of the approved types to/from XA GC.

- The approved files of type include .xls, .xlsx, .pdf, .tif/.tiff, .xrted (XA trend file), .xcgm (XA chromatogram file), and .xcmp (XA comparison file).

- Scan the mass storage device with the latest anti-virus software before uploading any files to GC.

Check integrity for distributed binaries

- A hash value will be provided for some software/firmware files distributed by Emerson GC, so that the user can verify the integrity of the file.

- The hashing algorithm SHA-256 is used for calculating the hash value of the binary file.

- There are many programs for calculating the SHA-256 hash including Windows Command Prompt, Windows PowerShell, and third-party software (such as Hash Tool). Select a program to calculate the SHA-256 hash value of the downloaded file and compare it to the value specified on the download page.

- The following is an example of using Windows Command Prompt to calculate the SHA-256 hash value:
  — In a command line, run the command:
    - `certutil -hashfile [filename] SHA256`

  — For example:

2 Getting started

Welcome to Rosemount MON2020—a menu-driven, Windows®-based software program designed to remotely operate and monitor the Rosemount XA series of gas chromatographs (GCs).

This software operates on an IBM-compatible personal computer (PC) running the Windows 10 operating system or later.

The software can initiate or control the following GC functions:

- Alarm parameters
- Alarm and event processing
- Analog scale adjustments
- Analyses
- Baseline runs
- Calculation assignments and configurations
- Calibrations
- Component assignments and configurations
- Diagnostics
- Event sequences
- Halt operations
- Stream assignments and sequences
- Valve activations
- Timing adjustments

The software can also generate the following reports:

- Analysis (Gas Processing Association)
- Analysis (International Organization for Standardization)
- Calibration
- Final Calibration
- Validation
- Final Validation
- Hourly Averages
- Monthly Averages
- Daily Averages
- GC Configuration
- Raw Data
- Variable Averages
- Weekly Averages
- Dew Temperature Calculation (optional)

In addition, the software can access and display the following GC-generated logs:

- Alarm Log
- Event Log
- Parameter List
- Maintenance Log

2.1 Rosemount MON2000 and MON2020

Customers familiar with MON2000 or MON2000 Plus will find a few changes when using MON2020:

- Log-in security is at the gas chromatograph (GC) level instead of at the software level. This means that you no longer have to log in after starting the software, but you do have to log in to the GC to which you are trying to connect.

- An Administrator role has been added to the list of user roles. This new role has the highest level of authority and is the only role that can create or delete all other roles and users.

- Multiple customers can connect to the same GC simultaneously. By default, the first person to log in to the GC with Supervisor authority will have read/write access; all other people, including other supervisor-level users, will have read access only. This configuration can be changed so that all supervisor-level users have read/write access, regardless of who logs in first.

- Customers can display multiple windows within the software.

- Automatic re-connection. If the software loses its connection with the GC, it automatically attempts to reconnect.

- Analytical train configuration. Customers can configure analytical trains for the detectors, valves, and discrete outputs by selecting the check boxes. The number of detectors, valves, and discrete outputs is dependent on the installed hardware of the GC.

- Analysis clock configuration. Customers can configure/save settings of assigned analytical trains to analysis.

- Customers can view multiple instances of certain windows. To aid in data processing or troubleshooting, the software is capable of displaying more than one instance of certain data-heavy windows such as the *Chromatogram Viewer* and the *Trend Data* window.

- Enhanced *Chromatogram Viewer*. The following enhancements have been made to the *Chromatogram Viewer*:

  — Customers can view an unlimited number of chromatograms, in any configuration. For example, you can view an archived chromatogram and a live chromatogram.

  — The **Keep Last CGM** option. Upon starting a new run, the software can keep the most recently completed chromatogram on the graph for reference.

  — *Overview* window. When zoomed in to a smaller section of a chromatogram, you can open a miniature *Overview* window that displays the entire chromatogram for reference.

  — Older chromatograms available. The software has access to archived chromatograms as old as four or five days.

  — Full screen mode.

— Protected chromatograms. Chromatograms that you designate as protected will not be deleted.

- The **Invert Polarity** option. This feature reverses a detector's effect.

- Streamlined variables-picking menu. The method for selecting variables for calculations and other purposes is contained within one simple, self-contained menu.

- GC Time. The GC status bar displays the date and time based on the GC's physical location, which may be different from the location of the personal computer (PC).

- Daylight Savings Time. You have the option of enabling a GC's Daylight Savings Time feature. Also, there are two options for setting the start and end times for Daylight Savings Time on the GC.

- Baseline offsetting (Rosemount 700XA and 1500XA only). In some situations that involve multiple detectors, the baseline may be displayed either too high on the graph, in which case the tops of the peaks are cut off, or too low on the graph, so that the bases of the peaks are cut off. If this occurs, it is possible to offset the baseline either up or down so that the entire peak can be displayed on the graph. This offset will be applied to all traces—live, archived, and saved—that are displayed thereafter.

- Microsoft® Excel-based *Parameter List*. The *Parameter List* has been expanded to offer multiple pages of information and is Microsoft Excel-based to allow for data access outside of MON2020. You can import Excel files to and export them from GCs.

- Optional FOUNDATION™ Fieldbus variables. If your GC is installed with a FOUNDATION Fieldbus, you can map up to 64 GC variables to monitor using the AMS Suite.

- Optional local operator interface (LOI) variables. If your GC is installed with an LOI, you can configure up to 25 GC parameters to monitor using the LOI's Display mode.

- Access to GC-related drawings such as flow diagrams, assembly drawings, and electrical diagrams.

- Validation runs. During a validation run, the GC performs a test analysis to verify that it is working properly.

Related information

Connect to a gas chromatograph (GC)
Managing users
Use the Chromatogram Viewer
Additional plot commands
Display an archived chromatogram
Options for displaying chromatograms
Protect chromatograms
Invert the polarity of a valve
Invert the polarity of a discrete input
Use the context-sensitive variable selector
Set the gas chromatograph's (GC's) date and time
Set Daylight Savings
Offset the baseline (700XA and1500XA only)
View and edit the Parameter List
Map a FOUNDATION Fieldbus variable
Configure parameters to display on the local operator interface (LOI)
View and edit Validation Data tables (VDTs)
Validate the gas chromatograph

2.2 Getting started with Rosemount MON2020

2.2.1 System requirements

To achieve maximum performance when running the software, ensure that your personal computer (PC) system meets the following requirements.

Port requirements

For Rosemount MON2020 connection, make sure that TLS 1.2 is supported and that the following ports are open on the gas chromatograph (GC):

- FTP port 21
  - Default port data range for most GCs: 12100 to 12600
  - Port data range for Rosemount 700XA firmware older than 2.2.0 and 370XA older than 1.1.0: 10000 to 11000
- Port 502 for Ethernet Modbus®
- Port 10000 for database
- Port 11000 for chromatograms
- Port 22 for SSH (optional)

Compatible operating systems

Windows® 10 or 11

Minimum hardware specifications

- 1 gigahertz (GHz) 32-bit or 64-bit processor
- 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)
- 1 GB available hard disk space
- Super VGA Monitor with 1024 x 768 or higher resolution
- One Ethernet port for connecting to GCs
- Windows-compatible printer for printing reports (optional)

2.2.2 Install software

You must install the software from the USB drive onto your hard drive; you cannot run the program from the USB.

Note
Rosemount MON2020 is not an upgrade to Rosemount MON2000; therefore, install MON2020 to its own directory, separate from the MON2000 directory.

Prerequisites

Note
You must be logged into the computer as an administrator to install the software. Windows® 10 and 11 users, even with administrator privileges, will be prompted by the operating system's User Account Control feature to allow or cancel the installation.

Procedure

1. Insert the USB into your personal computer (PC).

2. Browse to the USB drive in Windows Explorer.

3. Double-click the **Setup** file and follow the on-screen installation instructions.

Upon successful installation, MON2020 creates a shortcut icon on the computer's desktop.

2.2.3 Start Rosemount MON2020

Procedure

To launch the software, double-click the MON2020 desktop icon or click the **Start** button and select **MON2020**.

2.2.4 Register the software

Registering your copy of Rosemount MON2020 allows you to receive information about free updates and related products.

Each time you start the software, it will prompt you to register if you have not already done so. You can also register by going to **Help → Register MON2020...**.

Procedure

1. Complete the appropriate fields in the **Register MON2020** dialog.

   Note
   The software's revision level is located on the back of its USB.

2. Click **Next** to continue.

3. Choose the desired registration method by clicking the corresponding check box.

4. Click **Finish**.

2.2.5 Set up **Data** folder

The **Data** folder stores files specific to the gas chromatograph (GC), such as reports and chromatograms.

The default location for the data folder is **C:\Users\user_account_name\Documents\GCXA Data**. If you want Rosemount MON2020 to store its data in a different location, such as on a network drive, do the following:

Procedure

1. Move the **Data** folder to its new location.

2. Select **Program Settings...** from the **File** menu.
   The current location of the **Data** folder displays in the Data Folder field.

3. To change the data folder's location, click the **Browse** button next to the Data Folder field.

4. Use the **Browse for Folder** window to navigate to the **GCXP Data** folder's new location and click **OK**.

   Note
   Another method for changing the folder location is to type the folder's location into the Data Folder field and press **Enter**. When the **Create the folder?** dialog box appears, click **Yes**.

The Data Folder field updates to display the new location.

2.2.6 Configure the software to connect to a gas chromatograph (GC)

Procedure

1. Go to **File → GC Directory...**.

   If this is the first time that this option was selected, you will get the following error message:

   Figure 2-1: `GC directory file not found` **message**
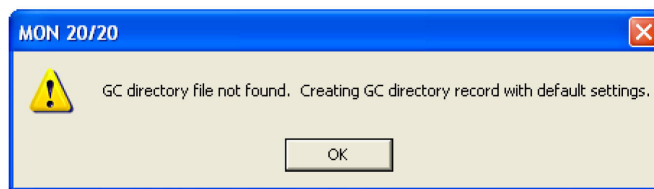
   If you get the **GC directory file not found** message, click **OK**. The **GC Directory** window appears and displays a table containing an inventory of the GCs to which the software can connect.

2. If you are configuring the first GC connection for Rosemount MON2020, there will be only one generic GC record listed in the window. To add another record, select **Add** from the **GC Directory** window's **File** menu.
   A new row will be added to the bottom of the table.

3. Click in the GC Name field and enter the name for the GC to which you want to connect.

   Optionally, you can click in the Short Desc field and enter pertinent information about the GC to which you want to connect, such as its location. You can enter up to 100 characters in this field.

   By default, Ethernet 1 (`RJ-45` connection on the backplane) is selected as the connection method. Other options are Direct and Ethernet 2 (terminal block on the backplane).

4. Select the correct check box.

   You can select multiple connection methods. For Ethernet 1 or Ethernet 2, click the button at the bottom of the screen. The **Ethernet Connection Properties for New GC** window appears.

   a) Enable the radio button for the connection type.

      • IP address: numeric value

      • Server name: alphabetical value

   b) Select the designated port, a shared public Internet connection network address translation (NAT) using a single Internet protocol (IP) address assigned to different GCs.

      • FTP

      • Database

      • Chromatogram

      • Modbus®

> **Note**
> The default address for the GC's `RJ-45` port in DHCP mode is *192.168.135.100*.

> **Note**
> If you type an invalid IP address, you will get an error message when the software attempts to connect to the GC.

5. Click **OK**. When the *Save changes?* dialog box appears, click **Yes**.

6. Repeat Step 2 through Step 5 for any other GCs to which you want to connect.

7. To delete a GC from the *GC Directory* table, select the GC and then click **Delete** from the *File* window.

8. To copy a GC's configuration information into a new row, select the row to be copied and then select **Insert Duplicate** from the *File* window.

9. To insert a row below a GC, select the GC and then select **Insert** from the *File* window.

10. To sort the table alphabetically, select **Sort** from the *Table* window or click **Sort** from the *GC Directory* window.

11. To copy the list of GCs to the clipboard to be pasted into another application, select **Copy Table to Clipboard** from the *Table* window.

12. To print the list of GCs, select **Print Table...** from the *Table* window.

13. To save the changes and keep the window open click **Save** from the *GC Directory* window. To save the changes and close the window, click **OK**. When the *Save changes?* dialog box appears, click **Yes**.

Related information

Configure an Ethernet port

2.2.7 Export a gas chromatograph (GC) directory file

You can save the *GC Directory*, which contains the list of networked GCs that are currently configured for your copy of Rosemount MON2020, as a *.DAT* file to a personal computer (PC) or other storage media such as a compact disk (CD) or flash drive.

Procedure

1. Click **Export**.
   The *Export GC Directory* window displays.

2. Select the check box for each GC whose information you want to save.

   > **Note**
   > If you want to save the entire list, click **Select All**.

3. Click **OK**.
   The *Export GC Directory File Save as* dialog displays.

4. Choose a save location.

   The default location is *C:\Users\user_account_name\Documents\GCXA Data*.

   > **Note**
   > The file is automatically given the name of *GC_DIRECTORY_EXPORT.DAT*. If you prefer a different name, type it into the File name field.

5. Click **Save**.

2.2.8 Import a gas chromatograph (GC) directory file

You can use a GC directory file to restore GC directory information to your copy of Rosemount MON2020 or to quickly and easily supply other copies of MON2020 that are installed on other computers with the profiles of the GCs that are in your network.

To import a GC directory file:

Procedure

1. Select **GC Directory...** from the *File* menu.

   If this is the first time that this option was selected, you will get the following error message:

   Figure 2-2: `GC directory file not found` **message**
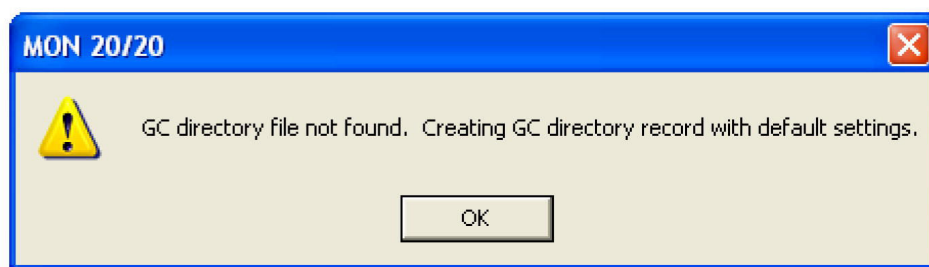
2. If you get the `GC directory file not found` message, click **OK**.
   The *GC Directory* window appears.

3. Click **Import**.
   The *Import GC Directory File* dialog displays.

4. Locate the GC directory file and select it.

5. Click **Open**.
   The newly configured *GC Directory* window reappears with the list of networked GCs displayed in the *GC Directory* table.

2.2.9 Launch the software from the SNAP-ON™ for DeltaV™

To complete this task, you must have DeltaV installed on the personal computer (PC) along with Rosemount MON2020.

Note

To successfully use SNAP-ON for DeltaV, you must be familiar with using the DeltaV digital automation system.

Procedure

1. Start the DeltaV Explorer by clicking on its desktop icon or by clicking the **Start** button and selecting **DeltaV → Engineering → DeltaV Explorer**.

2. In the *Device Connection View*, open device icons by clicking once on each icon. Follow the path of connections until you locate the desired gas chromatograph (GC) icon.

3. Right-click on a connected GC icon to display the context menu.

4. Select **SNAP-ON/Linked Apps → Launch MON2020**.

MON2020 starts and connects automatically to the GC.

2.2.10　Launch the software from the AMS Device Manager

To complete this task, DeltaV™ and AMS must be installed on the personal computer (PC) along with Rosemount MON2020.

Procedure

1. Start the AMS Device Manager by clicking on its desktop icon or by clicking the **Start** button and selecting **AMS Device Manager → AMS Device Manager**.

2. In the *Device Connection View*, open device icons by clicking once on each icon. Follow the path of connections until you locate the desired gas chromatograph (GC) icon.

3. Right-click on a connected GC icon to display the context menu.

4. Select **SNAP-ON/Linked Apps → Launch MON2020**.

MON2020 starts and connects automatically to the GC.

2.2.11　User interface

Rosemount MON2020 has two areas of interaction: the control area, at the top of the program's main window, and the gas chromatograph (GC) status bar, located at the bottom of the program's main window.

Figure 2-3: MON2020 window

A. *Control area*
B. *GC status bar*

Control area

The control area of the main window contains the menus and icons that allow you to control the software and the gas chromatograph (GC) to which it is connected.

Figure 2-4: Control area
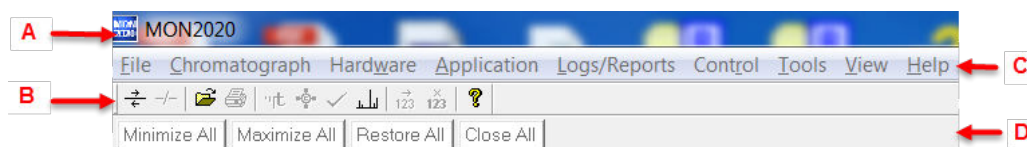
A. Title bar
B. Tool bar
C. Menu bar
D. Dialog control tabs

Title bar The Title bar displays the name of the program and the program's connection status. The software has the following three overall status modes:

- Not connected: If the software is not connected to a GC, then `MON2020` displays in the Title bar.

- Connected: If the software is connected to a GC, then `MON2020 – Connected to [GC name and connection type]` displays in the Title bar.

- Offline edit: If the software is in offline edit mode, then `MON2020 – Offline edit [file name]` displays in the Title bar.

Menu bar The Menu bar contains the commands that allow you to control and monitor GCs.

Tool bar The Tool bar contains shortcut icons for the most important and/or most often used software commands. From the Tool bar, you can do such things as connect to and disconnect from a GC, view chromatographs, and view *Help* files.

⇌	Connect to a GC.
–/–	Disconnect from a GC.
📂	Open a configuration file.
🖨	Print a GC configuration report.
t	View the *Timed Events* window.
✛	View the *Component Data* window.
✓	Clear or acknowledge alarms.
⊥⊥	Open the *CGM Viewer* window.
123→	Begin auto sequencing.
123✕	Halt auto sequencing.

❓	Open the context-sensitive Help.

Dialog Control Tabs bar
The Dialog Control Tabs bar contains four buttons that allow you to manage the behavior of all windows that are open in the main window. The four buttons are **Minimize All**, **Maximize All**, **Restore All**, and **Close All**. The bar also displays a button for each open window that allows you to select or deselect that window.

You can hide or display the Tool bar and the Dialog Control Tabs bar by clicking the appropriate option from the *View* menu.

Gas chromatograph (GC) Status bar

The GC Status bar of the main window displays useful information about the status and functioning of the GC to which Rosemount MON2020 is connected.

The GC Status bar contains the following sections:

GC
The first row displays the name of the GC to which the software is connected. If the software is not connected to a GC, `Not Connected` displays in this row. If the software loses its connection to the GC, `Comm Fail` displays in this row, and the program will automatically try to reconnect. The second row displays status flags such as active alarms (with red background) and unacknowledged alarms (with yellow background).

Analysis Clock Name
This field displays the `Analysis Clock N` (where *N* represents the number of the analysis clock). Multiple analyses can run independently to analyze multiple streams at the same time. The GC can run two or more (maximum four) analyses at a time. The number of analyses are set at factory per the mechanical configurations.

Det #
A GC can have a maximum of three detectors.

Mode
Potential modes are:
- Idle

- Warmstart

- Manual Anly

- Manual Cal

- Manual Validation

- Auto Anly

- Auto Cal

- Auto Validation

- Auto Valve Timing

- Module Validation

- CV Check

- Manual Purge

- Auto Purge

- Actuation Purge

Stream	The current stream being analyzed.
Next	The next stream to be analyzed.
Anly	The analysis time.
Cycle	The total cycle time, in seconds, between successive analyses.
Run	The amount of time, in seconds, that has elapsed since the current cycle began.
GC System	Displays the date and time according to the GC to which the software is connected. The date and time displayed may be different from your date and time, depending on the physical location of the GC.
FOUNDATION™ Fieldbus FFB	Displays the status as **In Service** or **Not In Service**.
FID Flame Status	Displays the status of the flame ionization detector (FID) flame. Options are OFF with red background, ON with green background, and OVER TEMP with red background. The **FID Flame Status** indicator only displays on the GC Status bar when the GC to which the software is connected has an FID detector.

You can hide or display the GC Status bar by clicking **GC Status Bar** from the *View* menu.

2.2.12 Disconnect from a gas chromatograph (GC)

Disconnecting from a GC automatically logs you off of the GC.

Procedure

To disconnect from a GC, do one of the following:

- On the Tool bar, click ⁻/⁻ .

- Go to **Chromatograph → Disconnect**.

Note
If you are connected to a GC and want to connect to a different GC, it is not necessary to disconnect first; simply connect to the second GC, and in the process the software disconnects from the first GC.

2.3 Keyboard commands

You can use the following keyboard keystrokes throughout the program:

Arrow keys	Move cursor: • Left or right in a data field. • Up or down in a menu or combo box. • Up or down (column), left or right (row) through displayed data entries.
Delete	• Deletes the character after cursor.

- Deletes selected rows from a table or return row values to the default settings.

Enter	Activates the default control element (such as the **OK** button) in current window.
Esc	Exits application or active window without saving data.
F1	Accesses context-sensitive *Help* topics.
Insert	Toggles between insert and type-over mode in selected cell.
Tab	Moves to the next control element (such as a button) in the window; to use the **Tab** key to move to the next data field, select **Program Settings...** from the *File* menu and clear the **Tab from spreadsheet to next control** check box.
Shift+Tab	Moves to previous control element (e.g., button) or data field in window; see Tab description.
Space	Toggles settings (via radio buttons or check boxes).

You can use the following function keys from the main window:

F2	Starts the auto-sequencing function.
F3	Halts the gas chromatograph (GC) (such as an analysis run) at the end of the current cycle.
F5	Displays the *Timed Events* table per specified stream.
F6	Displays the *Component Data* table per specified stream.
F7	Displays the chromatogram for the sample stream being analyzed.
F8	Displays any chromatogram stored in the GC Controller.

Related information

Initiate an auto sequence analysis run
Halt an analysis run
View and edit Timed Events tables
View and edit Component Data tables
Display a live chromatogram
Display an archived chromatogram

2.4   Procedures guide

Use Table 2-1 to look up the related manual section, menu path, and, if appropriate, the keystroke for a given procedure.

Table 2-1: Rosemount MON2020 procedures

Task or data item	Section(s)	Menu path (keystroke)
Edit 24-hour averages or component(s) measured.	Edit averages calculations	**Application → Calculations → Averages**
Add a gas chromatograph.	Configure the software to connect to a gas chromatograph (GC)	**File → GC Directory**
Manage alarms related components.	View and edit Component Data tables Set alarm limits Discrete outputs	**Application → Component Data(F6)** **Application → Limit Alarms → User...** **Hardware → Discrete Outputs**
Program alarms and stream numbers.	Set alarm limits	**Application → Limit Alarms → User...**
Set analysis time.	Set the cycle and analysis time	**Application → Timed Events**
Print analysis or average reports.	Schedule report generation	**Logs/Reports → Printer Control...**
Start or end auto-calibration.	Streams	**Application → Streams...**
Set auto-calibration interval.	Streams	**Application → Streams...**
Set auto-calibration start time.	Streams	**Application → Streams...**
Auto-calibrate.	Streams	**Application → Streams...**
Configure analytical trains.	Configure analytical train	**Application → Analytical Train Configuration**
Configure analysis clock.	Configure an analysis clock	**Application → Analysis Clock Configuration**
Set base pressure for calculations.	Streams	**Application → Streams...**
Set calibration concentration.	View and edit Component Data tables	**Application → Component Data...(F6)**
Set calibration cycle time.	Set the cycle and analysis time	**Application → ... → Timed Events(F5)**
Set the number of averaged calibration runs.	Streams	**Application → Streams...**
Set the number of calibration runs.	Streams	**Application → Streams...**
Set the number of calibration streams.	Streams	**Application → Streams...**
Change the default C6+ mixture ratio.	Edit percentage of C6+ in a Component Data table	**Application → Component Data...(F6)**
Manage communications.	Communication screen	**Application → Communication...** **Application → Ethernet ports...**
Set component codes and names.	View and edit Component Data tables	**Application → Component Data...(F6)**
Set component full scale (for output).	System screen Analog outputs	**Application → System...** **Application → System AlarmsHardware → Analog Outputs...**
Program components for input.	Manage your gas chromatograph's (GC's) analog inputs Discrete inputs	**Hardware → Analog Inputs...** **Hardware → Discrete Inputs...**

Table 2-1: Rosemount MON2020 procedures *(continued)*

Task or data item	Section(s)	Menu path (keystroke)
Program components for output.	Set alarm limits Analog outputs Discrete outputs	Application → Limit Alarms → User… Hardware → Analog Outputs… Hardware → Discrete Outputs…
Set component retention time.	View and edit Component Data tables	Application → Component Data…(F6)
Zero component for output.	Analog outputs	Hardware → Analog Outputs…
Turn compressibility on and off.	Set standard calculations by stream	Application → Calculations → Control
Configure the valve timing.	Configure the valve timing	Rosemount 700XA and 1500XA: Application → Timed Events… Rosemount 370XA and 470XA: Application → Timed Events… or Control → Auto Valve Timing…
Set date.	Set the gas chromatograph's (GC's) date and time	Chromatograph → View/Set GC Time…
Set time.	Set the gas chromatograph's (GC's) date and time	Chromatograph → View/Set GC Time…
Set cycle time.	Set the cycle and analysis time	Application → Timed Events…(F5)
Delete alarms	Set alarm limits Alarms menu	Application → Limit Alarms…Logs/ Reports → Alarms → Alarm Log…
Delete component from component list.	View and edit Component Data tables	Application → Component Data…(F6)
Delete inhibit, integration, or peak width.	View and edit Timed Events tables	Application → Timed Events…(F5)
Delete output(s).	Analog outputs Discrete outputs	Hardware → Analog Outputs… Hardware → Discrete Outputs…
Enable or disable multi-user write.	System screen	Application → System…
View existing alarms.	Alarms menu	Logs/Reports → Alarms → Alarm Log…
Set full-scale value for input.	Manage your gas chromatograph's (GC's) analog inputs	Hardware → Analog Inputs…
Generate a repeatability certificate.	Generate a repeatability certificate	Logs/Reports → Repeatability Certificate…
Switch GPM liquid equivalent on or off.	Set standard calculations by stream	Application → Calculations → Control…
Set height or area measurement method.	View and edit Component Data tables	Application → Component Data…(F6)
Set high alarm limit.	Set alarm limits	Application → Limit Alarms → User…
Set analyzer identification.	System screen	Application → System…
Set inhibit on and off times.	Set the cycle and analysis time	Application → Timed Events…(F5)
Set inputs being used.	Manage your gas chromatograph's (GC's) analog inputs Discrete inputs	Hardware → Analog Inputs… Hardware → Discrete Inputs…
Set integration on and off times.	Set the cycle and analysis time	Application → Timed Events…(F5)
Set low alarm limits.	Set alarm limits	Application → Limit Alarms → User…

Table 2-1: Rosemount MON2020 procedures *(continued)*

Task or data item	Section(s)	Menu path (keystroke)
Manage the GC's pressure.	Managing the gas chromatograph's (GC) pressure with the electronic pressure control (EPC) Change the carrier pressure set point	For Rosemount 370XA: **Hardware→ EPC...** For Rosemount 470XA: **Hardware→ Carrier Pressure...**
Switch mole percent on or off.	Set standard calculations by stream	**Application→Calculations→Control...**
Switch normalization on or off.	Set standard calculations by stream	**Application→Calculations→Control...**
Set outputs being used.	Set alarm limits Analog outputs Discrete outputs	**Application→Limit Alarms→User...** **Hardware→Analog Outputs...** **Hardware→Discrete Outputs...**
Set the peak width time.	Set the cycle and analysis time	**Application→Timed Events...(F5)**
Switch relative density on or off.	Set standard calculations by stream	**Application→Calculations→Control...**
Set response factor.	View and edit Component Data tables	**Application→Component Data...(F6)**
Set the response factor percent deviation.	View and edit Component Data tables	**Application→Component Data...(F6)**
Set the retention time percent deviation.	View and edit Component Data tables	**Application→Component Data...(F6)**
Set spectrum gain.	Configure spectrum gain events	**Application→Timed Events...(F5)**
Set stream number(s) for output.	Set alarm limits Analog outputs Discrete outputs	**Application→Limit Alarms→User...** **Hardware→Analog Outputs...** **Hardware→Discrete Outputs...**
Set the number of stream sequences skipped.	Streams	**Application →Streams...** **Application→Stream Sequence...**
Set the number of streams analyzed.	System screen Streams	**Application→System...** **Application→Streams...**
Set the sequence of streams analyzed.	System screen Streams	**Application→System...** **Application→Streams...**
Set valve on and off times.	Configure valve events	**Application→Timed Events...(F5)**
Switch weight percent on or off.	Set standard calculations by stream	**Application→Calculations→Control...**
Switch Wobbe value on or off	Set standard calculations by stream	**Application→Calculations→Control...**
Set zero value for input.	Manage your gas chromatograph's (GC's) analog inputs	**Hardware→Analog Inputs...**

2.5   Configuration files

Procedure

Use the **File** menu to edit, save, and restore configuration files.

2.5.1   Edit a configuration file

Procedure

1. Disconnect from the gas chromatograph (GC).
2. Go to **File→Open Configuration File...**.

The *Open* dialog displays. Configuration files are saved with the *.xcfg* extension.

3. Locate and select the configuration file that you want to edit and click **Open**. Rosemount MON2020 opens the file in Offline Edit mode.

4. Use the *Application* and *Hardware* menu commands to edit the configuration file.

5. When you have finished editing the configuration file, click ⊸⁄⊸ to save the changes to the configuration file and to leave Offline Edit mode.

Related information

[Hardware menu](#)
[Application menu](#)

2.5.2 Save the current configuration

Configuration files are saved with the `.xcfg` extension. To save a gas chromatograph's (GC's) current configuration to a personal computer (PC):

Procedure

1. Go to **File → Save Configuration (to PC)...**.
   The *Save as* dialog displays.

2. Give the file a descriptive name or use the pre-generated file name and navigate to the folder to which you want to save the file.

3. Click **Save**.

2.5.3 Import a configuration file

NOTICE

The current configuration will be overwritten.
Be sure to save the current configuration before importing a new or previous configuration. See [Save the current configuration](#) to learn how to save a configuration.

NOTICE

Keep the gas chromatograph (GC) in Idle mode while performing this task.

Procedure

1. Go to **File → Restore Configuration (to GC)...**.
   The *Open* dialog displays. Configuration files are saved with the `.xcfg` extension.

2. Locate and select the configuration file that you want to import and click **Open**.
   The file's data is loaded into the GC.

2.5.4 Restore factory settings to the gas chromatograph (GC)

Emerson creates the GC's default *Timed Event*, *Component Data*, and *Validation Data* tables at the factory and does not make them accessible to customers. To restore these tables to their default values:

NOTICE

Keep the GC in Idle mode while performing this task.

Procedure

1. Go to **File → Restore to Factory Settings...**.
   The following warning message displays:

   Figure 2-5: Restore to factory settings warning message
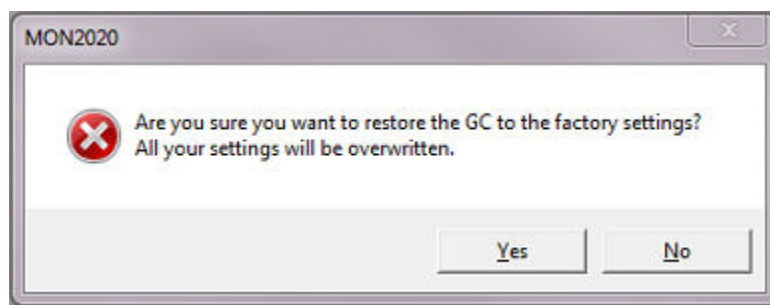
2. Click **Yes**.
   Rosemount MON2020 restores the default values to the GC's data tables. When the process is completed, a confirmation message displays.
3. Click **OK**.

Related information

Halt an analysis run

2.6 Configure printer

Procedure

Go to **File → Print Setup...** to configure the settings for the printer connected to your personal computer (PC).

These settings will apply to any print job queued from Rosemount MON2020, such as the reports that are configured by the Printer Control.

The settings available depend on the printer model. Refer to the printer manufacturer's user manual for more information.

Note

Your new configuration will be cleared, meaning the settings will return to the default values, when you exit Rosemount MON2020. To select a default printer, select **Devices and Printers** in the Windows® *Control Panel*.

Related information

Schedule report generation

2.7 Access context-sensitive Help

Currently, the context-sensitive Help feature contains all user information and instructions for the Rosemount MON2020.

Procedure

To access the Help, do one of the following:
- Press **F1** to view help topics related to the currently active dialog or function.

- Select **Help Topics** from the *Help* menu to view the *Help Contents* dialog.

2.8 Operating modes

Rosemount 700XA Gas Chromatographs, firmware versions 2.2.0 and prior, support two different operating modes. Each mode allows the GC to analyze data from a given number of detectors, streams, and methods.

Table 2-2: Operating modes

Mode ID number	Detectors supported	Streams supported	Methods supported
0	1	1	1
1	2	1	1

The Rosemount 700XA and 1500XA GCs use the **Application → Analytical Train Configuration** to configure the detectors, valves, and discrete outputs.

2.9 View Physical Name column

Most Rosemount MON2020 hardware windows, such as *Analog Inputs* or *Valves*, contain a hidden column, called Physical Name, which lists the default name of the associated gas chromatograph (GC) device. It might be useful to know a device's physical name while troubleshooting.

To view the hidden column:

Procedure

1. Go to **File → Program Settings...**.
   The *Program Settings* window displays.
2. Select the **Show Physical Names** check box.
3. Click **OK**.
   The Physical Name column is now visible on all windows that have the column, such as the *Heater* window or the *Valves* window.

2.10 Select networking protocol

Connect Rosemount MON2020 to the gas chromatograph (GC) using the PPP networking protocol.

Procedure

1. Go to **File → Program Settings...**.
   The *Program Settings* window displays.

2. Make sure the **Use PPP protocol for serial connection (use SLIP if unchecked)** check box is selected.

3. Click **OK**.

2.11 Use the context-sensitive variable selector

The Rosemount MON2020 method for selecting variables for calculations and other purposes is based on a simple, self-contained system.

You may access the context-sensitive variable selector from several different screens. The variables you see are dependent on the screen from which you are viewing them. One screen that has a context-sensitive variable selector is the *Averages Calculations* screen. To access this screen, go to **Application → Calculations → Averages...**.

Figure 2-6: Example of a context-variable selector
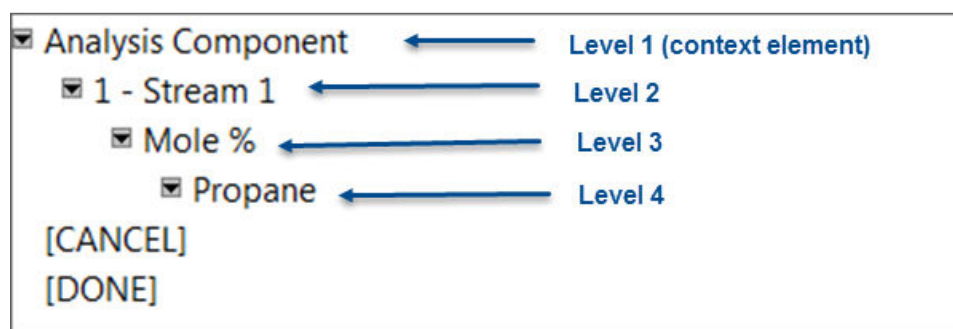
The context-sensitive variable selector consists of a first-level element, called the context element, that is followed by a series of tiered, drop-down lists. The options available from the drop-down lists depend upon the context element.

The following example explains how to use the context-sensitive variable selector to select a gas component:

Procedure

1. Click the first-level drop-down list.
   The full list of available categories displays.

2. Select the category you want to analyze.

3. Click the second-level drop-down list.
   The full list of available streams displays.

4. Select the stream you want to analyze.

5. Click the third-level drop-down list.
   The full list of available variables displays.

6. Select the variable you want to analyze.

7. Click the fourth-level drop-down list.
   The full list of available components displays.

8. Select the component you want to analyze.

9. Click **[DONE]**.

The context-sensitive variable selector closes, and the new variable displays in the Variable field. In the example shown in Figure 2-6, the Variable field would display: *1-Stream 1_Mole%_Propane*.

3   Chromatograms

When it comes to viewing and managing chromatograms, Rosemount MON2020 is flexible and straightforward.

This chapter shows you how to access the **Chromatogram Viewer**, as well as how to use the viewer to display, print, and manipulate live, archived (stored on the gas chromatograph [GC]), or saved (stored on the personal computer [PC]) chromatograms. There is no limit to the number of archived and saved chromatograms that can be displayed at once. The **Chromatogram Viewer** can display all three types of chromatograms together, alone, or in any combination.

Figure 3-1: Chromatogram Viewer
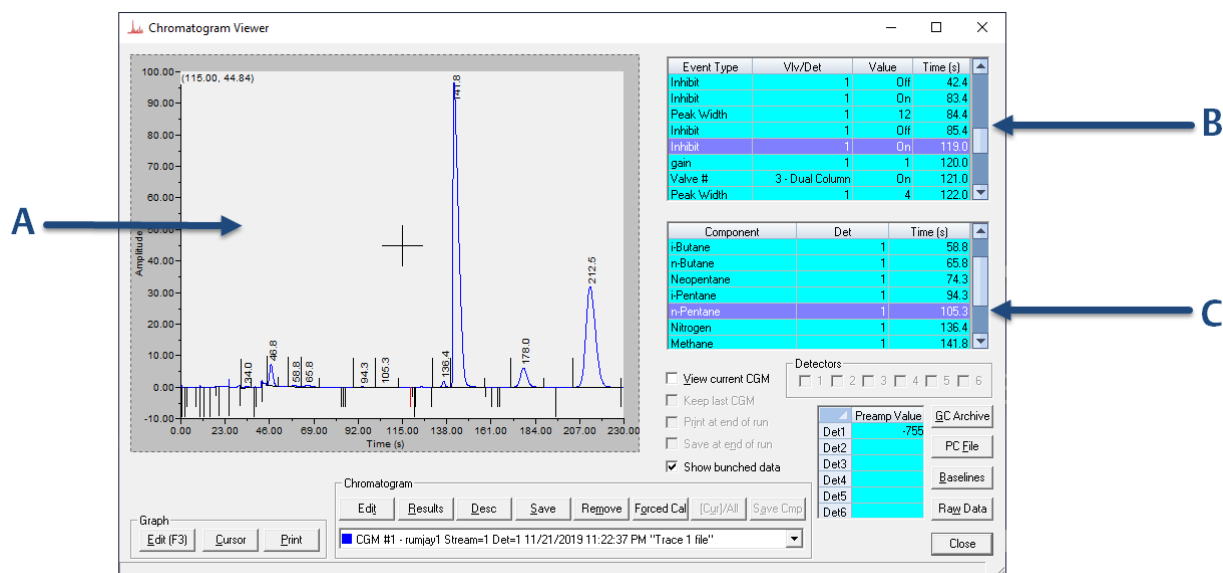
A. *Chromatogram window*
B. *Time Events table*
C. *Component Data table*

A chromatogram displays in the **Chromatogram** window.

Each trace that displays is color-coded; use the Chromatogram drop-down list to select a specific trace.

Figure 3-2: Chromatogram Drop-Down List
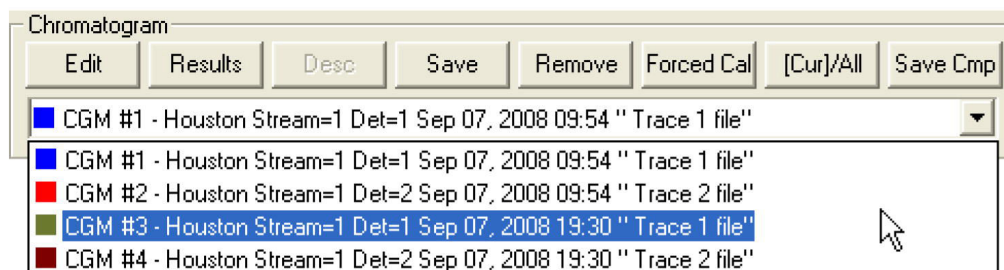
The list of GC events associated with the production of the chromatogram, along with each event's status and time, displays in the **Timed Events** table to the right of the **Chromatogram** display window. The **Component Data** table, to the lower right of the **Chromatogram** display window, lists the components measured during the analysis.

Note
When displaying a live chromatogram, by default, the **Timed Events** and **Component Data** tables are configured to scroll to and highlight the next occurring event in the analysis cycle. To disable this feature, right-click on one of the tables and deselect the **Auto Scroll** option on the pop-up menu.

3.1   Connect to a gas chromatograph (GC)

Most of the software's menus and options are inactive until you have logged on to a GC.

Prerequisites

Before connecting to a GC, you must create a profile for it on Rosemount MON2020.

Procedure

1. There are two ways to start the process:

    • On the **Tool** bar, click ⇄.

    • Go to **Chromatograph → Connect....**

    The **Connect to GC** dialog, which displays a list of all the GCs you can connect to, appears.

    Note
    If you want to edit the connection parameters for one or all GCs listed in the **Connect to GC** dialog, click **Edit Directory**. The **GC Directory** dialog appears.

2. Click the connection method (Direct, Modem, Ethernet 1, or Ethernet 2) button beside the GC you want to connect to.
    The **Login** dialog appears.

3. Enter a user name and user personal identification number (PIN) and click **OK**.

If the name in the **Connect to GC** dialog does not match the GC's name, the **GC Name** dialog opens.
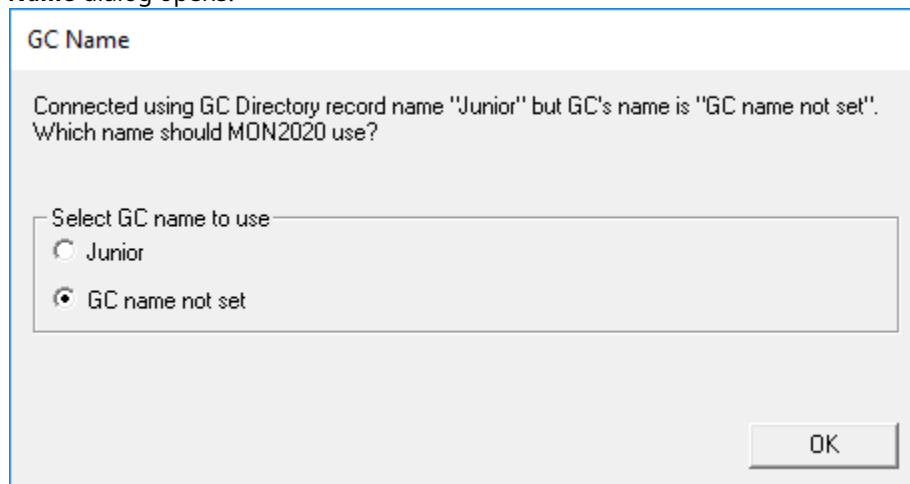
Select the name you would prefer to use. Then click **OK**.

Once connected, the name of the GC appears under the GC column in the GC Status bar.

Note
All GCs are shipped with a default user name:. The Rosemount MON2020 security policy requires a user password for the first time log in.

Note
If you enter an invalid user name or password, the **Login** dialog closes without connecting to the GC.

Related information

Configure the software to connect to a gas chromatograph (GC)
Managing users

3.1.1 Connect directly to a personal computer (PC) using the gas chromatograph's (GC's) Ethernet port

The GC's DHCP server feature and its Ethernet port on the backplane at **J22** allow you to connect directly to the GC. This is a useful feature for GCs that are not connected to a local area network (LAN); all that is needed is a PC and a CAT 5 Ethernet cable.

Prerequisites

Note
The PC must have an Ethernet network interface card (NIC) that supports the automatic medium-dependent interface crossover (Auto-MDIX) technology and either an Ethernet cable of at least CAT 5 or an Ethernet Crossover Cable of at least CAT 5.

Note
The GC can be connected (or remain connected) to the local network on **TB11** on the backplane while the DHCP feature is being used.

Procedure

1. Plug one end of the Ethernet cable into the PC's Ethernet port and the other end into the GC's **RJ-45** socket on **J22** on the backplane.

2. Locate the set of switches at **SW1**, directly beneath the Ethernet port on the back plane. Flip the switch that is labeled **1** to ON. This starts the GC's DHCP server feature.

   NOTICE

   Although it is possible to use the Ethernet cable to connect the GC, by way of the **RJ-45** socket, to the local network, do not do so if the **SW1** switch has been turned on. Setting the **SW1** switch to ON puts the GC in server mode, and doing so while the GC is plugged into the LAN will disrupt the local network's functioning.

   The GC's DHCP server feature starts. The server takes approximately 20 seconds to initialize and start up.

3. Wait for 20 seconds and then do the following to ensure that the server has provided an Internet protocol (IP) address to the PC:

   a) From the PC's desktop, go to **Start → menu → Control Panel → Network and Sharing Center**.
      The **Network Connections** screen lists all Dial-up and LAN / High-Speed Internet connections installed on the PC.

   b) In the list of LAN / High Speed Internet connections, find the icon that corresponds to the PC-to-GC connection and check the status that displays beneath the LAN.
      It should show the status as Connected. The PC is now capable of connecting to the GC. If the status is Disconnected, the PC may not be configured to accept IP addresses. Continue to Step 4.

4. Configure the PC to accept IP addresses.

   a) Go to **Start → Control Panel → Network and Sharing Center**.

   b) Select **Change adapter settings**.

   c) Right-click **Local Area Connection** and select Properties.
      The **Local Area Connection Properties** dialog opens.

d) In the **Connection** list box, select Internet Protocol (TCP/IPv4).
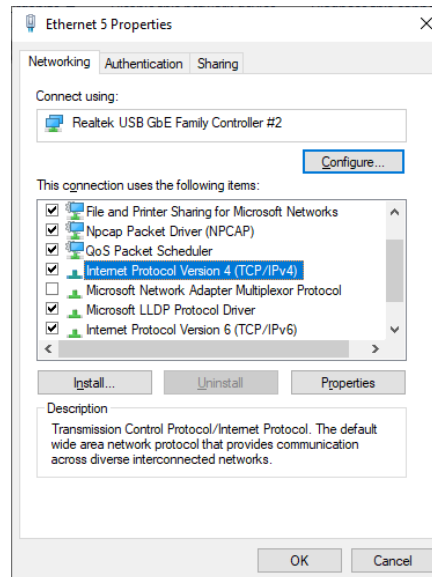
e) Click **Properties**.
The **Internet Protocol Version 4 (TCP/IP) Properties** dialog
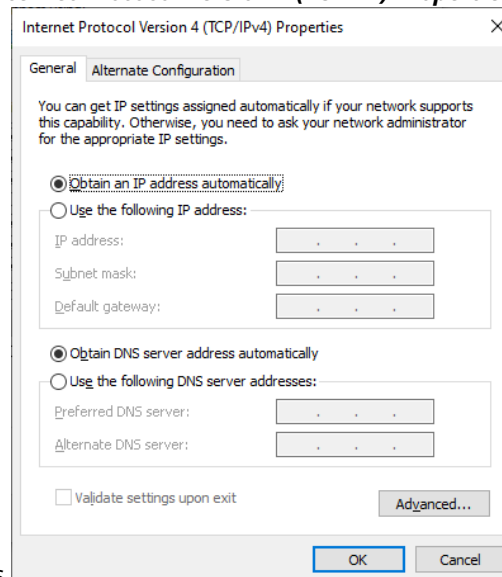
opens.

f) To configure the PC to accept IP addresses issued from the GC, select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** radio buttons.

g) Click **OK** to save the changes and to close the **Internet Protocol Version 4 (TCP/IP) Properties** dialog.

h) Click **OK** to close the **Local Area Connection Properties** screen.

i) Return to the **Network Connections** screen and confirm that the appropriate icon's status reads Connected.

5. Connect to the GC.

    a) Do one of the following:

- Open the *GC Directory* screen and click **Insert** to create a new GC entry with an IP address of `192.168.135.100`.

- Select an existing GC entry for direct DHCP connection. Click **Ethernet 1** to open the *Ethernet 1 Connection Properties* screen. Edit the IP address to `192.168.135.100`.

    b) Close the *GC Directory* screen.

    c) In Rosemount MON2020, go to **Chromatograph → Connect**.

    d) On the *Connect to GC* screen, click the **Ethernet 1** button next to the appropriate entry for direct DHCP connection.

Postrequisites

If the icon still reads Disconnected refer to [Troubleshoot DHCP connectivity](#).

> **NOTICE**
>
> If you power cycle the GC, you will lose connectivity.

3.1.2   Connect directly to a personal computer (PC) using the gas chromatograph's (GC's) serial port

The GC's serial port at **J23** on the backplane allows a PC with the same type of port to connect directly to the GC. This is a useful feature for a GC that is located in an area without Internet access; all that is needed is a PC running a Microsoft® Windows operating system and a serial cable.

Procedure

1. Install the Daniel Direct Connect modem driver onto the PC:

    a) Navigate to **Start → Control Panel** and double-click the **Phones and Modem Options** icon.
The *Phones and Modem Options* dialog opens.

    b) Select the *Modem* tab and click **Add**.
The *Add Hardware* wizard appears.

    c) Select the **Don't detect my modem; I will select it from a list** check box and then click **Next**.

    d) Click **Have Disk**.
The *Install from Disk* dialog opens.

    e) Click **Browse**.
The *Browse* dialog opens.

    f) Navigate to the Rosemount MON2020 install directory (typically *C:\Program Files (x86)\Emerson Process Management\MON2020* if you have 64 bit Windows or *C:\Program Files \Emerson Process Management\MON2020* if you have 32 bit Windows) and select *Daniel Direct Connection.inf*.

    g) Click **Open**.
You are returned to the *Install from Disk* dialog.

    h) Click **OK.**

You are returned to the *Add Hardware* wizard.

i) Click **Next**.

j) Select an available serial port and click **Next**.
The *Hardware Installation* dialog opens.

k) Click **Continue Anyway**.
After the modem driver is installed, you will be returned to the *Add Hardware* wizard.

l) Click **Finish**.
You are returned to the *Phones and Modems* dialog. The Daniel Direct Connect modem should be listed in the *Modem* column.

2. Start Rosemount MON2020 to create a GC connection for the Daniel Direct Connection modem:

a) Go to **File → GC Directory**.
The *GC Directory* dialog opens.

b) Go to **File → Add**.
A new row is added to the bottom of the table.

c) Select the New GC text and type in a new name for the GC connection.

Note
You can enter additional helpful information about the connection in the Short Desc field.

---

d) Select the new GC's **Direct** check box. Click the **Direct** button located at the bottom of the GC Directory window.
The *Direct Connection Properties* window opens.

e) Select **Daniel Direct Connection (COMn)** from the *Port* drop-down list.

Note
The letter *n* stands for the COM number.

---

f) Select **57600** from the Baud Rate drop-down list.

g) Click **OK** to save the settings.
You are returned to the *GC Directory* dialog.

h) Click **OK** to save the new GC connection and to close the *GC Directory* dialog.

3. Connect one end of a direct connect cable to the GC's serial port at **J23** on the backplane.

4. Connect the other end of the direct connect cable to the PC's corresponding serial port.

5. Go to **Chromatograph → Connect**.
The *Connect to GC* dialog opens.

6. Click **Direct** to connect to the GC using the serial cable connection.

3.2   Use the Chromatogram Viewer

Use the *Chromatogram Viewer* to display and print live, archived, or saved chromatograms.

There is no limit to the number of archived and saved chromatograms that can be displayed at once; however, to maximize performance, Emerson recommends limiting the number of chromatograms displayed to 25 or less. The *Chromatogram Viewer* can display all three types of chromatograms together, alone, or in any combination.

The *Chromatogram Viewer* contains a host of information about both current and past gas chromatograph (GC) analyses and many ways of editing and manipulating that data.

Procedure

Go to **Chromatograph → Chromatogram Viewer**.

3.2.1   Data displayed in the chromatogram window

Figure 3-3: Chromatogram Window
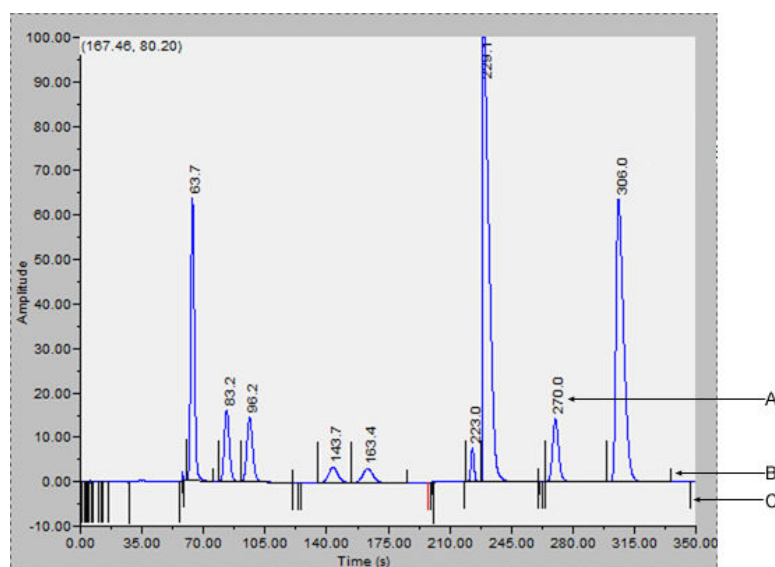
A. *Retention time*
B. *Peak detection marker*
C. *Timed event marker*

The following elements are displayed in the chromatogram window:

Chromatogram	A trace is the graphical representation of the detector output from a single detector; a chromatogram is the collection of all traces and associated data that are generated by a gas chromatograph's (GC's) detector or detectors. Each trace displays in a different color.
Retention times	The retention time, which displays above each component's peak, is the time that elapses between the start of an analysis and the sensing of the maximum concentration of that component by the detector.
Baselines	The baseline extends from the beginning to the end of a peak. Click **Baselines** to turn the baseline on or off.

Timed event markers	These markers, which correspond to events from the **Timed Events** table, display on the chromatogram as black vertical lines below the trace-line. There are three types of timed event markers:

- Valve events display as long vertical lines.

- Integration events display as medium vertical lines.

- Spectrum gain events display as short vertical lines.

Peak detection markers	These markers display on the chromatogram as black vertical lines above the trace-line. Each peak has two peak detection markers: one at its beginning and one at its end.

3.2.2 Display a live chromatogram

Procedure

1. Connect to the gas chromatograph (GC).
2. Select **Chromatogram Viewer...** from the **Chromatograph** menu.

   Note
   Another way to display the **Chromatogram Viewer** is to click 📊, which is located on the Tool bar.

   ---

3. From the **Chromatogram Viewer** window, select the **View current CGM** check box.
4. If the GC has multiple clocks, select which clock/analysis chromatogram you would like to view.
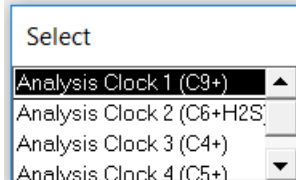
3.2.3 Display an archived chromatogram

Archived chromatograms are stored on the gas chromatograph (GC), so you must be logged in to access them.

Archived chromatograms are sorted and displayed on four tabbed panes:

Chromatograms	This view displays the last five runs for each stream by default. Click **All** to display all the files that are stored on the GC and sorted by time.
Protected chromatograms	Protected chromatograms are never deleted from the GC. To protect a chromatogram, see Protect chromatograms.

Note

Protected chromatogram files have a *lock* icon (🔒) displayed beside them.

Final calibration chromatograms	As long as there is space, Rosemount MON2020 stores all final calibration chromatograms; once space runs out,the software deletes the oldest non-protected final calibration chromatogram for each new final calibration chromatogram that is created. If multiple final

calibration chromatograms are created on the same day, the last chromatogram created is archived, unless you have configured the software to archive all final calibration chromatograms.

> **Note**
> See Managing the system to learn how to configure the software's archiving behavior.

Final validation chromatograms

These chromatograms are treated in the same manner as final calibration chromatogram files.

To view one or more archived chromatograms, do the following:

Procedure

1. From the *Chromatograph* menu, select **Chromatogram Viewer**.

2. Click **GC Archive**.
   The *Select archive file(s)* window appears. Click the appropriate column header to sort the files by date, stream name, analysis type, time, or stream number. By default, they are sorted by date, with the newest file listed first.

   > **Note**
   > By default, only recent chromatograms (that is, the last five runs for each stream) are displayed. To view all archived chromatograms, click **All**. To return to viewing only recent chromatograms, click **Recent**.

3. Select one or more archive files by clicking them.

   Use the **Shift** and **Ctrl** keys to make multiple selections.

   > **Note**
   > To save the selected files to the personal computer (PC) without displaying them first, select the **Download and save selected chromatograms** check box and click **Download && Save**.

4. Click **Download && Show**.
   The *Select* window displays for each chromatogram that contains data from more than one detector.

   Figure 3-4: The Select window
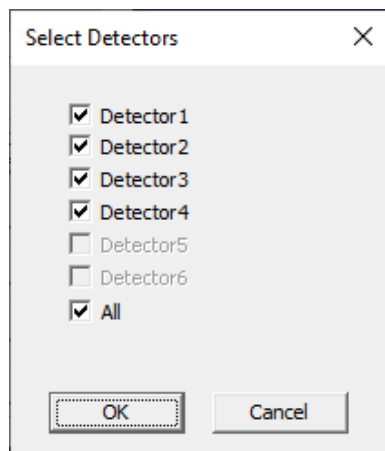
5. For each chromatogram, double-click **Detector 1**, **Detector 2**, or **Both** from the *Select* window.

Rosemount MON2020 plots the archived chromatogram(s) and the corresponding data displays in the *Timed Event* and *Component Data* tables.

3.2.4   Protect chromatograms

By default, archived chromatograms are not saved indefinitely. Once the gas chromatograph's (GC's) storage capacity for archived chromatograms has been reached, the software deletes the oldest archived chromatograms to make room for the newest archived chromatograms.

If you have a chromatogram that you would like to preserve, it is possible to protect it. The software does not delete protected chromatograms to accommodate newer chromatograms. Rosemount MON2020 can save up to 100 protected chromatograms.

Note

Protected chromatograms have a lock icon ( ) displayed beside them.

Note
To protect an archived chromatogram, you must be logged in as a supervisor or administrator.

Procedure

1. Click **GC Archive**.
    The *Select Archive File(s)* dialog appears. You can sort chromatograms by date, stream name, analysis type, time, or stream number by clicking the appropriate column header. By default, they are sorted by date, with the newest chromatogram listed first.

    Note
    By default, only recent chromatograms (that is, the last five runs for each stream) are displayed. To view all archived chromatograms, click **All**. To return to viewing only recent chromatograms, click **Recent**.

2. Select the *Chromatogram* tab and then select the appropriate archived chromatogram by clicking it. Use the **Shift** and **Ctrl** keys to make multiple selections.
3. Click **Protect**.
    The *Edit Description* dialog displays.
4. Enter any information that you would like to have associated with the chromatogram and then click **OK**.

Rosemount MON2020 places a lock icon ( ) beside the selected chromatogram to verify its protected status. You can also click on the *Protected Chromatograms* tab to view your newly protected archived chromatogram.

3.2.5   Display a saved chromatogram

To view a chromatogram that was saved to the personal computer (PC):

Procedure

1. Click **PC File**.
   The **Open** dialog appears.

2. Navigate to the desired *.xcgm* file or *.xcmp* comparison file and select it.

   To make multiple selections, use the **Shift** or **Ctrl** key.

3. Click **OK**.
   The **Select Detectors** window displays for each chromatogram that contains data for more than one detector.

Figure 3-5: Select Detectors Window
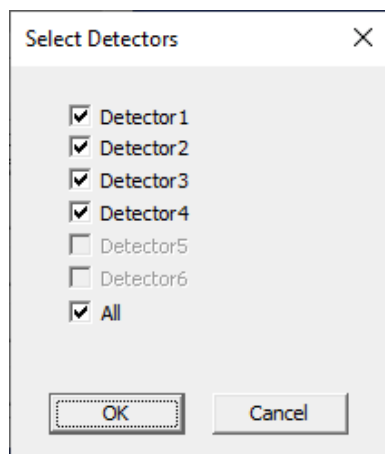
4. For each chromatogram, double-click the detector from the **Select Detectors** window.

Rosemount MON2020 plots the archived chromatogram(s) and the corresponding data displays in the **Timed Event** and **Component Data** tables.

3.3   Options for displaying chromatograms

Right-click the chromatogram to bring up the following commands:

Command name	Shortcut	Description
Zoom in	**Ctrl** + "**+**" (NUMPAD)	Zooms in on the entire chromatogram. **Note** You can also zoom in by clicking and dragging your mouse to select the region of the chromatogram that you want to zoom in on.
Zoom out	**Ctrl** + "**-**" (NUMPAD)	Zooms out from the entire chromatogram.
Zoom X in	**6** (NUMPAD)	Zooms in on the X axis.
Zoom X out	**4** (NUMPAD)	Zooms out from the X axis.
Zoom Y in	**8** (NUMPAD)	Zooms in on the Y axis.

Command name	Shortcut	Description
Zoom out	**2** (NUMPAD)	Zooms out from the Y axis.
Save state	**Ctrl + Home**	Saves current or archived display settings for the selected chromatogram. **Note** The Save State function is available only when viewing a live or archived chromatogram.
Restore state	**Home**	Restores the last saved display settings for the selected chromatogram. **Note** Press **Home** to return to the saved state.
Toggle full screen	**F11**	Toggles the display of the ***Chromatogram Viewer***'s tables and buttons and maximizes the Chromatogram window.
Cursor to nearest point	**F8**	Snaps the cursor to the nearest point on the chromatogram in both the X and Y directions.
Toggle coarse/fine cursor	**F4**	Toggles the cursor from coarse and less accurate to fine and more accurate.
Toggle lines/dots.	**F9**	Toggles the chromatograms from lines to dots or dots to lines.
Toggle mouse position tip	**Ctrl** + **F4**	The chromatogram's cursor follows the movement of the mouse while a hovering tool tip displays the exact coordinates of the current point.
Toggle nearest point tip	**Ctrl+F9**	The chromatogram's cursor follows the movement of the mouse cursor.
Print	**Ctrl+P**	Prints the chromatogram.
Copy to clipboard	**Ctrl+C**	Copies from the chromatogram the raw detector data that was used to plot the selected chromatogram. You can paste this data into another application such as Microsoft™ Word or Excel.
Paste from clipboard	**Ctrl+V**	Plots a range of points copied from another application such as Microsoft Word or Excel.

3.4 Configuring a chromatogram's appearance

Rosemount MON2020 allows you to change the appearance of many of the chromatogram's elements, such as its X axis and Y axis values, the color of the chromatogram's background, and the display status of its labels.

3.4.1 Use the Graph bar

Use the Graph bar buttons to change the display parameters of the chromatogram.

Procedure

1. Click **Edit** from the Graph bar.
   The ***Edit Scales*** window displays.

   The following table lists the parameters that can be edited:

Command	Description	Default value
X Min	Sets the minimum value, in seconds, for the X axis.	0
X Max	Sets the maximum value, in seconds, for the X axis. This value is determined by the ***Timed Events*** table.	100

Command	Description	Default value
Y Min	Sets the minimum value for the Y axis.	-10
Y Max	Sets the maximum value for the Y axis.	100
Print Speed	Sets the number of inches per second for the X-axis while printing a chromatogram, similar to an XY plotter.	0
X Intervals	Sets the number of intervals to be displayed on the graph for the X axis.	10
Y Intervals	Sets the number of intervals to be displayed on the graph for the Y axis.	11
Display Option	Determines whether the chromatograph is displayed as a solid line or as a dotted line.	Lines
Show labels	Toggles the display of the graph labels.	Checked
Scroll newest X	Determines whether the graph's window moves to focus on the most recent data point along the X xis. **This feature only applies to live chromatograms.**	Unchecked

Figure 3-6: A Chromatogram
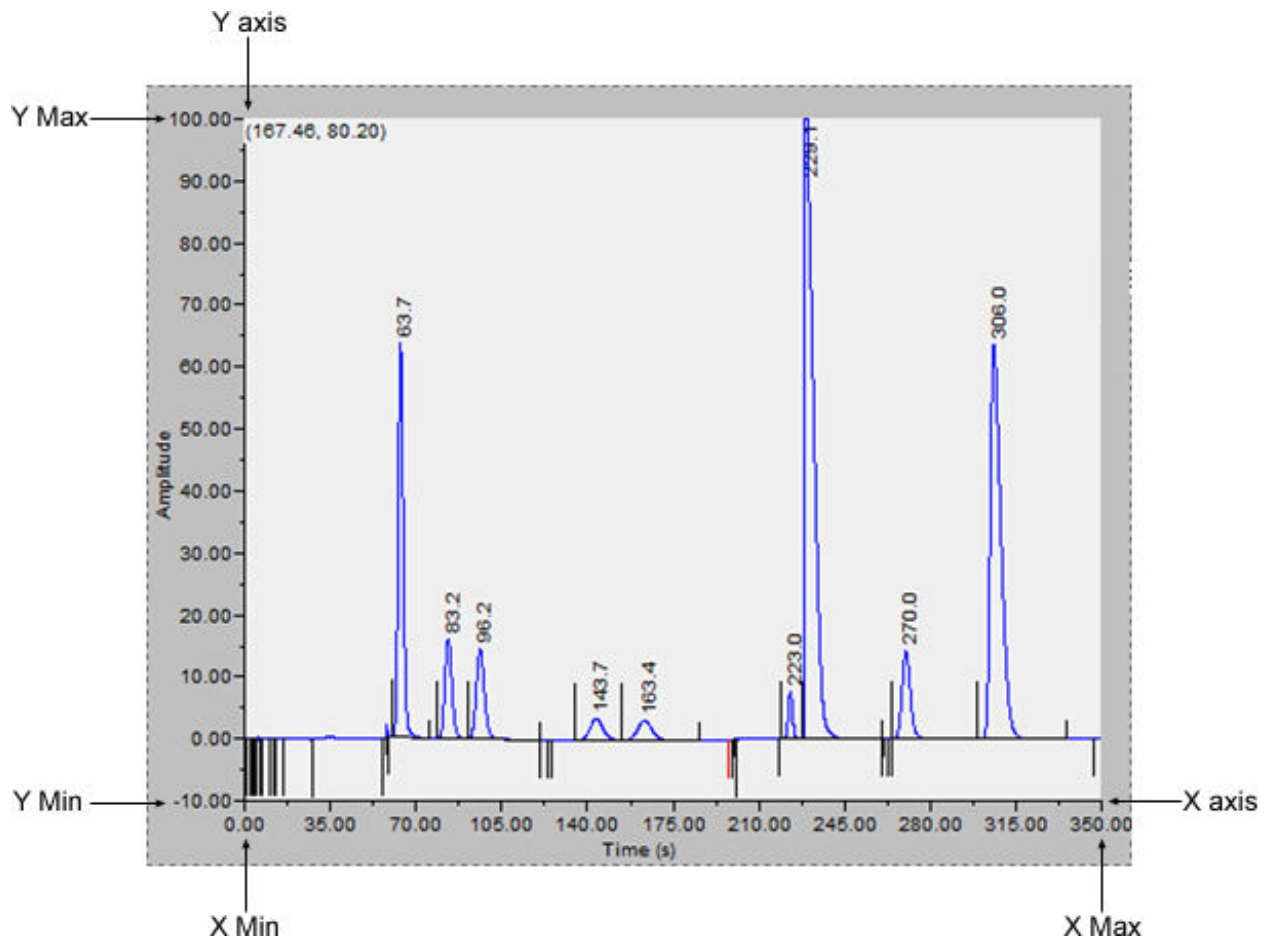
2. To see how your changes affect the graph, click **Apply**.

3. To accept your changes, click **OK**.

- Click **Cursor** to toggle the cursor size from coarse movement (less accurate) to fine movement (more accurate).

- Click **Print** to print the chromatogram window.

3.4.2 Additional plot commands

In addition to the Graph bar, there are a few other commands available that allow you to manipulate the look and feel of the chromatogram.

To access the additional plot commands menu, right-click the ***Chromatogram Viewer*** anywhere except on the chromatogram or the ***Timed Events*** and ***Component Data*** tables. The additional commands are:

Set Plot Area Color	Changes the color of the chromatogram's background. This may be necessary to make the chromatogram more visible. The default RGB color values are 236, 233, and 216.
Auto Re-size Series	Scales down the X-axis and the Y-axis to fit the entire chromatogram into the window.
Show Mini Plot	Toggles the display of a smaller version of the chromatogram in a separate, smaller, and re-sizable window. This allows you to keep an overview of the entire chromatogram at all times, especially when zoomed in.
	This window automatically displays whenever you zoom in on the original chromatogram.
Rearrange Series	Re-sizes and offsets two or more traces so that they can both be fully displayed on the graph. To offset a trace means to raise its Y axis relative to the Y axis of the previous trace so that one trace is not drawn over the other but instead one trace is drawn above the other.
Trace Offset Settings	Indicates the amount of offset between two or more traces. To offset a trace means to raise its Y-axis relative to the Y-axis of the previous trace so that one trace is not drawn over the other but instead one trace is drawn above the other.
	If two detectors are in use, each set of traces can be offset independently, that is, the traces for one detector can be offset relative to each other, but independent of the traces from the second detector.

3.5 Change how a chromatogram displays

Figure 3-7: The Chromatogram bar
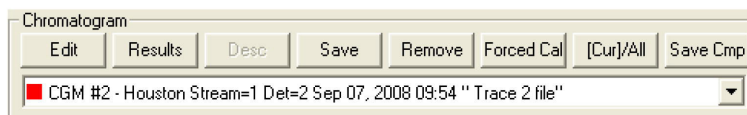
The **Chromatogram** bar contains a row of buttons that allows you to manipulate a single chromatogram. Below the row of buttons is the **Chromatogram** bar's dropdown list, which contains a list of all of the currently displayed chromatograms/traces. Before you can work with a chromatogram you must first select it from the dropdown list.

3.5.1 Edit a chromatogram trace

You can use the Edit function to change the X and Y offset values for a trace, as well as its color. These changes may be necessary to make the trace more distinguishable from those that surround it or to align a trace with a different trace for comparison.

Procedure

1. Select the trace that you want to edit from the **Chromatogram** drop-down list.
2. Click **Edit**.
   The **Edit Chromatogram** dialog appears.

X Offset	Enter a positive number to move the trace to the right or a negative number to move the trace to the left.
Y Offset	Enter a positive number to move the trace up or a negative number to move the trace down.
# points	Number of data points in the trace. This field is read-only.
Color	Assigns a color to the trace.

3. To see how your changes affect the trace, click **Apply**. To accept your changes, click **OK**.

3.5.2 Display chromatogram results

To display a table of calculation results for a chromatogram, do the following:

Procedure

1. From the **Chromatogram** bar's dropdown list, select the appropriate trace.
2. Click **Results**.
   A window appears displaying the calculation results for the selected trace.

- Click **Save** to save these results in one of the following formats: tab-delimited (.txt), comma-delimited (.csv), Microsoft Excel (.xls), HTM (.htm), or XML (.xml).

- Click **Clipboard** to copy the data to the Windows® clipboard, where it can be pasted into another document.

- Click **Print** to print a tab-delimited version of the results.

3.5.3   Save a chromatogram

To save a chromatogram, do the following:

Procedure

1. From the **Chromatogram** bar's dropdown list, select the trace that you want to save.
2. Click **Save**.

   The **Save As** window displays.

   For convenience the file is given an auto-generated file name that includes the trace's creation date and time; however, you can give the file any name that you choose.

3. Click **Save**.

3.5.4   Remove a chromatogram from the Chromatogram Viewer

To remove a live trace from the chromatogram window, do one of the following:

- If you want to remove all live traces, click the **View current CGM** checkbox to uncheck it.
- If you want to remove a single live trace, click the appropriate detector checkbox beside the **View current CGM** checkbox.

To remove a saved or an archived chromatogram from the chromatogram window and to close the file, do the following:

Procedure

1. From the **Chromatogram** bar'sdropdown list, select the trace that you want to remove.
2. Click **Remove**.

3.5.5   Initiate a forced calibration

The Forced Cal command uses an archived chromatogram's raw data to calibrate the GC. The calculation results are stored in the component data table for the corresponding stream.

A major benefit of a forced calibration is increased efficiency. Using a **previously validated** chromatogram removes the necessity for the GC to perform a calibration and a validation before performing an analysis.

To perform a forced calibration, do the following:

Procedure

1. From the **Chromatogram** bar's dropdown list, select the trace that you want to use to calibrate the GC.

2. Click **Forced Cal**.

3.5.6   Chromatogram Viewer tables

Rosemount MON2020 can display two levels of information in the ***Chromatogram Viewer***'s timed events and component data tables:

• All timed events and all components for all open chromatograms.

• Timed events and components for the currently selected chromatogram.

By default, the two tables show only the timed events and components for the currently selected chromatogram.

Figure 3-8: Timed events and Component Data Tables Showing Data for a Currently Selected Trace

Figure 3-9: Timed Events and Component Data Tables Showing Data for All Open Traces

CGM#	Event Type	Vlv/Det	Value	Time (s)
1	gain	1	3	0.0
1	gain	1	3	0.0
1	Valve #	2 - Valve 2	On	0.0
2	Inhibit	2	On	0.0
1	Inhibit	1	On	0.0
2	Slope Sens	2	10	2.0
1	Valve #	3 - Valve 3	On	2.0
1	Slope Sens	1	20	3.0

CGM#	Component	Det	Time (s)
1	Propane	1	45.8
1	i-Butane	1	61.3
1	n-Butane	1	71.7
1	Neopentane	1	79.0
1	i-Pentane	1	109.8
1	n-Pentane	1	125.6
1	Nitrogen	1	148.2

Note

The brackets ([ ]) on the **Cur/All** button indicate which mode is being displayed in the tables.

Procedure

1. To view the data for a different chromatogram, select the trace from the *Chromatogram* bar's drop-down list.

2. To view all timed events and all components for all open chromatograms, click **Cur/All**.

3. To toggle back to viewing only the timed events and components for the currently selected chromatogram, click **Cur/All** again.

3.5.7   Open a comparison file

A comparison file contains two or more chromatograms and their associated data. To open a comparison file, do the following:

Procedure

1. Click **PC File**. The *Open* dialog displays.

2. Select **XA CMP Files (*.xcmp)** from the **Files of type** dropdown list.

3. Navigate to the folder that contains the comparison file that you want to open and select the file.

4. Click **Open**.

3.5.8   Save a comparison file

A comparison file allows you to save your current view, including all open chromatograms, for later review and reuse. To save a comparison file, do the following:

Procedure

1. Click **Save Cmp**.
   The *Save As* dialog appears.

2. Navigate to the folder in which you want to save the file.

   Note
   For convenience the file is given an auto-generated file name that includes the current date and time; however, you can give the file any name that you choose.

3. Click **Save**.

3.6   Miscellaneous commands

The series of check boxes to the right of the graph have the following functions:

Figure 3-10: Miscellaneous options

Keep last CGM	When viewing a live chromatogram, upon starting a new run, Rosemount MON2020 keeps the most recently completed chromatogram on the graph for comparative purposes.
Print at end of run	Prints the chromatogram to the PC's default printer at the end of the run and is unchecked by default.
Save at end of run	Saves the chromatogram to the gas chromatograph's (GC's) *Data* folder at the end of the run and is unchecked by default.
Show bunched data	If this box is unchecked, then all of the raw data points are plotted to the chromatogram window; if this box is checked, which is the default option, then each point plotted on the graph represents the average of a group of raw data values. The size of the data group is determined by the peak width value listed in the *Timed Events* table.

3.6.1   The Chromatogram Viewer's Timed Events table

The *Chromatogram Viewer* displays a compact version of the Timed Events table, located on the upper right side of the window. The events displayed in the table are sorted by time. See View and edit Timed Events tables for more information.

The Timed Event table displays the following data for each event:

Event Type	The type of timed event. These events are mapped to the Time Events window and include Valve, Integration, and Gain events.
Vlv/Det	Identifies which valve or detector is involved in the event.
Value	Setting of the event; for example, a valve was turned ON, or the gain was set to **4**.
Time (s)	The number of seconds into the cycle that the event occurred or will occur.

Timed events from live or archived chromatograms can be edited from the Chromatogram Viewer by double-clicking on the Timed Events table. The changes will affect the next analysis run. The following commands are available by right-clicking on the table:

Auto Scroll	When checked, if a live trace has been selected from the Chromatogram bar's pull-down menu, the Timed Event table will keep its focus on the event closest in time by highlighting that event in dark blue.
Save Sheet	Allows you to save the table to the PC in one of the following formats: TXT, CSV, XLS, HTM, or XML.
Copy to Clipboard	Allows you to copy the table to the clipboard. This data can be pasted into another application such as Microsoft Word or Microsoft Excel.
Print Sheet	Allows you to print the table to your default printer.

3.6.2   Launch the Timed Events table from the Chromatogram Viewer

To launch the *Timed Events* dialog directly, right-click on the *Chromatogram Viewer's* **Timed Events** table and select **Edit Timed Events Table**. The *Timed Events* dialog displays. See View and edit Timed Events tables for more information.

3.6.3   Edit timed events from the Chromatogram Viewer

To edit timed events from the *Chromatogram Viewer*, do the following:

Procedure

1. From the **Chromatogram** bar's dropdown list, select the chromatogram whose timed events you want to edit.

2. Right-click the **Timed Events** table and select **Edit** or double click the `Timed Events` table.
   The cells that can be edited turn white.

3. Edit the appropriate event.

4. Right-click on the Timed Events table and select **Save Changes**.
   The data are saved, and the table's cells turn blue, indicating that they are read-only. The changes will affect the next analysis run.

   Note
   To return to the Timed Events table *without* saving your changes, select **Discard Changes**.

3.6.4 Use the Chromatogram Viewer's cursor to update a Timed Event

Figure 3-11: Chromatogram cursor
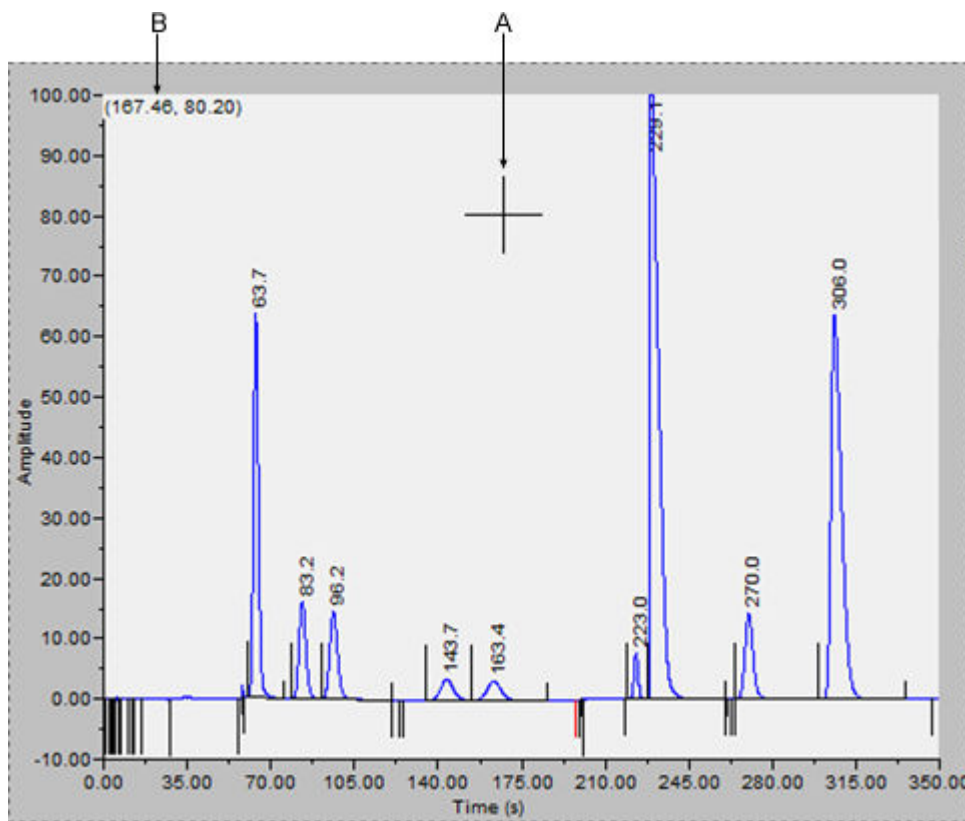
The *Chromatogram Viewer's* cursor (A) can be dragged to any point on the graph, or it can be relocated by double-clicking within the boundaries of the graph.

As the cursor moves across the chromatogram, the **Timed Events** table automatically scrolls to the event that corresponds to the cursor's coordinates. The cursor's coordinates (B) display in the upper left corner of the graph.

The cursor can be useful if you want to change a timed event based on the data displayed by the chromatogram.

To update a timed event based on the location of the *Chromatogram Viewer's* cursor, do the following:

Procedure

1. Select the live or archived trace that you want to use as the source for changing the timed event.

2. Drag the cursor to the desired location.

   You can track the cursor's location by watching the coordinates that display in the upper left corner (B). The X-coordinate represents the analysis time in seconds. When you see the desired time displayed, stop dragging the cursor.

   Note

   To toggle the cursor's size between coarse movement (less accurate) and fine movement (more accurate), click the **Cursor** button on the **Graph** bar.

3. Go to the **Time Events** table and right-click on the appropriate event.

4. Select **Update Time from Cursor**.
   The event's time will be changed to match the cursor's time (X-coordinate).

5. To save your changes, right-click the **Timed Events** table and select **Save Changes**.
   The changes will affect the next analysis run.

   Note

   To return to the **Timed Events** table without saving your changes, select **Discard Changes**.

3.6.5 The Chromatogram Viewer's Component Data table

The *Chromatogram Viewer* displays a compact version of the **Component Data** table beneath the **Timed Events** table. See [View and edit Component Data tables](#) for more information.

The **Component Data** table displays the following data for each component:

Component	The name of the component.
Det	Identifies the detector associated with the component.
Time (s)	The retention time for the component.

Retention times for components from live or archived chromatograms can be edited from the *Chromatogram Viewer* by double-clicking on the Component Data table. The changes will affect the next analysis run. The following commands are available by right-clicking on the table:

Auto Scroll	When checked, if a live trace has been selected from the **Chromatogram** bar's dropdown list, the **Component Data** table keeps its focus on the component closest in time by highlighting it in dark blue.
Save Sheet	Allows you to save the table to the PC in one of the following formats: .txt, .csv, .xls, .htm, or .xml.
Copy to Clipboard	Allows you to copy the table to the clipboard . This data can be pasted into another application such as Microsoft Word or Microsoft Excel.
Print Sheet	Allows you to print the table.

3.6.6   Edit retention times from the Chromatogram Viewer

To edit the retention time for a component, do the following:

Procedure

1. Double-click the **Component Data** table or right-click the table and select **Edit Retention Times**.
   The **Ret Time** column turns white, indicating that its cells are editable.

2. Click the appropriate cell for the component that you want edit, and enter a new retention time, in seconds. The value must be less than the analysis time.

3. To save your changes, right-click on the table and select **Save Changes**.
   The changes affect the next analysis run.

   Note

   To return to the **Component Data** table without saving your changes, select **Discard Changes**.

3.6.7   Display raw data from the Chromatogram Viewer

Use the **Raw Data** button to display the **Raw Data** table for the selected trace.

Procedure

1. Use the **Chromatogram** bar's pull-down menu to select a specific trace.

   Note

   Even though you are selecting a *trace*, the data that is displayed will be for the *chromatogram*, which may include more than one trace.

2. Click **Raw Data**.
   The *Raw Data* window displays and shows the raw data for the selected chromatogram. The following data displays for each peak from the trace:

No.	Numerical identifier for the peak, listed by the order of discovery.
Ret Time	Time, in seconds, that the component eluted.
Peak Area	The area under the peak.
Peak Height	The maximum height of the peak.
Det	The detector associated with the peak.
Method	Method of peak end detection. Options are: • 1 (Baseline) • 2 (Fused Peak) • 3 (Last Fused Peak) • 4 (Tangent Skim) • 100 (Inhibit) • 300 (Forced Integration) • 500 (Summation)
Baseline Start	The raw detector counts at the start of an integration.
Baseline End	The raw detector counts at the end of an integration.
Integ. Start	Time, in seconds, when integration started.
Integ. Stop	Time, in seconds, when integration stopped.
Peak Width Half Height	The width of the peak taken at half of the peak's height.
Partial Peak	If Yes, then the Partial Peak value is used in the summation calculation; if No, then the Partial Peak value is not used in the summation calculation.

3.7 Set the gas chromatograph's (GC's) date and time

When Rosemount MON2020 connects to a GC the **Status** bar displays the GC's date and time.

Note
The date and time displayed for the GC may be different from your date and time, depending on the physical location of the GC.

To set the GC's date and time:

Procedure

1. Go to **Chromatograph → View/Set Date Time...**.
   The **View/Set Date Time** window displays.
2. Use the drop-down menus to set the date and time.

3. Click **OK**.

Related information

[Set Daylight Savings](#)

3.7.1 Set Daylight Savings

Daylight Savings Time is the practice of temporarily advancing clocks so that afternoons have more daylight and mornings have less. Typically clocks are adjusted forward one hour near the start of spring and are adjusted backward in autumn. Since the use of Daylight Savings Time is not universal, you have the option of enabling or disabling it in Rosemount MON2020.

To configure Rosemount MON2020 to use Daylight Savings Time, do the following:

Procedure

1. Go to **Chromatograph → View/Set Date Time...**.
   The *View/Set Date Time* window displays.

   Note
   Make sure the GC is set to the current date and time before enabling the Daylight Savings feature.

2. Click the **Enable Daylight Savings** check box.
   The *Daylight Savings* section will be enabled, giving you the following two options for setting the start and end times for Daylight Savings:

Week format	You can specify on which week day, of what week, and of what month Daylight Savings Time to start and end.
Month/Day format	You can specify the exact day of the month and the month number for which you want Daylight Savings Time to start and end.

   Note
   These formats can be used interchangeably; for example, the Week format can be used to specify the start date, and the Month/Day format can be used to specify the end date.

Figure 3-12: Daylight Savings Options
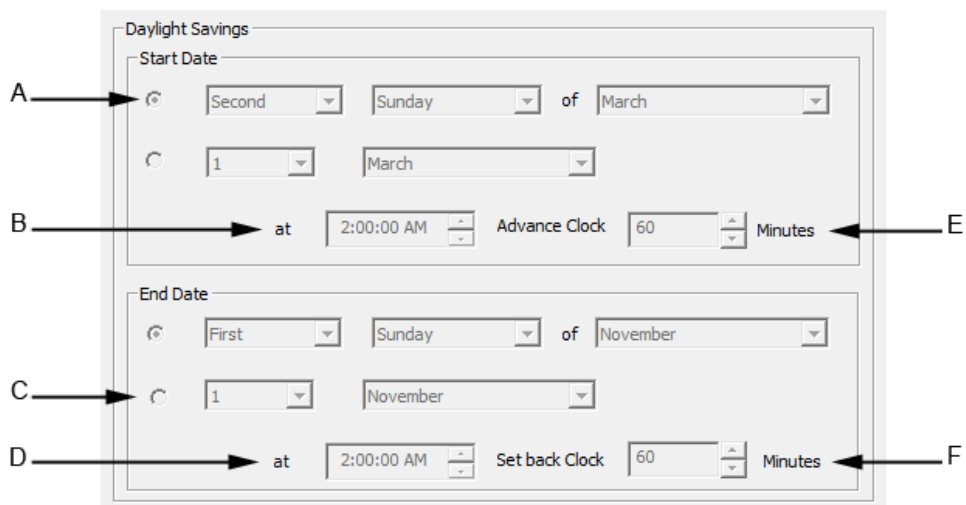
A. Week format
B. Start time
C. Month/day format
D. End time
E. Advance time
F. Set back time

3. Set the start date for Daylight Savings Time.

4. Set the start time and the advance time.

5. Set the end date for Daylight Savings Time.

6. Set the end time and the setback time.

7. Click **OK** to implement your changes and close the *View/Set Date Time* window.

Note
To implement your changes without closing the *View/Set Date Time* window, click
Save.

Note
Daylight Savings Time should be configured each time the feature is enabled;
thereafter, each year Rosemount MON2020 will automatically compute the start and
end times based on the initial configuration.

4   Hardware menu

To manage the gas chromatograph's (GC's) hardware components, click **Hardware** on the Menu bar.

4.1   Heater configuration

From the **Heaters** window, you can:

- Name each heater.

- Monitor the heaters' performance.

- Set a target temperature.

4.1.1   Heaters screen

With this feature, you can a set a heater's desired temperature or fix its power output.

To edit a heater's settings, go to **Hardware** → **Heaters**. This opens the **Heaters** screen. You can set a heater's desired temperature or fix its power output.

Figure 4-1: Heaters screen

The **Heaters** screen displays the following information:

Label	The descriptive name for the heater. This name must be unique; two heaters cannot share the same label. The heaters are labeled Heater 1 through Heater N by default, where *N* equals the total number of heaters available to the gas chromatograph (GC).
Switch	Each heater can be set to one of the following modes:

Auto	Allows you to set the desired temperature for the heater.
Fixed On	Allows you to set the power output for the heater regardless of the temperature.
Not Used	Removes the heater from service.

Setpoint	The target temperature for the heater, in degrees Celsius. Only applies if the heater is switched to Auto. Valid values fall between 20 and 500.
Allowed Dev	Allowed percentage of deviation from the setpoint.
PID Gain	Valid values fall between 0 and 500.
PID Integral	Valid values fall between 0 and 500.

PID Derivative	Valid values fall between 0 and 50000.
Fixed PWM Output	The target percentage of the GC's power output to be directed to the heater. Only applies if the heater is switched to Fixed On. Valid values fall between 0 and 100.
Ignore Warm Start	Excludes a heater from the warm start process. A warm start occurs when the GC restarts after having been shut down during an auto sequence analysis run. The GC will activate the heaters and wait until they reach their set points and the temperature stabilizes; the GC will then resume the auto sequence run.
Heater Type	Can be set to DC or AC.
Temperature	Current temperature of the heater.
Current PWM	Current percentage of the GC's power output being used by the heater.
Status	Current operational state of the heater.

OK	The heater's control card is installed and is working correctly.
Not Installed	The heater's control card is not installed.
Out of Range	The heater is running and is in the process of reaching its temperature set point.
Error	The GC cannot communicate with the heater.
Not Configured	The operator has not yet configured the heater.

4.1.2   Set the temperature of the gas chromatograph's heaters

Procedure

1. Go to **Hardware → Heaters...**

2. Use the *Switch* drop-down list to select each heater and set it to one of the following modes:

Auto	Allows you to set the desired temperature for the heater.
Fixed On	Allows you to set the power output for the heater without regard to temperature.
Not Used	Removes the heater from service.

4.1.3 Rename a heater

To assign an identifying label to a heater:

Procedure

1. Go to **Hardware → Heaters...**.
   The *Heaters* window displays.

2. Double-click on the appropriate row under the Label column for the heater that you want to name.

3. Type in a descriptive name for the heater.

   This name must be unique; two heaters cannot share the same label.

4. Click **OK**.

4.1.4 Set a heater's voltage type

Procedure

1. Go to **Hardware → Heaters...**.

2. Click on the appropriate Heater Type cell and select AC or DC from the drop-down list.

3. Click **OK** to save the changes and close the window.

   Note
   To save the changes without closing the window, click **Save**.

4.1.5 Monitor the a heater's temperature

Procedure

Go to **Hardware → Heaters...**.

The current temperature of each heater displays under the Temperature column and updates in real time. The percentage of the gas chromatograph's power output that is being used by each heater displays under the Current PWM column.

4.1.6 Monitor a heater's operational status

Procedure

Go to **Hardware → Heaters...**.

The status of each heater displays under the Status column. There are four possible statuses:

OK	The heater's control card is installed and is working correctly.
Not Installed	The heater's control card is not installed.
Out of Range	The heater is running and is in the process of reaching its temperature set point.
Error	The gas chromatograph (GC) cannot communicate with the heater.
Not Configured	The operator has not yet configured the heater.

4.1.7 Set the desired temperature

Procedure

1. Go to **Hardware → Heaters...**.
   The *Heaters* window displays.

2. For each heater that you want to set, select **Hardware → Heaters → Auto** from the drop-down menu from the appropriate row under the Switch column.

3. For each heater that you want to set, double-click on the appropriate row under the Setpoint column, and enter the desired temperature, in degrees Celsius.

   You can enter a value between 20 and 500.

   Note

   Heaters 1 and 2 should never exceed 302 °F (150 °C).

4. To exclude a heater from the warm start process, select its **Ignore Warm Start** check box.

   Note

   A warm start occurs when the gas chromatograph (GC) restarts after having been shut down during an auto sequence analysis run. The GC activates the heaters and waits until they reach their setpoints and the temperature stabilizes; the GC then resumes the auto sequence run.

5. To edit rows under the PID Gain, PID Integral, and PID Derivative columns double-click the desired cell and enter the new value.

   The value ranges for each column is as follows:

PID Gain	0 - 500
PID Integral	0 - 500
PID Derivative	0 - 50,000

   ⚠ CAUTION

   Experienced personnel determined the default settings for these variables.

   Do not deviate from the default settings.

6. Click **OK** to save the changes and close the window.

   Note

   To save the changes and leave the window open so that you can monitor the heaters' statuses, click **Save**. The current temperature of each heater displays in the Temperature column and is updated in real time.

4.1.8 Set pulse-width modulation (PWM) output

Note

PWM is a technique for providing intermediate amounts of electrical power between fully on and fully off.

A heater needs voltage to operate. The amount of voltage that is delivered to a heater can be controlled manually when the heater is set to Fixed On mode. Setting a heater to Fixed On mode can be useful when troubleshooting heater issues.

> ⚠ **CAUTION**

Switching a heater to Fixed on mode removes its ability to maintain a constant temperature, because the power to the heater will not fluctuate based on the temperature setpoint, but will instead remain at the level you set.

Do not use Fixed On mode for general gas chromatograph (GC) operations.

Procedure

1. Go to **Hardware** → **Heaters...**
   The *Heaters* window displays.

2. For each heater that you want to set, select **Fixed On** from the appropriate row under the Switch column.

3. For each heater that you want to set, double-click on the appropriate row under the Fixed PWM Output column, and enter the desired percentage of output.

   You can enter a decimal value between 0 and 100.

4. Click **OK** to save the changes and close the window, .

   Note
   To save the changes and leave the window open so that you can monitor the heaters' statuses, click **Save**. The current temperature of each heater displays in the Temperature column and is updated in real time.

4.1.9   Take a heater out of service

To remove a heater from service, do the following:

Procedure

1. Select **Heaters...** from the **Hardware** menu.
   The *Heaters* window displays.

2. For each heater that you want to set, select **Not Used** from the appropriate row under the **Switch** column.
   The row turns turquoise, indicating that it is no longer in service.

3. To save the changes and close the window, click **OK**.

   Note
   To save the changes without closing the window, click **Save**.

4.2   Valve configuration

From the *Valves* window, you can:

- Assign identifying labels to each valve.

- Monitor valve operation.

- Control the operation modes for each valve.

4.2.1   Rename a valve

Give each valve a descriptive label to avoid confusing one valve for another. To assign an identifying label, do the following:

Procedure

1. Select **Valves...** from the **Hardware** menu.
   The *Valves* window displays.

2. Double-click on the appropriate row under the *Label* column for the valve that you want to name.

   Note

   The valves are labeled **Valve 1** - **Valve N** by default, where **N** equals the total number of valves available to the GC.

3. Type in a new descriptive name for the valve.

4. Click **OK**.

4.2.2   Set a valve's operational mode

A valve has three operational modes: Auto, On, and Off.

- Set the valve to Off to turn off the valve. The valve remains off until the operational mode is changed.

- Set the valve to Auto to turn the valve On and Off according to the **Timed Events** table.

- Set the valve on to turn the valve On. The valve remains On until the operational mode is changed.

Note
The gas chromatograph's (GC's) switch panel overrides Rosemount MON2020's valve settings.

To set a valve's operational mode, do the following:

Procedure

1. Go to **Hardware → Valves....**
   The **Valves** window displays.

2. Select the desired mode from the drop-down menu under the **Switch** column for the valve.

3. Click **OK** to save the changes and close the window.

   Note
   To save the changes and leave the window open so that you can monitor the valve's progress, click **Save**. The current state of the valve displays in the **State** column, and is updated in real time.

4.2.3   Monitor the operational status of a valve

To check a valve's status, select **Valves...** from the **Hardware** menu.

The status of each valve displays under the **Status** column. There are five possible status readings, and their meanings are as follows:

OK	The valve is installed and is working correctly.
Not Installed	The valve is not installed.
Under/Over Current Error	Unable to switch the solenoid on or off. There is a potential problem with the solenoid.
Error	The Heater/Solenoid board is installed but the GC cannot communicate with it.
Not Configured	The operator has not yet configured the valve.

4.2.4   Invert the polarity of a valve

The **Invert Polarity** option reverses the effect of switching a valve on or off. By default, the **Invert Polarity** option is unchecked. This means that switching the valve to ON activates it, and switching the valve to OFF deactivates it. Checking the **Invert Polarity** box means that switching a valve to ON *deactivates* it, and switching the valve to OFF *activates* it.

To set the polarity of a valve, do the following:

Procedure

1. Select **Valves...** from the **Hardware** menu.
    The *Valves* window displays.

2. If the **Invert Polarity** checkbox is selected, switching a valve to **ON** *deactivates* it, and switching a valve to **OFF** *activates* it. Deselect the checkbox if you want switching the valve **ON** to activate it and switching the valve **OFF** to deactivate it.

4.2.5   Set the usage mode for a valve

A valve's usage mode determines its general function, or role, during an analysis run. A valve can be assigned one of the following usage modes:

*   Unused

*   FID H2 Valve (700XA and 1500XA only)

*   Stream

*   Analyzer01 ... Analyzer016 (only available for the Rosemount 700XA and 1500XA)

*   Analyzer (for the Rosemount 4500XA)

The usage mode is set at the factory and under ordinary circumstances it should not be changed.

To set the usage mode for a valve, do the following:

Procedure

1. Select **Valves...** from the **Hardware** menu.
    The *Valves* window displays.

2. Select the desired mode from the dropdown list under the **Usage** column for the valve.

3. Click **OK** to save the changes and close the window.

    Note
    To save the changes and leave the window open so that you can monitor the valve's progress, click **Save**. The current state of the valve displays in the **State** column, and is updated in real time.

4.3   Managing the gas chromatograph's (GC) pressure with the electronic pressure control (EPC)

You can do the following from **Hardware** → **EPC**:

Note
This option is only available for the Rosemount 370XA.

*   Change the EPC set point.

*   Monitor the EPC's status.

*   Switch EPC modes.

Figure 4-2: EPC screen
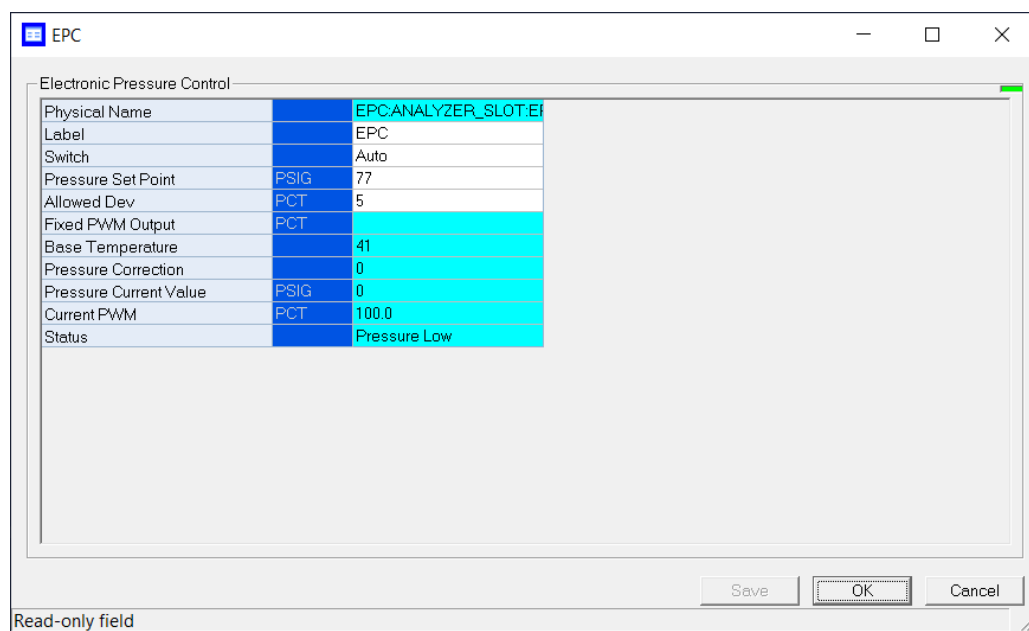
Editable fields

- Label
- Switch
- Pressure Set Point
- Allowed Dev (Allowed deviation from set point)

Read-only fields

- Physical Name
- Fixed PWM Output
- Base Temperature
- Pressure Correction
- Pressure Current Value
- Current PWM
- Status

4.3.1 Change the electronic pressure control (EPC) set point

To adjust the carrier pressure set point:

Procedure

1. Go to **Hardware**→ **EPC**.
   The *EPC* window opens.
2. Double-click the Set Point field and enter the desired value.

> **Note**
> If the field does not become active after double-clicking it, make sure the Switch field is set to Auto.

3. Click **OK**.
    The new set point is accepted, and the ***EPC*** window closes.

4.3.2   Check electronic pressure control (EPC) status

> **NOTICE**
>
> This feature is only available for the Rosemount 370XA gas chromatograph (GC).

Procedure

1. Go to **Hardware** → **EPC**.
    The ***EPC*** window opens.

2. Check the ***Status*** column to learn the current state of the EPC:

State	Description
OK	EPC is working normally and controlling the pressure to the set point.
Pressure Low	The Carrier Pressure Current value is less than the Set Point value.
Pressure High	The Carrier Pressure Current value is greater than the Set Point value.
Out of Range	The EPC is not able to control the pressure to the desired set point.
Not Installed	There is no EPC installed on the GC.
Not Configured	The operator has not yet configured the EPC.
Error	The GC cannot communicate with the EPC.
Comms Error	There is an internal error (for example, the GC is unable to read or write values in the database).
Comms Failed#unique_126/unique_126_Connect_42_fn_4500XA	There is a communication failure between the EPC board and the central processing unit (CPU) board.
Not Used#unique_126/unique_126_Connect_42_fn_4500XA	The EPC is turned off and not being used.

4.3.3   Switch to a different electronic pressure control (EPC) mode

Procedure

1. Go to **Hardware** → **EPC**.
    The ***EPC*** window opens.

2. Click the Switch field.
    A drop-down list opens.

3. Select the appropriate mode.

Option	Description
Auto	Let's the gas chromatograph (GC) control and maintain its pressure at the desired set point.
Fixed On	Allows you to control the power output for the EPC valve by entering a value, in the Fixed PWM Output field.
Not Used	Shuts off the EPC.

4. Click **OK**.
    The EPC switches modes, and the *EPC* window closes.

4.4 Managing the gas chromatograph's (GC's) pressure with the Carrier Pressure screen

You can change the carrier pressure set point from the **Hardware**→ **Carrier Pressure** screen.

NOTICE

This screen is only available for Rosemount 470XA GCs.

Figure 4-3: Carrier Pressure screen
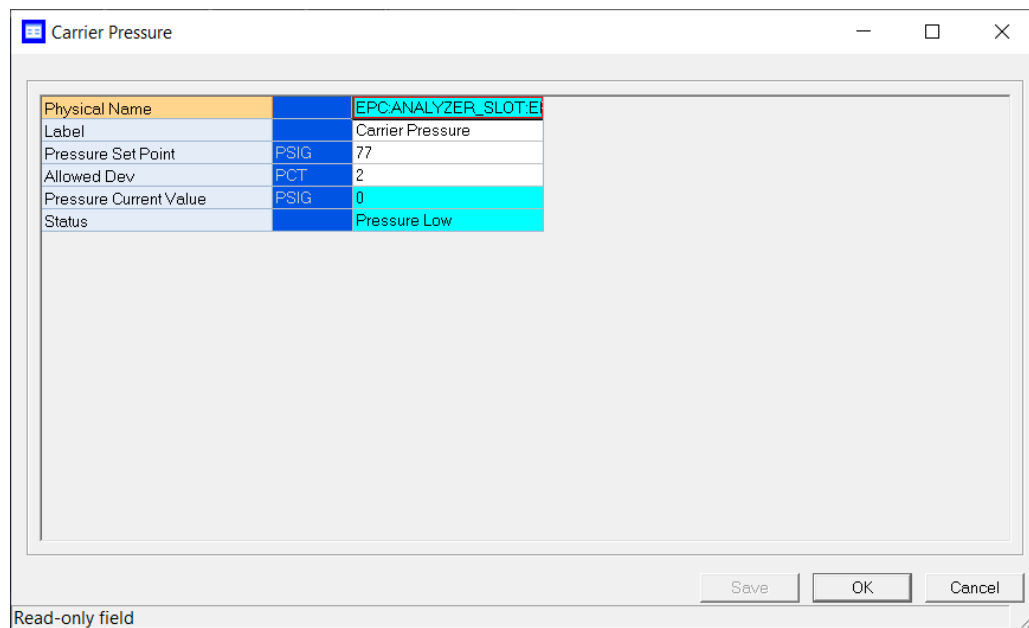
Editable fields

•   Label

•   Pressure Set Point

•   Allowed Dev (Allowed deviation from set point)

Read-only fields

- Physical Name

- Pressure Current Value

- Status

4.4.1 Change the carrier pressure set point

To adjust the carrier pressure set point:

Procedure

1. Go to **Hardware → Carrier Pressure**.
   The *Carrier Pressure* window opens.

2. Double-click the Set Point field and enter the desired value.

3. Click **OK**.
   The new set point is accepted, and the *Carrier Pressure* window closes.

4.4.2 Check pressure status

Note
This feature is available for Rosemount 470XA gas chromatographs (GCs).

Procedure

1. Go to **Hardware → Carrier Pressure**.
   The *Carrier Pressure* window opens.

2. Check the *Status* column to learn the current pressure status:

State	Description
OK	The carrier pressure is working normally and controlling the pressure to the set point.
Pressure Low	The Carrier Pressure Current value is less than the Set Point value.
Pressure High	The Carrier Pressure Current value is greater than the Set Point value.
Out of Range	The carrier pressure is not being controlled to the desired set point.
Not Configured	The operator has not yet configured the carrier pressure.
Error	The GC cannot detect the carrier pressure.

4.5 View and edit detectors

Use the *Detectors* dialog to monitor the activity and status of the gas chromatograph's (GC's) detectors.

Prerequisites

NOTICE

Before modifying any of the values in this dialog, halt the analysis.

NOTICE

Blue cells display read-only data; white cells display editable data.

The following data displays for each detector:

Det #	Numerical identifier for the detector to which the following data applies.
Detector	Options, which depend on your GC's configuration, are: • Thermal conductivity detector (TCD) • Flame photometric detector (FPD) • FPD G2 (Integral FPD) • Flame ionization detector (FID) • FID G2 (Integral FID)
Flame Temp RTD	Select the appropriate RTD from the drop-down list. The RTD measures the temperature of the FID flame.
H2 Valve	Optional carrier gas shut-off valve.
Flame Ignition	Select Manual if you want to control the ignition of the FID; select Auto if you want the GC to control the ignition of the FID.
Ignition Attempts	Indicates the number of times the GC will try to light the flame. If an Auto FID ignition sequence fails to light the flame after the specified number of attempts, the GC will close the hydrogen valve, switch the ignition parameter to Manual, and set an active alarm.
Wait Time Bet Tries	Indicates the amount of time, in seconds, the GC will wait between ignition attempts.
Igniter On Duration	Indicates the length of time that the igniter will remain on.
Flame On Sense Temp	The flame ignites when the burner internal temperature exceeds the value set in this field.
Flame Out Sense Temp	The flame is extinguished when the burner internal temperature falls below the value set in Flame On Sense Temp.
FPD Flame Status DI	Allows you to select from a list of available digital inputs (DIs). The digital input that is selected will receive the FPD's flame status value.
FPD High Voltage	
Preamp Val	Detector value. Read-only.
Flame Temperature	Temperature of the burner flame as read by the RTD. Read-only.
Flame Status	Read-only. Options are: • On • Off • Over Temperature
H2 Valve Cur State	Options are: Open and Closed. Read-only.
Scaling Factor	Preamplifier calibration factor.

Igniter Status	Options are: Off and On. Read-only.
Electrometer Voltage	Output at first stage of FID/FPD preamplifier. Read-only.
Preamplifier Voltage	Output at second stage of FID/FPD preamp. Read-only.
Polarizing Voltage	Igniter voltage. Read-only.
Gain Status	Options are: Low and High.
Status	Read-only. Options are:

- OK

- Not Installed

- Not Configured

- Calibrating

- Error

- Timeout

Procedure

To view the **Detectors** dialog, go to **Hardware → Detectors...**.

4.5.1 Gain High

The FID/FPD gain status displays on the **Hardware → Detectors**, which can be either *Low* or *High*.

Procedure

1. If the gain status is *Low* and you want to set it to *High*, click **Gain High** button.
2. If the gain status is *High* and you want to change it to *Low*, click **Gain Low**.

Related information

[Setting the Detector Gain](#)

4.5.2 Ignite the burner flame

If the **Flame Ignition** field on the **Detectors** window is set to **Manual**, and if the **Flame Status** field is set to **Off**, do the following to restart the flame:

Procedure

1. Click **Open H2 Valve**.
   The **H2 Valve Cur State** field changes to **Open**.
2. Click **Ignite**.
   The **Flame Status** field changes to **On** when the internal flame temperature exceeds the value set in the **Flame On Sense Temp** field.

   Note
   If the **Flame Ignition** field is set to **Auto**, the GC will automatically restart the flame if it goes out.

4.5.3 Open H2 Valve

To manually ignite the FID/FPD, the H2 valve must open.

Procedure

1. Click **Hardware** → **Detectors** and set the **Flame Ignition** field is set to **Manual**

2. Select the **Open H2 Valve** button.

3. The **H2 Valve Cur State** field changes to **Open**.

4.5.4   Null Electrometer

The **FID/FPD Detector's NULL Electrometer** feature is used to reset the electromer.

Procedure

1. Click **Hardware** → **Detectors**.

2. Click the **NULL Electrometer** button to reset the FID/FPD electrometer.

4.5.5   Offset the baseline (700XA and1500XA only)

Note
In GC Firmware version 2.1.X and later, the bridge is automatically balanced by the firmware.

In some situations that involve TCD detectors the baseline may be displayed either too high on the graph, in which case the tops of the peaks are cut off, or too low on the graph, so that the bases of the peaks are cut off. If this occurs it is possible to offset the baseline either up or down so that the entire peak can be displayed on the graph. This offset will be applied to all traces—live, archived and saved—that are displayed thereafter.

To offset the baseline, do the following:

Procedure

1. Select **Detectors...** from the **Hardware** menu.
   The *Detectors* window displays.

2. Select the appropriate detector. It may be necessary to return to the *Chromatogram Viewer* to learn which detector is the source of the trace that needs to be offset.

3. Balance the preamp:

   - To *lower* the baseline, click **Lower Baseline (N)**. Each time this button is clicked, N is incremented by -1. For example, if this is the first time the button has been clicked, **Lower Baseline(0)** is incremented to **Lower Baseline(-1)**, and the baseline is lowered one step. If **Raise Baseline(N)** was clicked previously, then that button is incremented by -1 first, until it reaches **RaiseBaseline(0)**; at that point, **Lower Baseline(N)** is incremented by -1.

     Note
     To reset the baseline to its original setting, click **Raise Baseline(N)** and **Lower Baseline(N)** until they read **Raise Baseline(0)** and **Lower Baseline(0)**.

   - To *raise* the baseline, click **Raise Baseline(N)**. Each time this button is clicked, N is incremented by 1. For example, if this is the first time the button has been clicked, **Raise Baseline(0)** is incremented to **Raise Baseline(1)**, and the baseline is raised one step. If **Lower Baseline(N)** was clicked previously, then that button is incremented by 1 first, until it reaches **Lower Baseline(0)**; at that point, **Raise Baseline(N)** is incremented by 1.

     Note
     To reset the baseline to its original setting, click **Right(N)** and **Left(N)** until they read **Raise Baseline(0)** and **Lower Baseline(0)**.

4. After the baseline has been raised or lowered to your satisfaction, click **OK**.

4.5.6 Auto-zero

To automatically adjust the baseline, click **Auto-Zero**. This only applies to FID or FPD detectors.

Related information

Detectors screen

4.5.7 Setting the Detector Gain

The **Detector** window displays the detector's gain status, which can be either Low or High.

Procedure

1. If the detector's gain status is **Low** and you want to set it to **High**, click **Gain High**.
2. If the detector's gain status is **High** and you want to change it to **Low**, click **Gain Low**.

4.5.8 Resetting the Electrometer

To reset the detector's electrometer, do the following.

Procedure

1. From the **Hardware** → **Detector** menu, click **NULL Electrometer**..
2. Click **OK** to apply your edits.

4.6 Discrete inputs

You can use Rosemount MON2020 to assign labels to the gas chromatograph's (GC's) discrete inputs and to control the discrete inputs' operational modes.

The number of discrete inputs available depends on the GC.

4.6.1 Rename a discrete input

Give each discrete input a descriptive label to avoid confusing one unit for another. To assign an identifying label, do the following:

Procedure

1. Select **Discrete Inputs...** from the **Hardware** menu.
   The *Discrete Inputs* window displays.
2. Double-click on the appropriate row under the *Label* column for the discrete input that you want to rename.

   Note
   The discrete inputs are labeled **Discrete Input 1** - **Discrete Input N** by default, where N equals the total number of discrete inputs available to the GC.

3. Type in a new descriptive name for the discrete input.
4. Click **OK**.

   Note
   Several of the discrete inputs on the 700XA/1500XA GCs are pre-defined and mapped by default to System Alarms. Renaming these discrete inputs does not

remove the underlying system alarm. You will need to disable the associated system alarm before renaming the discrete input.

On the 700XA, the following discrete inputs are mapped to System Alarms by default.
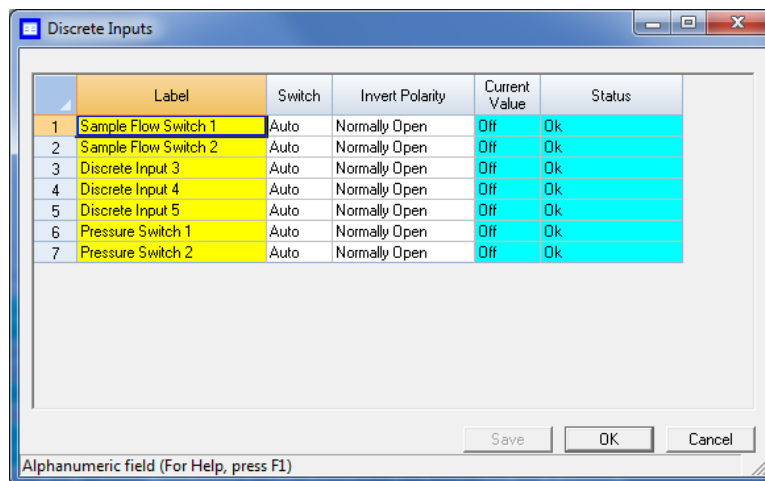
Discrete Input	DI Description	System Alarm Name
1	Sample Flow Switch 1	No Sample Flow 1
2	Sample Flow Switch 2	No Sample Flow 2
6	Pressure Switch 1	Low Carrier Pressure 1
7	Pressure Switch 2	Low Carrier Pressure 2

On the 1500XA, the following discrete inputs are mapped to System Alarms by default.
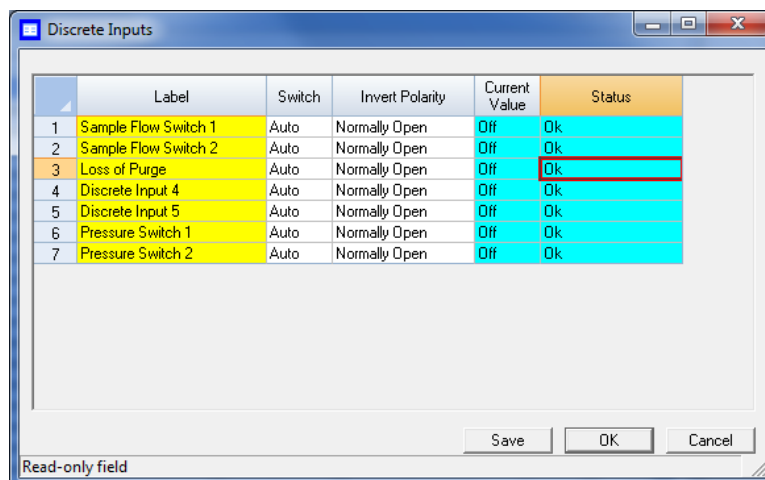
Discrete Input	DI Description	System Alarm Name
1	Sample Flow Switch 1	No Sample Flow 1
2	Sample Flow Switch 2	No Sample Flow 2
3	Loss Of Purge	Loss Of Purge

Discrete Input	DI Description	System Alarm Name
6	Pressure Switch 1	Low Carrier Pressure 1
7	Pressure Switch 2	Low Carrier Pressure 2

Related information

View System Alarms

4.6.2   Set a discrete input's operational mode

A discrete input has three operational modes: **Auto**, **On**, and **Off**.

- Setting the discrete input to **Off** means that it will interpret all incoming signals as OFF, despite the true nature of the signal.

- Setting the discrete input to **Auto** means that it will analyze the incoming signal to determine whether it is ON or OFF.

- Setting the discrete input to **On** means that it will interpret all incoming signals as ON, despite the true nature of the signal.

To set a discrete input's operational mode, do the following:

Procedure

1. Select **Discrete Input...** from the **Hardware** menu.
   The *Discrete Input* window displays.

2. Select the desired mode from the drop-down list under the **Switch** column for the discrete input.

3. To save the changes and leave the window open so that you can monitor the discrete input's progress, click **Save**. The current state of the discrete input displays in the **State** column, and is updated in real time.

4. To save the changes and close the window, click **OK**.

4.6.3   Monitor the operational status of a discrete input

Procedure

To check a valve's status, select **Discrete Input...** from the **Hardware** menu.
The status of each discrete input displays under the **Status** column. There are three possible status readings, and their meanings are as follows:

OK	The discrete input is installed and is working correctly.
Not Installed	The discrete input is not installed.
Error	The Base In/Out (IO) board is installed, but the GC cannot communicate with it.
Not Configured	The operator has not yet configured the discrete input.

4.6.4   Invert the polarity of a discrete input

The **Invert Polarity** option reverses the way a voltage signal is interpreted by the discrete input. By default, the **Invert Polarity** option is set to **Normally Open**, which means that a high voltage signal is interpreted by the discrete input as **ON**, and a low voltage signal is interpreted by the discrete input as **OFF**. Setting **Invert Polarity** to **Normally Closed** means

that a high voltage signal is interpreted by the discrete input as **OFF**, and a low voltage signal is interpreted by the discrete input as **ON**.

To set the polarity of a discrete input, do the following:

Procedure

1. Select **Discrete Input...** from the **Hardware** menu.
    The *Discrete Inputs* window displays.

2. Select **Normally Open** or **Normally Closed** from the drop-down menu under the **Invert Polarity** column.

4.7 Discrete outputs

You can use Rosemount MON2020 to assign labels to the gas chromatograph's (GC's) discrete outputs and to control the discrete outputs' operational modes.

The number of discrete outputs available depends on the GC.

4.7.1 Rename a discrete output

Give each discrete output a descriptive label to avoid confusing one unit for another.

To assign an identifying label, do the following:

Procedure

1. Select **Discrete Outputs...** from the **Hardware** menu.
    The *Discrete Outputs* window displays.

2. Double-click on the appropriate row under the **Label** column for the discrete output that you want to rename.

    Note
    The discrete outputs are labeled **Discrete Output 1** - **Discrete Output *N*** by default, where ***N*** equals the total number of discrete outputs available to the GC.

3. Type in a new descriptive name for the discrete output.

4. Click **OK**.

4.7.2 Set a discrete output's operational mode

A discrete output has three operational modes: **Auto**, **On**, and **Off**.

*   Setting the discrete output to **Off** means that the discrete output will turn off and remain off until the operational mode is changed.

*   Setting the discrete output to **Auto** means that the discrete output will turn on and off according to the **Timed Events** table or the **Discrete Outputs** table.

*   Setting the discrete output to **On** means that the discrete output will turn on and remain on until the operational mode is changed.

To set a discrete output's operational mode, do the following:

Procedure

1. Select **Discrete Output...** from the **Hardware** menu.
    The *Discrete Output* window displays.

2. Select the desired mode from the drop-down menu under the **Switch** column for the discrete output.

3. Click **OK** to save the changes and close the window.

> **Note**
> To save the changes and leave the window open so that you can monitor the discrete output's progress, click **Save**. The current state of the discrete output displays in the **State** column, and is updated in real time.

4.7.3 Monitor the operational status of a discrete output

Procedure

To check a discrete output's status, select **Discrete Output...** from the **Hardware** menu. The status of each discrete output displays under the **Status** column. There are three possible status readings, and their meanings are as follows:

OK	The discrete output is installed and is working correctly.
Not Installed	The discrete output is not installed.
Error	The Base In/Out (IO) board is installed, but the GC cannot communicate with it.
Not Configured	The operator has not yet configured the discrete output.

4.7.4 Set the usage mode for a discrete output

A discrete output's usage mode determines which signals are routed to it via the Limit Alarm and Discrete Alarm functions. A discrete output can be assigned one of the following usage modes:

- DO
- Common Alarm
- FID/FPD H2 valve
- Stream
- Analyzer01

  ...

- Analyzer016
- Calibration
- Calibration on Analysis Clock(N)
- Maintenance
- Calibration or Maintenance
- Validation
- Calibration or Validation or Maintenance

To set the usage mode for a discrete output, do the following:

Procedure

1. Select **Discrete Output...** from the **Hardware** menu.
   The *Discrete Output* window displays.
2. Select the desired mode from the drop-down menu under the **Usage** column for the discrete output.

Options are:

- Calibration on Analysis Clock 1
- Maintenance
- Calibration or Maintenance on Analysis Clock 1
- Validation on Analysis Clock 1
- Calibration or Validation or Maintenance on Analysis Clock 1
- Calibration on Analysis Clock 2
- Calibration or Maintenance on Analysis Clock 2
- Validation on Analysis Clock 2
- Calibration or Validation or Maintenance on Analysis Clock 2
- Calibration on Analysis Clock 3
- Calibration or Maintenance on Analysis Clock 3
- Validation on Analysis Clock 3
- Calibration or Validation or Maintenance on Analysis Clock 3
- Calibration on Analysis Clock 4
- Calibration or Maintenance on Analysis Clock 4
- Validation on Analysis Clock 4
- Calibration or Validation or Maintenance on Analysis Clock 4

3. If you select **DO** for **Usage**, then you must also set the **Start Time** and **Duration**.

   a) Click on the appropriate row under the **Start Time** column and enter the time that the digital output should be turned on.

   b) Click on the appropriate row under the **Duration** column and enter the amount of time (in Hour:Minute:Second format) that the digital output should remain on.

   c) Click on the appropriate row under the **Interval** column and enter the amount of time, in hours, that should pass before the digital output turns on again.

4. Click **OK** to save the changes and close the window.

   Note

   To save the changes and leave the window open so that you can monitor the discrete output's progress, click **Save**. The current state of the discrete output displays in the *State* column, and is updated in real time.

4.7.5 Invert the polarity of a discrete output

To set the polarity of a discrete output:

Procedure

1. Select **Discrete Output...** from the **Hardware** menu.
   The *Discrete Outputs* window displays.

2. Check or uncheck the box under the **Invert Polarity** column.
   With **Invert Polarity** unchecked:

DO current value	Normally open terminals	Normally closed terminals
On	Closed	Open
Off	Open	Closed

   With **Invert Polarity** checked:

DO current value	Normally open terminals	Normally closed terminals
On	Open	Closed
Off	Closed	Open

4.8 Manage your gas chromatograph's (GC's) analog inputs

With Rosemount MON2020 you can control analog inputs in the following ways:

- Assign identifying labels.

- Assign scale ranges.

- Calibrate analog inputs for zero and full scale values.

- Code.

- Adjust analog input 4-20 mA external loop power.

Note
Electrical current signals ranging from 4 to 20 mA (±10%) are accepted as analog inputs.

4.8.1 Rename an analog input

Give each analog input a descriptive label to avoid confusing one unit for another. To assign an identifying label, do the following:

Procedure

1. Select **Analog Inputs...** from the **Hardware** menu.
   The *Analog Inputs* window displays.

2. Double-click on the appropriate row under the *Label* column for the analog input that you want to rename.

   Note
   The analog input devices are labeled **Analog Input 1** and **Analog Input *N*** by default, where *N* equals the total number of analog inputs available to the GC.

3. Type in a new descriptive name for the analog input.

4. Click **OK**.

4.8.2 Set an analog input's operational mode

An analog input has the following operational modes:

- **Var_Standard**: The analog input will be set automatically, based on the signal it receives.

- **Var_Namur_NE43**: Namur_NE43 uses the 3.8 to 20.5 mA signal range for measurement information, with ≥21 mA or ≤3.6 mA to indicate diagnostic failures.

- Setting the switch to **Fixed** means that the analog input will be set to the value that you enter in the appropriate row under the **Fixed Value** column. This is the default setting.

To set an analog input's operational mode, do the following:

Procedure

1. Select **Analog Inputs...** from the **Hardware** menu.
   The *Analog Input* window displays.

2. Select the desired mode from the drop-down menu under the **Switch** column for the analog input.

3. Click **OK** to save the changes and close the window.

   Note

   To save the changes and leave the window open so that you can monitor the analog input, click **Save**. The current value of the analog input signal displays in the **Current Value** column, and is updated in real time.

4.8.3 Set the scale values for an analog input device

To set the zero scale and full scale, which are used when converting the analog input value, do the following:

Procedure

1. Select **Analog Input...** from the **Hardware** menu.
   The *Analog Input* window displays.

2. Double-click on appropriate row under the **Zero Scale** column and enter a zero scale value.

3. Double-click on appropriate row under the **Full Scale** column and enter a full scale value.

4. Click **OK** to save the changes and close the window.

   Note

   To save the changes and leave the window open so that you can monitor the analog input, click **Save**.

4.8.4 Assign an Analog Inputs code

Sets the unique code for each available analog input system variable.

The same code value is outputted via Modbus to differentiate the analog inputs.

Procedure

1. Use the **Hardware**→**Analog Input** menu.

2. Select the **Code** column and enter the code for the analog input.

4.8.5 Set the type of analog input signal

The GC's analog inputs can receive a 4-20 mA current. To set the type of signal generated by the analog input device, do the following:

Procedure

1. Select **Analog Inputs...** from the **Hardware** menu.
   The *Analog Inputs* window displays.

2. Select **Switch** and use the pull-down menu to choose the input type.

   • Setting the switch to **Variable** means that the analog input will be set automatically, based on the signal it receives.
     — Options are: **Var_Std**

     — **Var_Namur_NE43**

   • Setting the switch to **Fixed** means that the analog input will be set to the value that you enter in the appropriate row under the **Fixed Value** column.

3. Click **OK** to save the changes and close the window.

   Note
   To save the changes and leave the window open so that you can monitor the analog input's progress, click **Save**. The type of signal being generated displays in the **mA/Volts** column, and is updated in real time.

4.8.6 Monitor the status of an analog input

To check an analog input's status, select **Analog Input...** from the **Hardware** menu.

The operational status of each analog input displays under the **Status** column. There are three possible status readings, and their meanings are as follows:

OK	The analog input is installed and is working correctly.
Not Installed	The analog input is not installed.
Error	The analog input is installed, but the GC cannot communicate with it.
Not Configured	The operator has not yet configured the analog input.

This window also displays other types of data, such as the following:

mA	The type of analog input signal being received.
mA	If **mA** displays in the **mA** column, then this column displays the amount of current being received, in milliamperes.
Cur Val	The current value of the analog input signal.

4.8.7 Calibrate an analog input

Procedure

1. Go to **Hardware**→**Analog Input...**.

The ***Analog Input*** dialog displays.

2. Click the analog input that you want to calibrate.

3. Set the analog input's Zero Scale by entering its minimum anticipated value.

4. Set the analog input's Full Scale by entering its maximum anticipated value.

5. Click **AutoCal...(F4)** or press **F4**.
The ***Analog Input Calibration Assistant*** runs.

6. Click **Next**.
Step 2 of the ***Analog Input Calibration Assistant*** displays.

7. Click **Next**.
Step 3 of the ***Analog Input Calibration Assistant*** displays.

8. Click **Next**.
Step 4 of the ***Analog Input Calibration Assistant*** displays.

9. Click **Finish**.

The calibration is complete.

4.9 Analog outputs

With Rosemount MON2020 you can control the analog outputs in the following ways:

- Assign identifying labels.

- Assign scale ranges.

- Calibrate analog outputs for zero and full scale values.

- Adjust analog output 4-20 mA external loop power.

4.9.1 Rename an analog output

Give each analog output a descriptive label to avoid confusing one unit for another. To assign an identifying label, do the following:

Procedure

1. Select **Hardware → Analog Outputs...** from the menu.
The *Analog Outputs* window displays.

2. Double-click on the appropriate row under the **Label** column for the analog output that you want to rename.

   Note
   The analog output devices are labeled **Analog Output 1** - **Analog Output** *N* by default, where *N* equals the total number of analog outputs available to the GC.

3. Type in a new descriptive name for the analog output.

4. Click **OK**.

4.9.2 Set an analog output's operational mode

An analog output has the following operational modes:

- **Var_Standard**: Setting the switch to **Var_Standard** means that the analog output will be proportional to the variable selected in from the **Variables** column.

- **Var_Namur_NE43**: **Namur_NE43** uses the 3.8 to 20.5 mA signal range for measurement information, with ≥21 mA or ≤3.6 mA to indicate diagnostic failures.

- **Fixed**: Setting the switch to **Fixed** means that the analog output will be set to the value that is entered in the appropriate row under the **Fixed Value** column. This is the default setting.

To set an analog output's operational mode, do the following:

Procedure

1. Select **Analog Output...** from the **Hardware** menu.
   The *Analog Output* window displays.

2. Select the desired mode from the drop-down menu under the **Switch** column for the analog output.

3. Click the drop-down menu in the **Variable** column.
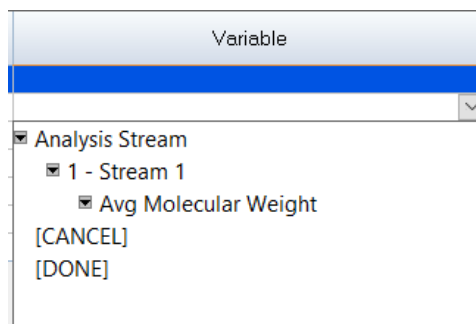
4. Double click the **Variable** name and click to configure the selected opton.

5. Click **Save** to save the changes and leave the window open so that you can monitor the analog output.

   Note
   To save the changes and close the window, click **OK**. The current value of the analog output displays in the **Cur Val** column, and is updated in real time.

4.9.3 Set the scale values for an analog output device

To set the zero scale and full scale, which are used when converting the analog output value, do the following:

Procedure

1. Select **Analog Output...** from the **Hardware** menu.
   The **Analog Output** window displays.

2. Click on appropriate row under the **Zero Scale** column and enter a zero scale value.

3. Click on appropriate row under the **Full Scale** column and enter a full scale value.

4. Click **OK** to save the changes and close the window.
   To save the changes and leave the window open so that you can monitor the analog output's progress, click **Save**.

4.9.4 Map a system variable to an analog output

To select the system variable on which to base the signal level of the analog output, do the following:

Procedure

1. Select **Hardware→Analog Output...** from the menu.

The *Analog Output* window displays.

2. Select a new variable by clicking on the appropriate drop-down list under the **Variable** column.

3. Click **OK** to save the changes and close the window.

Note

To save the changes and leave the window open so that you can monitor the analog output's progress, click **Save**.

Related information

Use the context-sensitive variable selector

4.9.5 Monitor the status of an analog output

To check an analog output device's status, select **Analog Output...** from the **Hardware** menu.

The operational status of each analog output displays under the **Status** column. There are three possible status readings, and their meanings are as follows:

OK The analog output device is installed and is working correctly.

Not Installed The analog output device is not installed.

Error The Base In/Out (IO) board is installed, but the GC cannot communicate with it.

Not Configured The operator has not yet configured the analog output.

This window also displays other types of data, such as the following:

mA The amount of current being generated in milliamperes.

Loop Power Loop power can be configured as Internal or External ,
- Internal – This uses internal power from GC power supply and this is default setting.

- External – This uses external power supply

The 4-20 mA loop current is changed by varying the opposition (resistance) to current flow on the loop. Used to measure the process variables.

Current Value The current scaled value of the analog output signal.

Related information

[Hardware menu](#)

4.9.6 Calibrate an analog output

Procedure

1. Go to **Hardware** → **Analog Output...**.
   The ***Analog Outputs*** dialog displays.

2. Click the analog output that you want to calibrate.

3. Click **AutoCal...(F4)** or press **F4**.
   The ***Analog Output Calibration Assistant*** runs.

4. Select the check box for the unit of measure you want to use for the calibration and then click **Next**.
   Step 2 of the ***Analog Output Calibration Assistant*** displays.

5. Enter the Zero Scale Adjustment value and then click **Next**.
   If the value entered is within tolerance, it is accepted and Step 3 of the ***Analog Output Calibration Assistant*** displays. If the value is not within tolerance, an error icon (⊙) appears beside the field. Tolerance is set to ±1 mA of the analog output's default zero adjustment setting, which is 4 mA. Enter a different value and try again.

6. Enter the Full Scale Adjustment value and then click **Next**.
   If the value entered is within tolerance, it is accepted and Step 4 of the ***Analog Output Calibration Assistant*** displays. If the value is not within tolerance, an error icon (⊙) appears beside the field. Tolerance is set to ±1 mA of the analog output's default full adjustment setting, which is 20 mA. Enter a different value and try again.

7. Click **Finish**.

The calibration is complete.

Related information

Hardware menu

4.10 View installed hardware

Rosemount MON2020 can compile an inventory table of all hardware that is installed in the gas chromatograph (GC).

Procedure

To view all the hardware installed in the GC, go to **Hardware → Installed Hardware....**.

Figure 4-4: Installed Hardware screen

	IO Name	IO Function	Slot Number	Revision Number	Device Description
1	PREAMP_STR:ANALYZER_SLOT:PREAM Preamp Streaming		Analyzer	0	Preamp (Streaming)
2	PREAMP_CFG:ANALYZER_SLOT:PREAMI Preamp Configuration		Analyzer	0	Preamp (Configuration)
3	HTR_CTRL:ANALYZER_SLOT:HTR_CTRL Heater Control		Analyzer	0	Heater Control
4	HTR_CTRL:ANALYZER_SLOT:HTR_CTRL Heater Control		Analyzer	0	Heater Control
5	SOL:ANALYZER_SLOT:SOL_1	Solenoid	Analyzer	0	Solenoid Control
6	SOL:ANALYZER_SLOT:SOL_2	Solenoid	Analyzer	0	Solenoid Control
7	SOL:ANALYZER_SLOT:SOL_3	Solenoid	Analyzer	0	Solenoid Control
8	SOL:ANALYZER_SLOT:SOL_4	Solenoid	Analyzer	0	Solenoid Control
9	SOL:ANALYZER_SLOT:SOL_5	Solenoid	Analyzer	0	Solenoid Control
10	SOL:ANALYZER_SLOT:SOL_6	Solenoid	Analyzer	0	Solenoid Control
11	SOL:ANALYZER_SLOT:SOL_7	Solenoid	Analyzer	0	Solenoid Control
12	RTD:ANALYZER_SLOT:RTD_1	RTD	Analyzer	0	RTD
13	RTD:ANALYZER_SLOT:RTD_2	RTD	Analyzer	0	RTD
14	DIGI_IN:ANALYZER_SLOT:DIGI_IN_1	Digital Input	Analyzer	0	Digital Input
15	DIGI_IN:ANALYZER_SLOT:DIGI_IN_2	Digital Input	Analyzer	0	Digital Input
16	DIGI_IN:ANALYZER_SLOT:DIGI_IN_3	Digital Input	Analyzer	0	Digital Input
17	DIGI_IN:ANALYZER_SLOT:DIGI_IN_4	Digital Input	Analyzer	0	Digital Input
18	DIGI_OUT:ANALYZER_SLOT:DIGI_OUT_1	Digital Output	Analyzer	0	Digital Output
19	ANA_IN:ANALYZER_SLOT:ANA_IN_1	Analog Input	Analyzer	0	Analog Input
20	EPC:ANALYZER_SLOT:EPC_1	EPC Controller	Analyzer	0	EPC
21	PRESSURE:ANALYZER_SLOT:PRESSUR Sample Pressure		Analyzer	0	Sample Pressure
22	CTRL:ANALYZER_SLOT:CTRL_1	RS232/485 Control	Analyzer	0	RS232/RS485 Control
23	CTRL:ANALYZER_SLOT:CTRL_2	RS232/485 Control	Analyzer	0	RS232/RS485 Control
24	DIAGNOSTIC:ANALYZER_SLOT:DIAGNOS Diagnostic		Analyzer	0	Analyzer Diagnostic
25	IMB_COMM:IMB_SLOT:IMB_COMM_1			63	IMB Communication

IO Name	Name of the device.
IO Function	Describes the function of the device.
Slot Number	Describes the location of the device on the GC. The slot number refers to the card cage assembly, which is located in the GC's Electronics enclosure.
Revision Number	The revision number of the backplane.
Device Description	Describes data for a field device.

5   Application menu

Use the Application menu to manage many of the variables that a gas chromatograph (GC) uses during an analysis run, such as timed events, stream sequences, and calculation types.

Some tasks you can perform include:

- View and edit general information about the GC to which Rosemount MON2020 is connected, such as name, model, and default stream sequence.

- View and edit **Component Data**, **Validation Data**, and **Timed Event** tables.

- View and change control, average, and user-defined calculations.

- View and edit limit alarm data.

- View and change stream data.

- View and edit the stream sequence.

- View and edit communication and Ethernet port data.

- View and map local operator interface (LOI) status variables.

- View and map the FOUNDATION™ Fieldbus process variables.

5.1   System screen

Use this feature to select the default gas chromatograph (GC) stream sequence and to set or edit system-wide variables such as the GC's name, serial number, and system description.

The following information displays on this screen:

Analyzer Name	Defines the GC name that appears in the **Status** bar on the main window when Rosemount MON2020 is connected to the GC. Can contain up to twelve characters.
System Description	A place to record miscellaneous reference information to further identify the currently connected system. Can contain up to 28 characters.
Site ID	Holds customer-defined identification information.
Company Name	The name of the company that operates the GC.
Location	The physical location of the GC.
Model	The model number of the GC.
Serial Number	Serial number of the GC. This is a unique identifier that is given to the GC at the factory.
Firmware Version	Revision level of firmware of the GC and its associated firmware checksum.
Standard Component Table Version for GPA	Indicates which version of the Gas Processors Association's standard component table is being used.
Standard Component Table Version for ISO	Indicates which version of the International Organization for Standardization's standard component table is being used.

CGM FCAL Archive	Chromatogram Final Calculation Archive: Sets the storage behavior for final calibration chromatograms. The options are:	
	Keep Last FCAL Per Day	Saves only the last final calibration chromatogram of the day.
	Keep All FCAL Per Day	Saves all final calibration chromatograms.
CGM FVAL Archive	Chromatogram Final Validation Archive: Sets the storage behavior for final validation chromatograms. The options are:	
	Keep Last FVAL Per Day	Saves only the last final validation chromatogram of the day.
	Keep All FCAL Per Day	Saves all final validation chromatograms.

Date Format Defines how the date will be displayed. Option are:

- MM$$DD$$YYYY
- MMDDYY
- DDMMYYYY
- DDMMYY
- YYYYMMDD
- YYMMDD

$ is the date field separator

Date Field Separator Defines the text symbol that will be used as the separator when displaying, the options are:

- /
- -
- .

Time Format Defines how time will be displayed. The options are:

- HH:M
- HH:MM

Time Notation Defines the cycle of time to use when displaying the time: The options are:

- 12 Hr
- 24 Hr

Synchronize with FF Timing Sets the GC's time to match the FOUNDATION™ Fieldbus's time. Select the check box to enable this function.

Show Advanced System Variables Determines whether advanced system variables will be displayed along with basic system variables. Advanced system variables can be customized and may include:

- Analyzer Name
- System Description
- Company Name
- Location

- Chromatograph ID

Allow Multiple Writers	Determines whether all supervisor-level users that connect to the GC have write access, or just the first supervisor-level user to connect. Options are True and False.
Maintenance Mode	Switches the GC to Maintenance mode and triggers an alarm that the GC is down for maintenance.
Max Warm Start Delay	This is the maximum time, (in hours) after a GC recovers power failure during normal operation, that the GC will wait for an electronic pressure controller (EPC) to reach its respective set and stabilize before triggering the *Warm Start Failure* alarm.
Energy Value Check	(Rosemount 370XA only)

For Energy Value Check:

If enabled, the GC analyzes the calibration gas as an unknown stream and computes its energy value. The GC then compares this value to the **Calibration Gas Certification** CV and determines if the calibration gas's energy value is within the CV Check Allowed Deviation. If it isn't, the GC triggers the Energy Value Invalid alarm.

The following conditions must be met before the GC can perform a EV Check:

- The EV Check flag in the **System** dialog must be enabled.

- At least one stream must be set up in the **Streams** dialog as a calibration stream and the **Auto** flag for this stream must be enabled.

The EV Check is performed under the following circumstances:

- During a warm start that follows a power failure during normal operation, the GC waits for the heater and EPC to reach their respective set points and stabilize. It then analyzes the calibration gas as an unknown stream and identifies the peaks. If all the component peaks are identified, the GC computes the calibration gas's energy value and performs the EV Check.

- After a successful calibration, the GC computes the gas' energy value with the new response factors and performs the EV Check.

Sales Order Number	The sales number for the GC. When contacting Customer Support, you may be asked to provide this number to the Customer Support agent.
Calibration Retry on Failure	If enabled, if a calibration fails, the GC will re-run the calibration sequence.
Calibration Repeatability Check	If enabled, the GC will check the repeatability of calibration runs to the limits specified in ISO6974-6:2002(E), Table 1. If the calibration fails to meet the conditions set forth in the table, then the calibration is deemed to have failed, and the GC will rerun the calibration sequence.
Metrology Type	Shows the metrology type that the GC is configured for.
GC ID	This field can be used to store a unique text string that will be associated with the GC and that can be displayed on reports.
Identification Number	This field can be used to store a unique text string that will be associated with the GC and that can be displayed on reports.

Configuration Checksum at Lockout	The checksum of the configuration fields that is calculated when the security switch is locked.
Current Configuration Checksum	The GC with periodically recalculate and update the configuration checksum. The current value willl be the latest calculated value.
Checksum Update Time	The time that the configuration checksum was last updated.
Chromatograph ID	A three character string value which is unique across all installed GCs. The first character must be a letter, and the second and third characters may be either numbers or letters. Special characters are not allowed in the Chromatograph ID.
Chromatograph Site ID	A float value; you can set any float value to differentiate the GCs.
Keep Last Good Average	A check box column. • If you deselect this option, then a zero value will be logged in the archive records during times when the alarm is not averaging. • If you select this option, the last average value will be logged in the archive records when the alarm is not averaging. In this case, the number of samples is set to zero while the average archive records.
Ext. Modbus® Calibration Archive Data	A drop-down list with the following options (the selected option will be used by the Calibration and Final Calibration data types in the Modbus Map Editor for the Rosemount 700XA series registers):

Circular Buffer	Default. If you select this archived calibration, data will be logged as a circular buffer, and a maximum of 35 calibration records will be stored.
Contract Day	If you select this option, the calibration data will be for each contract day, and a maximum of one month of calibration data will be stored. Select this option for El Paso type applications.

GC Mode	Rosemount 370XA only. Allows you to select an operating mode for the GC.
Modbus Stream Alarm Bit Association	Rosemount 700XA only. Modbus Stream Alarm Bit Association defines the behavior of how stream specific alarms are encoded into **Analysis Stream → Active Low Alarm Status** and **Analysis Stream → Active High Alarm Status** system variables. Possible values for this column:

0 - SIM2251 Emulation	Default. If you select this option, only one stream will be displayed. The first alarm configured for a particular stream in the **Limit Alarms** dialog will be conveyed through Bit 0 Status (active or inactive). The second alarm configured for a particular stream will be conveyed through Bit 1 and so on. The status for up to 32 limit alarms per stream can be transmitted if a 32 bit register is used.
1 - Limit Alarm Row Position	The row position in the **Limit Alarms** dialog determines which bit is used to convey status. If you select this, the statuses of up to 32 alarms selected

in the ***Limit Alarms*** dialog will be displayed. Status (active or inactive) of Limit Alarm 1 is conveyed it 0. Status (active or inactive) of Limit Alarm 2 is conveyed through Bit 1, so on. The status for up to 32 limit alarms per stream can be transmitted if a 32 bit register is used.

Default Stream Sequence	Rosemount 370XA only. Sets the default sequence to be used by the indicated detector during auto-sequencing. To create a new stream sequence or to edit an already-created sequence, click **Stream Sequence**.
Calculate Checksum	Click **Calculate Checksum** to calculate the current configuration checksum of the input file and the number of bytes the file contains.

1. Press **Calculate Checksum** at the bottom of the ***System*** dialog to compute a 32-bit checksum of the configuration that can be compared to the Configuration Checksum at Lockout field to determine if the analyzer's configuration has been modified.

2. The checksum that is calculated is stored in the Current Configuration Checksum field, and the date and time of the calculation is stored in the Checksum Update Time field.

   Note
   If you receive a *Configuration checksum calculation failed* error message after pressing **Calculate Checksum**, contact your local Emerson Customer Care Representative.

Related information

Set alarm limits
Create or edit a stream sequence

5.2 View and edit Component Data tables

The number of available ***Component Data*** tables depends on the gas chromatograph (GC) unit configuration.

Procedure

1. To view a component data table, go to **Application → Component Data...**.

   The ***Component Data Tables*** dialog appears, displaying a list of available ***Component Data*** tables.

   Note
   You can also access the ***Component Data*** tables by pressing **F6** or by clicking ✛ from the tool bar.

2. Select the table that you want to view.

   The selected ***Component Data*** table displays.

   Note
   To see a different table, select it from the ***Choose table*** drop-down list.

Note

To sort the list of components by detector, and then by retention time, click **Sort RT**.

Related information

Link a valve with a stream

5.2.1 Edit a Component table

Note

Table cells with a white or yellow background are editable; table cells with a turquoise background are not editable.

Procedure

1. Click the cell you want to edit.
   Depending on the cell type, you are either required to select a value from a drop-down list, or you can type in the value directly.

2. To save the changes and close the dialog, click **OK**.

   Note

   To save the changes without closing the dialog, click **Save**.

   The following lists all of the editable parameters available on the **Component Data Table** dialog. The standard values for these parameters were taken from the second editions of the *Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids* and the *Compressibility Factors of Natural Gas and Other Related Hydrocarbon Gases*.

Component	This drop-down list contains the complete catalog of available components for the selected stream.
Usr Std	Indicates the source of the component:
	• Usr - The component was edited or defined by the user.
	• Std - The component was selected from the standard list of components and no changes were made to its standard data.
Det #	The component's detector number.
Ret Time	Time in seconds before the apex of the component's peak will appear. The retention time can be set from 0 to 3600 seconds.

   > **NOTICE**
   >
   > Ensure that the component retention times do not exceed the analysis time, as defined by the **Timed Events** table. Rosemount MON2020 does not automatically prevent the operator from defining excessive component retention times.

Resp Factor	A component's response factor is equal to the raw data of the component's peak divided by the component's concentration. The maximum value is 1.0E+38.
Calib Type	Rosemount MON2020 can perform six types of calibrations:
	• Single-Level - Uses the standard calibration in which the response factor is needed to determine the mole percentage during the calibration.

- Fixed - During the calibration, the response factor is not updated.

- Relative - Calibration in which a reference component is used to compute the mole percentage.

- Multi-Level - Uses a polynomial equation to compute the mole percentage during the calibration. Values must be entered in the Multi-level Calib a, Multi-level Calib b, Multi-level Calib c, and Multi-level Calib d cells.

- 2-pt Calib - Uses an exponential power fit using two different points to address non-linear detector response. Two calibration gases - (Low and High) with different calibration concentrations are required. By doing a single-level (or linear) calibration on these individual streams, the gas chromatograph (GC) computes the coefficients for the 2-pt exponential power fit.

- From CDT X (X = 1 to 8) - Allows you to copy calibration factors (Response Factor and Retention Time) from another **Component Data** table (CDT). This is used when two or more calibration gases are required to generate response factors and retention times for all the components that are to be analyzed. At the end of a successful calibration, response factors and retention time will be copied from the alternate CDT.

Calib Conc	The amount, in mole %, parts per million (ppm), parts per billion (ppb), or mg/m^3 of the component that is present in the calibration gas.
Unit	Indicates the unit of measure used when calculating and displaying the component's calibration concentration. Options are Mole%, ppm, ppb, and mg/m^3.
Cal Conc Uncertainty	For the Rosemount 370XA and 470XA only, uncertainty values from the calibration gas's certificate. Default value is 2.
Anly Meth	Defines how the component concentration is computed. The analysis method can take one of the following values:

- Area - Calculates the component concentration by dividing the peak area by the response factor.

- Height - Calculates the component concentration by dividing the peak height by the response factor.

- Fixed - The component concentration equals the component's calibration concentration displayed in the **Calib Conc** column of the component data table. No calculation is performed using the response factor.

- By Difference - All components except one (*n*) are added up and then subtracted from 100%. *n* is 100 - (sum of all other components).

- Analog Input - The GC reads the analog input channel, scales the raw milliampere value to engineering values that were set in the **Analog Inputs** window, and uses this value as the component concentration. No calculation is performed using the response factor.

RT Secs Dev	The maximum acceptable deviation time, in seconds, of the new retention time from the current retention time.
RT Upd Meth	Determines when the retention time will be updated. Options are: • Cal - Updates the retention time only during the final calibration run. • Anly - Updates after each analysis.
Resp Fact %	The maximum acceptable percent of deviation between the new response factor and the current response factor.
Gross Dry BTU	Gross energy content per cubic foot (ft.^{3}), assuming no water is present.
Net Dry BTU	Net energy content per cubic foot, assuming no water is present.
Gross Dry BTU per lb	Gross energy content per pound, assuming no water is present.
HV Sup MJ/m^3	Gross heating value in megajoules per cubic meter.
HV Inf MJ/m^3	Net heating value in megajoules per cubic meter.
HV Sup MJ/kg	Gross heating value in megajoules per kilogram.
HV Inf MJ/kg	Net heating value in megajoules per kilogram.
Sum Factor Pri	Used to calculate the compressibility factor.
Sum Factor Sec	Used to calculate the compressibility factor (the ratio of the actual volume of a real gas to the volume predicted by the ideal gas at the same temperature and pressure).
CV Superior KJ/mol - Pri	Gross caloric value per kilojoule/mol (kJ/mole %).
CV Inferior Pri	Net caloric value per kilojoule/mol (kJ/mole %).
CV Superior KJ/mol - Sec	Gross caloric value per kilojoule/mole (kJ/mole %).
CV Inferior Sec	Net caloric value per kilojoule (kJ/mole %).
Hydrogen Atoms	Displays the number of hydrogen atoms for a component.
Gals/1000 SCF	Liquid equivalent volume in gallons/1000 ft.^{3}.
Reid Vapor	The component's vapor pressure in pounds per square inch (psig) at 100 °F (38 °C)
Lbs/Gallon	Liquid density for the component at base conditions.
Rel Dens Gas	The relative density of the gas phase for the component at base conditions.
Rel Dens Liquid	The relative density of the liquid phase for the component at base conditions.
Mole Weight	The molecular weight of the component, which is used to calculate the weight percent of each component in the sample.
Carbon Weight	The molecular weight of the carbon atoms in the component.

AGA 8 Component	The name of the component according to the American Gas Association, which is used in the AGA 8 compressibility calculation.
Ref Comp	The component not found in the calibration gas but in the sample gas for indirect calibration. If *none*, normal (direct) calibration is used.
	Not editable unless the calibration type is set to Relative.
Rel Resp Fact	A fixed multiple of the response factor of the component found in the sample gas for indirect calibration.
	Not editable unless the calibration type is set to Relative.
Rel Dens Liquid 15C	The relative density in kilograms per cubic meter (kg/m^3) of the liquid phase for the component at 15 °C.
Molar Mass	The mass of one mole of the component.
Multi-level Calib a	Third-order polynomial coefficient for multi-level calibrations.
	Not editable unless the calibration type is set to Multi-Level.
Multi-level Calib b	Second-order polynomial coefficient for multi-level calibrations.
	Not editable unless the calibration type is set to Multi-Level.
Multi-level Calib c	First-order polynomial coefficient for multi-level calibrations.
	Not editable unless the calibration type is set to Multi-Level.
Multi-level Calib d	Zero-order polynomial coefficient for multi-level calibrations.
	Not editable unless the calibration type is set to Multi-Level.
Component Code (UK)	An index number that corresponds to the standard component numbers taken from the American Gas Association. Up to 20 components can be defined per data table.
Component Code (US)	An index number that corresponds to the standard component numbers taken from the American Gas Association. Up to 20 components can be defined per data table.
2 Pt Calib Low CDT	The **Component Data** table associated with a low calibration gas (Rosemount 700XA and 1500XA only).
2 Pt Calib High CDT	The **Component Data** table associated with a high calibration gas (Rosemount 700XA and 1500XA only).
2 Pt Exp	Value calculated from the 2 pt Calib Low CDT and the 2 Pt Calib High CDT (Rosemount 700XA and 1500XA only).

Related information

Streams

Set up an analysis/validation stream to use two point calibration (Rosemount 700XA and 1500XA only)

Add a component to a Component Data table (CDT)

Remove a component from a Component Data table (CDT)

View raw data
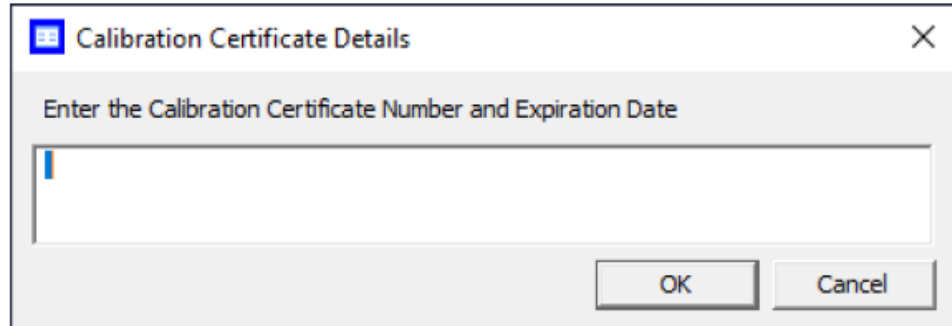
View Standard Component Values table

Editing energy value

5.2.2   Edit calibration certificate details

Procedure

1. To access the *Calibration Certificate Details* dialog, either click the **Edit Calib Certificate Details** button in the *Component Data Table* dialog or press **F8**. The *Calibration Certificate Details* dialog opens.

2. Enter the calibration certificate number and expiration date.
3. Click **OK** to save your changes and close the *Calibration Certificate Details* dialog.

5.2.3 Editing energy value

Procedure

1. To access the *Edit Energy Value* window, you may either click the **Edit Energy Value** button in the *Component Data* window or press **F7**.
    The *Edit Energy Value* window opens.

2. Choose a table from the **Choose Table** dropdown list.

3. Enter the **Cal Gas Energy Value** and the **Energy Deviation Limit** in the appropriate fields.

    The **Calculated Cal Gas Energy Value** field cannot be edited.

4. Click **Save** to save your changes without closing the *Edit Energy Value* window. Click **OK** to save your changes and close the *Edit Energy Value* window. Click **Cancel** to close the *Edit Energy Value* window without saving your changes.

Related information

View and edit Component Data tables

5.2.4 View Standard Component Values table

To view the standard component values in a *Component Data* table:

Procedure

1. Go to **Application** → **Component Data...** or press **F6**.
    The **Component Data** dialog opens.

Figure 5-1: Component Data Window
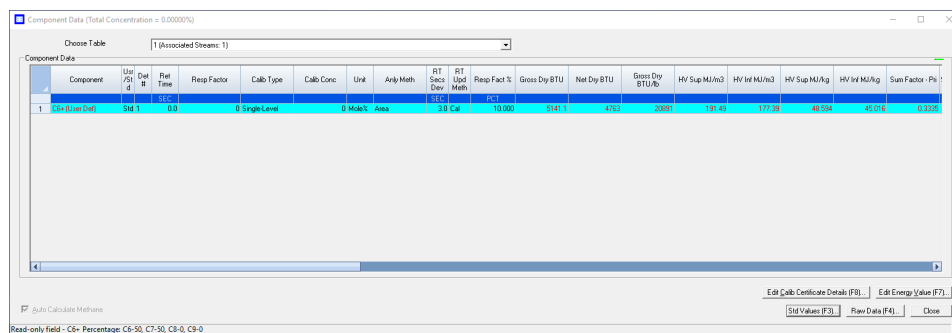
2. Click **Std Values [F3]...** or press **F3**.
    The **Standard Component Values** dialog opens.

Figure 5-2: Standard Component Values Window

5.2.5   View raw data from the Component Data table

To view the raw data for the displayed **Component Data** table:

Procedure

1. Go to **Application → Component Data**.
    The **Component Data** dialog displays.

2. Click **Raw Data (F4)** or press **F4**.
    The **Select** dialog displays, listing the streams that are associated with the
    Component Data table.

3. Double-click the desired stream.

    The **Raw Data** dialog displays, listing the peak raw data from the last run of the
    stream represented by the **Component Data** table.

    The following data displays for each peak:

Peak No.	Numerical identifier for the peak, listed by the order of discovery.
Ret Time	Time, in seconds, that the component eluted.
Peak Area	The area under the peak.
Peak Height	The maximum height of the peak.
Det	The detector associated with the peak.
Method	Method of peak end detection. Options are:

1 (Baseline)	Baseline termination occurs when the absolute values of twelve successive slope calculations are less than the slope sensitivity.
2 (Fused Peak)	A fused peak is found if a peak onset is detected after the discovery of a peak crest and before the baseline termination is detected.
3 (Last Fused Peak)	The last peak in a group of fused peaks.
4 (Tangent Skim)	Baseline termination occurs when the current level is lower than the Start Baseline value and the slope at the point is negative and smaller in magnitude than the average slope from the beginning of the peak.
100 (Inhibit)	An Inhibit On event in the *Timed Events* table caused the peak to be terminated.
300 (Forced Integration)	An Integration Off event in the *Timed Events* table caused the peak to be terminated.
500 (Summation)	A Summation Off event in the *Timed Events* table caused the peak detection logic to sum together the peak areas under multiple peaks between the Summation On and Summation Off events and to add an entry for an artificial peak with its area set to the composite area under the constituent peaks.

Baseline Start	The raw detector counts at the start of an integration. For example, if the peak starts at 10 seconds, then the raw detector count at 10 seconds becomes the Baseline Start value.
Baseline End	The raw detector counts at the end of an integration. For example, if the peak ends at 35 seconds, then the raw detector count at 35 seconds becomes the Baseline End value.
Integration Start	Time, in seconds, when integration started.
Integration End	Time, in seconds, when integration stopped.
Peak Width @ Half Height	The width of the peak taken at half of the peak's height.
Partial Peak	If Yes, then the Partial Peak value is used in the summation calculation.

> If No, then the Partial Peak value is not used in the summation calculation.

4. Click **Close** to return to the *Component Data* dialog.

5.2.6 Edit percentage of C6+ in a Component Data table

The C6+ component that the gas chromatograph (GC) detects is actually a mixture of up to four heavy hydrocarbons: from hexane and above. When the energy value and other physical properties are calculated for the mixture, the GC assumes a ratio of heavy hydrocarbon components, and that ratio is used for the C6+ value.

By default, there are four pre-defined ratios:

Component	C6/C7/C8 percentages
C6+ 47/35/17	47.466/35.34/17.194
C6+ GPA 2261-99	60.0/30.0/10.0
C6+ 57/28/14	57.143/28.572/14.285
C6+ 50/50/0	50.0/50.0/0

To change the defined ratio:

Procedure

1. Go to **Application**→ **Component Data** or press **F6**.
   The *Component Data* dialog opens.

2. Click the C6+ component field, which displays one of the four ratios described previously.
   A drop-down list opens.

3. Select **C6+ (User Def.)** from the drop-down list.

4. Click **Edit Percentage (F5)**.
   The *C6+ User Def.* dialog opens.

5. Enter a composition percentage for each component.
   The Total Percentage, which must equal 100 and is displayed on the dialog's title bar, updates with the sum of the four ratios.

6. Click **OK**.
   The *Component Data* dialog closes. The edited row on the *Component Data* table is updated based on the new ratio.

7. Click **Save** to accept the changes without closing the dialog or click **OK** to accept the changes and close the dialog.

5.2.7 Set up an analysis/validation stream to use two point calibration (Rosemount 700XA and 1500XA only)

Procedure

1. In the *Component Data* table (CDT) associated with the **Analysis/Validation** stream:

   a) Change the Calibration Type for a component to **2 Pt Calib**.

   b) Change the 2 Pt Calib Low CDT to select the CDT associated with low calibration gas.

    c) Change the 2 Pt Calib High CDT to select the CDT associated with high calibration gas.

2. Run **Single Stream** on the stream associated with the low calibration gas until the readings stabilize.

3. Run **Forced Calibration** on the low stream.

4. Run **Normal Calibration** on the low stream.

5. Run **Single Stream** on the stream associated with the high calibration gas until the readings stabilize.

6. Run **Forced Calibration** on the high stream.

7. Run **Normal Calibration** on the high stream.
   If the Normal Calibrations on the low and high streams in Step 4 and Step 7 are successful, the GC is ready to analyze the analysis/validation stream using two-pt calibration constants that are gathered during the low and high calibration runs.

Related information

How a two point calibration works

How a two point calibration works

When you select **2 pt. calibration:**

1. When the gas chromatograph (GC) does a calibration on the low stream, it copies the response factor (RF) and calibration concentration (CC) for each component to the columns marked **Multi-Level Calib a** and **Multi-Level Calib b** in the **Component Data** table (CDT) associated with the analysis or validation stream.

2. When the GC does a calibration on the high stream, it copies the RF and CC for each component to the columns marked **Multi-Level Calib c** and **Multi-Level Calib d** in the CDT associated with the analysis or validation stream.

3. It then computes two-point exponent and RF values for each component using the following formulas and stores them in the **2pt_exp** and **Response Factor** columns in the CDT.

$$2\text{pt exp} = \frac{\ln(d) - \ln(b)}{\ln(c*d) - \ln(a*b)}$$

$$where$$

$$a = \text{Multi-level calib a}$$

$$b = \text{Multi-level calib b}$$

$$c = \text{Multi-level calib c}$$

$$d = \text{Multi-level calib d}$$

4. The Retention Time for each component in the **Analysis/Validation** CDT is an average of the retention time from the **Low** and **High** CDTs.

5. During analysis/validation, the concentration is calculated using the formula:

$$RF = \frac{POWER(c*d,2pt\_exp)}{d}$$

where POWER (y, x) is the power of function $y**x$

5.2.8   Add a component to a Component Data table (CDT)

Modbus® registers use row indices instead of component names to extract component-based results. If you add a component to a CDT, the row indices for all the components that elute after the added component shift down by one position. Similarly, if you delete a component, the row indices for all the components after the deleted component shift up by one position. You will need to adjust all Modbus registers mapped to the per-component analysis results to ensure that they use the correct row index.

Procedure

1. Go to **Application→ Component Data...**, press **F6**, or click ✛ on the tool bar.
   The **Component Data Tables** dialog appears, displaying a list of available CDTs.
2. Select the CDT that you want to add a component to.
   The selected CDT displays.

   Note
   To sort the list of components by detector, and then by retention time, click **Sort RT**.

3. To add the new component below the currently selected component, select **Insert after**.

4. To save the changes and close the dialog, click **OK**.

   Note
   To save the changes without closing the dialog, click **Save**.

5.2.9   Remove a component from a Component Data table (CDT)

Procedure

1. Go to **Application→ Component Data...**, press **F6**, or click ✛ on the tool bar.
   The **Component Data Tables** dialog appears, displaying a list of available CDTs.
2. Select the CDT that you want to remove a component from.
   The selected CDT displays.

   Note
   To sort the list of components by detector, and then by retention time, click **Sort RT**.

3. Select the component that you want to remove.
4. Click **Delete**.
5. To save the changes and close the window, click **OK**.

Note
To save the changes without closing the window, click **Save**.

5.3   View and edit Timed Events tables

Use this function to view and/or edit the *Timed Events* tables assigned to and used by particular gas streams.

The number of available timed events depends on the gas chromatograph (GC) configuration. The standard GC application contains eight *Timed Events* tables. The Rosemount 370XA and 470XA contain two *Timed Events* tables.

Procedure

1. Go to **Application → Timed Events...**, press **F5**, or click 🔲 on the tool bar.
   The *Timed Events* dialog appears, displaying a list of available *Timed Events* tables.

   Note
   If only one *Timed Events* table is available, it displays immediately, bypassing the *Timed Events* selector dialog.

2. Select the table that you want to view.
   The selected *Timed Events* table displays.

   Note
   To sort events by time, click the appropriate **Sort** button.

3. Choose the analysis train associated with timed event.

4. To see a different *Timed Events* table, select it from the **Choose Table** drop-down list.

Related information

Launch the Timed Events table from the Chromatogram Viewer
Link a valve with a stream

5.3.1 Configure valve events

Valve-related events are grouped on the upper left side of the **Timed Events** dialog.

Procedure

1. Go to **Application** → **Timed Events...**, press **F5**, or click ⊞ on the tool bar.
   The **Timed Events** dialog appears, displaying a list of available **Timed Events** tables.

   Note
   If only one **Timed Events** table is available, it displays immediately, bypassing the **Timed Events** selector dialog.

2. Select the table that you want to view.
   The selected **Timed Events** table displays.

   Note
   To sort events by time, click the appropriate **Sort** button.

3. Click the cell that you want to edit.
   Depending on the cell type, you may either select a value from a drop-down list or type in the value directly. The following list describes the valve-related parameters that are available in the **Timed Events** dialog.

   Type — The type of device associated with the event. You have the following choices:
   - Valve # - Valve number.
   - DO # - A discrete output.
   - Strm Sw - Switches to the next stream in the sequence.
   - FID Gain - Changes the gain of the flame ionization detector. Available options are Low and High.
   - FID Auto Zero - Resets the baseline of the FID.
   - Cal Gas Save - Sets the start or end time for the Cal-Gas Saver™ feature.
   - Hardware Inhibit - Set to Off to start to look for a peak; set to On to stop looking for a peak for the valve, discrete output number, or detector number.

   Valve/DO # /Det # — Use the drop-down list to select the specific valve or discrete output that should be used for the event.
   This column does not apply if Strm Sw was selected from the **Type** column.

   State — Turns the valve or discrete output on or off or sets the FID to high or low.
   This column does not apply if Strm Sw was selected from the **Type** column.

   Time — Indicates the time, in seconds, that the event should occur during the analysis. Enter a value between 0.0 and 3600.0.

   Note
   Event time must be less than the analysis time.

4. To save the changes and close the window, click **OK**.

> **Note**
> To save the changes without closing the window, click **Save**.

5.3.2   Configure integration events

Integration-related events are grouped on the upper right side of the *Timed Events* dialog.

Procedure

1. Go to **Application** → **Timed Events...**, press **F5**, or click ⊥ on the tool bar.
   The *Timed Events* dialog appears, displaying a list of available *Timed Events* tables.

   > **Note**
   > If only one *Timed Events* table is available, it displays immediately, bypassing the *Timed Events* selector dialog.

2. Select the table you want to view.
   The selected *Timed Events* table displays.

   > **Note**
   > To sort events by time, click the appropriate **Sort** button.

3. Double-click the cell that you want to edit.
   Depending on the cell type, you may either select a value from a drop-down list or type in the value directly. The following list describes the integration-related parameters that are available on the *Timed Events* window.

   Type   The type of integration event. You have the following options:
   - Inhibit: Set to Off to start to look for a peak; set to On to stop looking for a peak.

   - Integrate: Set to On and Off to set a region in which the area under the trace is computed as a peak regardless of peak onset discovery. The resulting area is added to the raw data as a peak with the retention time set to the integration off time.

   - Summation: Set to On and Off to set a region in which the area of all peaks found will be added together to create a single summed value. The peaks that contribute to the summation are marked as partial peaks in the raw data table, and the summation total is added to the raw data as a new peak with the retention time set to the summation off time.

   - Slope Sens: The peak starts when the slope of six consecutive points is greater than the slope sensitivity value that is displayed in the *Value* column; the peak ends when the slope of six consecutive points is less than the slope sensitivity value that is displayed in the *Value* column.

   - Peak Width: Each point displayed on the graph represents the average of *N* raw data points, where *N* is the value displayed in the corresponding *Value* column.

   - Single Base: Determines how the baseline is drawn under a peak.
     — Off: The baseline is drawn from the point of peak onset to the point of peak termination. This is not necessarily horizontal and in fact usually has a slight slope. (Default)

     — Bgn: Draws a horizontal baseline from the point of peak onset to a point above or below the peak termination.

> — End: Draws a horizontal baseline from a point above or below the peak onset to the point of peak termination.

- Fused Ovrrd: Determines how the baseline is drawn when two or more peaks are fused together.
  - Off: A single baseline is drawn from the onset of the first peak of the fused group to the termination of the last peak of the group. (Default)
  - On: Causes a separate baseline to be drawn for each peak in the fused group.

- Negative Peak: Determines whether peak detection will detect inverted peaks, which are peaks that point downward from the baseline. At any given moment you can detect positive or negative peaks but not both at once.
  - Off: Detect positive peaks. (Default)
  - On: Detective negative peaks.

- SW Auto Zero: Re-zeros the baseline of the trace at the specified time for the specified detector. Used after a flame ionization detector (FID) gain change event or a spectrum gain change event.

  Note
  The Single Base and Fused Override events can act together to produce multiple horizontal baselines, at different heights, for a fused peak group.

Det # The ID number of the detector that will be affected by the event. Valid values are:

- 1 - 4 (Rosemount 1500XA)
- 1 - 3 (Rosemount 700XA with integral flame photometric detector [μFPD])
- 1 - 6 (Rosemount 4500XA)

Value The values available depend on the integration type selected from the *Type* column.

- Slope Sens: Enter the number of points, between 1 and 99999, to be used.

  Note
  The peak starts when the slope of six consecutive points is greater than the slope sensitivity value that is displayed in the *Value* column; the peak ends when the slope of six consecutive points is less than the slope sensitivity value that is displayed in the *Value* column.

- Peak Width: Enter the number of points, between 1 and 99, to be used.

- Single Baseline: Select Off, End, or Bgn.

- SW Auto Zero: No options.

- All other integration types: Select On or Off.

Time Indicates the time, in seconds, that the event should occur during the analysis. Enter a value between 0.0 and 3600.0.

  Note
  Event time must be less than the analysis time.

4. To save the changes and close the window, click **OK**. To save the changes without closing the window, click **Save**.

5.3.3   Configure spectrum gain events

The spectrum gain feature graphically magnifies the size of a chromatogram's peaks. The data itself is not affected, only the presentation of the data. This feature can be useful for viewing peaks that are otherwise too small to examine or so large that the top of the peak cannot be seen.

Spectrum gain-related events are grouped on the lower left side of the *Timed Events* dialog.

Procedure

1. Go to **Application → Timed Events...**, press **F5**, or click 🔳 on the tool bar.
   The *Timed Events* dialog appears, displaying a list of available *Timed Events* tables.

   Note
   If only one *Timed Events* table is available, it displays immediately, bypassing the *Timed Events* selector dialog.

2. Select the table that you want to view.
   The selected *Timed Events* table displays.

   Note
   To sort events by time, click the appropriate **Sort** button.

3. Click the cell that you want to edit.
   Depending on the cell type, you may either select a value from a drop-down list, or type in the value directly. The following list describes the spectrum gain-related parameters that are available in the *Timed Events* dialog.

   Det #   The ID number of the detector that will be affected by the event. Select 1 or 2.

   Gain   Enter a value between 0 and 64. This is the exponent value in the following expression: $2^{gain\ value}$. For example, a value of 0 means no gain is applied; a value of 5 means the gain is increased to 32 times it's original value.

   Time   Indicates the time, in seconds, that the event should occur during the analysis. Enter a value between 0.0 and 3600.0.

   Note
   Event time must be less than the analysis time.

4. To save the changes and close the window, click **OK**. To save the changes without closing the window, click **Save**.

5.3.4   Set the cycle and analysis time

Procedure

1. Go to **Application → Timed Events...**, press **F5**, or click 🔳 on the tool bar.
   The *Timed Events* dialog appears, displaying a list of available *Timed Events* tables.

   Note
   If only one *Timed Events* table is available, it displays immediately, bypassing the *Timed Events* selector dialog.

2. Select the table that you want to view.
    The selected **Timed Events** table displays. The Analysis Time section is located on the lower right side of the **Timed Events** dialog.

    > **Note**
    > To sort events by time, click the appropriate **Sort** button.

3. Click the Analysis Time cell and enter a value, in seconds, between 0 and 3600.
4. Click the Cycle Time cell and enter a value, in seconds, between 0 and 3620.

    > **Note**
    > The cycle time must be at least 10 seconds greater than the analysis time.

5. To save the changes and close the window, click **OK**.

    > **Note**
    > To save the changes without closing the window, click **Save**.

5.3.5   Add a timed event

To add an event to one of the **Valve Events**, **Integrate Events**, or **Spectrum Gain Events** tables in the **Timed Events** dialog:

Procedure

1. Go to **Application → Timed Events...**, press **F5**, or click on the tool bar.
    The **Timed Events** dialog appears, displaying a list of available **Timed Events** tables.

    > **Note**
    > If only one **Timed Events** table is available, it displays immediately, bypassing the **Timed Events** selector dialog.

2. Select the table you want to view.
    The selected **Timed Events** table displays.

    > **Note**
    > To sort events by time, click the appropriate **Sort** button.

3. To add the event below the currently selected event, click **Insert after**.
    The new event is added to the table.

4. Define the event as necessary, and enter a new Time for the event.
5. To save the changes and close the window, click **OK**. To save the changes without closing the window, click **Save**.

5.3.6   Remove a timed event

To remove an event from one of the **Valve Events**, **Integrate Events**, or **Spectrum Gain Events** tables in the **Timed Events** dialog:

Procedure

1. Go to **Application → Timed Events...**, press **F5**, or click on the tool bar.
    The **Timed Events** dialog appears, displaying a list of available **Timed Events** tables.

    > **Note**
    > If only one **Timed Events** table is available, it displays immediately, bypassing the **Timed Events** selector dialog.

2. Select the table you want to view.
   The selected *Timed Events* table displays.

   Note
   To sort events by time, click the appropriate **Sort** button.

3. Select the event you want to delete.

4. Click **Delete**.

5.4 View and edit Validation Data tables (VDTs)

Use VDTs to hold information about the composition of the gas that is used in the validation run. During a validation run, the gas chromatograph (GC) performs a test analysis of a gas with a known component composition to verify that the GC is working properly.

Procedure

1. Go to **Application → Validation Data**.
   The *Validation Data* dialog displays.

   Note
   If no VDT is in use (or configured), then Rosemount MON2020 shows the *NO VDT table in use* message.

2. If the appropriate VDT is not displayed, select it from the *Choose Table* drop-down list.

3. Select a new variable by clicking on the appropriate drop-down list under the *Variable* column.

4. To update the nominal value automatically when component data is updated, select **Link with Component Data**.

5. Enter the component's concentration percentage in the appropriate cell under the *Nominal Value* column.

   To ensure accuracy, take this value, which is compared to the GC's analysis results at the end of the validation run, from the documentation provided with the gas cylinder.

6. Enter a value in the appropriate Percent Deviation cell.

   Example

   If you enter 10 in this field, and the GC's analysis result for the component differs from the component's Nominal Value by ±10% or more, then an alarm is generated.

7. To copy a component variable to the next empty row, click **C + Copy (F8)**.

   The component is incremented to the next available component (for example, from ammonia to benzene). The Nominal Value and Percent Deviation values are also copied.

   Note
   You can select and copy more than one component at a time.

   If there are no components available, instead of copying the component, the software displays the following message:

8. To save the changes and close the window, click **OK**. To save the changes without closing the window, click **Save**.

Related information

Streams

5.5   Calculations menu

Rosemount MON2020's *Calculations* sub-menu allows you to activate and define how the output of standard or user-defined chromatograph analysis data is used in various calculations.

You can configure the following types of calculations:

Control   Allows you to designate, by streams, the standard calculations that should be performed from the analysis data.

Averages   Allows you to designate, by streams and components, averages of standard calculations the gas chromatograph (GC) should perform.

User Defined   Allows you to create and edit customized calculations using analysis data.

Dewpoint   This optional feature allows you to calculate dewpoint temperatures and to estimate the cricondentherm, which is the temperature above which no liquid will form at any pressure.

Metrology Options   This feature is only available if the Metrology Type inside the GC is set to GOST. On this screen, you can edit the response factor (RF) Deviation Check and the RF Stability Check.

   • RF Deviation Check: Allows you to select Standard or GOST. The Standard method checks RF deviation as a percentage change from the previous calibration. The GOST method computes the range of RF during the calibration and compares it to the permissible range per *GOST 32371.7-2008*.

   • RF Stability Check: Allows you check the periodic accuracy of the analyzer per *Equation 15 GOST 31371.7-2008*. If you select **Enable** and

run the calibration, the RF Range is compared to a narrower permissible range per *Equation 15 GOST 31371.7-2008*.

5.5.1 Set standard calculations by stream

To designate, by streams, the standard calculations—for example, mole percent, liquid volume, gas density, Wobbe index, etc.—that should be performed from the analysis data, do the following:

Procedure

1. Select **Applications → Calculations → Control…**.
   The **Control Calculations** window appears.

2. Select a check box for a given stream to turn the calculation ON for that stream; click to clear the check box for a given stream to turn the calculation OFF for that stream.

   You can use the arrow keys to move from one stream cell to another, and you can press the space bar to toggle the calculation on or off.

3. To save the changes and close the window, click **OK**.

   Note
   To save the changes without closing the window, click **Save**.

   Note
   To save the information on this screen to a tab-delimited text file, right-click the table and select **Save Sheet** from the right-click menu.

   Note
   To copy the information on this screen to the clipboard so that it can be pasted into another application, such as Microsoft® Word or Microsoft® Excel, right-click the table and select **Copy** to clipboard from the right-click menu. The Streams and Calibration data is exported to the clipboard.

   Note
   To print the information on this screen, right-click the table and select **Print Sheet** from the right-click menu.

5.5.2 Edit averages calculations

To designate, by streams and components, averages of standard calculations the GC should perform, do the following:

Procedure

1. Select **Applications → Calculations → Averages…**.
   The **Averages Calculations** window appears.

2. Select a new variable by clicking on the appropriate dropdown list under the **Variable** column.

   Note
   The averages will be assigned in the default Modbus® map in the order that they appear in the table.

3. Select the type of average to be calculated from the **Average Type** dropdown list. You have the following options:

   Unused An average is not be calculated for the variable.

Hourly	Averages are calculated every hour at the time displayed in the **Reset Time** field from the **Averages Reset** section.
24 Hour	Averages start and stop once a day at the time displayed in the **Reset Time** field from the **Averages Reset** section.
Weekly	Averages start and stop once a week at the time displayed in the **Reset Time** field and on the day entered in the **Weekday** field, from the **Averages Reset** section.
Monthly	Averages will start and stop once a month at the time displayed in the **Reset Time** field and on the day of the month entered in the **Day** field, from the **Averages Reset** section.
Variable	Averages will start and stop for the duration entered in the **Hours** column starting from the reset time.
Everyrun	No average is stored; instead, the current value at the end of the run is stored.

4. To set a custom start and stop time for a particular calculation, set the **Average Type** for the calculation to **Variable** and enter the desired time in the **Hours** cell.

Note
The custom **Hours** setting overrides the **Reset Time** setting.

5. Set the appropriate **Restart Flag** to one of the following options:

NO	The current average is not reset.
CUR	When **CUR** is selected and saved from the drop-down menu, the current average is cleared (reset immediately) and a new average calculation starts. It is used during debugging or troubleshooting to exclude bad runs from averages.

6. To save the changes and close the window, click **OK**.

Note
To save the changes without closing the window, click **Save**.

Note
To save the information on this screen to a tab-delimited text file, right-click the table and select **Save Sheet** from the right-click menu.

Note
To copy the information on this screen to the clipboard so that it can be pasted into another application, such as Microsoft Word or Excel, right-click on the table and select **Copy to clipboard** from the right-click menu.

Note
To print the information on this screen, right-click the table and select **Print Sheet** from the right-click menu.

Related information

Use the context-sensitive variable selector
View an archive of averages for a given variable
Copy component settings

5.5.3 View an archive of averages for a given variable

To view an archive of averages for a given variable, do the following:

Procedure

1. Select **Applications → Calculations → Averages....**
   The *Averages Calculations* window appears.

2. Click on the desired variable to view its history.

3. Click **Archive**.
   The archive data screen appears.

   Note

   To copy the information in this table to the clipboard so that it can be pasted into another application such as Microsoft Word or Excel, select the cells that you want to copy and then press **CTRL + C** to copy the information to the clipboard.

5.5.4 Copy an average calculation configuration

To copy the average calculation configuration from a highlighted row and apply them to the next row:

do the following:

Procedure

1. Go to **Applications → Calculations → Averages**.
   The ***Averages Calculations*** window appears.

2. Select the row that you want to copy.

3. Click **S + Copy**.

   The stream is copied to the next row and incremented to the next available stream —for example, from Stream 2 to Stream 3.

   Note
   You can select and copy more than one stream at a time.

   If there are no streams available, instead of copying the stream, Rosemount MON2020 displays the following message:

4. To save the changes and close the window, click **OK**.

   Note
   To save the changes without closing the window, click **Save**.

5.5.5 Copy component settings

To copy the component settings from a highlighted row and apply them to the next row:

Procedure

1. Go to **Applications → Calculations → Averages...**.
   The *Averages Calculations* window appears.
2. Select the row that contains the component that you want to copy.
3. Click **C + Copy**.
   The component is copied to the next row and incremented to the next available component—for example, from ammonia to benzene.

   Note
   You can select and copy more than one component at a time.

   If there are no components available, instead of copying the component, Rosemount MON2020 displays the following message:

4. To save the changes and close the window, click **OK**.

   Note
   To save the changes without closing the window, click **Save**.

5.5.6 Build new calculations with user-defined calculations

You can use a previously created user-defined calculation when building new calculations.

Procedure

1. Go to **Application → Calculations → User-defined... → Edit (F2)**.
2. Select the *System Variables* drop-down list.
3. Click the **Calculations** arrow and select User Defined Calculations from the drop-down list that contains the full list of available calculations.
4. Select User-Defined Variable from the *Variables* drop-down list.
5. Click **Done**.
   The *User Calculations* selection menu closes. The selected system variable displays in the *System Variables* drop-down box and in the *Expression Editor*.

5.5.7 Set the dewpoint calculation

You can use this window to edit the options for calculating the dew point.

Procedure

1. Go to **Applications → Calculations → Dewpoint**.

The **DewPoint Calculation** window opens.
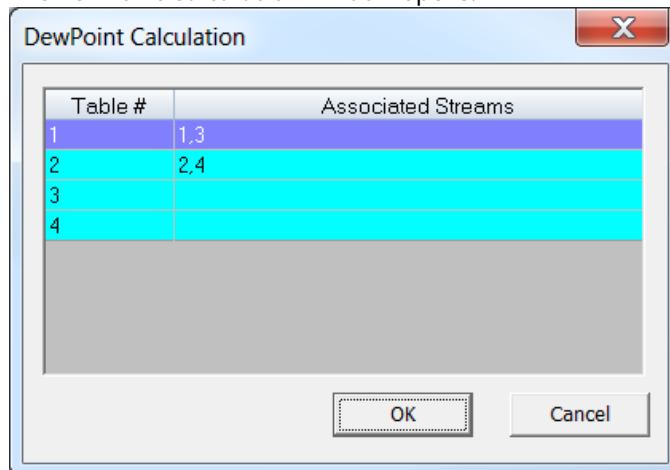
2. Click the row with the component data table you want to edit.
   The larger **Dewpoint Calculations** window opens.
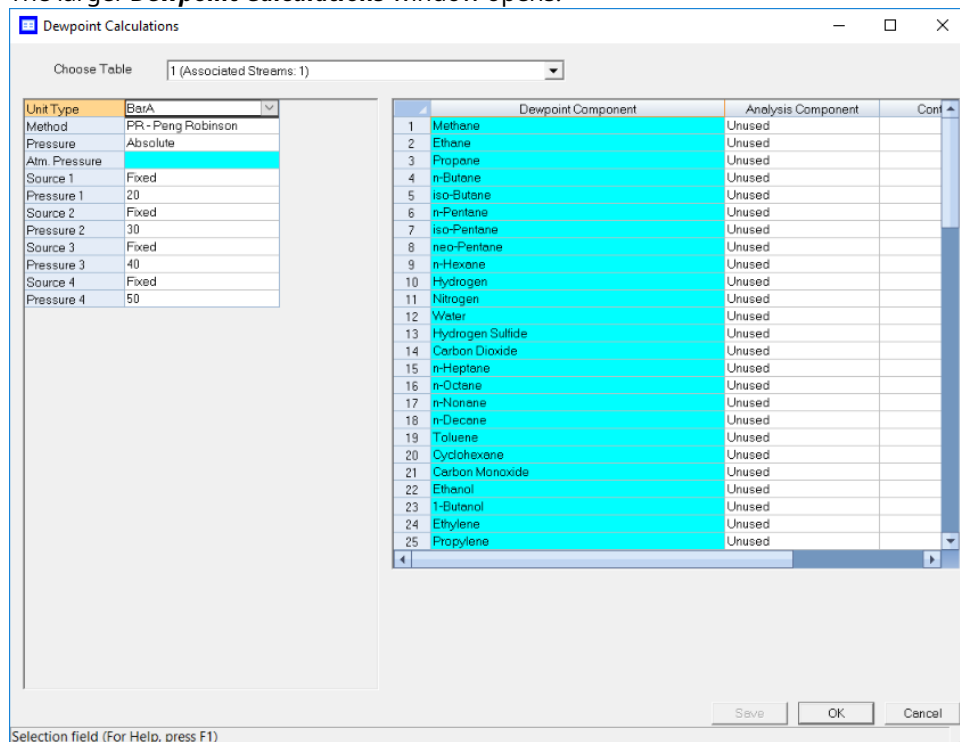
3. Select the unit of measurement from the **Unit Type** drop-down list. The options are:
   - BarA
   - PSIA

4. Select the dewpoint calculation method from the **Method** drop-down list. The options are:
   - PR - Peng Robinson
   - RKS - Redlich Kwong Soave

5. Select the type of pressure from the **Pressure** drop-down list. The options are:

- Absolute

- Gauge

6. If you selected Gauge in the Pressure field, enter the atmospheric pressure in the Atm. Pressure field.

7. Select the type for the first source from the **Source 1** drop-down list. The options are:
   - Fixed: If you select this option, you can enter a number in the Pressure 1 field or you can enter the number via Modbus®.

   - Analog Input 1 or Analog Input 2: If you select one of these options, Rosemount MON2020 automatically enters the number from the Current Value field in the **Analog Input** window.

8. If you selected Fixed in the Source 1 field, enter a number in the Pressure 1 field.

9. If you want to calculate more than one pressure, repeat Step 7 and Step 8 for Source 2.

   Note
   You may enter up to four pressure values.

10. For each component in the **Dewpoint Component** column, select a component to be analyzed in the **Analysis Component** column. The options are:
    - C2s

    - Propane

    - Propylene

    - C4s

11. For each component, enter the percentage of the Dewpoint Component that is made up of the corresponding Analysis Component in the **Contribution** column.

    Write the percentage as a decimal value between 0.000000 and 1.000000.

    Note
    The default values are correct for a C9+ analysis, in which all of the C9+ is assumed to be n-nonane.

12. When you have finished entering the information for each component you want to measure, click **Save** to save your changes.

13. Click **OK** to close the **Dewpoint Calculations** window.

    To close the **Dewpoint Calculations** window without saving your changes, click **Cancel**. If you make changes and then click **Cancel**, the **Unsaved data** dialog box opens.
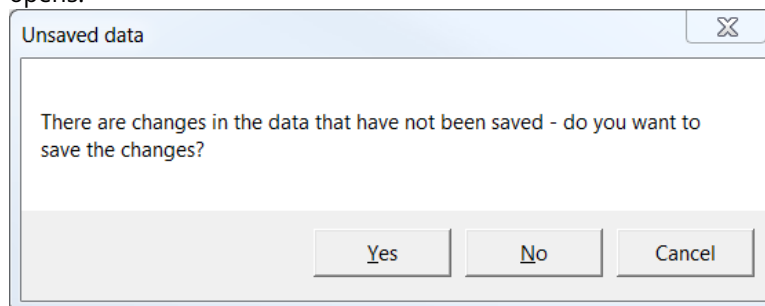
If you change your mind and want to save your changes, click **Yes**. If you don't want to save your changes, click **No**. To return to the ***Dewpoint Calculations*** window, click **Cancel**.

Related information

[Manage your gas chromatograph's (GC's) analog inputs](#)

5.6 Set the calculation method to GPA or ISO

You can configure Rosemount MON2020 to perform GPA calculations, ISO calculations, or both.

Procedure

1. Go to **Applications → Calculations → Configuration...**.
   The ***Calculations Configuration*** window displays.

2. Select the method from the ***Calculation Method*** drop-down list.
   The options are:

   • GPA

   • ISO

   • GPA && ISO (Rosemount 700XA and 1500XA only)

3. Select an ISO Version.
   The options are:

   • ISO6976: 1995

   • ISO6976: 2016

4. Select a unit of measure from the ***Base Pressure Units*** drop-down list.
   The options are:

   • PSIA

   • BarA

   • kPaA

5. If you set the calculation method to GPA or GPA && ISO, you can also set the following options:

   • GPA Calculator Units (U.S. or S.I.)

   • GPA Pressure Display (PSIA, BarA, or kPaA)

6. If you set the calculation method to ISO or GPA && ISO, you can also set the following options:

   - ISO Pressure Display (BarA or kPaA)

   - Primary Temperatures

     — 0C/0C

     — 0C/15C

     — 0C/20C

     — 15C/0C

     — 15C/15C

     — 15C/20C

     — 20C/0C

     — 20C/15C

     — 20C/20C

     — 25C/0C

     — 25C/15C

     — 25C/20C

     — 0C/15.55C

     — 15C/15.55C

     — 20C/15.55C

     — 25C/15.55C

     — 15.55C/0C

     — 15.55C/15C

     — 15.55C/15.55C

     — 15.55C/20C

   Note
   Updating this field also updates the primary values (Sum Factor Pri, CV Superior Pri and CV Inferior Pri) that display in the ***Component Data*** table.

   - Secondary Temperatures (same options as **Primary Temperatures**)

   Note
   Updating this field also updates the secondary values (Sum Factor Sec, CV Superior Sec and CV Inferior Sec) that display in the ***Component Data*** table.

   - Primary CV Units

     — kilojoules per cubic meter (kJ/m^3)

     — kilocalories per cubic meter (kCal/m^3)

     — kilowatt hours per cubic meter (kWhrs/m^3)

     — megajoule per cubic meter (MJ/m^3)

     — megajoule per kilogram (MJ/kg)

     — megajoule per mole (MJ/mole)

- Secondary CV Units (same options as Primary CV Units)

- AGA 8 Method
    — AGA8 1994 (Detail)

    — AGA8 2017 (Detail)

    — AGA8 2017 (GERG-2008)

7. Click **OK** to accept the changes and close the window.

   Note
   Click **Save** to accept the changes without closing the window.

5.7   Set alarm limits

Use this function to set threshold limits for gas chromatograph (GC) analysis data. When a limit is exceeded, an alarm is activated and logged.

Procedure

1. Go to **Applications → Limit Alarms...**.
   The *Limit Alarms* window displays.

2. Select a new variable by clicking on the appropriate drop-down list under the *Variable* column.

3. To change the alarm type, click the appropriate cell under the *Type* column.

   You have the following the options:

   - Off - Turns off the alarm.

   - All - Use high and low limits to activate alarms. Enter the lower limit value in the appropriate cell under the *Low Limit* column. Enter the upper limit value in the appropriate cell under the *High Limit* column.

   - High - If the status value of the variable rises above the value set in the corresponding *High Limit* column, the high limit alarm is activated.

   - Low - If the status value of the variable falls below the value set in the corresponding *Low Limit* column, the low limit alarm is activated.

4. If you want a discrete output to activate when the alarm triggers, click on the appropriate cell under the *DO # to Set* column and select it from the drop-down list.

5. If you want to inhibit averaging when the alarm triggers, select the **Inhibit Avg** check box.

6. To customize the text of the alarm message, enter the new text in the appropriate cell under the *User Alarm Text* column.
   When the alarm triggers, this text will display under the *Alarm Message* column on the *Unack/Active Alarms* window.

7. To configure the alarm delay, enter the duration of the alarm condition, in seconds, before the Halt command should be executed.

   Valid values are between 0 and 1800.

8. To apply the current limit alarm conditions to the stream, click **S + Copy**.
   The conditions are applied to the next available stream (for example, from Stream 2 to Stream 3).

   If there are no streams available, instead of copying the stream, Rosemount MON2020 displays the following message:

9. To apply the current alarm conditions to the next available component, click **C + Copy**.

The alarm limit conditions are copied to the next available component (for example, from ammonia to benzene).

If there are no more components available, instead of copying the component, Rosemount MON2020 displays the following message:

10. If you want the gas chromatograph (GC) to halt after the current analysis when an alarm is triggered, do the following:

   a) Select the **Halt on Alarm?** check box.

   b) Enter a value in the *Delay* column for the length of time, in seconds, that the alarm condition should exist before the alarm is displayed.

      You can enter a value between 0 and 1800.

11. Select the check box to enable the Associated Analysis Clock 1 alarm(s).

12. Select the check box to enable the Associated Analysis Clock 2 alarm(s).

13. Select the check box to enable the Associated Analysis Clock 3 alarm(s).

14. Select the check box to enable the Associated Analysis Clock 4 alarm(s).

15. To save the changes and close the window, click **OK**.

Note
To save the changes without closing the window, click **Save**.

Related information

View the alarm log
Use the context-sensitive variable selector
Create or edit a stream sequence

5.8   Discrete alarms

Procedure

1. Select **Discrete Alarms...** from the **Applications** menu.
   The *Discrete Alarms* window displays.

2. Click the **Variable** cell. Select the discrete input of interest under **Discrete Inputs** → **Current Value**.

3. If you want a discrete output to activate when the alarm triggers, click on the appropriate cell under the **DO # to Set** column and select it from the dropdown list.

4. If you want to inhibit averaging when the alarm triggers, select the **Inhibit Avg** checkbox.

5. To enable the alarm, select the checkbox under the **Is Alarm Enabled?** column; to disable the alarm, deselect the checkbox under the **Is Alarm Enabled?** column.

6. To halt the GC after the current analysis when an alarm is triggered, select the **Halt on Alarm?** checkbox.

7. To set the amount of time that should pass between the recognition of an alarm condition and the display of the alarm, enter a value between **0** and **1800** in the **Delay** column.

8. Select the **Associated Analysis Clock 1** checkboxes to configure the discrete alarms for Analysis Clock 1.

9. Select the **Associated Analysis Clock 2** checkboxes to configure the discrete alarms for Analysis Clock 2.

10. Select the **Associated Analysis Clock 3** checkboxes to configure the discrete alarms for Analysis Clock 3.

11. Select the **Associated Analysis Clock 4** checkboxes to configure the discrete alarms for Analysis Clock 4.

12. To customize the text of the alarm message, enter the new text in the appropriate cell under the **Alarm Message** column.
    When the alarm triggers, this text displays under the **Alarm Message** column on the *Unack/Active Alarms* window.

13. To save the changes and close the window, click **OK**.

Note

To save the changes without closing the window, click **Save**.

5.9   View System Alarms

To edit system alarms, do the following:

Procedure

1. Select **System Alarms...** from the **Applications** menu.
    The *System Alarms* window displays.
2. If you want a discrete output to activate when the alarm triggers, click the appropriate cell under the **DO # to Set** column and select it from the dropdown list.
3. If you want to inhibit averaging when the alarm triggers, select the **Inhibit Avg** checkbox.
4. To enable the alarm check the checkbox under the **Is Alarm Enabled?** column; to disable the alarm, uncheck the checkbox under the **Is Alarm Enabled?** column.
5. To set the amount of time that should pass between the recognition of an alarm condition and the display of the alarm, enter a value between **0** and **1800** in the **Delay** column.
6. To halt the GC after the current analysis when an alarm is triggered, check the **Halt on Alarm?** checkbox.
7. Select the checkbox to enable the Associated Analysis Clock 1 alarm(a).
8. Select the checkbox to enable the Associated Analysis Clock 2 alarm(s).
9. Select the checkbox to enable the Associated Analysis Clock 3 alarm(s).
10. Select the checkbox to enable the Associated Analysis Clock 4 alarm(s).
11. To save the changes and close the window, click **OK**.

    Note
    To save the changes without closing the window, click **Save**.

5.10   Streams

Use this feature to configure and validate the streams.

With Rosemount MON2020, you can:

*   Assign component data tables, validation data tables, timed events tables and associated analysis clocks to a particular stream.

*   Designate a stream for analysis, validation, or calibration.

*   Control automatic calibration or validation parameters, such as the total number of runs, runs to be averaged, starting times, and time between automatic calibrations and baseline runs.

5.10.1   Create or edit a stream sequence

A stream sequence defines the order of stream analysis for a detector. You can create three sequences; each can be activated by a digital input device or via a Modbus® link.

Procedure

1. Go to **Application → Stream Sequence...**.

    Each *Stream Sequence* table can contain up to three sequences: a primary, or default, sequence and two auxiliary sequences.

The **_Stream Sequence_** window displays.

2. Double-click the appropriate cell under the **_Strm Seq Name_** column to give your new sequence a name or to edit the name of an existing sequence. Type in the new name.

3. To define which discrete input should activate the sequence, select it from the drop-down list of the appropriate cell under the **_Seq Activate DI_** column.

Note
No two sequences can be activated by the same discrete input.

4. To define the order of analysis, double-click the appropriate cell under the **_Seq of Strms_** column and enter the numbers for the streams, separated by commas, that should be analyzed.

Example

For example 1,2 would continuously analyze stream 1 followed by stream 2. A sequence of 1,1,1,2 would analyze stream 1 three times and then analyze stream 2 every fourth time in the sequence.

5. For each analysis clock, configure the different stream sequence from the **Application → Analysis Clock Configuration** screen.

6. To save the changes and close the window, click **OK**.

Note
To save the changes without closing the window, click **Save**.

5.10.2   Designate how a stream is used

To assign a function to a stream, do the following:

Procedure

1. Select **Streams…** from the **Application** menu.
   The _Streams_ window opens.

2. For the appropriate stream, select one of the following options from the **Usage** column:

   • **Unused** - Not used

   • **Cal** - Calibration

   • **Analy** - Analysis

   • **Validate** - Validation

   If you select **Cal** or **Validation**, you can also edit the following parameters:

Auto	If checked, the calibration or validation will be automatic.
Total Runs	The number of runs, from **1** to **10**, to make for each calibration.
Avg Runs	The number of most-recent calibration runs to average; for instance, if five calibration runs are performed and **Avg Run** is set to 3, then the last three runs of the five will be used to average the calibration results.
Start Time	The time the first automatic calibration should be performed.
Interval	The number of hours between automatic calibrations.
Stream Valve	Options are Unused, Calibration, Stream 1, Stream 2, Stream 3.

Stream Valve ON to Select	If this option is checked the GC will purge the sample through the sample loop when the stream valve is set to ON; if this option is not checked the GC will purge the sample through the sample loop when the stream valve is set to OFF.

3. To save the changes and close the window, click **OK**.

> **Note**
> To save the changes without closing the window, click **Save**.

5.10.3 Link a valve with a stream

Multiple streams can be linked to the same valve to allow for different uses of that stream—for example, the calibration gas can be assigned to both calibration and validation runs.

Procedure

1. Select **Streams...** from the **Application** menu.
   The *Streams* window opens.

2. Go to the **Stream Valve** column for the corresponding stream and select the appropriate valve from the dropdown list.

   You can view details about the valves in the dropdown list in the *Valves* window.

3. To save the changes and close the window, click **OK**.

   > **Note**
   > To save the changes without closing the window, click **Save**.

4. If the sample stream is selected when the valve is on, check the corresponding **Stream Valve On to Select** checkbox; if the sample stream is selected when the valve is off, uncheck the corresponding **Stream Valve On to Select** checkbox.

5.10.4 Assign a data table to a particular stream

To assign a component data table, a validation data table, or a timed events table to a stream, do the following:

Procedure

1. Select **Streams...** from the **Application** menu.
   The *Streams* window opens.

2. For the appropriate stream, if **Usage** is set to **Cal** or **Analy**, select a component data table from the **CDT** column and a timed events table from the **TEV** column.

3. For the appropriate stream, if **Usage** is set to **Validate**, select a component data table from the **CDT** column, a timed events table from the **TEV** column, and a validation data table from the **VDT** column.

4. To save the changes and close the window, click **OK**.

   > **Note**
   > To save the changes without closing the window, click **Save**.

5.10.5   Change the base pressure for a stream

The software uses base pressure to calculate the Gas Processors Association/American Gas Association (GPA/AGA) physical properties.

Note

The base pressure for the International Organization for Standardization (ISO) calculation is always 1 barg.

To change the base pressure for a stream:

Procedure

1. Go to **Application** → **Streams**
   The **Streams** dialog opens.

2. For the appropriate stream, double-click on the corresponding cell under the **Base Pressure** column and enter a new value.

   Note

   The software can calculate GPA/AGA at up to three additional optional pressures. Use the **Optional Pressure 1**, **Optional Pressure 2**, and **Optional Pressure 3** columns for this purpose.

3. To save the changes and close the window, click **OK**.

   Note

   To save the changes without closing the window, click **Save**.

5.10.6   Add a customized sequence to a stream

Use the *Edit Custom Logic* window to create a customized sequence of events that can be executed during stream switching.

You can create up to eight customized sequences.

You must create two sub-sequences: one to activate the stream and the other to deactivate the stream. Set up the cycle time so that while in auto sequence mode there is adequate time for the stream with custom logic to activate and deactivate.

To add a customized sequence to a stream:

Procedure

1. Go to **Applications → Streams**.
   The *Streams* window opens

2. For the chosen stream, select Custom Logic # from the drop-down list in the *Stream Valve* column.

   The **Edit Custom Logic** button becomes active.

3. Click **Edit Custom Logic**.

   The *Edit Custom Logic* window opens.

4. Add events to the ***Events - Activate Stream*** table and the ***Events - Deactivate Stream*** table.

   a) Select a row in the table.

   b) Click **Insert After**.
   A row is added to the table.

   c) Select the event Type.

      The event Type options are:

      • Valve #: Select a stream valve to turn on or off.

      • DO#: Select a discrete output (DO) to turn on or off.

      • Delay: Introduce a delay in seconds.

      • Check Status: Select a discrete input and a desired state for the discrete input. If the desired state is not present, a **Sample Fluid Unavailable** alarm is triggered.

      • Check Analog Input Low: Rosemount MON2020 reads the analog input and generates an alarm if the analog input's value is lower than the threshold set in the associated ***State/Value*** column.

      • Check Analog Input High: Rosemount MON2020 reads the analog input and generates an alarm if the analog input's value is higher than the threshold set in the associated ***State/Value*** column.

      Note
      The Check Status, Check Analog Input Low, and Check Analog Input High events are only available for activating the stream.

   d) Select the Valve/DO#:

      The Valve/DO# is the name of the analog input or discrete output to activate or deactivate.

   e) Select the State/Value.

      The State/Value is the desired state or value at which you want the stream to activate or deactivate.

5. When you have finished entering all the events, click **OK** to save your changes and close the ***Edit Custom Logic*** window.

6. Click **OK** to save the changes to the ***Streams*** window and close it.

The custom logic sequence is executed before starting the analysis if:

• The **Purge stream for 60 seconds** check box is selected on the ***Single Stream***, ***Calibration***, or ***Validation*** window.

• You start a single stream analysis, a calibration, or a validation from Idle mode on a stream that has custom logic applied and

If several delays are set up in the custom logic sequence, then the delays will be executed before executing the next custom logic event.

If you start the GC in auto sequence mode:

• When the stream that has custom logic is the next stream to be turned on, the customized sequence of activation events will be executed when the current stream's Stream SW event is reached.

- When the current stream is a stream that has custom logic and the next stream is a different stream, the customized sequence of deactivation events will be executed when the current stream's Stream SW event is reached.

5.11 Configure analytical train

Use the *Analytical Train Configuration* window for multiple analysis clocks to assign the valves, discrete outputs (DO), and detectors to each train and then assign each train to its respective analysis clock.

Figure 5-3: Analytical Train Configuration window

> **Note**
> This feature is not available for Rosemount 370XA gas chromatographs (GCs).

Procedure

1. Assign the usage of valves and DOs to each analyzer on the **Hardware → Valves**, **Hardware → Detectors**, and **Hardware → Discrete Outputs** screens.

2. Open the **Application → Analytical Train Configuration** screen.

   You can use the *Filter Selections* drop-down list to filter by the type of hardware you are interested in. The options are:

   - All

   - Detectors

   - Valves

   - Discrete Output

   - Heaters

   By default, `All` is selected, and all types of hardware are displayed. To filter by a certain type of hardware, select it from the list. Then only rows with the selected hardware will be displayed.

3. Click **Discrete Output** and **Valves**. Assign the respective DOs, valves, and detectors to each analytical train.

The valves are assigned with **Usage** as `Analyzer#` displayed on this screen. All available detectors are also displayed on this screen. You cannot configure the same valve or DO to multiple trains, but you can configure the same detector to multiple trains.

4. On the **Application→Timed Events** screen, filter the configured events as per train selection by selecting the **Train#** check box.

5.12 Configure an analysis clock

Use this feature to configure a single analysis clock or multiple clocks.

> **NOTICE**
>
> This feature is not available for Rosemount 370XA or 470XA gas chromatographs (GCs).

One analysis clock can be considered as one virtual gas chromatograph (GC) that has independent *Sample Loop*, *Analytical Path*, and *Timed Event* tables.

Multiple analysis clocks can run independently to analyze multiple streams at the same time. Emerson sets the number of analysis clocks at the factory per the mechanical configurations of the GC.

Mechanical configurations	Description
Trains (1 - 6)	The configured trains that are used by the analysis
Default Stream Sequence (Def Strm Seq)	Sets the default sequence to be used by the indicated analysis during auto-sequencing. To create a new stream sequence or to edit an already-created sequence, click **Stream Sequence** .
Purge Duration	The amount of time, in seconds, to purge the stream before starting an analysis, calibration, or validation run. The default value is `60 SEC`. Purging allows sample gas to flow through the sample loop prior to beginning the run.
Energy Value Check	If enabled, the GC analyzes the calibration gas as an unknown stream and computes its energy value. The GC then compares this value to the *Cal Gas Cert CV* and determines if the calibration gas's energy value is within the CV Check Allowed Deviation. If it isn't, the GC triggers the `Energy Value Invalid` alarm. The following conditions must be met before the GC can perform a EV Check: • The **EV Check** flag on the *System* screen must be enabled. • At least one stream must be set up in the *Streams* screen as a calibration stream, and the **Auto** flag for this stream must be enabled. The EV Check is performed under any of the following circumstances: • After a successful calibration, the GC computes the gas's energy value with the new response factors and performs the EV Check

1. Press **Insert** to add a new analysis.

2. Press **Delete** to delete an analysis.

Related information

Configure analytical train

5.13 Method Switching screen

The purpose of the *Method Switching* screen is to change the component data table (CDT) and associated calibration gas as you measure different percentages of your target gas.

The Method Switching function tells the gas chromatograph (GC) which CDT to use when the measured gas is at a certain percentage.

This screen is only available for the Rosemount 700XA and Rosemount 1500XA GC. To access the **Method Switching** screen, select **Application → Method Switching...** menu.

To enable the method switching functionality from this screen, select the checkbox.

By default, this screen shows the available number of methods or CDTs. For example, if four CDTs are supported, the screen will display four rows.
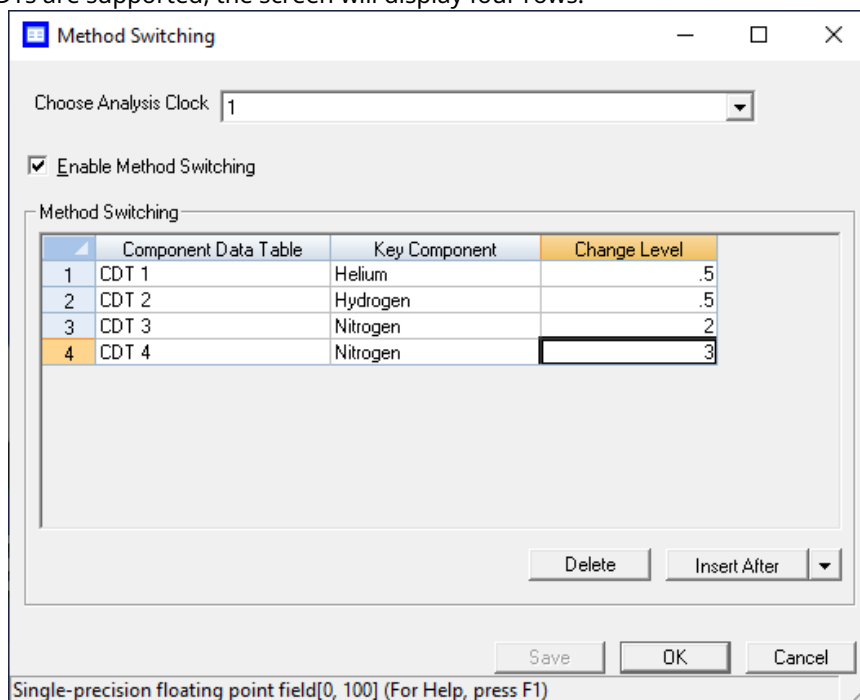
Note
Choose Analysis Clock - Option to select the Analysis Clock for GC's configured for more than one analysis clock.

The screen contains the following three columns.

Name	Description
Component Data table	Number of the component data table: CDT 1 to CDT 4. These names are fixed.
Key Component	This column shows a dropdown list of components associated with the CDT. For example, for the first row, it will display a list of components from the CDT 1 table.
Change Level	The change level is a value between 0 and 100. At the end of the analysis, if the calculated Mole % value of the component in the first row is greater than the value in the **Change Level** column, the GC uses CDT 1 to process the results for the next analysis. If the first key component does not exceed the value in the **Change Level** column, the system checks to see if the Mole % value of the second key component exceeds the value in the second row of the **Change Level** column. If this is the case, the system uses CDT 2 to process the results for the next analysis. If the Mole % value does not exceed the **Change Level** value in the second row, the system compares the Mole % value of the third component to the value in the third column of the **Change Level**.

Related information

[View and edit Component Data tables](#)

5.14 Communication screen

Use this screen to configure the gas chromatograph's (GC's) ports.

To access the communication settings, go to **Applications → Communication**.

Table 5-1 lists the ***Communication*** window's settings:

Note
During Modbus® serial communications, Rosemount MON2020 can differentiate between RTU or ASCII protocols; however, you still need to manually configure the data bit, stop bit, and parity settings.

Table 5-1: Communication Window Settings

Name	Description
Label	The name of the group of settings.
Modbus Id	Identification number of the Modbus device associated with the port.
Baud Rate	The baud rate setting. Options are: • 1200 • 2400 • 9600 • 19200 • 38400 • 57600 For high performing personal computers (PCs), set the baud rate to 38400. If you experience a communications failure at this rate, set the baud rate to 9600. Baud rate settings less than 9600 may result in information delivery that is unacceptably slow.
Data Bits	The number of data bits. Options are 7 and 8 (default).
Stop Bit	The number of stop bits. There is 1 stop bit.
Parity	The parity check method. Options are None (default), Even, and Odd.
RTS OFF Delay	Communication port handshaking ready to send (RTS) delay time.
RTS ON Delay	Communication port handshaking RTS delay time.
Response Delay	The response delay time before checking for an active ready to send/clear to send (RTS/CTS).
MAP File	Points to the file that contains the registers that should be used.
Port	Allows you to set the type of protocol to be used for the port: • RS232 • RS422 • RS485 • Ethernet If the port is set to RS422 or RS485, additional configuration steps are required. If Ethernet protocol is configured, the Default_Map is selected.

Related information

Connect to a gas chromatograph (GC)

Create or edit registers

Create a map file

Assign a variable to a register

View or edit scales

5.14.1 Create or edit registers

You can map gas chromatograph (GC) data to Modbus® registers and generate map files, which can then be associated with communications ports.

For a list of variable assignments made to all registers, consult the Communication section of the **GC Config Report**, which can be accessed from the **Logs/Reports** menu.

To map GC data to Modbus registers, do the following:

Procedure

1. Go to **Applications → Communication...**.
   The **Communication** window appears.

2. Click **Registers**.
   The **Modbus Map Editor** window appears.

3. To view or edit registers that are contained in an existing map file, click the select the appropriate file from the **Select MAP File** drop-down list.
   The registers will load into the table.

   Note
   Not all parts of a map file can be edited. The parts that can be edited are white; the read-only parts are turquoise.

4. To edit a cell, double-click it.

   You can edit the following parameters:

Register Number	Displays the number for the Modbus registers that will be polled by a connected data acquisition system.
Data Type	Describes the type of data that is stored in the register.

   Options are:
   - BOOLEAN: Has two states ON (1) or OFF (0).

   - INT: 16-bit unsigned integer.

   - LONG: 32-bit signed integer

     Note
     If the Modbus data type is Usr Modbus, each long value uses two registers; if the data type is SIM2251, each long value uses a single register.

   - ULONG: 32-bit unsigned integer

   - FLOAT: 32-bit floating point.

     Note
     If the Modbus data type is Usr Modbus, each floating point value uses two registers; if the data type is SIM2251, each floating point value uses a single register.

   - Bitmap(INT)

   - Bitmap(LONG)

   - SCALED_FP1

   - SCALED_FP32

If one of the scaled floating point options is chosen, the Zero Scale and Full Scale values for that option will display in the appropriate column cells.

SIM_2251 registers use only the FLOAT data type.

Variable(s)	Displays the variable(s) whose value is to be stored in the register.
Record Number	The Record Number is enabled for Archive type of variables. Select which archive record's data needs to output over Modbus. Record number 1 is referred to as recent record and maximum value is referred to as oldest record.
Access	Determines whether the register will be read-only (RD_ONLY) or read/write (RD_WR).
Format	The date and time format for related variables.

Options are:

- MMDDYY

- DDMMYY

- YYMMDD

- hhmmss

- hhmm

- DD

- MM

- YY

- YYYY

- WW

- hh

- mm

- ss

5. To copy the component settings from a highlighted row and apply them to the next row, click **C + Copy**.

   This feature also increments the Component value to the next available component (e.g., incrementing from ammonia to benzene), per the GC application. An error message displays when the last available component is reached.

6. To copy the stream settings from a highlighted row and apply them to the next row, click **S + Copy**.

   This feature also increments the Stream value to the next available stream (e.g., incrementing from Stream 2 to Stream 3), per the GC application. An error message displays when the last available stream is reached.

7. To delete a row, click **Delete Row**.

8. To insert a row, click **Insert Row**.

9. To check for conflicting register assignments, click **Check**.

   Rosemount MON2020 will check the table and if it encounters a conflict it displays the following message:

Review the table to locate the conflicting registers and change one.

10. To save the Map file, do the following:

   a) Click **Save**.
   Rosemount MON2020 validates the table for errors (for instance, ensuring that no two registers share a register number). If any errors are found, Rosemount MON2020 displays the appropriate error message. When no errors are found, the *Save As* window displays.

   b) Click **OK**.

Related information

[Assign a variable to a register](#)

5.14.2 Create a map file

Procedure

1. Go to **Application → Communication...**.
   The *Communication* window appears.

2. Click **Registers**.
   The *Modbus Map Editor* window appears.

3. Click **New**.

4. Create a new map file name.

5. From the *Register Type* drop-down list, select the type of PLC emulation protocol you want to use.

   You have two options:

   • User_Modbus, a PLC emulation Modbus® protocol that can use scaling to convert floating point numbers to .

   • SIM_2251: emulates the Model 2500 communication protocol and is a simulation of the 2251 gas chromatograph (GC) controller.

6. Click **OK**.

7. If you want to base a new map file on an existing map file, you have two options:
   •
      a. Click **Open from PC**.

      b. Select the file you want to import and click **Open**.

   • Select an existing map file from the drop-down list. Click **Save As**.

8. To edit a cell, double-click it.

You can edit the following parameters:

Register Number Displays the number for the Modbus registers that will be polled by a connected data acquisition system.

Data Type Describes the type of data that is stored in the register.

Options are:
- BOOLEAN: Has two states ON (1) or OFF (0).

- INT: 16-bit unsigned integer.

- LONG: 32-bit signed integer

    Note
    If the Modbus data type is Usr Modbus, each long value uses two registers; if the data type is SIM2251, each long value uses a single register.

- ULONG: 32-bit unsigned integer.

- FLOAT: 32-bit floating point.

    Note
    If the Modbus data type is Usr Modbus, each floating point value uses two registers; if the data type is SIM2251, each floating point value uses a single register.

- Bitmap(INT)

- Bitmap(LONG)

- SCALED_FP1

    ...

- SCALED_FP32

If one of the scaled floating point options is chosen, the Zero Scale and Full Scale values for that option will display in the appropriate column cells.

SIM_2251 registers use only the FLOAT data type.

Variable(s) Displays the variable(s) whose value is to be stored in the register.

Record Number Select the archive record's data needed to output over Modbus.

Note
Record number 1 is referred as recent record and max value is referred as oldest record.

Select archive type of variables and their maximum records as shown in Table 5-2.

Table 5-2: Archive Types

Archive type	Maximum number of records supported (as default)
Analysis	20
Calibration	35
Final calibration	35
Validation	35

Table 5-2: Archive Types *(continued)*

Archive type	Maximum number of records supported (as default)
Final validation	35
Hourly averages	168
Daily averages	35
Weekly averages	53
Monthly averages	12

Access Determines whether the register will be read-only (RD_ONLY) or read/write (RD_WR).

Format Use the *Format* drop-down list to configure the date/time. Options are:

- MMDDYY

- DDMMYY

- YYMMDD

- hhmmss

- hhmm

- DD

9. To copy the component settings from a highlighted row and apply them to the next row, click **C + Copy**.

   This feature also increments the Component value to the next available component (e.g., incrementing from ammonia to benzene), per the GC application. An error message displays when the last available component is reached.

10. To copy the stream settings from a highlighted row and apply them to the next row, click **S + Copy**.
    This feature also increments the Stream value to the next available stream (e.g., incrementing from Stream 2 to Stream 3), per the GC application. An error message displays when the last available stream is reached.

11. To delete a row, click **Delete Row**.

12. To insert a row, click **Insert Row**.

13. To check for conflicting register assignments, click **Check**.

    Rosemount MON2020 checks the table, and if it encounters a conflict, it displays the following message:

    Review the table to locate the conflicting registers and change one.

14. To save the map file to a personal computer (PC):

    a) Click **Save**.
       Rosemount MON2020 validates the table for errors (for instance, ensuring that no two registers share a register number). If any errors are found, Rosemount MON2020 displays the appropriate error message. When no errors are found, the *Save As* window displays.

    b) Click **Save File to PC**.

    c) Click **OK**.

Related information

[Assign a variable to a register](#)

5.14.3　Assign a variable to a register

Procedure

From the *Modbus Map Editor* window, double-click the appropriate Variable(s) cell and select a new variable.

Related information

[Use the context-sensitive variable selector](#)

5.14.4 View or edit scales

Rosemount MON2020 uses scales to convert floating point values to integers.

The software supports 32 different scales that are labeled SCALED_FP1 through SCALED_FP32. The **Data Type** column on the **Modbus Map Editor** window displays the type of scale, if any, that is being used for a particular register. If a scale is being used, the **Zero Scale** and **Full Scale** columns display the lower and upper values for the chosen scale.

To view the list of scales, select **Applications→Communication...→Registers** and click **Edit Scales** from the **Modbus Map Editor** window. The **Edit Scales** window displays all of the scales, along with each scales lower and upper values.

Use the following formula to calculate the variable's integer value:

$$integer = \left(\frac{R_F - R_Z}{S_F - S_Z}\right)(D_{fp} - S_Z) + R_Z$$

where:

- R_F = Full Scale, range
- R_Z = Zero Scale, range
- S_F = Full Scale, scale
- S_Z = Zero Scale, scale
- D_{fp} = Floating Point value

For example:

- R_F = 65535
- R_Z = 0
- S_F = 100 (from SCALED_FP1)
- S_Z = 0 (from SCALED_FP1)
- D_{fp} = 97.13 (scaled percent for methane)

$$63654 = \left(\frac{65535 - 0}{100 - 0}\right)(97.13 - 0) + 0$$

To edit or create your own scale, do the following:

Procedure

1. From the **Modbus Map Editor** window, select **Applications→Communication...→Registers→Edit Scales**.
   The **Edit Scales** window displays.
2. Double-click the appropriate cell and enter a new value.
3. Click **OK** to save the changes and close the window.

Related information

Create a map file

5.15 Configure an Ethernet port

To configure an Ethernet port, select **Ethernet Ports...** from the **Application** menu. The *Ethernet Ports* window displays.

The following list describes the Ethernet ports' parameters:

Ethernet 1 IP Address	IP address to use to connect to the GC's RJ-45 Ethernet port.
Ethernet 1 Subnet Mask	Subnet mask for the IP address of the GC's RJ-45 Ethernet port.
Ethernet 1 Gateway	Gateway address for the GC's RJ-45 Ethernet port.
Ethernet 2 IP Address	IP address to use to connect to the GC's wired Ethernet port.
Ethernet 2 Subnet Mask	Subnet mask for the IP address of the GC's wired Ethernet port.
Ethernet 2 Gateway	Gateway address for the GC's wired Ethernet port.
LOI IP Address	IP address for the GC's LOI.

5.16 Configure a file transfer protocol (FTP) data port range

When gas chromatographs (GCs) are installed behind a router through port forwarding, it can be useful to configure an FTP data port range. With this feature, GCs will be differentiated by their ports, but will have the same Internet protocol (IP) address.

Note
This feature has been added to Rosemount 370XA, 470XA, 700XA, and 1500XA GCs with firmware version 4.1.1 or newer.

If using port forwarding (for example, if the GC is connected behind a cellular router), set the FTP data port range when Rosemount MON2020 is connected locally to a GC with a DHCP connection.

This feature will only be enabled if:

- Rosemount MON2020 is connected to a GC.

- The user logged into Rosemount MON2020 has admin rights.

- The **Security** switch is unlocked.

- The **Designate Port** option is selected.

Prerequisites

Make sure the **Designate Port** option is selected in the *Ethernet 1 Connection Properties for a DHCP* dialog.

Figure 5-4: Ethernet 1 Connection Properties for a DHCP dialog
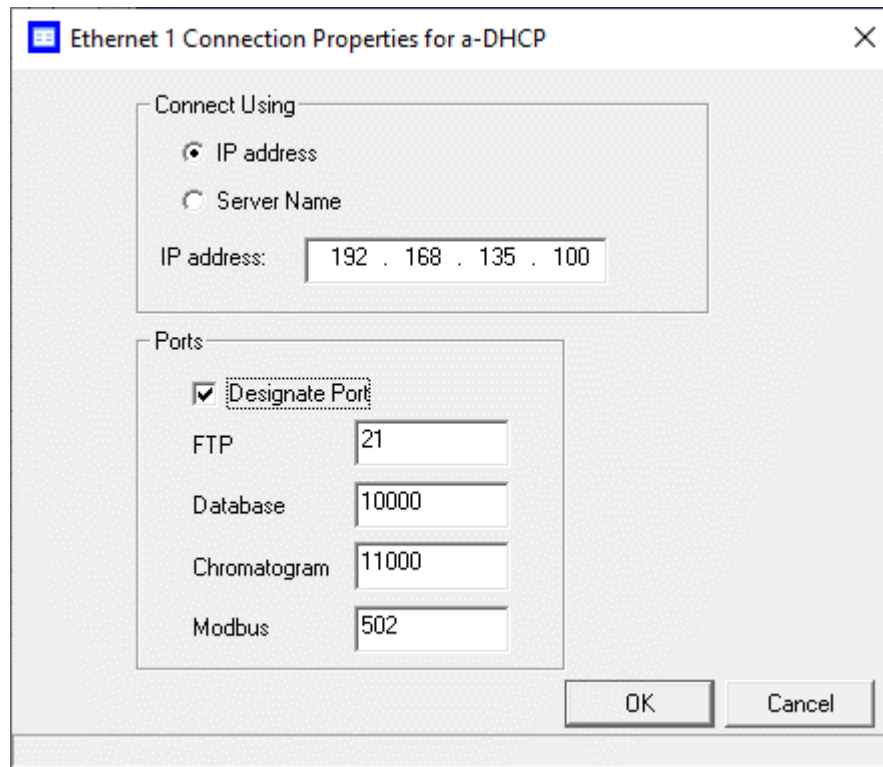
Procedure

1. Go to **Application→ FTP Settings**.
   The **FTP Settings** dialog opens.

   Figure 5-5: FTP Settings dialog

2. Optionally, select **Router/Modem IP Address** or **Router/Modem Name** and enter the IP address or name in the appropriate field.

   In most cases, you can leave this setting as default and leave the field blank.

3. Enter numbers in the **FTP Passive Port Range** fields.

   Important
   The numbers in these fields must be different for each GC installed behind the router or modem.

   The total port range is 1024 to 65535. Each GC must have a minimum range of five ports.

4. Click **OK**.
   Rosemount MON2020 displays the following message:

Figure 5-6: Rosemount MON2020 message
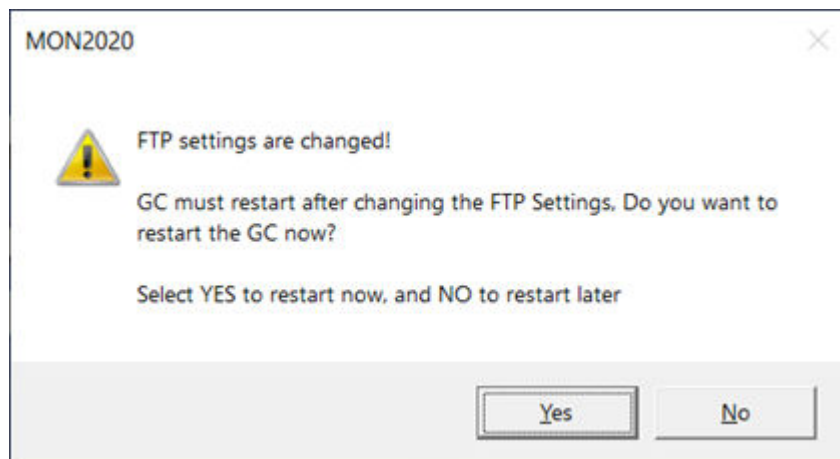
5. Click **Yes** to reboot the GC. Click **No** to save the FTP settings and restart the GC later.

Once you have configured the FTP data port range, you can access it remotely through port forwarding. If you change the FTP port data range, you will also need to change the port forwarding settings accordingly.

Postrequisites

If you change the FTP port data range, you will also need to change the port forwarding settings accordingly.

5.17 Configure parameters to display on the local operator interface (LOI)

Use this *LOI Status Variables* window to select and configure up to 25 gas chromatograph (GC) parameters that you would like to monitor using the LOI's Display mode.

Procedure

1. If the GC is configured with more than one analysis clock, use the **Choose Analysis Clock** drop-down menu and select an analysis clock from the list.

2. Go to **Application → LOI Status Variables...**.
   The *LOI Status Variables* window appears.

3. Select a variable by clicking on the appropriate drop-down list under the *Variable* column.

4. To copy the stream settings from a highlighted row and apply them to the next row, click **S + Copy**.

   This feature also increments the Stream value to the next available stream (for instance, incrementing from Stream 2 to Stream 8) per the GC application.

5. To copy the component settings from a highlighted row and apply them to the next row, click **C + Copy**.

   This feature also increments the Component value to the next available component (for example, incrementing from ammonia to benzene) per the GC application.

6. Enter a value in the Precision column to indicate the number of decimal places to display for this particular variable.

   The range of possible precision values is between 0 and 6.

7. Click **OK** to save the changes and close the window.

   Note
   To save the changes without closing the window, click **Save**.

Related information

Use the context-sensitive variable selector

5.18 Map a FOUNDATION™ Fieldbus variable

To map a gas chromatograph (GC) variable to a FOUNDATION Fieldbus process variable (PV), do the following:

Procedure

1. Take the GC out of service from the host.
2. Open Rosemount MON2020 and go to **Applications → FFB PV Mappings...**.
   The **FFB PV Mappings** window displays.
3. Select a new variable by clicking on the appropriate drop-down list under the **Variable** column.

   Note
   The **PV Value** column displays the current value of the GC variable indicated in the **Variable** column.

   Note
   The **PV Status** column indicates the state of the data displayed in the **PV Value** column. If the data was generated under predictable conditions without any alarms, then the statuses for all mapped process variables are Good; if the data was generated under unpredictable conditions—that is, if any alerts were triggered during the analysis cycle—then the statuses for all mapped process variables are Bad, because the GC cannot guarantee the results of the analysis.

4. To copy the stream settings from a highlighted row and apply them to the next row, click **S + Copy**.

   This feature also increments the Stream value to the next available stream—for instance, incrementing from Stream 2 to Stream 8, per the GC application.

5. To copy the component settings from a highlighted row and apply them to the next row, click **C + Copy**.

   This feature also increments the Component value to the next available component —incrementing from ammonia to benzene, per the GC application.

6. If necessary, enter a date or time format into the **Date/Time Format** column.
7. Click **OK** to save the changes and close the window.

   Note
   To save the changes without closing the window, click **Save**.

Related information

Use the context-sensitive variable selector

6 Logs/Reports menu

From the **_Logs/Reports_** menu, you can:

- View alarm, system, and event logs.
- Keep a maintenance record.
- Keep a parameter record.
- View relevant drawings and diagrams.
- View and print trend data.
- Create or view a _Repeatability Certificate_.
- View the _GC Configuration_ report.
- View archived analysis, calibration, and averages reports.
- Configure how and when certain reports are printed.
- View and print a stream's molecular weight vs. response factor.

6.1 Alarms menu

Use this menu to view and/or clear unacknowledged and active alarms, as well as to view the **_Alarm Log_**.

6.1.1 View unacknowledged and active alarms

Procedure

To view unacknowledged and active alarms, go to **Logs/Reports → Alarms → Unack/Active Alarms.....**.

The **_Unack/Active Alarms_** window displays.

Note
Double-clicking on the **GC Status Bar** from the main window also displays the **_Unack/Active Alarms_** window.

There are three display options for viewing alarms on this window:

- To view both unacknowledged alarms and active alarms, select **All Alarms**. This is the default display option.
- To view unacknowledged alarms only, select **Unacknowledged Alarms**.
- To view active alarms only, select **Active Alarms**.

The **_Unack/Active Alarms_** window supplies the following data for each alarm:

Status	Indicates whether the alarm has been acknowledged or not.
State	Indicates whether the alarm is ACTIVE or INACTIVE.
Date	Indicates the date and time on the gas chromatograph (GC) when the alarm condition began.
Alarm Message	Describes the alarm condition.
Type	Indicates whether a high limit or low limit alarm was triggered:

- HI means a high limit alarm was triggered.

- LO means a low limit alarm was triggered.

Limit   Indicates the value that was set as the trigger for the alarm.

Value   Indicates the current status value being output by the device.

Name   Indicates the name of the variable that triggered the alarm.

Note
Discrete alarms do not display type, limit, or value data.

6.1.2   Acknowledge and clear alarms

There are three ways to acknowledge and clear alarms:

- To acknowledge and clear alarms without viewing them, go to **Logs/Reports → Alarms → Clear/Ack All Active Alarms**.

- Another method to acknowledge and clear alarms without viewing them is to click ☑ from the tool bar.

- To view the alarms before acknowledging and clearing them, go to **Logs/Reports → Alarms → Unack/Active Alarms...**. The *Unack/Active Alarms* window provides several options:

  — To acknowledge an alarm, select it and then click **Ack Selected (F2)**.

    Note
    An alarm continues to display as an active alarm until that value is no longer in the alarm state.

  — To acknowledge all the alarms displayed on the window, click **Ack All (F3)**.

  — To acknowledge all the alarms displayed on the window and then remove them from the table, click **Clear/Ack All (F4)**.

    Note
    If an alarm is cleared before the condition has been resolved, Rosemount MON2020 redisplays the alarm entry as an active alarm.

6.1.3 View the alarm log

The Alarm Log records every alarm triggered from the GC. The *Alarm Log* window gives you the option of viewing the total list of alarms, or a date-filtered list.

To view the Alarm Log, select **Logs/Reports** → **Alarms** → **Alarm Log...**. The *Alarm Log* window displays.

The *Alarm Log* window supplies the following data for each alarm:

Date Time	Indicates the date and time at the GC when the alarm condition began.
Alarm Message	Describes the alarm condition.
State	Indicates whether the alarm is **SET** (active) or **CLR** (inactive).
Type	If applicable, indicates whether a high limit or low limit alarm was triggered: • **High** means a high limit alarm was triggered. • **Low** means a low limit alarm was triggered.
Limit	If applicable, indicates the value that was set as the trigger for the alarm.
Value	If applicable, indicates the current status value being output by the device.
Unit	If applicable, unit of measurement for the displayed values.
Name	Indicates the name of the variable that triggered the alarm.
User	Indicates which user made the change.

Note
Discrete alarms do not display **Type**, **Limit**, or **Value** data.

To view a list of alarms, do the following:

Procedure

1. To view all alarms, select the **All** checkbox. Otherwise, select the **Select Range** checkbox and use the **Start Date** and **End Date** dropdown lists to select a date range.

2. Click **Read Records**.
   The list of alarms displays with the most recent alarm at the top and the oldest alarm at the bottom. The alarms are also sorted and color-coded by time so that alarms that occurred simultaneously are grouped together.

3. Click **Save** to save the list.
   The list can be saved in the following formats:

   • Tab-Delimited (.txt)

   • Comma-Delimited (.csv)

   • Microsoft Excel (.xls)

   • HTML File (.html)

   • XML File (.xml)

4. Click **Close** to close the window.

6.2 The maintenance log

Use this function to manually record and track maintenance activities performed on a given GC unit.

To view the maintenance log, select **Maintenance Log...** from the **Log/Reports** menu.

6.2.1 Add an entry to the maintenance log

Use this window to manually record and track maintenance activities performed on a given GC unit.

To view the maintenance log, select Maintenance Log on the Log/Reports menu.

To add an entry to the maintenance log, do the following:

Procedure

1. Select **Maintenance Log...** from the **Log/Reports** menu.
   The **Maintenance Log** window displays. Log entries are sorted with the most recent on top

2. Click **Insert At Top**.
   A new row appears on the maintenance log table. The **Date** field contains the GC's current date and time, and is editable.

3. Double-click the *Message* cell and enter the relevant information for the log entry.

   Note

   To edit an old log entry, click it and the cell becomes editable.

4. Click **OK** to save the changes and close the window.

   Note

   To save the changes and keep the window open, click **Save**.

6.2.2   Delete an entry from the maintenance log

To delete an entry from the maintenance log, do the following:

Procedure

1. Select **Maintenance Log...** from the **Log/Reports** menu.
    The **Maintenance Log** window displays.

2. Select the entry that you want to delete.

3. Click **Delete**.
    The entry is removed from the maintenance log.

4. Click **OK** to save the changes and close the window.

    Note
    To save the changes and keep the window open, click **Save**.

6.3 View and edit the Parameter List

Use the *Parameter List* to keep a record of the hardware components and associated parameters for a given gas chromatograph (GC).

The *Parameter List* is a Microsoft Excel® document that you can be view and edit from Rosemount MON2020. Before attempting to edit the document, be sure to review it first to get an idea of what sorts of data it contains.

The *Parameter List* may contain one or all of the following pages:

- Cover Sheet
- Spare Parts
- TE Rework
- Application Data
- Programming
- Modbus® Configuration
- Stream Composition and Application
- Col Data
- Calibration Standard Data
- Stamp

6.3.1 View and edit the parameter list

To view and edit the parameter list, do the following:

Procedure

1. Select **Parameter List...** from the **Logs/Reports** menu.
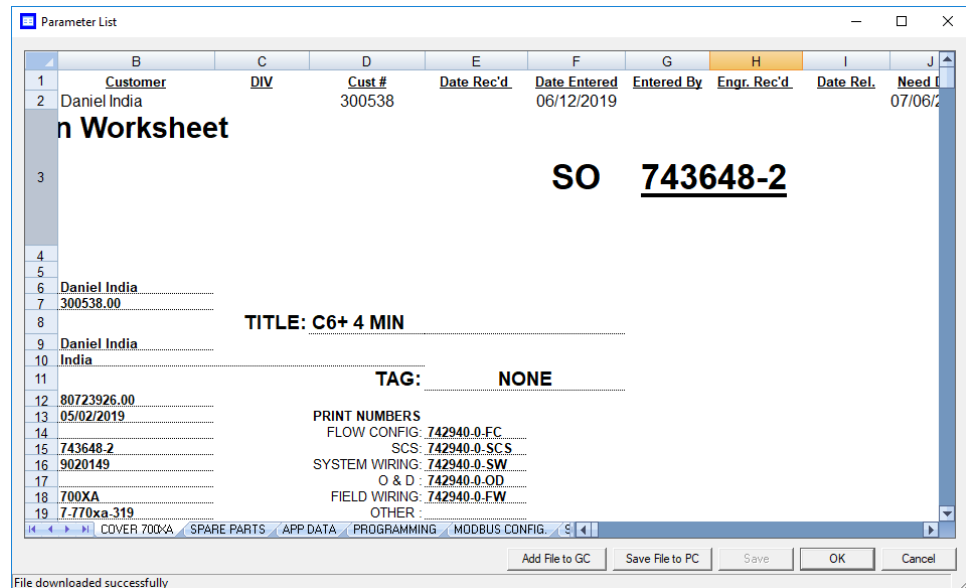
   The **Parameter List** window displays.

2. Make your changes to the parameter list.

3. Use the scroll tabs to view the data.
   Parameter list tabs:

   • Cover Sheet

   • Spare Parts

   • TE Rework

   • App Data

   • Programming

   • Modbus® Config

   • Strm Composition and Application

   • Col Data

   • Cal Std Data

   • Stamp

4. Click **OK** to save the changes and close the window.

   Note
   To save the changes and keep the window open, click **Save**.

6.3.2   Adding a parameter list file to the GC

The parameter list is a Microsoft Excel® document and is therefore saved with the .xls extension.

To import a parameter list, do the following:

Procedure

1. Select **Parameter List...** from the **Logs/Reports** menu.
   The *Parameter List* window displays.

2. Click **Add File to GC**.
   The *Open* dialog displays.

3. Locate and select the *Parameter List* that you want to import.

4. Click **Open**, and the document is imported and displayed in the *Parameter List* window.

5. Click **OK** to save the changes and close the window.
   This version of the parameter list will now be displayed by default.

   Note
   To save the changes and keep the window open, click **Save**.

6.3.3   Export a Parameter List

Prerequisites

To export the **Parameter List**, do the following:

Procedure

1. Click **Save File to PC**. The *Save as* dialog opens.

2. Navigate to the folder to which you want to save the file.

3. Click **Save**. The **Parameter List** will be saved with the .xls extension.

4. To save the changes and keep the window open, click **Save**.

5. To save the changes and close the window, click **OK**. This *Parameter List* displays by default whenever **Parameter List** is selected on the **Logs/Reports** menu.

6.4   View drawings and documents

Use the **Drawings and Documents** feature to access drawings and documents related to the gas chromatograph (GC), such as flow diagrams, the sales order, assembly drawings, and electrical diagrams.

You can store these files on the GC in the following formats:

- PDF

- TIFF

- GC Trend file (.xtrd)

- XA CGM file (.xcgm)

- XA Comparison file (.xcpm)

- GC Configuration file (.xcfg)

6.4.1 View drawings or documents

To view a drawing, do the following:

Procedure

1. Select **Drawings/Documents...** from the **Logs/Reports** menu.
   The *Drawings/Documents* window displays.

2. Select the drawing to view from the drop-down list.

   Note
   If no list displays under the *Drawings/Documents* label, and there is no **+** beside the label, then this GC does not contain any documents.

3. Click **File Viewer (F3)**.
   The drawing displays.

4. Click **Close** to exit the window and to return to the *Drawings/Documents* window.

6.4.2 Add files to the GC

To add files, such as new or updated drawings, to the GC, do the following:

Procedure

1. Select **Drawings/Documents...** from the **Logs/Reports** menu.
   The *Drawings/Documents* window displays.

2. Click **Add File(s) to GC**.
   The *Open* dialog displays.

3. Locate and select the file to add to the GC.

4. Click **Open**.
   The file is saved to the GC, and the *Drawings/Documents* list is updated.

6.4.3 Delete files from the GC

To delete drawings from the GC, do the following:

Procedure

1. Select **Drawings/Documents**... from the **Logs/Reports** menu.
   The *Drawings/Documents* window displays.

2. Select the file to delete from the GC.

3. Click **Delete File from GC**.
   The *Confirm* message displays.

4. Click **Yes**.
   The file is deleted from the GC, and the *Drawings/Documents* list is updated.

6.5 Track changes with the Event Log

Use the *Event Log* to track the changes that are made to various tables within the gas chromatograph (GC).

Procedure

1. To view the *Event Log*, select **Logs/Reports** → **Event Log**.
   The *Event Log* window displays.

   The *Event Log* window gives you the option of viewing the total list of change events, or a date-filtered list of events. The *Event Log* window supplies the following data for each event:

User ID	Indicates which user made the change.
Date	Indicates the date at the GC when the event occurred.
Time	Indicates the time at the GC when the event occurred.
Event Message	Provides a description of the event.
Old Value	If applicable, indicates the value in the cell before the change.
New Value	If applicable, indicates the value in the cell after change.

2. To view all events, select **All**. Otherwise, select **Select Range** and use the *Start Date* and *End Date* drop-down lists to select a date range.

3. Click **Read Records**.
   The list of events displays with the most recent event at the top and the oldest event at the bottom. The events are also sorted and color-coded by time, so that events that occurred simultaneously are grouped together.

4. To save the list, click **Save**.

   The list can be saved in the following formats:

   - Tab-Delimited (.txt)

   - Comma-Delimited (.csv)

   - Microsoft® Excel (.xls)

   - HTML File (.html)

   - XML File (.xml)

6.6 Display reports

Use the *Display Reports* screen to immediately display, print, or store pre-configured reports of gas chromatograph (GC) analysis data. The report displays data in real time from the GC or from saved files.

Report types

Rosemount MON2020 can generate the following types of reports:

Analysis	Displays a list of the components that were detected, based on raw data. Displays a list of calculations for each component, based on the table located at **Application** → **Calculations** → **Control**. There are two types of analysis reports. • Gas Processors Association (GPA)

Figure 6-1: Analysis (GPA) Sample Report

```
                              Analysis Report (GPA)


Date-Time :  11/04/2019 12:10:06 PM  Analysis time :    20.00  sec   Cycle Time        :  30.00 sec
Stream    :  Stream 1                Mode          :    Analysis    Cycle Start Time  :  10/23/2019 06:53:52 AM
Analyzer  :                          Stream Seq.   :    1
Company   :

Firmware Revision, Checksum :  4.0.0, 2019/10/22, 0x65fcb1c2

Component Name             Mole Percent   Dry Gross      Dry Net      Relative
                                             BTU           BTU      Gas Density

Methane                       74.2940%      752.15       677.26       0.4115
Nitrogen                       6.0000%        0.00         0.00       0.0580
Carbon Dioxide                 6.0000%        0.00         0.00       0.0912
Ethane                         8.0000%      141.92       129.83       0.0831
Propane                        3.0000%       75.66        69.62       0.0457
i-Butane                       0.1500%        4.89         4.51       0.0030
Butanes                        0.3000%        9.79         9.04       0.0060
i-Pentane                      0.0500%        2.01         1.85       0.0012
n-Pentane                      0.1000%        4.02         3.72       0.0025
n-Hexane                       0.0300%        1.43         1.32       0.0009
n-Heptane                  80.0000ppm         0.44         0.41       0.0003
n-Octane                   40.0000ppm         0.25         0.23       0.0002
n-Nonane                   30.0000ppm         0.21         0.20       0.0001
n-Decane                   10.0000ppm         0.08         0.07       0.0000
Hydrogen                       0.4000%        1.30         1.10       0.0003
Oxygen                         0.5000%        0.00         0.00       0.0055
Carbon Monoxide                0.2000%        0.64         0.64       0.0019
Water                          0.0100%        0.00         0.00       0.0001
H2S                            0.2500%        1.60         1.47       0.0029
Helium                         0.7000%        0.00         0.00       0.0010

TOTALS                       100.0000%      996.39       901.27       0.7154

'*' indicates user-defined components

Compressibility Factor (Z) @  14.73000 PSIA and 60.0 Deg.F = 0.99738

Base Pressure                    14.73000 PSIA
-------------------------------------------------
Gross Dry BTU                =      999.0101 Corrected for Z
Actual Gross BTU             =      998.9153 Corrected for Z
Net Dry BTU                  =      903.6357 Corrected for Z
Actual Net BTU               =      903.5453 Corrected for Z
Real Relative Density Gas    =        0.7170
Total Unnormalized Mole Percent =   100.000
Average Molecular wgt.       =       20.72


ACTIVE ALARMS
Alarm Name                                                     Alarm State

Preamp Board 3 Comm Failure


ANALOG INPUTS
Analog Input              Value
Analog Input 1            0.000
Analog Input 2            0.000



USER CALCULATIONS
```

• International Organization for Standardization (ISO)

Figure 6-2: Analysis (ISO) Sample Report

```
                                    ISO Analysis


Date-Time :  11/06/2019 09:10:00    Analysis time :    230.00 sec   Cycle Time          :  240.00 sec
Stream    :  Stream 1               Mode          :    Analysis     Cycle Start Time  :  11/06/2019 09:00:55
Analyzer  :  C6PlusEXMB             Stream Seq.   :    1,2,3
Company   :

Firmware Revision, Checksum :  4.0.0, 2019/10/22, 0x65fcb1c2

                                            Primary    Secondary
Reference Temperature - Combustion Deg.C     15.00      15.00
Reference Temperature - Metering   Deg.C     15.00      15.00
Calorific Value - Units                      MJ/m3      MJ/m3


Component Name          Mole Percent   Relative    Superior CV   Inferior CV   Superior CV   Inferior CV
                                       Density     Pri units     Pri units     Sec Units     Sec units

C6+ 47/35/17              0.0349%       0.0012       0.0689        0.0689        0.0688        0.0688
Propane                  0.9122%       0.0139       0.8589        0.8588        0.8569        0.8568
i-Butane                 0.2309%       0.0046       0.2809        0.2809        0.2803        0.2802
n-Butane                 0.2233%       0.0045       0.2726        0.2726        0.2720        0.2719
Neopentane               0.0000%       0.0000       0.0000        0.0000        0.0000        0.0000
i-Pentane                0.0713%       0.0018       0.1067        0.1067        0.1064        0.1064
n-Pentane                0.0760%       0.0019       0.1141        0.1141        0.1138        0.1138
Nitrogen                 2.4393%       0.0236       0.0000        0.0000        0.0000        0.0000
Methane                 89.7739%       0.4973      33.9280       33.9236       33.8485       33.8441
Carbon Dioxide           1.0662%       0.0162       0.0000        0.0000        0.0000        0.0000
Ethane                   5.1719%       0.0537       3.4250        3.4245        3.4169        3.4165

TOTALS                 100.0000%       0.6186      39.0551       39.0501       38.9635       38.9585

'*' indicates user-defined components

Primary   Compressibility Factor(Z) @ 1.01325 BarA and 15.00 Deg.C = 0.99765

Base Pressure                          1.01325 BarA
-------------------------------------------------------------
Real Superior CV - Dry - Primary     =     39.0551 MJ/m3
Real Superior CV - Sat - Primary     =     38.3979 MJ/m3
Real Inferior CV - Dry - Primary     =     39.0501 MJ/m3
Real Inferior CV - Sat - Primary     =     38.3929 MJ/m3
Real Superior CV - Dry - Secondary   =     38.9635 MJ/m3
Real Superior CV - Sat - Secondary   =     38.3078 MJ/m3
Real Inferior CV - Dry - Secondary   =     38.9585 MJ/m3
Real Inferior CV - Sat - Secondary   =     38.3028 MJ/m3
Real Relative Density Gas - Primary  =      0.6197
Real Gas Density - Primary           =      0.7595 kg/m3
Real Wobbe index - Sup - Primary     =     49.6105 MJ/m3
Average Molar Mass                   =     17.916
Total Unnormalized Mole Percent      =     99.479
```

Calibration
Displays a list of the components that were detected, along with each component's calibration concentration, raw data value, new response factor, and new retention time.

Figure 6-3: Calibration Sample Report

Calibration Report

Calibration Run 2 of 3

Date-Time : 11/22/2019 12:33:35 PM Analysis time : 230.00 sec Cycle Time   : 240.00 sec
Stream   : Calibration   Mode   : Forced Calib Cycle Start Time : 11/22/2019 09:49:33 AM
Analyzer : Dusty Bottom   Stream Seq. : 1

Firmware Revision, Checksum : 3.0.1, 2018/05/22, 0x69c37e18

Component Name	Cal Conc.	Raw Data	New RF	RF % Dev.	New RT	RT % Dev.
C6+ 47/35/17	0.0298%	8585400.00	2.881007e+08	-1.45	34.2	0.0
Propane	0.982%	180845872.00	1.841608e+08	-0.56	46.4	0.0
i-Butane	0.297%	66573736.00	2.24154e+08	-0.24	58.1	0.0
n-Butane	0.297%	69368832.00	2.335651e+08	-0.13	64.6	-0.1
Neopentane	0.0994%	24947122.00	2.509771e+08	1.01	73.7	-0.11
i-Pentane	0.099%	26006184.00	2.626887e+08	0.71	92.6	-0.0
n-Pentane	0.099%	26859036.00	2.713034e+08	1.45	102.7	-0.0
Nitrogen	2.48%	286400832.00	1.154842e+08	-0.02	134.4	0.0
Methane	89.7068%	8500160000.00	9.475491e+07	-0.23	139.3	0.0
Carbon Dioxide	0.99%	136537792.00	1.37917e+08	-0.42	173.1	0.05
Ethane	4.92%	767719360.00	1.560405e+08	-0.12	203.3	-0.0

ACTIVE ALARMS
Alarm Name   Alarm State

ANALOG INPUTS
Analog Input   Value

Analog Input 1   0.000

Final Calibration The *Final Calibration* report displays the list of components along with each component's old and new response factors, and each component's old and new retention times, based on the averaged data.

Figure 6-4: Final Calibration Sample Report

Final Calibration ReportDate-Time : 11/22/2019 12:34:23 PM Analysis time : 230.00 sec   Cycle Time   : 240.00 sec
Stream : Calibration   Mode   : Forced Calib   Cycle Start Time : 11/22/2019 09:53:33 AM
Analyzer : Dusty Bottom   Stream Seq. : 1
Firmware Revision, Checksum : 3.0.1, 2018/05/22, 0x69c37e18+
Calibration Certificate Details : Cylinder # ME BU.3X93ZP-FX

Component Name	Cal Conc.	Old RF	New RF	*	RF % RT	Old RT	New RT	*	RT % Dev.	.
C6+ 47/35/17	0.0298%	2.923532e+08	2.891985e+08	*	-1.08	34.2	34.2	*	0.00	
Propane	0.982%	1.85198e+08	1.841547e+08	*	-0.56	46.4	46.4	*	0.00	
i-Butane	0.297%	2.246887e+08	2.241822e+08	*	-0.23	58.1	58.1	*	0.00	
n-Butane	0.297%	2.338593e+08	2.335332e+08	*	-0.14	64.7	64.6	*	-0.06	
Neopentane	0.0994%	2.484577e+08	2.502308e+08&	*	0.71	73.8	73.7	*	-0.11	
i-Pentane	0.099%	2.608311e+08	2.624054e+08	*	0.60	92.7	92.6	*	-0.09	
n-Pentane	0.099%	2.67428e+08	2.717085e+08	*	1.60	102.8	102.7	*	-0.08	
Nitrogen	2.48%	1.155077e+08	1.155037e+08	*	-0.00	134.4	134.4	*	0.00	
Methane	89.7068%	9.49687e+07	9.4761e+07	*	-0.22	139.3	139.3	*	0.00	
Carbon Dioxide	0.99%	1.385033e+08	1.37982e+08	*	-0.38	173.0	173.1	*	0.05	
Ethane	4.92%	1.562332e+08	1.560357e+08	*	-0.13	203.4	203.3	*	-0.04	

"*" indicates RTs and RFs were updated, or RF % Devs from Ideal were out-of-limit, or RF orders were out-of-order.

"RT" = Retention Time
"RF" = Response Factor

ACTIVE ALARMS
Alarm Name

                                                  Alarm State

ANALOG INPUTS
Analog Input   Value

Analog Input 1   0.000

Validation

For the most recent validation cycle, displays the nominal value, allowed percent deviation[1], and the measured value of each variable in the *Validation Data* table.

Figure 6-5: Validation Sample Report

                                    Validation Report

Date-Time : 11/22/2019 12:34:35 PM   Analysis time : 230.00 sec   Cycle Time   : 240.00 sec
Stream   : Validation   Mode   : Validation   Cycle Start Time : 11/20/2019 10:08:38 AM
Analyzer : Dusty Bottom   Stream Seq. : 1

Firmware Revision, Checksum : 3.0.1, 2018/05/22, 0x69c37e18

Variable Name	Nominal Value	% Deviation	Measured Value
5 - Validation_Mole %_C6+ 47/35/17	0.0298	5.000000	0.0253
5 - Validation_Mole %_Propane	0.9820	3.000000	0.9832
5 - Validation_Mole %_i-Butane	0.2970	3.000000	0.2976
5 - Validation_Mole %_n-Butane	0.2970	3.000000	0.2982
5 - Validation_Mole %_Neopentane	0.0994	3.000000	0.1005
5 - Validation_Mole %_i-Pentane	0.0990	3.000000	0.0985
5 - Validation_Mole %_n-Pentane	0.0990	3.000000	0.0981
5 - Validation_Mole %_Nitrogen	2.4800	3.000000	2.4729
5 - Validation_Mole %_Methane	89.7068	0.500000	89.7160
5 - Validation_Mole %_Carbon Dioxide	0.9900	3.000000	0.9897
5 - Validation_Mole %_Ethane	4.9200	3.000000	4.9199
5 - Validation_HV Gross BTU Dry	1055.5156	0.100000	1055.4474
5 - Validation_GPA Real Rel Den Gas	0.6235	3.000000	0.6234
5 - Validation_Total Unnormalized Conc	100.0000	3.000000	99.9819

ACTIVE ALARMS
Alarm Name   Alarm State
Stream 4
RF Deviation

ANALOG INPUTS
Analog Input   Value
Analog Input 1   0.000

USER CALCULATIONS

Final Validation

For the most recent validation run, shows the nominal value, allowed percent deviation[1], and the average value of each variable in the *Validation Data* table.

---

(1) *If the actual deviation is beyond the allowed amount, then the row will be flagged with an asterisk (*).*

Figure 6-6: Final Validation Sample Report

```
                             Final Calibration Report


Date-Time :  12/05/2019 01:29:22 PM   Analysis time :    230.00 sec   Cycle Time        :   240.00 sec
Stream    :  Calibration              Mode          :    Calibration  Cycle Start Time  :   11/06/2019 07:54:24 AM
Analyzer  :  44226878                 Stream Seq.   :    1,2,3

Firmware Revision, Checksum :  4.0.0, 2019/10/22, 0x65fcb1c2
Calibration Certificate Details :


Component Name            Cal Conc.        Old RF         New RF   *      RF % Dev.    Old RT    New RT  *   RT % Dev.

C6+ 47/35/17              0.0295%      5.687038e+07   5.697038e+07   *        0.18       30.5      30.4  *       -0.46
Propane                   0.99%        2.013015e+07   2.003015e+07   *       -0.50       46.8      46.8  *        0.00
i-Butane                  0.291%          5892742        5892742     *        0.00       58.8      58.8  *        0.00
n-Butane                  0.289%          7413916        7413916     *        0.00       65.8      65.8  *        0.00
Neopentane                0.101%      2.290791e+08   2.290791e+08   *        0.00       74.0      74.0            0.00
i-Pentane                 0.097%          3770900        3770900     *        0.00       94.4      94.4  *        0.00
n-Pentane                 0.097%          2314456        2314456     *        0.00      105.3     105.2  *       -0.06
Nitrogen                  2.5%        2.973863e+07   2.963863e+07   *       -0.34      136.5     136.4  *       -0.09
Methane                   89.6155%     8.959182e+07   8.959182e+07   *        0.00      141.9     141.8  *       -0.04
Carbon Dioxide            1%          8.247581e+07   8.247581e+07   *        0.00      177.9     177.9  *        0.00
Ethane                    4.99%        1.186523e+08   1.186523e+08   *        0.00      212.4     212.4  *        0.00


"*" indicates components whose Retention Times and Response Factors were updated.

ACTIVE ALARMS
Alarm Name                                                       Alarm State



ANALOG INPUTS
Analog Input                     Value

Analog Input 1                   4.000
Analog Input 2                   4.000
```

Raw Data

Displays a list of data for each peak that was detected during the run, including the retention time, peak area, and peak height.

Figure 6-7: Raw Data Sample Report

```
               Raw Data Report

Date-Time :  11/22/2019 12:42:30 PM      Analysis time   :  230.00 sec      Cycle Time        :  240.00 sec
Stream    :  Stream 1                    Mode            :  Analysis        Cycle Start Time  :  11/22/2019 10:17:33 AM
Analyzer  :  Dusty Bottom

Firmware Revision, Checksum :  3.0.1, 2018/05/22, 0x69c37e18

Peak    Ret    Peak Area      Peak Height    Det    Method    Baseline   Baseline   Integration       Peak Width@    Partial
No.     Time                                 No.               Start      End        Start    End      Half Height    Peak
1       46.9   9.8391e+06     106,920        1      4         55,331     38,961     45.1     50.4     1.7            No
2       58.7   3.12827e+06    27,420         1      2         28,458     24,160     56.0     62.4     2.2            No
3       65.2   2.67819e+06    24,899         1      2         24,160     17,983     62.4     71.6     2.4            No
4       74.1   488592         5,392          1      3         17,983     11,268     71.6     81.6     2.3            No
5       93.3   1.28797e+06    6,548          1      2         9,180      7,574      89.0     99.3     3.8            No
6       103.2  1.30482e+06    6,036          1      3         7,574      4,996      99.3     115.9    4.6            No
7       135.1  5.42481e+07    544,036        1      2         4,735      4,329      132.1    139.6    1.8            No
8       142.8  6.38168e+08    5,833,851      1      3         4,329      3,610      139.6    152.8    2.2            No
9       173.7  1.20142e+07    59,353         1      1         1,759      1,518      168.0    182.7    3.8            No
10      205.2  4.71451e+07    177,113        1      1         1,355      1,387      197.7    216.1    5.3            No


ACTIVE ALARMS
Alarm Name                     Alarm State


ANALOG INPUTS                  Analog Input                     Value
Analog Input 1                                                  0.000
```

Every Run

Displays a configurable list of calculations after each run.

Figure 6-8: Every Run sample report

```
                                    Everyrun Average Report

Everyrun Average from 01/19/2022 02:16:05 PM      Analyzer : 370T11

SN : 370T11  System Description : 370XA- 3 Stream + 1 Cal

Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932

1       Oven Heater_Temperature
                                        Value
1       01/19/2022 02:04:09 PM          80.005
2       01/19/2022 02:08:09 PM          79.994
3       01/19/2022 02:12:09 PM          79.997


2       IMB Temp_Temperature
                                        Value
1       01/19/2022 02:04:09 PM          43.553
2       01/19/2022 02:08:09 PM          43.572
3       01/19/2022 02:12:09 PM          43.583


3       Oven Heater_Current PWM
                                        Value
1       01/19/2022 02:04:09 PM          35.16
2       01/19/2022 02:08:09 PM          36.007
3       01/19/2022 02:12:09 PM          36.332
```

Hourly

Displays a configurable list of average calculations each hour, beginning at the time set in the *Average Calculations* window at **Application → Calculations → Averages**.

Figure 6-9: Hourly sample report

```
                                Hourly Average Report

Hourly Average from   01/19/2022 02:17:26 PM      Analyzer :   370T11

SN : 370T11  System Description : 370XA- 3 Stream + 1 Cal

Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932

1       1 - Stream 1_Mole %_Nitrogen
                                Average         Minimum         Maximum         Samples
1       01/19/2022 12:00:00 PM  2.54405         2.54319         2.54496         15
2       01/19/2022 01:00:00 PM  2.54466         2.54392         2.54554         15
3       01/19/2022 02:00:00 PM  2.54529         2.5447          2.54569         15

2       1 - Stream 1_Mole %_Carbon Dioxide
                                Average         Minimum         Maximum         Samples
1       01/19/2022 12:00:00 PM  0.980135        0.979412        0.980818        15
2       01/19/2022 01:00:00 PM  0.980092        0.979314        0.981494        15
3       01/19/2022 02:00:00 PM  0.97988         0.979196        0.981058        15

3       1 - Stream 1_Mole %_Methane
                                Average         Minimum         Maximum         Samples
1       01/19/2022 12:00:00 PM  89.67           89.6683         89.6714         15
2       01/19/2022 01:00:00 PM  89.6678         89.6645         89.6713         15
3       01/19/2022 02:00:00 PM  89.6666         89.6644         89.6687         15

4       1 - Stream 1_Mole %_Ethane
                                Average         Minimum         Maximum         Samples
1       01/19/2022 12:00:00 PM  4.99823         4.99571         5.00091         15
2       01/19/2022 01:00:00 PM  4.99751         4.9946          4.99986         15
3       01/19/2022 02:00:00 PM  4.99756         4.99555         4.99895         15
```

24 Hour

Displays a configurable list of average calculations each day, beginning at the time set in the *Average Calculations* window at **Application → Calculations → Averages**.

Figure 6-10: 24 Hour sample report

```
                              24 Hour Average Report

24 Hour Average from  01/19/2022 02:18:00 PM      Analyzer : 370T11

SN : 370T11  System Description : 370XA- 3 Stream + 1 Cal

Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932

1     1 - Stream 1_Mole %_Nitrogen
                                  Average        Minimum        Maximum        Samples
1     01/17/2022 07:00:00 AM      2.54109        2.5378         2.54406        360
2     01/18/2022 07:00:00 AM      2.5414         2.53874        2.54486        360
3     01/19/2022 07:00:00 AM      2.5425         2.53987        2.54652        360

2     1 - Stream 1_Mole %_Carbon Dioxide
                                  Average        Minimum        Maximum        Samples
1     01/17/2022 07:00:00 AM      0.980452       0.979212       0.982085       360
2     01/18/2022 07:00:00 AM      0.980514       0.979195       0.983242       360
3     01/19/2022 07:00:00 AM      0.980333       0.979064       0.982334       360

3     1 - Stream 1_Mole %_Methane
                                  Average        Minimum        Maximum        Samples
1     01/17/2022 07:00:00 AM      89.6753        89.6653        89.7007        360
2     01/18/2022 07:00:00 AM      89.6734        89.6664        89.6954        360
3     01/19/2022 07:00:00 AM      89.6735        89.6652        89.7108        360

4     1 - Stream 1_Mole %_Ethane
                                  Average        Minimum        Maximum        Samples
1     01/17/2022 07:00:00 AM      4.9975         4.99416        5.00169        360
2     01/18/2022 07:00:00 AM      4.99789        4.99436        5.00113        360
3     01/19/2022 07:00:00 AM      4.99734        4.99459        5.00128        360
```

Weekly

Displays a configurable list of average calculations each week, beginning on the day set in the *Average Calculations* window at **Application → Calculations → Averages**.

Figure 6-11: Weekly sample report

```
                              Weekly Average Report

Weekly Average from   01/19/2022 02:30:08 PM      Analyzer : 370T11

SN : 370T11  System Description : 370XA- 3 Stream + 1 Cal

Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932

1     1 - Stream 1_Mole %_C6+ 47/35/17
                                  Average        Minimum        Maximum        Samples
```

Monthly

Displays a configurable list of average calculations each month, beginning on the day of the month set in the *Average Calculations* window at **Application → Calculations → Averages**.

Figure 6-12: Monthly sample report

```
                          Module Validation Report


Date-Time :  01/20/2022 06:56:39 AM  Analysis time :    230.00 sec   Cycle Time      :  240.00 sec
Stream   :  Stream 4               Mode          :   Module Val    Cycle Start Time :  01/19/2022 02:52:33 PM
Analyzer :  300T7
Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932


Cycle Start Time :   01/19/2022 02:52:33 PM

Component              Nominal     Measured    Difference       Percent    Allowed pct.  Status
                        Value       Value                      Deviation     Deviation

C6+ 47/35/17           0.0294      0.0300       0.0006          1.9660       15.0000     Pass
Propane                0.9950      0.9964       0.0014          0.1396        5.0000     Pass
i-Butane               0.2930      0.2789      -0.0141          4.7997        5.0000     Pass
n-Butane               0.2930      0.2833      -0.0097          3.3246        5.0000     Pass
Neopentane             0.1000      0.0946      -0.0054          5.4410       10.0000     Pass
i-Pentane              0.1000      0.1001       0.0001          0.1310       10.0000     Pass
n-Pentane              0.1000      0.1012       0.0012          1.1750       10.0000     Pass
Nitrogen               2.4700      2.4763       0.0063          0.2538        5.0000     Pass
Methane               89.6556     89.6710       0.0154          0.0171        5.0000     Pass
Carbon Dioxide         0.9840      0.9861       0.0021          0.2178        5.0000     Pass
Ethane                 4.9800      4.9822       0.0022          0.0442        5.0000     Pass


Cycle Start Time :   01/19/2022 02:56:33 PM

Component              Nominal     Measured    Difference       Percent    Allowed pct.  Status
```

Variable   Displays a configurable list of average calculations every hour at the time entered in the **Hours** column in the **Average Calculations** window at **Application → Calculations → Averages**.

Figure 6-13: Variable sample report

```
                           Variable Average Report
Variable Average from 11/25/2019 02:15:35 PM      Analyzer : 741596 2        SN :  System Description : 370XA- 3 Stream + 1
CalFirmware Revision, Checksum :  3.0.1, 2018/05/22, 0x69c37e181
```

1 - Stream 1_Mole %_Nitrogen	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	2.43461	2.42919	2.44216	15	2
11/25/2019 01:00:00 PM	2.43147	2.42048	2.43874	15	3
11/25/2019 02:00:00 PM	2.43209	2.42009	2.44472	15	2

1 - Stream 1_Mole %_Carbon Dioxide	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.986802	0.972008	1.00146	15	2
11/25/2019 01:00:00 PM	0.988167	0.973753	1.02632	15	3
11/25/ 2019 02:00:00 PM	0.9 90089	0.978409	1.0093	15	3

1 - Stream 1_Mole %_Methane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	89.7449	89.7104	89.7838	15	2
11/25/2019 01:00:00 PM	89.7428	89.6943	89.7708	15	3
11/25/2019 02:00:00 PM	89.7441	89.7058	89.7728	15	4

1 - Stream 1_Mole %_Ethane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	4.91754	4.89489	4.9391	15	2
11/25/2019 01:00:00 PM	4.9241	4.90446	4.95152	15	3
11/25/2019 02:00:00 PM	4.92168	4.90802	4.93232	15	5

1 - Stream 1_Mole %_Propane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.97898	0.977714	0.980875	15	2
11/25/2019 01:00:00 PM	0.978904	0.974508	0.980007	15	3
11/25/2019 02:00:00 PM	0.978361	0.976447	0.980803	15	6

1 - Stream 1_Mole %_n-Butane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.299928	0.294564	0.302929	15	2
11/25/2019 01:00:00 PM	0.300139	0.297413	0.3019	15	3
11/25/2019 02:00:00 PM	0.300161	0.297645	0.302318	15	7

1 - Stream 1_Mole %_i-Butane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.298352	0.295424	0.300454	15	2
11/25/2019 01:00:00 PM	0.298607	0.296507	0.301613	15	3
1/25/2019 02:00:00 PM	0.298633	0.297393	0.300696	15	8

1 - Stream 1_Mole %_i-Pentane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.100763	0.097928	0.106512	15	2
11/25/2019 01:00:00 PM	0.101483	0.099084	0.1052	15	3
11/25/2019 02:00:00 PM	0.10071	0.09856	0.104393	15	9

1 - Stream 1_Mole %_Neopentane	Average	Minimum	Maximum	Samples	1
11/25/2019 12:00:00 PM	0.10183	0.097917	0.103098	15	2
11/25/2019 01:00:00 PM	0.101035	0.097584	0.103776	15	3
11/25/2019 02:00:00 PM	0.10107	0.098876	0.103447	15	10

Auto Valve Timing (Rosemount 370XA and 470XA only)   Displays an *Auto Valve Timing* report.

Figure 6-14: Auto Valve Timing sample report


```
                         Auto Valve Timing


Date-Time :  01/20/2022 07:38:10 AM  Analysis time :    230.00 sec    Cycle Time          :  240.00 sec
Stream   :  Calibration               Mode          :    Avt          Cycle Start Time  :  01/20/2022 07:00:33 AM
Analyzer :  300T7                     Stream Seq.   :    1
Avt Mode :  Current
Company  :  ROSEMOUNT ANALYTICAL INC
S/N      :  H21F360400T7              SO            :    0
Firmware Revision, Checksum :  4.0.1, 2020/06/30, 0x62d04932


Sample             : None
EVC Component      : unused
LVC Component      : unused
Original Valve Timing : 0.00
Final Valve Timing    : 0.00



Backflush          : Off
EVC Component      : n-Pentane
LVC Component      : C6+ 47/35/17
Original Valve Timing : 26.50
Final Valve Timing    : 25.50

     Time        EVC Area       % Change     LVC Area      % Change

    24.50      2.63888e+07         0.00    1.06668e+07        0.00
    25.00      2.70924e+07         2.67    9.9052e+06        -7.14
    25.50      2.75323e+07         1.62    9.61618e+06       -2.92
```

Module Validation (Rosemount 370XA and 470XA only)	Displays a ***Module Validation*** report.

Each report begins with the following header information:

Date-Time	The GC's date and time when the report was generated.
Analysis Time	The duration, in seconds, of the analysis. Can be configured at **Application → Timed Events**.
Cycle Time	The duration, in seconds, between two consecutive analyses. Can be configured at **Application → Timed Events**.
Firmware Revision	Displays the firmware revision, checksum, date, and value.
Stream	The stream that was analyzed. Selected as part of the report generation process.
Mode	Displays the operational status of the detector.
Cycle Start Time	The date and time that the cycle started.
Analyzer	Name of the GC that generated the data used for the report.
Stream Sequence	The identification and order of the streams that were analyzed. Can be configured at **Application → Stream Sequence....** .
Company	Company name associated with the GC.
Firmware Revision, Checksum	Displays the installed firmware version, the checksum and date the log was generated.

Note

If you get an FTP error when trying to save a report, it may be an issue with your firewall blocking the FTP messages between the GC and Rosemount MON2020. Your IT department needs to open the following TCP ports in the firewall.

- TCP Ports 10,000 - 13,000 (Rosemount MON2020 proprietary protocol)

- TCP Ports 20, 21, 22 (SSH, FTP)

- TCP Port 502 (Modbus®)

- TCP Port 990 (Secure connection)

6.6.1 View reports from live data

Procedure

1. Go to **Logs/Reports→ Report Displays...**.
   The **_Report Display_** window appears.

   Note

   By default, the **Update automatically** check box is selected. This means that when viewing a report based on the most recent data, the report refreshes as new data is created, based on the type of report that you select. For example, in the **_Report Display_** window, if you select Analysis (GPA), the report display refreshes each time the gas chromatograph (GC) finishes an analysis of the selected stream. The refresh function displays the newly generated report and deletes the previous report (unless already saved to disk).

   ---

2. Select the type of report to generate and display.

3. Select the appropriate stream.

   To see a currently analyzed stream report, you can select the 0 - Current Analysis field from the **_Stream_** list.

4. Click **Start (F2)**, or press **F2**.
   The report is generated and displayed.

   Note

   If the report doesn't appear right away, check the status of the report generation process in the Status bar, which is below the row of buttons on the **_Report_** window.

   Note

   To change the font size, click **Font +/-**. There are five preset font sizes available. Continue to click **Font +/-** to cycle through the sizes until you are satisfied with the report's readability.

   Note

   For average reports, by default the software displays three records. To adjust the number of records displayed, go to **File→ Program Settings→ Number of Average records displayed in report** and change the number to 4 or 5; then Rosemount MON2020 shows the specified number of records in the report.

   ---

5. To save the file, click **Save**.

   The report can be saved in the following file formats:

   - .txt

   - .rpt

   - .htm

   - .html

   - .mht

   Related information

   [Report types](#)

6.6.2 View a saved report

Procedure

1. Go to **Logs/Reports** → **Report Displays...**.
   The *Report Display* window appears.

2. Click **File Viewer (F3)**.
   The *Report file viewer* window displays.

3. Click **Open**.
   The *Open* dialog displays.

4. Locate and select the report that you want to view.

   Reports may be found in the following file formats:

   - .txt

   - .rpt

   - .htm

   - .html

   - .mht

5. Click **Open**.

The report displays.

Postrequisites

Note
To change the font size, click **Font +/-**. There are five preset font sizes available. Continue to click **Font +/-** to cycle through the sizes until you are satisfied with the report's readability.

Note
To print the report, click **Print**.

6.6.3 Export reports compatible for ultrasonic spread of sound (SOS)

This feature allows you to export reports for ultrasonic meter spread of sound (SOS). You can save the report from the *Report Display* or *Archive Report* screen.

Procedure

1. Open **Logs/Reports** → **Report Display**.

2. Click **Analysis** report type.

3. Select **Start (F2)** to display an Analysis report.

4. Click **Save** to display the **Save** dialog.

5. Use the **Save as Type** drop-down menu and select **Comma-Delimated (CUI/ MeterLink Compatible) (*.csv)**.

6. The report is exported as an Excel® file compatible with Ultrasonic Meters. format.

7. Repeat Step 1 through Step 6 for a Calibration Report and a Validation Report.

6.7 Generate reports from archived data

Use the **Archive Report** commands to generate analysis, calibration, and average reports from archived GC runs.

6.7.1 Generate analysis and calibration reports from archived data

To generate and view an analysis or calibration report from archived data, do the following:

Procedure

1. Select **Logs/Reports → Archive Report → Analysis/Calibration/Validation....**
   The *Analysis/Calibration/Validation Archive Report* window displays.

2. Select a report type from the **Report** dropdown list.

3. Select a stream from the **Stream** dropdown list.

   By default, the **Archive Records** table displays all records for the selected report type and stream.

   Note
   To date-filter the list of records, select the **Time Period** checkbox and use the **Start Date** and **End Date** dropdown lists to select a date range.

4. Select the record(s) that you want to view.

   To select several records, hold down **CTRL** and select each record. To select several records in a row, select the first record and then hold down **Shift** and select the last record in the series.

5. Click **Start (F2)**.
   The report displays. If more than one record was selected, each report displays after that previous report on the same page.

   Note
   To change the font size, click **Font +/-**. There are five preset font sizes available. Continue to click **Font +/-** to cycle through the sizes until you are satisfied with the report's readability.

   Note
   To print the report, click **Print**.

6. To save the file, click **Save**.

   The report can be saved in the following file formats: .txt, .htm, .html, and .mht.

   Related information
   Report types

6.7.2 Generate an Average report from archived data

To generate and view an average report from archived data, do the following:

Procedure

1. Select **Logs/Reports → Archive Report → Average....**
   The *Average Archive Report* window displays.

2. Select a report type from the *Report* drop-down list.

3. Select a stream from the *Stream* drop-down list.

   By default, the *List of Averages* table displays all variables for the selected report type and stream.

   Note

   To date-filter the list of records, select the *Time Period* checkbox and use the *Start Date* and *End Date* drop-down boxes to select a date range.

4. From the **Archive Record Selection** field, select the **Number of most recent records** and enter a number value. Or, select the **Time Period** check box and use the **Start Date** and **End Date** drop-down boxes to select a date range.

5. Click **Start (F2)** or press **F2**.

   Note

   To change the font size, click **Font+/-**. There are five preset font sizes available. Continue to click **Font +/-** to cycle through the sizes until you are satisfied with the report's readability.

   To print the report, click **Print**

6. To save the file, click **Save**.

   The report can be saved in the following file formats:

   • .txt

   • .htm

   • .html

   • .mht

   Related information

   Report types

6.7.3   Generate Export Data report

Use the **Logs and Reports** → **Archive Report** → **Export Data** menu to create an archive report.
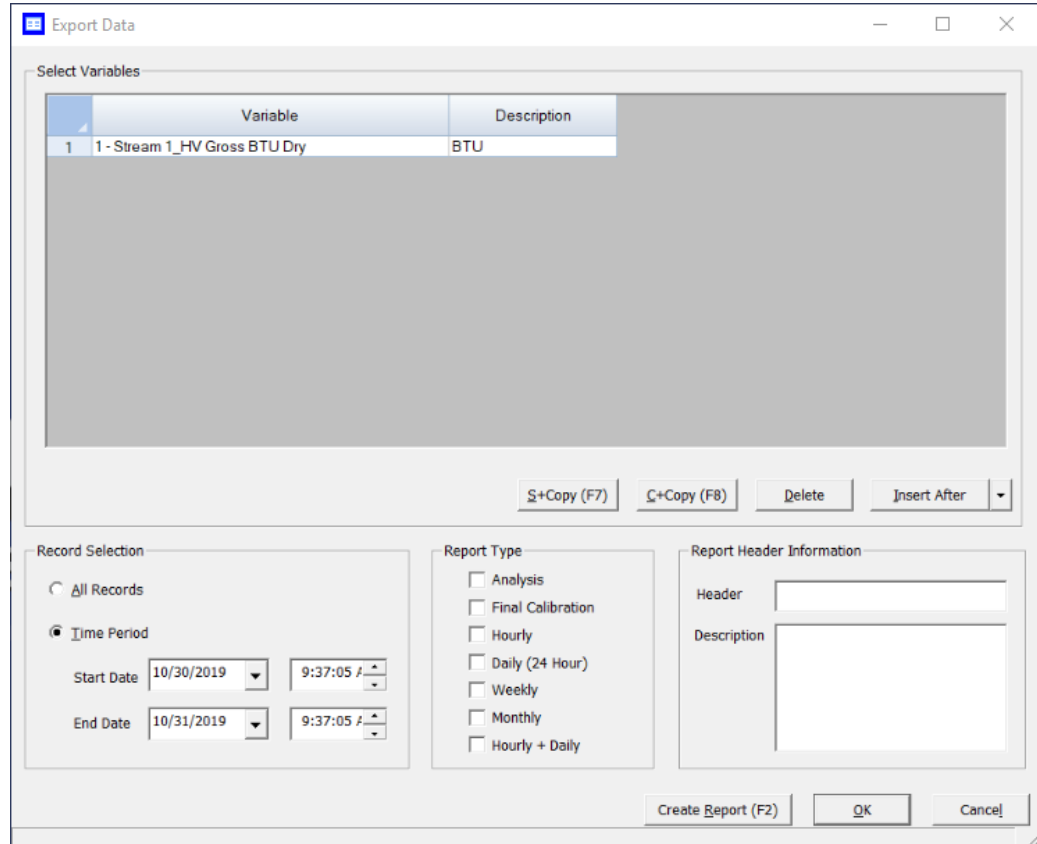
Procedure

1. Select the **Variables** drop-down list to configure the variables exported in the report.
   Options are:

   • Analysis Stream

   • Final Calib Stream

   • Final Calib Analysis Stream

   • Hardware

   • Application

2. Click the **Description** column and enter a description for the report.
   The description column is used for column headers in the **Export Data** report.

3. Click the **Record Selection** radio button to export either All Records or a Time Period for the data.

4. Select the **Report Type**
   Options are:

   • Analysis

   • Final Calibration

   • Hourly

   • Daily (24 Hour)

- Weekly
- Monthly
- Hour + Daily

5. Use the Report Header Information field and type a report Header title and a Description.

   The Description column is used for column headers in the **Export Data** report.

6. Click **S + Copy** to copy the stream settings from a highlighted row and apply them to the next row,

7. Click **C + Copy** to copy the settings from a highlighted row and apply them to the next row.

8. Click **Delete** to delete a row.

9. Click **Insert After** to insert variable rows after an entry or Insert row above an entry.

10. Click **Create Report (F2)** or press **F2** to create the report.

11. Click **OK** to save the report settings without generating the report and return to the home page.

12. Click **Cancel** to abort the report and return to the home page.

Related information

Logs/Reports menu

6.7.4   Schedule report generation

Rosemount MON2020 can automatically generate and print each report according to the following schedule:

Analysis (GPA)	An analysis report is available to print after an analysis run, final calibration run, or final validation run.

> **Note**
> If ISO is set in the **Calculations Configuration** screen, Analysis (ISO) is listed under the **Report Name** column instead of Analysis (GPA); if GPA && ISO is set in the **Calculations Configuration** screen, then both Analysis (ISO) and Analysis (GPA) are listed under the **Report Name** column.

Calibration	A calibration report is available to print after a calibration run or final calibration run is completed.
Final Calibration	A final calibration report is available to print after a final calibration run is completed.
Validation	A validation report is available to print after validation or final validation run is completed.
Final Validation	A final validation report is available to print after a final validation run is completed.
Every Run	An every run report is available to print after an analysis run is completed.
Hourly	A report is available to print each time an hourly average calculation is run.
24 Hour	A report is available to print each time a 24 hour average calculation is run.

Weekly	A report is available to print each time a weekly average calculation is run.
Monthly	A report is available to print each time a monthly average calculation is run.
Variable	A report is available to print each time a variable average calculation is run.
Raw Data	A raw data report is available to print after an analysis run, calibration run, final calibration run, validation run, or final validation run is completed.

To configure Rosemount MON2020 to generate and print a report of your choosing based on that report's schedule of availability, do the following:

Procedure

1. Go to **Logs/Reports**→**Printer Control...**.
   The **_Printer Control_** window displays.

   Note
   Rosemount MON2020 must be connected to the gas chromatograph (GC) for the report to be printed.

2. To print a report after a run, select the appropriate check box from the **_Print After Completion?_** column.

3. To print a report at a fixed interval, select the appropriate check box from the **_Print At Fixed Interval?_** column.

   a) Enter a start time in the **_Start Time_** column.

   b) Enter an interval, in hours, in the **_Interval_** column.

4. Use the columns numbered **_1_** through **_20_** to select the streams that you want to use for data collection.

5. Click **OK** to save the changes and close the window.

   Note
   To save the changes without closing the window, click **Save**.

6.8   Trend data

This function allows you to view, print, or save graphical representations, or trend lines, of accumulated analysis data from the GC.

6.8.1   Select variables for trending

Note
You cannot view a live trend if the corresponding analysis record does not exist in the memory of the gas chromatograph (GC).

Procedure

1. Go to **Logs/Reports**→**Trend Data...**.
   The **_Trend Data_** window displays.

2. Click **Trend**.
   The **_Select Variables for Trending_** window displays.

3. Select the analysis or calibration records that you want to trend from the **Select Analysis/Calibration Variables** section. Click **>** to move your selection to the **Selected Variables** queue.

4. If applicable, select the type of average record that you want to trend from the **Select Average Variables** section. Click **>** to move your selection to the **Selected Variables** queue.

   Note

   To remove a selection from the **Selected Variables** queue, click **Remove**. To remove all selections from the **Selected Variables** queue, click **Remove All**. To save the list of variables to a personal computer (PC), click **Save**. To open the list of variables from the PC, click **Open**.

5. Select the **All Records** check box from the **Trend Record Selection** section to use all data for the trend report, or click the **Time Period** check box and select a Start Date and End Date for the data to be used.

6. Click **Trend**.

   Rosemount MON2020 reads the data from the GC and then closes the **Select Variables for Trending** window and plots the trend data on the graph section of the **Trend Data** window.

   Each trend record is color-coded; use the **Trend** drop-down list to select a specific trend record.

6.8.2　View saved trend data

Trend data files are saved with the. xtrd file extension. To view a saved trend file, do the following:

Procedure

1. Select **Trend Data...** from the **Logs/Reports** menu.
   The *Trend Data* window displays.

2. Click **PC File**.
   The *Open Trend File* window displays.

3. Select the file that you want to view and click **Open**.
   The trend graph displays.

6.9　Trend graph options

Right-clicking the graph brings up the following commands and keyboard shortcuts:

Zoom In　Numpad Shortcut: **+**

Zooms in on the entire graph.

Note
Another way to zoom in is by clicking and dragging your mouse to select the region of the graph that you want to zoom in on.

Zoom Out　Numpad Shortcut: **-**

Zooms out from the entire graph.

Zoom X In　Numpad Shortcut: **6**

Zooms in on the X-axis.

Zoom X Out　Numpad Shortcut: **4**

Zooms out from the X-axis.

Zoom Y In　Numpad Shortcut: **8**

Zooms in on the Y-axis.

Zoom Y Out　Numpad Shortcut: **2**

Zooms out from the Y-axis.

Note
When the **Selected Data** checkbox is selected, the small table to the right of the graph displays the trend data for the visible area of the graph when zooming in and out.

Save State　Shortcut: **CTRL** + **HOME**

Saves current or archived display settings for the selected trend graph.

Note
The **Save State** function is available only when viewing a live or archived trend graph.

Restore State　Shortcut: **HOME**

Restores the last saved display settings for the selected trend graph.

Note
Pressing **HOME** returns the user to the saved state.

Toggle Full Screen　Shortcut: **F11**

Maximizes the display of the graph in the Trend Data window.

Cursor to Nearest Point　Shortcut: **F8**

Snaps the cursor to the nearest point on the trend graph in both the X and Y directions.

Toggle Coarse/ Fine Cursor　Shortcut: **F4**

Toggles the cursor from coarse and less accurate to fine and more accurate.

Toggle Lines/Dots Displays　Shortcut: **F9**

Toggles the trend graph from lines to dots, or dots to lines.

Toggle Mouse Position Tip	Shortcut: **CTRL** + **F4**
	The graph's cursor follows the movement of the mouse while a hovering Tooltip displays the exact coordinates of the current point.
Toggle Nearest Position Tip	Shortcut: **CTRL** + **F9**
	The graph's cursor follows the movement of the mouse cursor.
Print	Shortcut: **CTRL** + **P**
	Prints the trend graph.
Copy to clipboard	Shortcut: **CTRL** + **C**
	Copies from the graph the raw detector data that was used to plot the selected trend graph. This data can be pasted into another application such as Microsoft Word® or Microsoft Excel®.
Paste from clipboard	Shortcut: **CTRL** + **V**
	Plots a range of points copied from another application such as Microsoft Word® or Microsoft Excel®.

6.10 Properties of the trend graph

6.10.1 The trend graph bar

Use the graph bar buttons to change the display parameters of the graph.

Figure 6-15: The graph
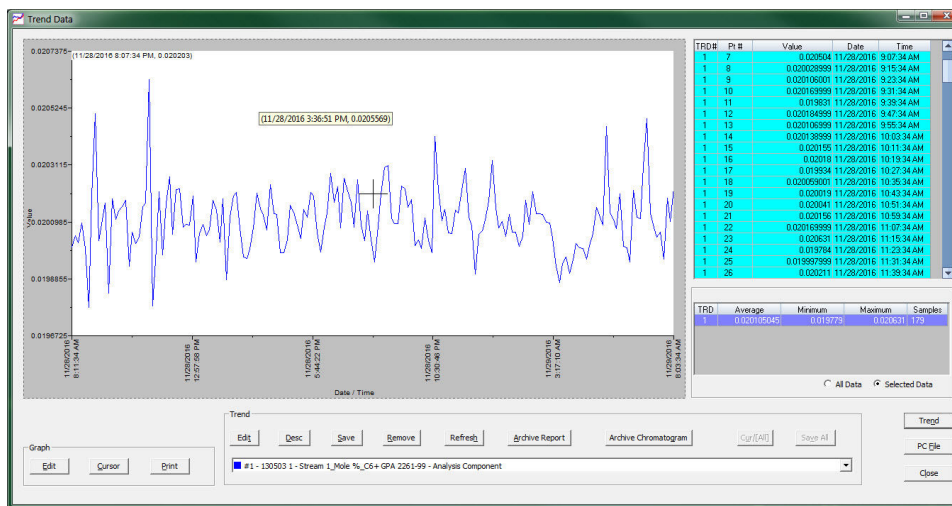
Click **Edit** to view or change the display properties of the X and Y axes. The *Edit Graph* window displays.

The following list defines the parameters that can be edited:

Point   Sets the X-axis values to points. For the purposes of this graph, each sample run is considered a data point. Therefore, if 2500 sample runs were used to generate the trend graph, then there are 2500 data points.

- **X Min** - Sets the minimum value for the X-axis to the point number of the first sample you want to use in the plot. Default value is **0**.

- **X Max** - Sets the maximum value for the X-axis to the point number of the last sample you want to use in the plot. Default value is **N - 1**, where **N** is the total number of points in the graph. Therefore, if there are 2500 points, then the X Max would be **2499**.

Note
The X-axis value for the first sample, or point, in the trend graph is **0**, not **1**. The X-axis value for the final point in the trend graph is **N - 1**, where **N** is the total number of points in the graph.

Date Time   Sets the X-axis values to the particular GC dates and times of each sample runs.

- **From** - Sets the minimum value for the X-axis to the date of the first sample you want to use in the plot.

- **To** - Sets the maximum value for the X-axis to the date of the last sample you want to use in the plot.

The primary Y-axis, which is on the left side of the graph, is the default axis for displaying trend graphs. The secondary Y-axis, which is on the right side of the graph, can be used to display a second graph whose minimum and maximum values are different than the minimum and maximum values of the first graph.

Note
If three or more graphs are displayed, by default, the first graph is plotted with the primary Y-axis; the second graph is plotted using the secondary Y-axis; all other graphs are plotted on the primary Y-axis.

Y-xis Display Format	• Percent - Sets the Y-axis values to a percentage of the **Y Max** value.
	• Value - Sets the Y-axis values to the sample run values.
	The default value is **0**.
Y Min	Sets the minimum value for the Y axis.
Y Max	Sets the maximum value for the Y axis.
Y Intervals	Sets the number of intervals to be displayed on the graph for the Y-axis.
Print Speed	Sets the number of inches per second for the X-axis while printing a chromatogram, similar to an XY plotter.
X Intervals	Sets the number of intervals to be displayed on the graph for the X-axis.
	The default value is **10**.
Display Option	Determines whether the trend is displayed as a solid line or as a dotted line.
	The default value is **Lines**.
Show labels	Determines whether each axis is labeled.
	The default value is **Checked**.
Scroll newest X	Determined whether the graph's window moves to focus on the most recent data point along the X-axis.
	The default value is **Checked**.

To accept your changes, click **OK**.

Click **Cursor** to toggle the cursor size from coarse movement (less accurate) to fine movement (more accurate).

Click **Print** to print the graph window.

6.11   The Trend bar

The **Trend** bar contains a row of buttons that allows you to manipulate a single trend trace. Below the row of buttons is the **Trace** dropdown list, which contains a list of all of the currently displayed traces that make up the trend graph (see Figure 6-15). Before you can work with a trend trace you must first select it from the dropdown list.

6.11.1   Edit a trend graph

You can use the ***Edit*** window to change the X and Y offset values for a graph, change its color, and also set which Y-axis should be used when plotting it. These changes may be necessary to make the trend more distinguishable from those that surround it or to position a graph in relation to a different graph for comparison.

Procedure

1. From the ***Trend*** drop-down list, select the graph that you want to edit.
2. Click **Edit**.
   The ***Edit Trend*** dialog displays.

X-Offset	Enter a positive number to move the trend to the right or a negative number to move the trend to the left.
Y-Offset	Enter a positive number to move the trend up or a negative number to move the trend down.
Color	Assigns a color to the trend.
Add Trace to:	Sets which Y-axis should be used when plotting the graph.

3. Click **OK** to accept your changes.

Related information

The trend graph bar

6.11.2   Enter a description for a trend graph

To add or change description text for a trend graph:

Procedure

1. From the ***Trend*** bar, click **Desc**.
   The ***Edit Description*** window displays.
2. Type or edit a description and then close the window.

6.11.3   Save a trend

To save a trend, do the following:

Procedure

1. From the **Trend** dropdown list, select the trace that you want to save.
2. Click **Save**.

The *Save Trend File* window displays.

Note

To save all currently displayed trend traces into one file, click **Save All**.

Note

For convenience the file is given an auto-generated file name that includes the current date and time; however, you can give the file any name that you choose.

---

3. Click **Save**.

6.11.4   View associated trend data

For each data point in a trend graph, it may be possible to view the associated report or chromatogram.

Note

The associate report most likely exists, but the existence of the associated chromatogram depends on the age of the trend. If the trend is more than a few days old it is likely that its associated chromatogram has been deleted to make space for newer chromatograms.

Procedure

1. Move the cursor to the desired trend point on the graph.
2. To view the associate report, click **Archive Report**.
   If the report exists, it will be displayed. If the report does not exist, the *Archive records information is not available!!* error message displays.
3. To view the associate chromatogram, click **Archive Chromatogram**.
   If the chromatogram exists, it will be displayed. If the it does not exist, the *Archive chromatogram information is not available!!* error message displays.

6.11.5   Remove a trend graph from view

To remove a trend graph from the graph display, do the following:

Procedure

1. From the **Trend** dropdown list, select the graph that you want to remove.
2. Click **Remove**.

6.11.6   Refresh a trend graph

Procedure

1. From the *Trend* pull-down menu, select the trace that you want to refresh.
2. Click Refresh.
   The trend graph is updated with any new data that was compiled since the most recent refresh.

6.11.7   Display trend data

The data to plot the trend graphs displays in the table to the right of the graph display area.

The *Trend Data* table contains the following columns:

TRD Indicates the identification number of the trend graph. Useful if more than one trend is being displayed. The first trend that is displayed is *#1*, and so on.

Pt # For the purposes of trend graphs, each sample run is considered a data point. Therefore, if 2500 sample runs were used to generate the trend graph, then there are 2500 data points.

Note
The first sample, or point, is counted as *0*, not *1*. The final point is counted as *N - 1*, where *N* is the total number of points in the graph.

Value The data point's value.

Data The gas chromatograph (GC's) date when the sample was run and the value was calculated.

Time The gas chromatograph (GC's) time when the sample was run and the value was calculated.

To view all trend data, click **Cur/All**. To view trend data for the trend graph selected from the Trend drop-down list, click **Cur/All** again.

The second trend data table is useful when zooming in to or out of the graph. When the **Selected Data** check box is selected, this table displays the trend data for the visible area of the graph. As the example shows, the table indicates that the trend data for five samples are visible after zooming in to the graph.

Figure 6-16: Trend Data screen
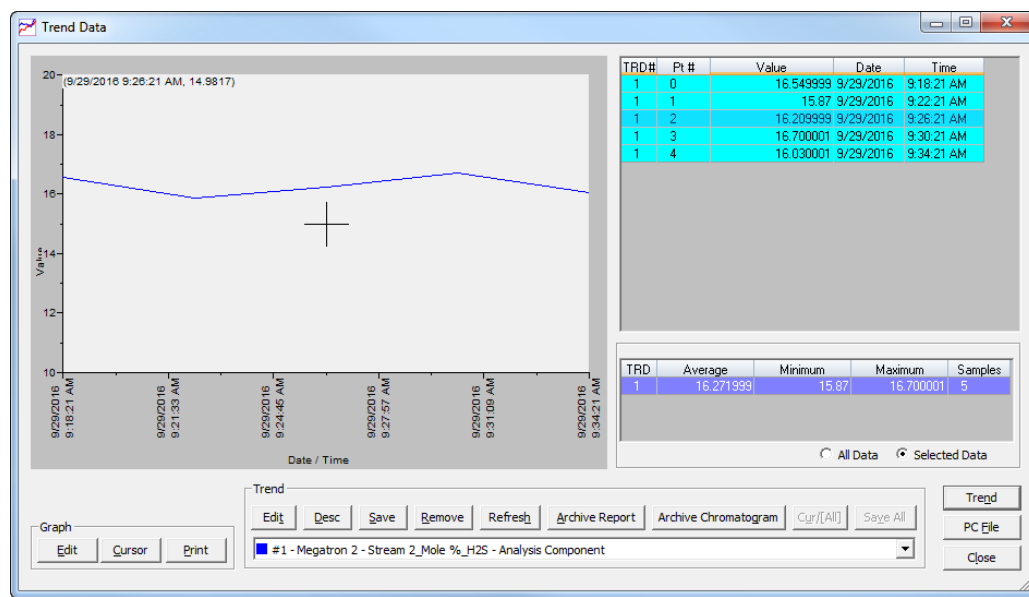
Procedure

1. Click **Trend** to configure the parameters for a trend file.
2. Click **PC File** to display the *Open Trend File* dialog and navigate to a saved file on your personal computer (PC).
3. Click **Close** to exit the *Trend Data* screen and return to the home page.

6.12   Edit/create a repeatability certificate

The following table lists the fields in a repeatability certificate.

Name	Description
Variable	Select to configure the certificate variable. Options are: Analysis Stream, Final Calib Stream, Final Calib Analysis Stream, Hardware, Application,, or Final Validation.
Plot	If selected, a graph will be added to the report.
Description	The name that will be used to denote the selected variable on the report.
Ambient Limit (RepeatabilityType)	The maximum allowed variation of the selected variable. If the variation of the selected variable is greater than the limit, the variable will fail the repeatability test.
Chamber Limit (RepeatabilityType)	The maximum allowed variation of the selected variable. If the variation of the selected variable is greater than the limit, the variable will fail the repeatability test.
Range Min Value	Based on the **Average Value** and the **Limit**, this is the lowest valid value that can be generated. If a value lower than this is generated, the result of the repeatability test for this variable is **FAIL**.
Range Max Value	Based on the **Average Value** and the **Limit**, this is the highest valid value that can be generated. If a value higher than this is generated, the result of the repeatability test for this variable is **FAIL**.
Units	Unit of measure for the associated limit value.
Calculation Method	Determines how the limit will be treated when calculating the data. Absolute: The limit will be subtracted from the average value to determine the minimum value, and the limit will be added to the average value to determine the maximum value. % of Avg: The limit will be divide by 100 to create a percentage value that will be applied to the average value to calculate the minimum and maximum values.

To edit or create a repeatability certificate:

Procedure

1. In the *Repeatability Certificate* window (under the **Log/Reports** menu), click **Insert After**.
   A row is added to the **Select Variables** table.

2. Select a variable from the **Variable** column.

   You can select a maximum of 100 variables.

   Note
   To copy a variable and increment the stream by one, select the variable and press **S + Copy**. For example, if you select **Stream 1_Mole%_Propane** and press **S + Copy**, **Stream 2_Mole%_Propane** is added to the table.

Note
To copy a variable and increment the component by one, based on the list of
components in the component data table, select the variable and press **C + Copy**.
For example, if you select **Stream 1_Mole%_Propane** and press **C + Copy**, **Stream
1_Mole%_ iButane** will be added to the table.

Figure 6-17: Example Repeatability Certificate

Ambient Repeatability Certificate

Analyzer : 741596 2
Company Name : ROSEMOUNT ANALYTICAL INC
S/N :
S/O :
Test Notes : Chamber Test

Test Start Time : 12/03/2019 10:45:12 AM
Test End Time : 12/04/2019 10:45:12 AM

Tested By : _____
Hai Nguyen

Description	Units	Calculation Method	Allowable Limit		Ambient Laboratory Test Summary				Result
			Stated	Absolute	Average	Minimum	Maximum	Variance	
Gross Dry BTU	BTU/scf	Absolute	0.125	0.125	1056.44	1048.48	1066.1	8.81	FAIL
Tot Unnormalized	Mole%	Absolute	0.375	0.375	109.898	109.347	110.754	0.703499	FAIL
C6+	Mole%	% of Avg	5%	0.00138164	0.0276327	0.006849	0.038915	70.0682%	FAIL
C3	Mole%	% of Avg	2%	0.0195796	0.97898	0.950201	1.06993	5.92679%	FAIL
i-C4	Mole%	% of Avg	2%	0.00598922	0.299461	0.272941	0.349574	12.3102%	FAIL
n-C4	Mole%	% of Avg	2%	0.00601299	0.30065	0.26092	0.345828	13.9939%	FAIL
neo-C5	Mole%	% of Avg	2%	0.0020573	0.102865	0.035363	0.147621	61.3485%	FAIL
i-C5	Mole%	% of Avg	3%	0.00308359	0.102786	0.060198	0.246397	60.7313%	FAIL
n-C5	Mole%	% of Avg	3%	0.00325891	0.10863	0	0.326155	100%	FAIL
N2	Mole%	% of Avg	2%	0.0487412	2.43706	2.40229	2.56936	3.36045%	FAIL
C1	Mole%	% of Avg	0.25%	0.224278	89.7112	88.9148	90.4011	0.828871%	FAIL
CO2	Mole%	% of Avg	2%	0.0199979	0.999893	0.885431	1.77192	33.3599%	FAIL
C2	Mole%	% of Avg	2%	0.0986168	4.93084	4.21739	5.37597	12.0769%	FAIL

6.13 Generate a repeatability certificate

The report is generated as a PDF, so if your computer does not have the Adobe™ Reader
installed, Rosemount MON2020 prompts you to install it.

A read-only user can generate a *Repeatability Certificate* report but can't modify any of
the fields that are used to generate the report. A regular user or higher can generate a

Repeatability Certificate report and can modify the fields that are used to generate the report.

Procedure

1. Go to **Log/Reports** → **Repeatability Certificate**.

    The *Repeatability Certificate* window opens.

2. To include all data in the report, select the **All Records** check box; to include a limited set of data in the report, select the **Time Period** check box and then select a Start Date and an End Date.

3. To run the test with ambient limit, select the Ambient **Limit Type**. To run the test with chamber limit, select the Chamber **Limit Type**.

4. Select the **Result Criteria** as a Variance or Standard Deviation Std. Dev (k=2).

5. Use the Test Information fields to track data related to the generation of the certificate.

    Note
    This information will be displayed on the report beneath a *Test Notes* heading.

6. Click **Create Report (F2)**. The data in the *Select Variables* table are saved, and the certificate is generated and displayed in Acrobat Reader. A table of repeatability values is displayed first and then each variable that you selected to be plotted has its own graph.

Table 6-1: Repeatability Values

Name	Description
Limit Type	This value is taken from the (Ambient or Chamber) Limit value that you entered in the *Repeatability Certificate* window.
Units	Unit of measure for the associated Limit value.
Average Value	The average of all the data collected during the test.
Range Min Value	Based on the Average Value and the Limit, this is the lowest valid value that can be generated. If a value lower than this is generated, the result of the repeatability test for this variable is FAIL.
Range Max Value	Based on the Average Value and the Limit, this is the highest valid value that can be generated.
Result Criteria	The result of the repeatability test. Select Variance or Standard Deviation Std. Dev (k=2). Is computed using the formula: $$\text{Tested Repeatability} = \frac{\text{Maximum Value} - \text{Minimum Value}}{2}$$ where Maximum Value = the highest measured value Minimum Value = the lowest measured value If Calculation Method is set to % of Avg, the tested repeatability is computed in percentage.

Table 6-1: Repeatability Values *(continued)*

Name	Description
Standard Deviation	Standard deviation shows the variation in measurement over the entire data set. A low standard deviation indicates that the measurement is close to the average reading, whereas a high standard deviation shows that the reading fluctuates from the average value. Standard deviation is calculated using the formula:
Result	Displays the Pass or Fail results. If a value higher than the Average Value limit is generated, the Result of the repeatability test for the variable is FAIL.

Note

To save the data in the **Select Variables** table without generating the report, click **OK**. The next time you open the **Repeatability Certificate** window, the table is populated with the saved data.

Enable the **Export Data** checkbox to Open the exported data file as *XML Files* in Microsoft Excel® or, drag and drop to Microsoft Excel®.

6.14 Export a repeatability certificate to Excel

Procedure

1. To generate an XML file of a *Repeatability* report, check **Export Data**.

   Note
   By default, the exported data are generated in *data.xml* under GC specific folders.

2. To select a different file or folder, click **Select File**. To open it in Excel, click **Select File** and drag and drop the file to Excel or open Excel, set the file type as XML, and then open the file.

6.15 Generate a Gas Chromatograph (GC) Configuration report

A **GC Configuration** report displays the current settings for the GC.

Procedure

1. Go to **Logs/Reports → GC Config Report...**.
   The **GC Config Report** window displays.

2. Select the check box for each option that you want to include in the report.

   Note
   To select all the options, click **Select All (F9)**. To clear all options, click **Clear All (F10)**.

3. Select the type of output you want for the report.

File	Saves the report as a .txt file.
Printer (with form feeds)	If multiple reports are selected, this option will add page breaks in between reports.

Printer (without form feeds)	If multiple reports are selected, after one report is finished, the next report will continue to print on the same page.
Screen	Opens the report in a new window within Rosemount MON2020.

Note

When choosing a Printer option, if you want to use a printer different from the one that you usually use, deselect the **Use default printer** check box. When the report is ready, the *Printer Configuration* window displays.

Note

When choosing the File option, the *Save* window displays, allowing you to name the text file and choose a location in which to save it.

4. Click **Start (F2)**.
   Rosemount MON2020 generates the customized report and prints or saves it, according to the output option you selected.

   Note

   A *GC Configuration* report that includes all options can take several minutes to generate and save. If you press **Esc** or click **Cancel** in the *Progress* dialog box, Rosemount MON2020 stops generating the report after the current option is completed.

Page from a Sample GC Configuration Report

```
System Report From 700XA 44226878
Firmware Revision, Checksum:  4.0.0, 2019/10/22, 0x65fcb1c2
12/05/2019 02:55:30 PM


Description                          Value


Analyzer Name                        44226878
System Description                   C6+ He/H2
Site Id                              1
Company Name                         EMP LTD
Location                             UK
Model                                700XA
Serial No                            00
Firmware Version                      4.0.0, 2019/10/22, 0x65fcb1c2
LOI Firmware Version                 4.0.0
Std. Component Table Version (GPA)   GPA Standard 2145-16
Std. Component Table Version (ISO)   ISO 6976:2016(E)
CGM FCAL Archive                     Keep Last FCAL Per Day
CGM FVAL Archive                     Keep Last FVAL Per Day
Date Format                          MM$DD$YYYY
Date Field Separator                 /
Time Format                          HH:MM:SS
Time Notation                        12 Hr
Synchronize with FF Timing           False
Show Advanced System Variables       False
Allow Multiple Writers               False
Maintenance Mode                     False
Max Warmstart Delay                  02:00
Sales Serial No                      00
Calibration Retry on Failure         False
Calibration Repeatability Check      False
Metrology Type                       None
GC Id                                0
Identification Number                0
Configuration Checksum at Lockout
Current Configuration Checksum       0xba418342
Checksum Update Time                 12/05/2019 02:50:30 PM
Chromatograph ID
Chromatograph Site ID                0.000000
Keep Last Good Average               False
Ext. Modbus Calibration Archive Data  Circular Buffer
Modbus Stream Alarm Bit Association   SIM2251 Emulation


****************************************************************************
Component Data Report From 700XA 44226878
Firmware Revision, Checksum:  4.0.0, 2019/10/22, 0x65fcb1c2
12/05/2019 02:52:37 PM

Component Data Table #1


Component          Usr/Std   Det #    Ret Time    Resp Factor   Calib Type
                                      (SEC)


C6+ 47/35/17       Std       1         45.0      3.422772e+08  Single-Level
Propane            Std       1         62.5       2.10626e+08  Single-Level
i-Butane           Std       1         80.6      2.449192e+08  Single-Level
n-Butane           Std       1         91.6      2.500847e+08  Single-Level
Neopentane         Std       1        103.6      2.734801e+08  Single-Level
i-Pentane          Std       1        135.3      2.791553e+08  Single-Level
n-Pentane          Std       1        152.4      2.828341e+08  Single-Level
Methane            Std       1        190.4       1.01714e+08  Single-Level
Carbon Dioxide     Std       1        229.3      1.463915e+08  Single-Level
Ethane             Std       1        262.2      1.647616e+08  Single-Level
Helium             Std       2        189.9       7.62229e+07  Single-Level
Hydrogen           Std       2        205.4      1.264064e+08  Single-Level
Nitrogen           Std       2        242.8      1.073546e+07  Single-Level




Component          Calib Conc  Unit           Anly Meth


C6+ 47/35/17        0.03009  Mole%           Area
Propane             1.0064   Mole%           Area
i-Butane            0.3019   Mole%           Area
n-Butane            0.3003   Mole%           Area
Neopentane          0.10074  Mole%           Area
i-Pentane           0.09942  Mole%           Area
n-Pentane           0.10004  Mole%           Area
Methane            88.4745   Mole%           Area
Carbon Dioxide      0.9931   Mole%           Area
Ethane              5.078    Mole%           Area
Helium              0.5117   Mole%           Area
Hydrogen            0.5165   Mole%           Area
Nitrogen            2.4873   Mole%           Area
```

6.16   Reset archive data

Use this feature to delete archived data and reset the gas chromatograph (GC) memory.

Procedure

1. Go to **Logs/Reports** → **Reset Archive Data...**.
    The *Reset Archive Data* window displays.

2. Select the types of data that you want to delete.

    Note
   To select all the options, click **Select All**. To clear all options, click **Deselect All**.

3. Click **Reset CGM Database** to reset the chromatogram database and delete all the archived chromatograms.

    Only do this under the direction of an Emerson Customer Care representative.

4. For Rosemount 370XA and 470XA GCs, click the **Erase IMB** button to erase the Intelligent Module Board memory.
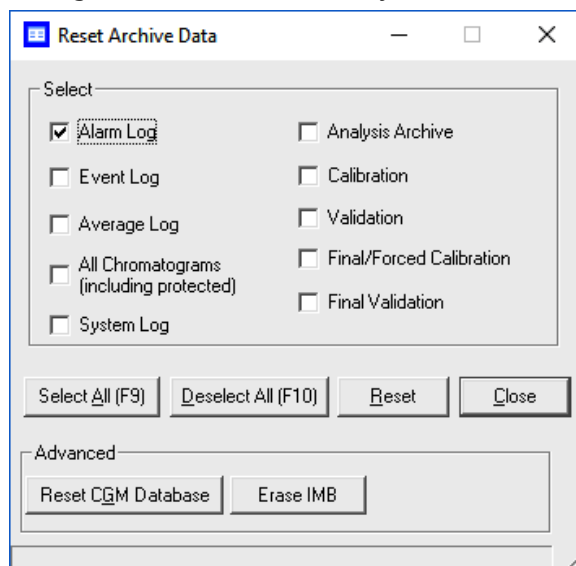
    Note
    Only select the **Erase IMB** function at the direction of an Emerson Customer Care Representative.

5. Click **Reset**.
    Rosemount MON2020 displays a confirmation dialog.
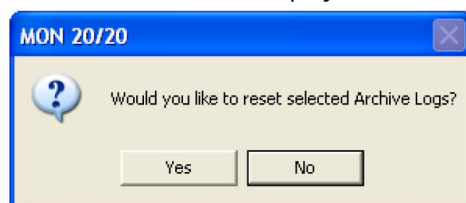
6. Click **Yes**.

Rosemount MON2020 clears the GC's memory. New archived records begin accumulating again as analysis and calibration runs occur.

6.17 The molecular weight vs. response factor graph

The *Molecular Weight Vs. Response Factor* window generates a graph according to Appendix B in *GPA 2198-03 Selection, Preparation, Validation, Care, and Storage of Natural Gas and Natural Gas Liquids Reference Standard Blends*. This graph can be useful in checking valve function and consists of the following information:

- Log (Molecular Weight) vs. Log (Response Factor): plots the values for the selected calibration.

- A trend line (best fit straight line);.

    Note
    The ideal trend line would be linear.

- R-squared correlation coefficient.

    Note
    The closer RSq is to **1**, the better.

This graph is only available for calibration streams, which can be selected from the **Stream** dropdown list. By default, the newest final calibration data is used to generate the graph, but any archived final calibration file can be used by selecting it from the **Final Calibration Record** dropdown list.

To print the graph, click **Print**.

6.18 Collect records from H(s) Archive

The *H(s) Archive* stores the superior dry primary calorific value (CV) for up to two years. The heating values measurement analysis is dependent on the gas composition and is available for gas chromatographs that have PTB selected as the metrology option.

Procedure

1. Use the drop-down lists to select the **Start Date** and **Start Time**.

2. Use the drop-down lists to select the **End Date** and **End Time**'

3. Click **Read Records.**
   The records display with the Date Time, Stream, and H(s) values

4. Right click on the table to save or print the records.

7   Control menu

Use the options in the *Control* menu to manage analysis, calibration, validation, and baseline runs.

From the *Control* menu, you can also stop an analysis run immediately or at the end of the run.

7.1   Initiate an auto sequence analysis run

This is the normal mode for an online gas chromatograph (GC). Use the auto sequence function to start continuous GC analysis runs that follow a predefined stream sequence.

Note
If an analysis run is in progress, you must stop it before starting auto sequencing.

Note
If auto calibration or auto validation is enabled, then these procedures will be performed as part of the auto sequence.

To initiate auto-sequencing:

Procedure

1. There are three ways of initiating auto sequencing:

   a) Select **Control → Auto Sequence... → Single Stream**.

   b) Press **F2**.

   c) Click ⌐→123⌐ on the toolbar.

   The *Start Auto Sequence* dialog displays.

2. Select **Analysis Clock** for GCs configured with more than one analysis clock.
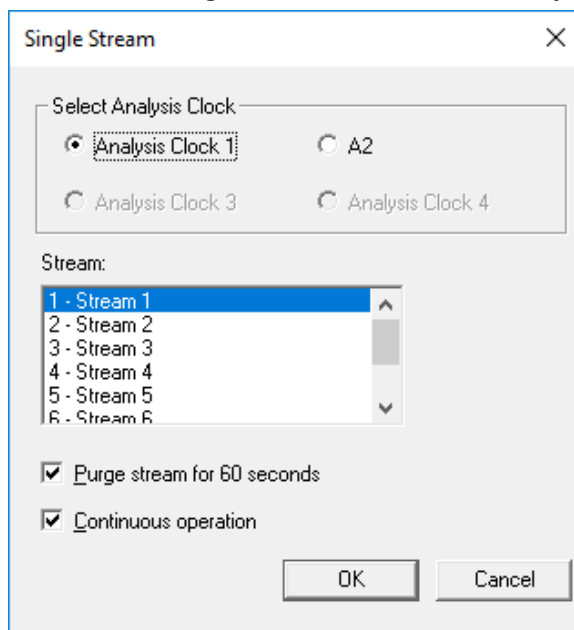
3. Decide whether to enable purging; then select or deselect the **Purge stream for 60 seconds** check box as necessary.

   Note

   You can configure purge duration in the Rosemount 700XA and 1500XA.

   Purging allows sample gas to flow through the sample loop for 60 seconds prior to beginning the first analysis. The check box is selected by default.

4. Click **OK**.

The auto sequence process begins.

Postrequisites

Use the *Mode* column on the GC Status Bar to monitor the status of the analysis run.

Related information

[Create or edit a stream sequence](#)
[Stop an analysis immediately](#)
[Configure an analysis clock](#)

7.2 Analyze a single stream

If an analysis run is in progress, it must be stopped before single stream analysis can be started.

Note
If auto calibration or auto validation is enabled then they will be performed as part of the auto sequence.

To start an analysis run on a single calibration or sample stream, do the following:

Procedure

1. Select **Single Stream...** from the **Control** menu.
   The *Start Single Stream Analysis* dialog displays.
2. Select **Analysis Clock** to display the analysis clock related streams in **Stream** list.
3. Select a stream from the **Stream** menu.
4. Decide whether to enable purging, then select or deselect the **Purge stream for 60 seconds** checkbox as necessary.

   Note
   Purge duration can be configured in the 700XA and 1500XA.

   Purging allows sample gas to flow through the sample loop for 60 seconds prior to beginning the first analysis. The checkbox is selected by default.

5. Check or uncheck the **Continuous operation** checkbox to set or disable repetitive analysis. The checkbox is selected by default.

   If you select **Continuous operation** the stream selected will continue until halted.

6. Click **OK**.
   The analysis starts. Use the **Mode** column on the **GC Status Bar** to monitor the status of the analysis run.

Related information

[Stop an analysis immediately](#)
[Configure an analysis clock](#)

7.3   Calibrate the gas chromatograph

Calibration runs are determined by the component data table (CDT) and Streams settings.

To calibrate a GC, do the following:

Procedure

1. Select **Control → Calibration...**.
    The **Calibration** dialog displays.

    > **Note**
    > If the GC is in *Auto Sequence* mode, calibration does not start until two or more
    > analysis runs have been completed. This delay is required to complete the current
    > analysis and the analysis of the stream currently purging through the valve.

2. Select **Analysis Clock** to display the analysis clock related streams in **Stream** list.

3. Select a **Stream**.

4. Decide whether to enable purging; then select or deselect the **Purge stream for 60
    seconds** checkbox as necessary.

    > **Note**
    > Purge duration can be configured in the 700XA and 1500XA.

    Purging allows sample gas to flow through the sample loop for 60 seconds prior to
    beginning the first analysis. The checkbox is selected by default.

5. Select the desired calibration type.

    •   Select **Normal** to perform a manual calibration in which the component data
        table for the selected stream(s) will be updated with calibration data *unless* the
        data is outside the acceptable deviations, as listed on the component data table.

    •   Select **Forced** to perform a manual calibration in which the component data table
        for the selected stream(s) will be updated with calibration data *even if* that data is
        outside the acceptable deviations, as listed on the component data table.

        > **Note**
        > A forced calibration updates the component data table's response factors even if
        > there are issues with the analysis; therefore, **manually check the results of the
        > calibration before returning the unit to service**.

6. Click **OK**.
    The calibration starts. Use the **Mode** column on the **GC Status Bar** to monitor the
    status of the operation.

Related information

[View and edit Component Data tables](#)
[Create or edit a stream sequence](#)
[Configure an analysis clock](#)

7.4 Validate the gas chromatograph

During a validation run, the GC performs a test analysis to verify that it is working properly. The test analysis is performed on a gas whose component concentrations are already known; if the GC's results deviate significantly from the predetermined data, an alarm is generated. Validation runs are determined by the validation data table and streams settings.

To validate the GC, do the following:

Procedure

1. Select **Control → Validation...**.
   The **Validation** dialog displays.

   Note
   If the GC is in **Auto Sequence** mode, validation does not start until two or more analysis runs have been completed. This delay is required to complete the current analysis and the analysis of the stream currently purging through the valve.

2. Select **Analysis Clock** to display the analysis clock related streams in **Stream** list.

3. Select a **Stream**.

4. Decide whether to enable purging, then select or unselect the **Purge stream for 60 seconds** checkbox as necessary.

   Note
   Purge duration can be configured in the 700XA and 1500XA.

   Purging allows sample gas to flow through the sample loop for 60 seconds prior to beginning the first analysis. The checkbox is selected by default.

5. Click **OK**.
   The validation starts. Use the **Mode** column on the **GC Status Bar** to monitor the status of the operation.

Related information

View and edit Validation Data tables (VDTs)
Create or edit a stream sequence
Configure an analysis clock

7.5 Configure the valve timing

Use this feature to set and adjust the valve timing.

Note
Auto valve timing is only available with the Rosemount 370XA Gas Chromatograph.

The function of valve timing is to switch the analytical flow path after the peak of a lighter component has left a column, but before the next component comes out. Figure 7-1 shows the valve timing occurring in-between the C6+ and n-pentane peaks correctly on a standard four-minute C6+ application. Figure 7-2 shows what happens when the valve timing is too early and cuts off some of the first peak. Figure 7-3 shows what happens when the valve timing is too late and cuts of some of the second peak. In the last two examples, not all of the component will reach the detector at the expected time, and therefore some components will not be measured correctly.

Table 7-1: Effects of Valve Timing on Component Leaks

Figure 7-1: Correct Valve Timing

Figure 7-2: Early Valve Timing Error

Figure 7-3: Late Valve Timing Error
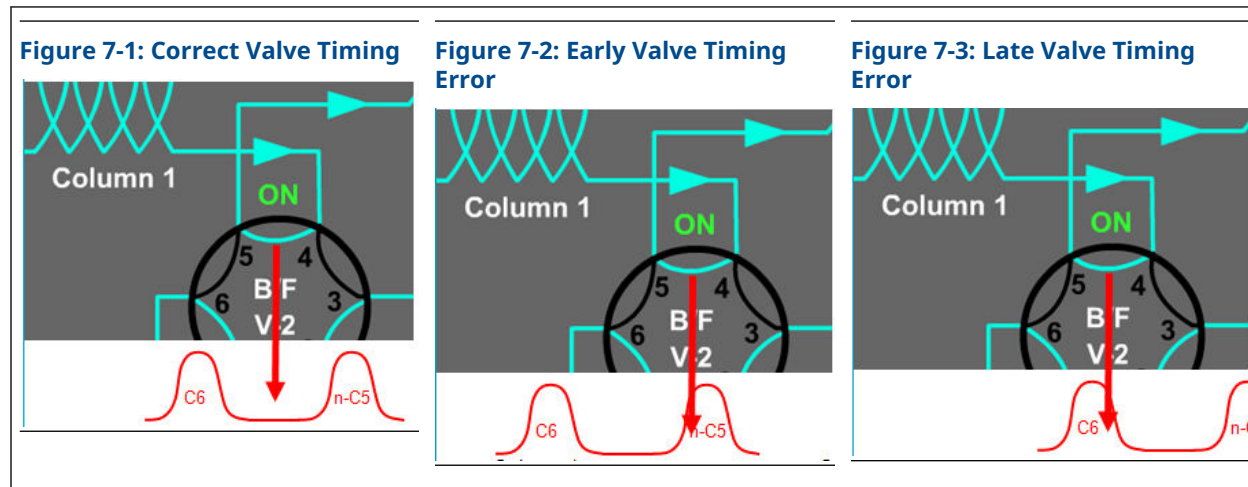
Historically, a technician would monitor the peak areas of the two affected peaks while making changes to the valve timing and determine the correct timing using personal judgment. The intention of the auto valve timing (AVT) process is to automatically make the adjustments and monitor the peak areas to determine the correct valve timing, reducing the load on the technician to just selecting when to initiate the AVT process.

The AVT is a process that runs on the calibration gas stream. The process consists of the following activities:

- Correctly identify all the component peaks.

- Adjust the timed events based on peak retention times.

- Automatically adjust the valve time.

- Run a calibration cycle after the adjustments have been made.

- Check the range and order of response factors.

Procedure

1. Select **Control → Auto Valve Timing…**.
   The **Start Auto Valve Timing** window opens.

2. If you are installing a new module, select the **Factory Defaults** check box; otherwise, select the **Use Current** check box.

3. Click **OK**.

The AVT process runs. When it completes, it will generate and display an **Auto Valve Timing** report.

Figure 7-4: Auto Valve Timing Sample Report

```
                        Auto Valve Timing

Date-Time: 10/15/08 09:29   Analysis Time: 350    Cycle Time: 360
Stream: 4 Cal               MODE:  FCAL      Cycle Start Time: 09:23
Analyzer: Houston        Strm Seq:1,3,2
Houston
S/N: 000001      SO: 000001


Valve 2 - OFF
EVC Component   n-Pentane
LVC Component   C6+(47/35/17)

Time         EVC Area      % Change       LVC Area      % Change
19             883624          -           606288          -
19.5       1.21677E+06       37.7%        421916        -30.4%
20*        1.24228E+06        1.8%        416836         -1.2%
20.5       1.25552E+06        1.1%        396148         -5.0%
21         1.25318E+06       -0.2%        336532        -15.0%


Valve 3 - OFF
EVC Component   Ethane
LVC Component   Propane

Time         EVC Area      % Change       LVC Area      % Change
38             883624          -           506288          -
38.5       1.11677E+06       32.7%        321916        -35.4%
39*        1.14256E+06        1.4%        316836         -1.4%
39.5       1.15534E+06        1.0%        396148         -4.8%
40         1.15378E+06       -0.4%        236532        -15.0%


ACTIVE ALARMS
```

7.6 Auto valve timing (AVT) alarms

Alarm name	Description	Example
Excessive AVT Adjustment	If the valve timing adjustment exceeds the limit set in the **_Configuration_** dialog, this alarm is triggered, and the retention times and timed events are set back to their previous settings. The valve number(s) that did not find an ideal time are reported with the alarm.	Exc AVT Adj: 2,3
AVT Timed Event Adjustment	If an adjustment of a timed event by the AVT process results in a timed event being within 0.5 seconds of another timed event, this alarm is triggered, and the retention times and timed events are set back to their previous values. The timed event and the time of the event are reported with the alarm.	AVT Timed Event Adj: 32 seconds
AVT Missing Peak	If any of the component peaks cannot be found during any of the calibration gas analysis runs, this alarm is triggered, and the retention times and timed events are set back to their previous values. The peak that could not be identified is reported with the alarm.	AVT Missing Peak: Nitrogen

Related information

Configure the valve timing

7.7 Halt an analysis run

To stop the current analysis at the end of its cycle:

Procedure

1. Use one of the following options to halt an analysis run:

    a) Go to **Control → Halt...**.

    b) Press **F3**.

    c) Click [⨯ 123] on the Toolbar.

    The **Halt** dialog opens.

Figure 7-5: Halt dialog
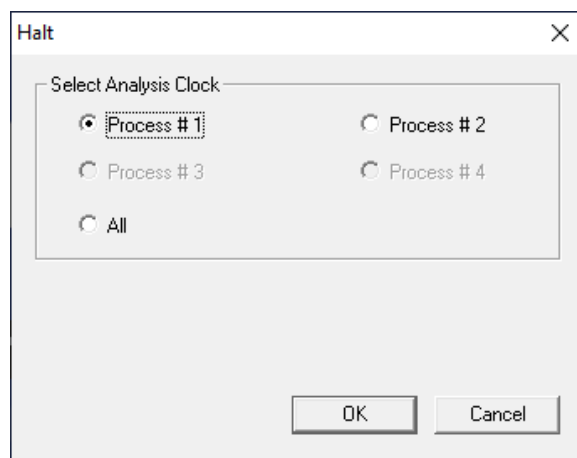
2. Select the analysis clock to halt.

The analysis stops at the end of the current cycle.

Postrequisites

Use the **Mode** column on the GC Status Bar to monitor the status of the operation. When the analysis has halted, the **Mode** value is **Idle**.

7.8 Stop an analysis immediately

This function forces the system into Idle mode. If Stop Now is performed while an analysis is in progress, the components may continue to elute from the columns, but the software will not generate analysis data.

Do not perform a Stop Now unless absolutely necessary. Whenever possible, use the Halt function.

Procedure

1. Select **Control** → **Stop Now....**

Figure 7-6: Stop Dialog
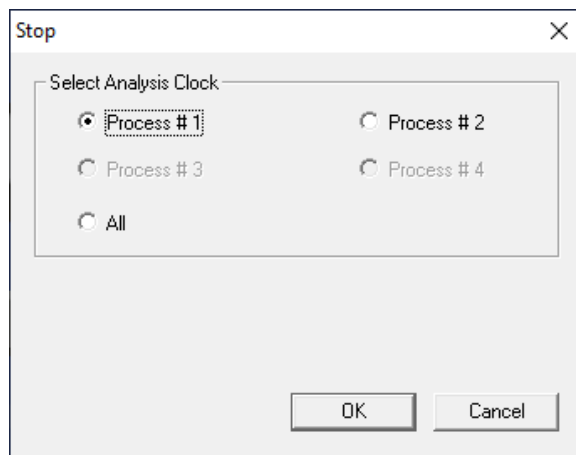
2. Select the analysis clock to stop.

The current analysis stops.

8 Tools menu

8.1 Managing users

Use the User Administration commands to create or delete users, change passwords, and to monitor connections between the personal computer (PC) and the gas chromatograph (GC).

Log-in security is at the GC level instead of at the software level. This means that you have to log in to the GC to which you are trying to connect.

Important

This also means that if you create a new user, that user is only valid for the GC to which you are connected. You cannot connect to any other GC unless you create the same user on it first.

Rosemount MON2020 recognizes the following four user types, or roles, each with an increasing level of access to functionality:

Read-only A read-only user has the lowest level of access and can view data but cannot make any changes. A read-only user can only change their own password.

Regular A regular user has all of the privileges of a read-only user, as well as the ability to acknowledge and clear alarms. A regular user can also control the GC through Rosemount MON2020's *Control* menu. A regular user can only change their own password and cannot create or delete other users.

Super User A super user has all of the privileges of a regular user, as well as the ability to manage and control the GC through Rosemount MON2020's *Application* and *Hardware* menus. A super user can only change their own password and cannot create or delete other users.

Administrator An administrator has complete access to all of Rosemount MON2020's commands and functions, as well as the ability to manage all other users by creating or deleting user accounts and changing passwords.

Note

Each GC ships with two administrator accounts. Contact your Customer Care Representative to obtain account information. For the first-time log-in, a password is required.

The following table lists in detail the functions and commands that are available to each user role:

Menu	Commands	Admin User	Super User	Regular User	Read-Only User
File	GC Directory	Yes	Yes	Yes	Yes
	Open Configuration File	Yes	Yes	Yes	Yes
	Save Configuration (to PC)	Yes	Yes	Yes	Yes
	Restore Configuration (to GC)	Yes	Yes	Yes	Yes
	Program Settings	Yes	Yes	Yes	Yes
	Print Setup	Yes	Yes	Yes	Yes

Menu	Commands	Admin User	Super User	Regular User	Read-Only User
	Exit	Yes	Yes	Yes	Yes
Chromatograph	Connect	Yes	Yes	Yes	Yes
	Disconnect	Yes	Yes	Yes	Yes
	Chromatogram Viewer	Yes	Yes	Yes	Yes
	Chromatogram - Forced Cal	Yes	Yes	No	No
	View/Set Date Time	Yes	Yes	Read-only	Read-only
Hardware	Heaters	Yes	Yes	Read-only	Read-only
	Valves	Yes	Yes	Read-only	Read-only
	Electronic pressure control (EPC)[1]	Yes	Yes	Read-only	Read-only
	Detectors	Yes	Yes	Read-only	Read-only
	Discrete Inputs	Yes	Yes	Read-only	Read-only
	Discrete Outputs	Yes	Yes	Read-only	Read-only
	Analog Inputs	Yes	Yes	Read-only	Read-only
	Analog Outputs	Yes	Yes	Read-only	Read-only
	Installed Hardware	Read-only	Read-only	Read-only	Read-only
Application	System	Yes	Yes	Read-only	Read-only
	Component Data	Yes	Yes	Read-only	Read-only
	Timed Events	Yes	Yes	Read-only	Read-only
	Calculations - Control	Yes	Yes	Read-only	Read-only
	Calculations - Averages	Yes	Yes	Read-only	Read-only
	Calculations - User Defined: • Calculation - Dew Point • Calculation - Configuration • Calculation - Metrology Options	Yes	Yes	Read-only	Read-only
	Limit Alarms	Yes	Yes	Read-only	Read-only
	Discrete Alarms	Yes	Yes	Read-only	Read-only
	System Alarms	Yes	Yes	Read-only	Read-only
	Streams	Yes	Yes	Read-only	Read-only
	Analytical Train Configuration	Yes	Yes	Read-only	Read-only
	Analysis Clock Configuration	Yes	Yes	Read-only	Read-only
	Stream Sequence	Yes	Yes	Read-only	Read-only
	Method Switching	Yes	Yes	Read-only	Read-only

Menu	Commands	Admin User	Super User	Regular User	Read-Only User
	Communication	Yes	Yes	Read-only	Read-only
	Ethernet Ports	Yes	Yes	Read-only	Read-only
	Local operator interface (LOI) Status Variables	Yes	Yes	Read-only	Read-only
	FOUNDATION™ Fieldbus primary variable (FFB PV) Mappings	Yes	Yes	Read-only	Read-only
Logs/Reports	Alarms	Yes	Yes	Yes	Read-only
	Unacknowledged/ Active Alarms	Yes	Yes	Yes	Read-only
	Alarm Logs	Read-only	Read-only	Read-only	Read-only
	Clear/Acknowledge Alarms	Yes	Yes	Yes	No
	Maintenance Log	Yes	Yes	Yes	No
	Parameter List	Yes	Yes	Yes	No
	Drawings/Documents	Yes	Yes	Yes	No
	Event Log	Read-only	Read-only	Read-only	Read-only
	Report Display	Read-only	Read-only	Read-only	Read-only
	Archive Report	Read-only	Read-only	Read-only	Read-only
	Analysis/Calibration/ Validation	Yes	Yes	Yes	No
	Average	Yes	Yes	Yes	No
	Export Data	Yes	Yes	Yes	No
	Printer Control	Yes	Yes	Yes	Read-only
	Trend Data	Read-only	Read-only	Read-only	Read-only
	Repeatability Certificate	Yes	Yes	Yes	No
	GC Configuration Report	Yes	Yes	Yes	No
	Reset Archive Data	Yes	No	No	No
	Molecular Weight vs. Response Factor	Yes	Yes	Yes	Read-only
	H(s) Archive	Yes	Yes	Yes	Read-only
Control	Auto Sequence	Yes	Yes	No	No
	Single Stream	Yes	Yes	Yes	No
	Calibration	Yes	Yes	Yes	No
	Validation	Yes	Yes	Yes	No
	Auto Valve Timing	Yes	Yes	Yes	No
	Halt	Yes	Yes	Yes	No
	Stop Now	Yes	Yes	Yes	No
Tools	Users	Yes	No	No	No

Menu	Commands	Admin User	Super User	Regular User	Read-Only User
	User Administration	Yes	No	No	No
	Change User Password	Any	Own	Own	Own
	Upgrade Firmware	Yes	No	No	No
	Cold Boot	Yes	No	No	No
	Restart GC	Yes	No	No	No
	Modbus® Map Editor	Yes	No	No	No
	Diagnostics	Yes	No	No	No
	Module Validation	Yes	No	No	No
	Force Module Validations Settings	Yes	No	No	No
	Edit Module Validation Allowable Deviations	Yes	No	No	No
	Auto valve timing (AVT) Timed Event Adjustments	Yes	No	No	No
	AVT Valve Selections	Yes	No	No	No
	LOI Key Sensitivity	Yes	No	No	No
	Save Diagnostic Data	Yes	No	No	No
	View Diagnostic Data	Yes	No	No	No

(1)   This screen is called Carrier Pressure when using a Rosemount 470XA.

8.1.1   Add a new user

Prerequisites
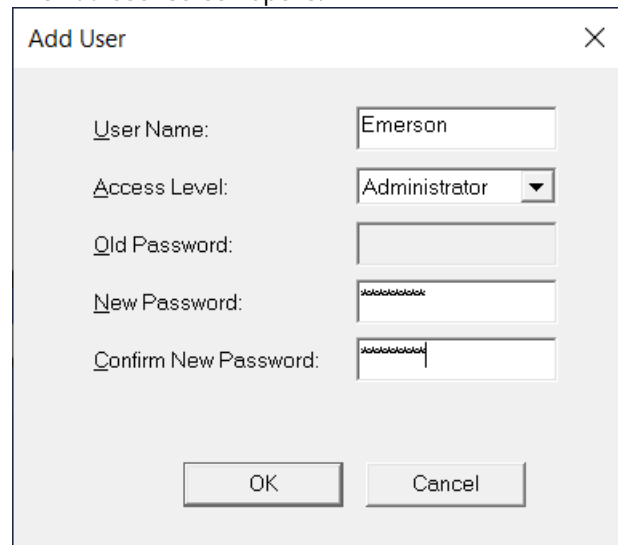
Note
Note: You must be logged in as an administrator.

Procedure

1. Go to **Tools → Users → User Administration**.
   The ***User Administration*** screen opens, displaying a list of current users and their role levels.

2. Click **Add User**.
The ***Add User*** screen opens.

3. Enter a name for the new user in the User Name field.

4. Select either **Administrator** or **User** from the Access Level drop-down list.

5. Enter a unique password for the new user in the New Password field and again in the Confirm New Password field.

6. Click **OK**.

The software creates the new user and adds them to the ***User*** table on the ***User Administration*** window.

8.1.2   Export a list of user profiles

To save a list of users, along with their role levels and passwords, do the following:

Procedure

1. Select **Tools** → **Users** → **User Administration...**.
The *User Administration* window appears, displaying a list of current users and their role levels.

2. Click **Export File**.
The *Export User File* window displays.

3. Navigate to where you want to save the file, if necessary.

4. Type in a file name or use the pre-generated name provided.

5. Click **Save**.

8.1.3   Import a list of user profiles

To load a list of users, along with their role levels and passwords, do the following:

Procedure

1. Select **Tools** → **Users** → **User Administration...**.
The *User Administration* window appears, displaying a list of current users and their role levels.

2. Click **Import File**.

The *Import User File* window displays.

3. Navigate to where the file is located, if necessary.

   Note
   User files have the .xusr extension.

4. Click on the file to be loaded.
5. Click **Open**. The users are added to the *User Administration* window.

8.1.4 Edit a user profile

Note
You must be logged in as an administrator.

To edit a user's name, role level, or password:

Procedure

1. Go to **Tools → Users → User Administration...**.
   The **User Administration** window appears, displaying a list of current users and their role levels.
2. Select the user whose role you want to edit and click **Edit User**.
   The **Edit User** window displays.
3. Change the appropriate information as required.
4. Click **OK**.

Rosemount MON2020 makes the requested changes and returns to the **User Administration** window.

8.1.5 Remove a user

Prerequisites

Note
You must be logged in as an administrator to remove a user.

To remove a user:

Procedure

1. Go to **Tools → Users → User Administration...**.
   The **User Administration** window appears, displaying a list of current users and their role levels.
2. Select the user you want to delete and click **Remove User**.
   A confirmation message displays.
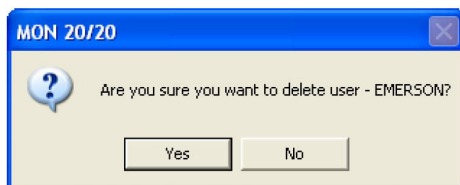
3. Click **Yes**.

Rosemount MON2020 deletes the user and returns to the **User Administration** window.

8.1.6   Change Password dialog

A user without administrator-level access can only change their own password.

Procedure

1. Go to **Tools → Users → Change User Password...**.
   The ***Change User Password*** dialog opens.
2. Enter the appropriate information in the text fields and click **OK**.

8.1.7　Reset the administrator password

Procedure

1. Start Rosemount MON2020 and go to **Users → Reset Administrator User / Password...**.

   Note
   If the software was already started, be sure to disconnect from all gas chromatographs (GCs) before attempting to reset the administrator password.

   The following warning displays:

   Figure 8-1: Password Reset Warning Message
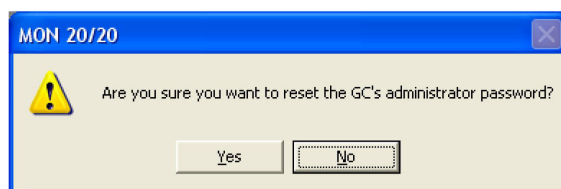
2. Click **Yes**.
   The **Connect to GC** window displays.

3. Click the **Ethernet** button that corresponds to the GC whose password you want to reset.
   Rosemount MON2020 connects to the GC and generates a password reset request ID for the default user *Emerson*. If *Emerson* does not exist, it is created. The **MON2020 - Password Reset** window displays.

4. Click **Copy to Clipboard** and email the password reset request ID to GC.CSC@emerson.com.
   Emerson sends you the password reset key.

5. After you receive the password reset key, return to the **Connect to GC** window and again click the **Ethernet** button that corresponds to the GC whose password you want to reset.
   The **Login** window displays.

6. Enter the User Name, *Emerson*, and the password reset key and click **OK**.
   Rosemount MON2020 connects to the GC. The Rosemount MON2020 security policy requires a user to change the password immediately after log-in.

7. After changing the password successfully, log in with the new password.

Related information

Change Password dialog

Set the password security level

8.1.8   Set the password security level

Procedure

1. Go to **Tools→User Administration…**.

2. Make a selection to **Add**, **Remove**, or **Edit** user profiles.

3. Click **Password Security Level** . Options are:

   • None: Sets the password as an empty string.

   • Low

   • Medium

   • High

4. Use **Export File** or **Import File** to save or import user profiles

8.1.9   Find out who is connected to the gas chromatograph

To ascertain which users are connect to the GC, select **Tools → Users → Logged on Users…**.
The *Logged on Users* window displays with a list of the users who are currently logged on to
the GC, along with each user's IP address.

8.2   Upgrade the firmware

This procedure is relevant to the Rosemount 700XA and 1500XA gas chromatographs
(GCs).

Procedure

1. Verify that you have the latest version of Rosemount MON2020.

   You can download the latest version from Emerson.com/en-us/automation/
   measurement-instrumentation/gas-analysis/gc-software-firmware-downloads.

2. Download the Rosemount 700XA and 1500XA firmware
   from Emerson.com/en-us/automation/measurement-instrumentation/gas-analysis/gc-
   software-firmware-downloads
   A zip file containing the firmware is downloaded to your personal computer (PC).

3. Save the GC's configuration.

   a) Connect Rosemount MON2020 to the GC.

   b) Go to **File→Save Configuration (to PC)** to save the configuration.

4. Upgrade the GC firmware.

   a) In Rosemount MON2020, go to **Tools→Upgrade Firmware** to open the
      Upgrade Firmware screen.

   b) Select **Open** and browse for the firmware zip file downloaded in Step 2.

c) Select the `Firmware` line in the table.
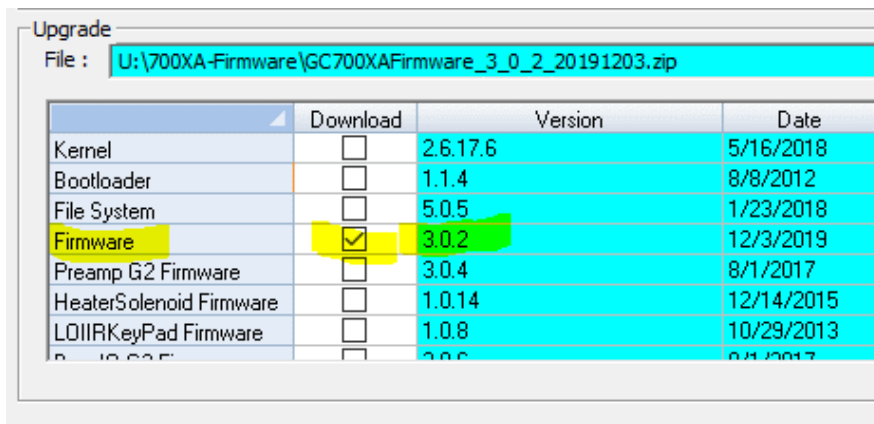
d) Click **Upgrade**.
The GC upgrades the firmware. After the upgrade is complete, the GC reboots.

5. Restore the GC's configuration.

a) After the GC reboots, connect it to Rosemount MON2020.

b) Go to **File → Restore Configuration (to GC)** to restore the configuration file saved in Step 3.

8.3 Cold boot

Cold booting the gas chromatograph (GC) clears all its stored analysis files and logs and resets all the tables to the default settings. This is a necessary step in procedures, such as refurbishing the GC or central processing unit (CPU) board.

Procedure

1. Go to **Tools → Cold Boot…**.
A warning message displays: *Are you sure you want to cold-boot the GC? The GC will lose its configuration and historical data! Are you sure you want to continue?*

2. Click **Yes**.
The GC will initiate the cold boot process. Once the process has completed, you will get the following confirmation message, which states: *The GC will reboot. MON2020 connection with GC will go away when you press OK. Reconnect to the GC in 3 minutes.*

3. Click **OK** to reboot the GC.

8.4 Restart the gas chromatograph (GC)

Procedure

1. Go to **Tools → Restart GC…**.
Rosemount MON2020 displays the *Are you sure you want to Restart the GC?* dialog.

2. Click **Yes** to restart the GC or click **No** to cancel and close the dialog.

8.5 Modbus Map Editor

Prerequisites

Use this window to map GC data to Modbus™ registers and generate MAP files, which can then be associated with communications ports.

For a list of variable assignments made to all registers, consult the *Communication* section of the *PC Config Report*.

To map GC data to Modbus registers, do the following:

Procedure

1. Select **Communication** from the *Application* menu. The *Communication* window opens.
2. Click **Registers**. The *Modbus Map Editor* window opens.
3. To view or edit registers that are contained in an existing MAP file, click the **Select MAP File** drop-down list and select the appropriate file. The registers will load into the table.
4. To edit a cell, double-click it. You can edit the following parameters:

   • To copy the component settings from a highlighted row and apply them to the next row, click C + Copy. This feature also increments the Component value to the next available component (e.g., incrementing from Ammonia to Benzene), per the GC application.

   • An error message displays when the last available component is reached.

Name	Description
Register Number	Displays the number for the Modbus register that will be polled by a connected data acquisition system.
Data Type	Describes the type of data that is stored in the register. SIM_2251 and User_Modbus options are: • BOOLEAN • INT • LONG • FLOAT • Bitmap(INT) • Bitmap(LONG) • SCALED_FP1 ... SCALED_FP32 If one of the scaled floating point options is chosen, the Zero Scale and Full Scale values for that option will display in the appropriate column cells. The default User_Modbus data type is FLOAT, which means the value is not converted to an integer and is stored in two adjacent registers. Data types other than FLOAT require only one register per variable.
Variable(s)	Displays the variable(s) whose value is to be stored in the register.
Record Number	The **Record Number** is enabled for Archive type of variables. The User selects which archive record's data needs to output over Modbus®. Record number 1 is referred to as the recent record and maximum value is referred to as the oldest record.
Access	Determines whether the register will be read-only (RD_ONLY) or read/write (RD_WR).

Name	Description
Format	Defines the date and time using the drop-down menu. Select DDMMYY, MMDDYY, YYMMDD, hhmmss, hhmm, DD, MM, YY, YYYY, WW, hh, mm, or ss.

Related information

Assign a variable to a register

8.6 Modbus® Test program

Use the Modbus program to poll the gas chromatograph's (GC's) Modbus registers (or registers from another device) to confirm that data is accurately relayed from the GC to the personal computer (PC). Then, as necessary, assign data types to the returned data. You can save all settings to a file for future reference.

You can use this program to facilitate software debugging or for special installations. With this program, you can troubleshoot any device that employs registers, including the GC, an ultrasonic meter, or a flow computer.

Traditionally, Modbus registers are polled by using a data collection system. To facilitate installation and debugging, the Modbus program emulates a Modbus master.

⚠ CAUTION

Only connect one Modbus master to a single serial link at a time.

This section provides detailed instructions for using the Modbus program. Use this program only if you are familiar with Modbus communication protocol and the operation of Rosemount MON2020.

Related information

Assign scale ranges to User_Modbus registers

Transmit a single data type

Transmit data using a template

Save Modbus data

Print Modbus data

8.6.1 Modbus protocol comparison

The GC and the Modbus test program can accommodate two different Modbus protocols: **SIM_2251** and **User_Modbus**. Some settings depend on which Modbus protocol is used.

The protocol you need depends ultimately on the hardware used for data acquisition from the GC Modbus register contents.

The following comparison should help clarify the differences between the two protocols as well as the utility of each.

Table 8-1: Comparing SIM_2251 and User_Modbus Protocols

SIM_2251	User_Modbus
A modified protocol that allows a floating point number to be assigned to a single register so that it can be transmitted over Modbus via 2251 emulation slave type. All Gas Custody Transfer GCs are shipped with the SIM_2251 Modbus Interface.	Standard Gould protocol that accommodates PLC Emulation LO-HI or HI-LO word order for 32-bit values. The GC uses the LO-HI order.
Most register contents are predefined. The pre-configured maps conform to the SIM_2251 register designations.	Predefined Boolean (coils) User-defined Numeric (registers)
Data types are predefined for the following register ranges: **1001-2999** discrete, coils **3001-4999** 16-bit integers **5001-6999** 32-bit integers **7001-8999** IEEE 32-bit floats **9000-9999** Any data type	Data types are user-defined **0 - 9999** discrete, coils **0 - 9999** 16-bit integers For transmitting 32-bit data, two contiguous registers can be used.
When using the Modbus test program, set **Register Mode** to **SIM2251** to view register contents.	When using the Modbus test program, set **Register Mode** to **PLC- LH** or **PLC-HL** to view register contents.
It is not necessary to assign scales to registers.	It may be necessary to assign scales to registers in order to convert floating point values to whole integer representations.

Related information

Pre-defined Modbus map files

8.6.2　Set communication parameters

To determine or reset the communications parameters used by the Modbus® Test program:

Procedure

1. Go to **Tools → Modbus Test...**.
   The **Modbus Test Program** window displays. The current port settings display in the window's title bar. If Rosemount MON2020 is connected to a gas chromatograph (GC) through an Ethernet connection, then the Modbus Test program uses the Ethernet connection.

2. Click **Port Setup**.
   The **Port Setup** window appears.

3. Make the appropriate configuration changes to match the settings for the link you are trying to test. The following table lists the typical setting for each parameter:

Parameter	RTU	ASCII	Comments
Port	COM1 or COM2	COM1 or COM2	For serial connection only
Baud Rate	9600	9600	For serial connection only
Data Bits	8	7	For serial connection only
Parity	None	Even	For serial connection only
Stop Bits	1	1	For serial connection only

Parameter	RTU	ASCII	Comments
Flow Control	None	None	For serial connection only
Read Timeout	1000 ms	1000 ms	N/A
Try	2	2	Retry when an error is detected on the frame
Register Mode	(SIM_2251) or PLC-LH (User_Modbus)	(SIM_2251) or PLC-LH (User_Modbus)	N/A

4. Click **OK**.

8.6.3 Obtain Modbus® data

To read or write register contents to the GC, or any other device, do the following:

Procedure

1. In the **Slave Addr** field, type the **COM ID** of the GC. The Modbus program will accept a slave address value of **1** to **247**.

   To use **Broadcast** mode, which directs the Modbus program to poll all known devices, enter **0** in the **Slave Addr** field. Each device interprets this poll attempt as an instruction to read and take action; however, a response message may not be received by the Modbus program.

2. Select the desired read or write option from the **Function** dropdown list.

Function Code	Description	Broadcast
1 (Read Coil)	Reads one or more coil values.	
2 (Read Input Status)	Reads one or more input status values.	
3 (Read Multiple Regs)	Reads one or more register values.	
4 (Read Input Regs)	Reads one or more input register values.	
5 (Set Single Coil)	Set (write) one coil value	✓
6 (Set Single Reg)	Set (write) one register value	✓
15 (Set Multiple Coils)	Set (write) multiple coil values	✓
16 (Set Multiple Regs)	Set (write) multiple register values	✓

3. Type the starting register value in the **Data Addr** field.

   Note
   When the register mode is set to **SIM_2251**, the data type is set automatically by the Modbus program, based on the specified data address.

4. In the **Quantity** field, type the number of registers to be retrieved.

   The Modbus test program accepts a quantity value of **1** to **2016**. The requested number of registers cannot exceed the amount contained by the selected message block but you *can* retrieve a partial block. You cannot cross a message block boundary.

   Also, in **Standard Modbus** mode each register is 16 bits. Therefore, integers (SHORT) consist of one register while floats (FLOAT) and long integers (LONG) consist of two registers.

> **Note**
> Boolean registers are not user-defined (for either SIM_2251 or User_Modbus) and primarily contain alarm flags useful for debugging. To view the contents of Boolean registers, select the **1 (Read Coil)** function code.
>
> Numeric registers for User_Modbus can be user-defined. To view the contents of numeric registers, select the **3 (Read Regs)** function code.

5. Type the desired repeat count, which is the number of times the Modbus program should read or set the specified registers before ceasing transmission, in the **Repeat** field.

   The Modbus program will accept a repeat value of **1** to **9999**. A value of **–1** produces an infinite polling loop that can be terminated by clicking **Stop**.

Related information

[Generate a Gas Chromatograph (GC) Configuration report](#)

8.6.4   Transmit a single data type

To assign a data type to a group of registers you will read or edit, do the following:

> **Note**
> To learn the variable names that are assigned to the Modbus registers before retrieving the data, generate a *GC Config Report*.

Procedure

1. In the **Slave Addr** field, type the COM ID of the GC.

   The Modbus test program accepts a slave address value of **1** to **247**.

   To use **Broadcast** mode, which directs the Modbus test program to poll all known devices, enter **0** in the **Slave Addr** field. Each device interprets this poll attempt as an instruction to read and take action; however, a response message may not be received by the Modbus test program.

   > **Note**
   > Changes are applied to the corresponding register value at each device.

2. Select the desired read or write option from the **Function** pull down menu.

Function Code	Description	Broadcast
1 (Read Coil)	Reads one or more coil values.	
2 (Read Input Status)	Reads one or more input status values.	
3 (Read Multiple Regs)	Reads one or more register values.	
4 (Read Input Regs)	Reads one or more input register values.	
5 (Set Single Coil)	Set (write) one coil value	✓
6 (Set Single Reg)	Set (write) one register value	✓
15 (Set Multiple Coils)	Set (write) multiple coil values	✓
16 (Set Multiple Regs)	Set (write) multiple register values	✓

3. Type the starting register value in the **Data Addr** field.

> **Note**
> The data type is set automatically by the Modbus test program, based on the specified data address.

4. In the **Quantity** field, type the number of registers to be retrieved.

   The Modbus test program will accept a quantity value of **1** to **2016**. The requested number of registers cannot exceed the amount contained by the selected message block but you *can* retrieve a partial block. You cannot cross a message block boundary.

   Also, in **Standard Modbus** mode each register is 16 bits. Therefore, integers (SHORT) consist of 1 register while floats (FLOAT) and long integers (LONG) consist of 2 registers.

   > **Note**
   > Boolean registers are not user-defined (for either SIM_2251 or User_Modbus) and primarily contain alarm flags useful for debugging. To view the contents of Boolean registers, select the **1 (Read Coil)** function code.
   >
   > Numeric registers for User_Modbus can be user-defined. To view the contents of numeric registers, select the **3 (Read Regs)** function code.

5. Type the desired repeat count, which is the number of times the Modbus program should read or set the specified registers before ceasing transmission, in the *Repeat* field.

   The Modbus test program accepts a repeat value of **1** to **9999**. A value of **–1** produces an infinite polling loop that can be terminated by clicking **Stop**.

6. Select the **Use <data type> to decode registers** radio button in the Data Type box.

7. Select a data type from the drop-down list.

   > **Note**
   > If **SIM2215 Register** mode is used, the radio buttons in the **Data Type** box are disabled. The following list displays the default data types for each block of SIM_2251 registers:
   >
   > | | |
   > |---|---|
   > | **1000 – 2999** | Boolean |
   > | **3000 – 4999** | Integer |
   > | **5000 – 6900** | Long |
   > | **7000 – 8999** | Float |
   > | **9000 - 9999** | Any data type |

   > **Note**
   > To ensure the best data type assignments, review a saved *GC Config Report*.

8. Click **Transmit** to retrieve the selected registers (i.e., the specified data addresses) from the GC.

   The transmitted/received packet data displays in the *Packet Input-Output* window.

9. Click **Stop** to end the transmission of the data and to return to the **Modbus Function Selection** options.

Related information

Generate a Gas Chromatograph (GC) Configuration report

8.6.5 Transmit data using a template

Templates are best used when decoding mixed data types because the template contains data that the Modbus program can use to determine which data type should be assigned to which register.

To create a new template or to use an existing template, do the following:

Note
To learn the variable names that are assigned to the Modbus registers before retrieving data, generate a *GC Config Report* and review the **Communication** section.

Procedure

1. In the **Slave Addr** field, type the **COM ID** of the GC.

   The Modbus program accepts a slave address value of **1** to **247**.

   To use **Broadcast** mode, which directs the Modbus program to poll all known devices, enter **0** in the *Slave Addr* field. Each device interprets this poll attempt as an instruction to read and take action; however, a response message may not be received by the Modbus program.

   Note
   Changes are applied to the corresponding register value at each device.

2. Select the desired read or write option from the *Function* pull down menu.

Function Code	Description	Broadcast
1 (Read Coil)	Reads one or more coil values.	
2 (Read Input Status)	Reads one or more input status values.	
3 (Read Multiple Regs)	Reads one or more register values.	
4 (Read Input Regs)	Reads one or more input register values.	
5 (Set Single Coil)	Set (write) one coil value	✓
6 (Set Single Reg)	Set (write) one register value	✓
15 (Set Multiple Coils)	Set (write) multiple coil values	✓
16 (Set Multiple Regs)	Set (write) multiple register values	✓

3. Type the starting register value in the **Data Addr** field.

   Note
   The data type is set automatically by the Modbus program, based on the specified data address.

4. In the **Quantity** field, type the number of registers to be retrieved.

The Modbus program will accept a quantity value of **1** to **2016**. The requested number of registers cannot exceed the amount contained by the selected message block but you *can* retrieve a partial block. You cannot cross a message block boundary.

Also, in **Standard Modbus** mode each register is 16 bits. Therefore, integers (SHORT) consist of 1 register while floats (FLOAT) and long integers (LONG) consist of 2 registers.

Note

Boolean registers are not user-defined (for either SIM_2251 or User_Modbus) and primarily contain alarm flags useful for debugging. To view the contents of Boolean registers, select the **1 (Read Coil)** function code.

Numeric registers for User_Modbus can be user-defined. To view the contents of numeric registers, select the **3 (Read Regs)** function code.

---

5. Type the desired repeat count, which is the number of times the Modbus program should read or set the specified registers before ceasing transmission, in the **Repeat** field. The Modbus program will accept a repeat value of **1** to **9999**. A value of **–1** produces an infinite polling loop that can be terminated by clicking **Stop**.

6. Depending on your intent, select **Use template to decode registers** or **Use template to decode logs**.
   The **Record No.** field becomes active if **Use template to decode logs** is selected.

7. Enter the desired record number in the **Record No** field.

To verify which record number should be entered, consult the Modbus specifications for your device.

The following table describes the relationship between templates and record numbers:

Data Type Setting	Other Setting(s)	Result
Use template to decode registers	• Enter **Data Addr** value. • Enter **Quantity** value.	Read **Quantity** fields (i.e., the number of fields specified by the **Quantity** setting) from the specified address of the register (**Data Addr**).
Use template to decode logs	Enter **Record No.** value.	Read all fields associated with the **Record No.**
	• Enter **Data Addr** value. • Enter **0** for the **Record No.** value.	Read all fields in all records for the specified log register **(Data Addr)**.

8. Click **Edit Template**.
   The *Template File* window displays with a new template.

9. To open an existing template file, click **Open**.
   The *Select Template Configuration File* dialog displays.

10. Locate and select the template file, and then click **Open**.

Template files are saved with the .cfg extension.

11. To edit the template, select a data type for each desired offset.

12. To change all offsets to the same data type, change the first offset to the desired data type, and then click **Auto Reset**.
    The data type for the remainder of the offsets switch to the data type of the first offset.

13. To save the displayed file to disk, click **Save As...**.
    The *Select Template Configuration File* dialog appears. Type in a filename and click **Save**.

14. Click **OK** to apply your selections and return to the main window.

8.6.6 Set the log parameters

The *Log Data* window allows you to log the polled data to a specified file.

Note
The log data function is not necessary to transmit Modbus data. To disable this function, clear the **Enable Logging 'Data' Registers and Values** checkbox in the *Log Data* window.

To set the log parameters for the Modbus program, do the following:

Procedure

1. Click **Log Data**.
   The *Log Data* window displays.

2. Select the **Enable Logging 'Data' Registers and Values** checkbox to enable data logging and to activate the **Log Data Parameters** section.

3. Select a **Logging Mode** from the dropdown list.

   You have the following options:

   • **Continuous** mode records the polled data continuously until the connection is terminated or data logging is disabled by clearing the **Enable Logging 'Data' Registers and Values** check box.

   • **Sampling** mode records the polled data based on the time interval that you set in the **Time Interval between consecutive logs** text box. Time intervals can be set in seconds, minutes, or hours.

4. Select a type of logging.

   You have the following options:

   • **Append** adds this log to the file specified, preserving previously logged data.

   • **Reset** deletes the previously-logged data and saves only this new log.

5. Click **Save As...**.
   The *Save As* window displays. The file can be saved as a tab-delimited text file or a Microsoft Excel file. Type in a filename and click **Save**.

8.6.7 Save Modbus data

To save the data table to a separate file, do the following:

Procedure

1. Click **Save Data**.
   The *Save 'Data' Displayed As* dialog appears. The file can be saved as a tab-delimited text file, an HTML file, or a Microsoft Excel file.

2. Type in a filename and click **Save**.

8.6.8　　Print Modbus® data

Procedure

1. Click **Print Data**.
   The standard *Print* dialog displays.
2. Click **Print**.

Rosemount MON2020 prints the report to your previously configured printer.

Related information

Configure printer

8.6.9　　Assign scale ranges to User_Modbus registers

By assigning scale ranges, floating point data can be converted to integer values. This is an optional task that applies to applications using the User_Modbus protocol.

Related information

View or edit scales

8.6.10　　View communication errors

The Modbus® program's **Error Log** is maintained in a circular buffer that holds up to 512 entries.

The Modbus program tracks the errors for a given session but does not store them. When you exit the Modbus program, all errors are cleared.

To view any communication errors that occurred during the data transfer:

Procedure

1. Click **Error...**.
   The *Error* window appears.

   Note
   Double-click a *Description* cell to scroll through the displayed text.

2. To view all errors that have occurred in this session, click **Update**.
3. To delete all entries to date, click **Clear**.

8.6.11　　View Modbus® trace logs

Procedure

1. Go to **Tools → View Diagnostic Data...**.

   Note
   You need to be disconnected from the gas chromatograph (GC) to perform this function. If you are still connected to the GC, you are asked if you want to disconnect and open the configuration file. Click **Yes**.

   The *Open* dialog displays. The default location is the same location as the current *Open configuration* file.

2. Locate and select the latest configuration and diagnostic data file that you want to open and click **Open**.
   A *Diagnostic Data* dialog opens.
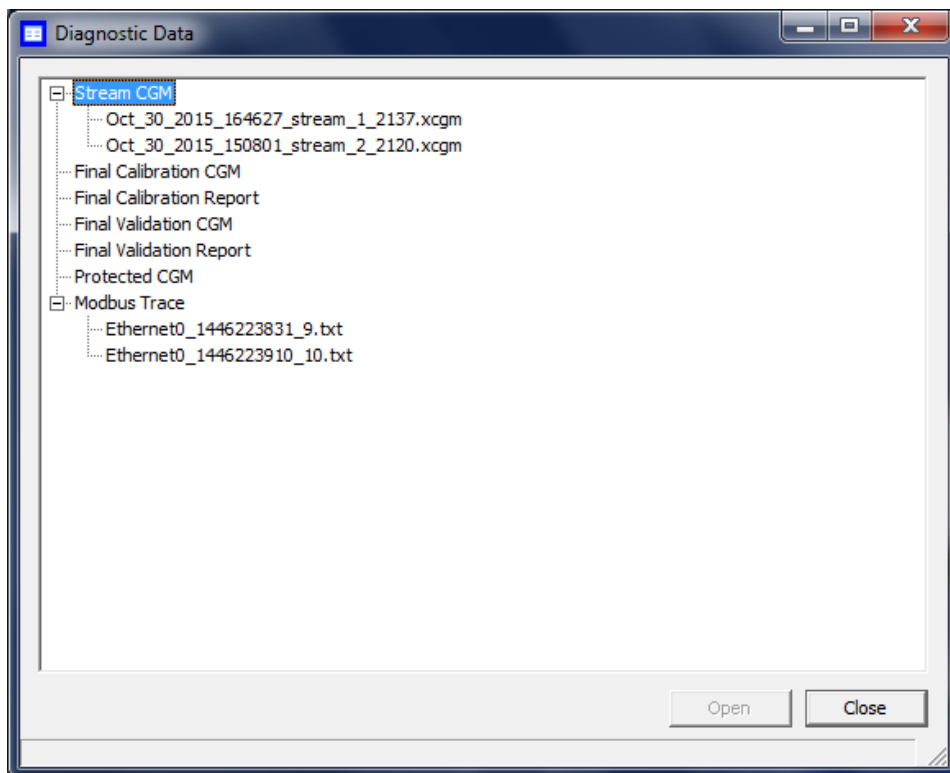
3. Double-click the file of interest under *Modbus Trace*.

   The file contains the raw protocol data.

   RX is what the GC receives, and *TX* is what the GC transmits.

Figure 8-2: Modbus Trace Text File
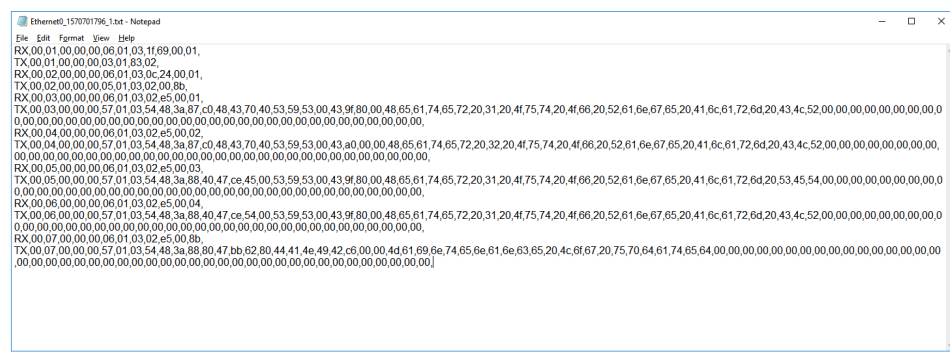
Related information

[Save diagnostic data](#)

8.7 View diagnostics

Procedure

To view the **Diagnostics** window, go to **Tools** → **Diagnostics...**.

Rosemount MON2020 opens a **_Diagnostics_** window that displays diagnostic information about the following software boards' revision and voltage levels:

- Central processing unit (CPU) Board

- Preamp board

- Heater/Solenoid board

- Base in/out (IO) board

- Electronic pressure controls (EPCs)

8.8 Complete Module Validation assistant

When you install a new analytical module in the Rosemount 370XA or 470XA gas chromatograph (GC) and turn on the power, Rosemount MON2020 automatically recognizes that a new module has been installed and starts the **_Module Validation_** assistant. You may also initiate module validation at any time by going to **Tools→ Module Validation** from either the Rosemount MON2020 interface or the GC's local operator interface (LOI).

This is only available for Rosemount 370XA and 470XA GCs.

The **_Module Validation_** wizard takes you through the following steps:

Procedure

1. Enter the calibration concentration.

This information is in the **_Calibration Gas Composition_** ticket.
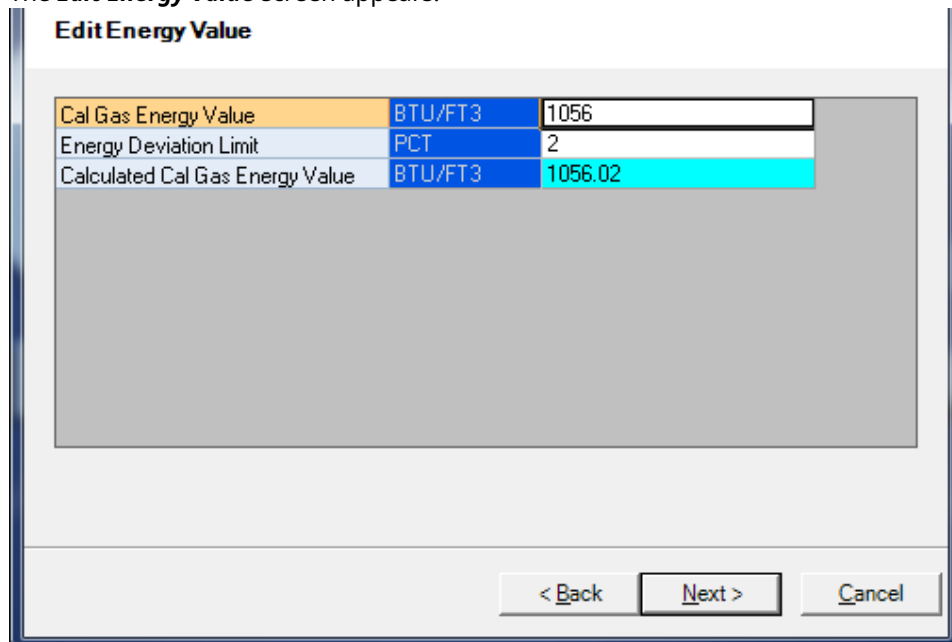
2. Enter the uncertainty percentage for each component in the calibration gas.

3. Click **Next**.
The **Calibration Certificate Details** screen appears.

4. Enter the Calibration Certificate number and expiration date and click **OK**.
The **Edit Energy Value** screen appears.

5. Warm up the oven, run the carrier gas through the analytical paths, and cycle the analytical valves to rapidly purge the system.

6. Analyze the calibration gas as an unknown, storing the response factors and retention factors in the new analytical module and ensuring that the measured composition is within the uncertainty percentage specified for the calibration gas (entered in Step 2).

7. Calibrate the analyzer with the calibration gas to generate updated response factors and retention times.

8. Click **Next**.
   The **Check Pressure** screen appears.
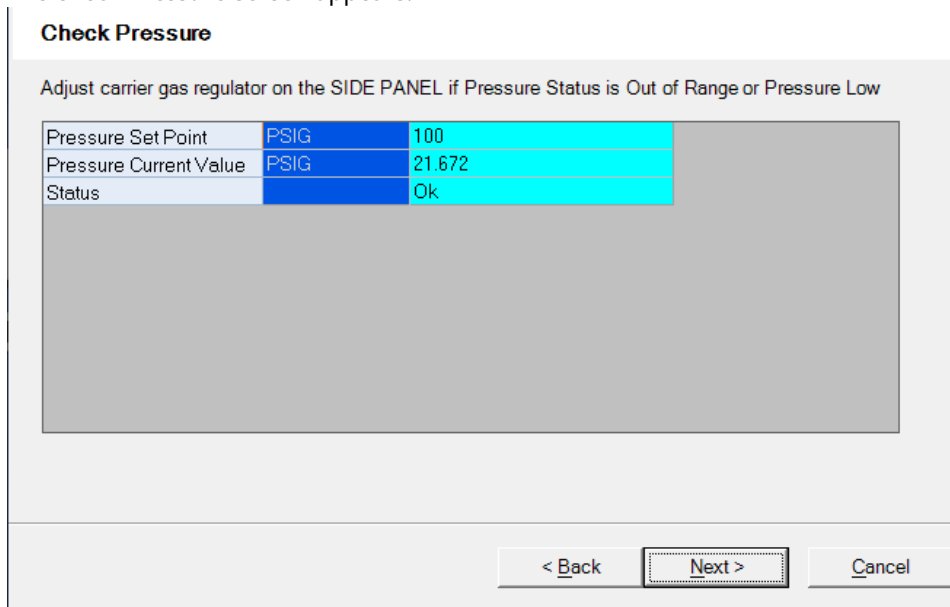
NOTICE

This screen is only appears if you are using a Rosemount 470XA GC.

9. If the Status on this screen is *Out of Range* or *Pressure Low*, adjust the carrier gas regulator on the side panel of the GC until the Status is **Ok**.

10. Click **Next** to start the auto sequence process.
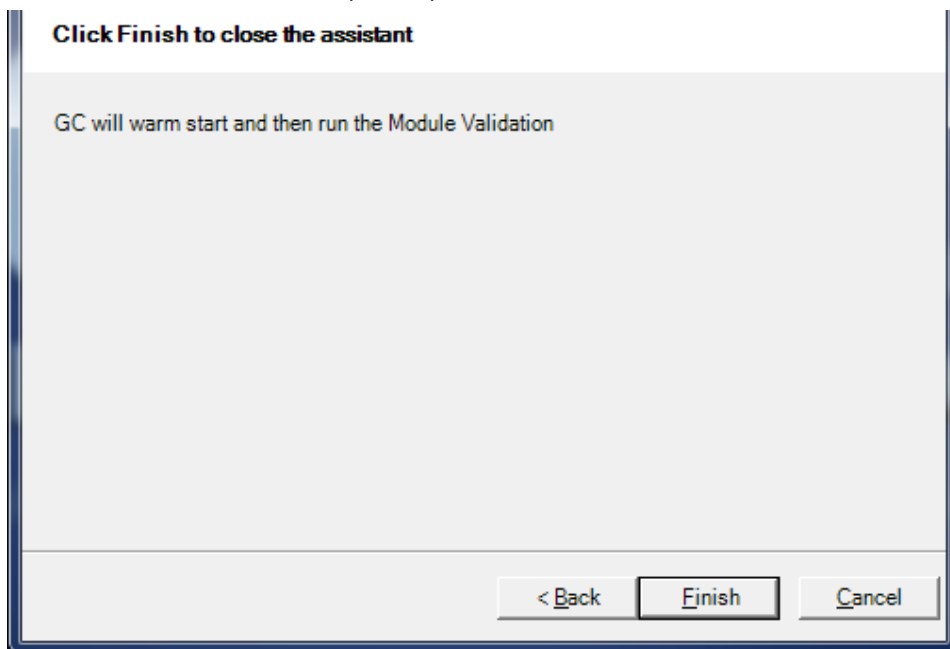
At any time during this process, you can monitor the status of the Change Module process by viewing the **Module Validation** report.

If any step in the module validation process fails, the analyzer generates a **Module Validation Failure** alarm and goes idle.

Related information

Initiate an auto sequence analysis run

Report types

8.8.1   Force a module update

<div style="background:#4a7ebb;color:white;padding:4px">NOTICE</div>

If you force a module update in the field, the factory settings programmed into the analytical module will be overwritten. Only force a module update if Emerson factory or service personnel tell you to do so. This command is used in the factory to write module-specific characteristics such as calibration factors and oven settings into the analytical module.

Procedure

Go to **Tools → Force Module Update....**

The software copies the response factors, retention times, oven temperature, and pressure settings from the gas chromatograph's (GC's) central processing unit (CPU) board into the intelligent module board inside the analytical module. The factory configuration stored in the analytical module is overwritten with the new factors.

The module serial number from the analytical module is cached in the analyzer's CPU board. This ensures that the analyzer will no longer see the analytical module as a new module and thus will not perform the module validation process when the analyzer is power cycled.

Related information

Complete Module Validation assistant

8.8.2   Module validation settings

Emerson sets module validation settings at the factory based on the analytical application and configuration of the gas chromatograph (GC).

<div style="background:#4a7ebb;color:white;padding:4px">NOTICE</div>

This feature is only available for the Rosemount 370XA and 470XA GCs.

Only make adjustments to the values in these fields at the direction of your Emerson Customer Care representative.

The module settings include:

- Minimum time to purge analytical paths (in minutes)

- Maximum number of runs of module validation

8.8.3   Edit module validation allowable deviations

Emerson sets module validation allowable deviations at the factory based on the analytical application and configuration of the gas chromatograph (GC). Only make adjustments to the values in this field at the direction of Emerson Customer Care personnel.

1. Right click the component's **Allowed Deviation** and enter a value.
   The allowable deviations for the components are measured as a percentage

2. Click **Save** to apply the changes.

3. Click **OK** to exit and return to the *Home* screen.

4. Click **Cancel** to abort the changes and return to the *Home* screen.

8.9   Adjust auto valve timing (AVT) timed events

Emerson sets the auto valve timing values at the factory based on the analytical application and configuration of the gas chromatograph (GC).

Only adjust the values in the *Timed Events* screen at the direction of Emerson Customer Care personnel.

The screen lists the component data and fields for Dependent Timed Events, Ideal RF Ratio, Reference Component with a drop-down selection menu, and Ideal RF Limit percent.

8.10   Select auto valve timing (AVT) values

Emerson sets the AVT values at the factory based on the analytical application and configuration of the gas chromatograph (GC). Only make adjustments to the values in this field at the direction of Emerson support personnel.

AVT valve selections are based on:

- Valve type
  — 1: Sample

  — 4: Back flush

  — 3: Dual column

- Timing to be adjusted
  — None

  — On

  — Off

- Early valve cut component
  — Unused

  — Component data list

- Late valve cut component: Read only

- Peak area change limit: Percent

1. Click **Save** to save the edits.

2. Click **OK** to return to the *Home* screen without making changes to the GC.

3. Click **Cancel** to discard the changes and to return to the *Home* screen.

8.11 Configure auto valve timing (AVT) settings

Emerson sets the auto valve timing settings at the factory based on the analytical application and configuration of the gas chromatograph (GC). Only make adjustments to the values in this field at the direction of Emerson support personnel.

1. Go to **Tools** → **AVT Settings....**
   Options are:

Valve Timing Adjustment	Unit of measurement (UOM) is seconds.
Maximum Adjustment Limit	UOM is seconds.
EVC # of Area Repeats	Number of iterations of valve timing adjustments where the area of the peak does not change before the valve timing is concerned.
Use Repeat # for Valve Timing	Apply the number of EVC area repeats.
Backup Time	UOM is seconds.

2. Click **Save** to save the edits.

3. Click **OK** to return to the *Home* screen without making changes to the GC.

4. Click **Cancel** to discard the changes and to return to the *Home* screen.

8.12 Adjust the sensitivity of the local operator interface (LOI) keys

Note
This feature is not available for Rosemount 370XA or 470XA gas chromatographs (GCs).

To adjust the sensitivity of the LOI keys, do the following:

Procedure

1. Select **LOI Key Sensitivity** from the **Tools** menu.
   The *LOI Key Sensitivity* window displays.

2. Adjust the sensitivity for a key by sliding the bar up or down.

   Raising the bar *increases* the sensitivity or the key; lowering the bar *decreases* the sensitivity.

   Note
   To manipulate all of the sliders together, select the **Apply same key sensitivity to all keys** check box.

   Note
   For the Rosemount 1500XA, you cannot set the LOI IR key sensitivity higher than 20.

   Note
   Click **Restore Factory Defaults** to return the sliders to their original settings.

3. Click **OK** to save the changes and close the window.

   Note
   To save the changes without closing the window, click **Save**.

8.13   Set the input/output (I/O) card type

Note
This feature is not available for Rosemount 370XA or 470XA gas chromatographs (GCs).

To set the card type for an optional communications (COM) card:

Procedure

1. Go to **Tools** → **I/O Cards...**.
    The *I/O Cards* window displays.

2. Select the card type for the I/O card from the drop-down list.
    Options are:

    *   None (Default)

    *   Analog Output Module

    *   Communication Module RS-232

    *   Communication Module RS-422/RS-485

    *   Discrete Output Module

    *   Discrete Input Module

    *   Analog Input Module

3. Click **OK** to save the changes and close the window.

    Note
    To save the changes without closing the window, click **Save**.

4. Restart the GC after saving the changes.

5. Click **Cancel** to discard the changes and return to the *Home* screen.

8.14   Save diagnostic data

Rosemount MON2020 provides methods to save and send configuration files and diagnostic data to a user-defined email address. This can be helpful when seeking guidance with troubleshooting. Diagnostic data consists of Stream Chromatogram (CGM), Final Calibration CGM, Final Calibration Report, Final Validation CGM, Final Validation Report, Protected CGM, and Modbus® Trace.

Stream CGM	The last stream chromatogram for each stream. The CGMs are listed in ascending order of stream numbers.
Final Calibration CGM	The final calibration chromatogram of the last calibration for the available calibration streams. The CGMs are listed in ascending order of calibration stream numbers.
Final Calibration Report	The report(s) are listed in ascending order of calibration stream numbers.
Final Validation CGM	The final validation chromatogram of the last final validation for the available validation streams. The CGMs are listed in ascending order of validation stream numbers.
Final Validation Report	The report(s) are listed in ascending order of validation stream numbers.

Protected CGM	Preserved chromatogram(s).
Modbus Trace	Modbus communication log reports. The ports are listed in ascending order of port numbers. Each port can have a maximum of two files.
Debug Information	Debug information used for diagnostic purposes.
Database Files	Archived database files

To create the diagnostic data file:

Procedure

1. Go to **Tools** → **Save Diagnostic Data...**.

   Note
   You need to be connected to the gas chromatograph (GC) to perform this operation.

   The **Save** dialog displays. The default file name is similar to current **Save Configuration** with **and Diagnostic Data** added. The default save location is the same location as the current **Save Configuration**. You can change location and/or file name as with current **Save Configuration**.

2. Click **Save**.
   After the information is saved to the personal computer (PC), a window pops up asking if you want to *Email config file and diagnostic data?*

3. Click **Yes**.
   Your email client launches with the configuration file and diagnostic data attached.

Related information

[Report types](#)
[Protect chromatograms](#)
[Save the current configuration](#)

8.15 View diagnostic data

Procedure

1. Go to **Tools** → **View Diagnostic Data...**.

   Note
   You need to be disconnected from the gas chromatograph (GC) to view diagnostic data. If you still connected to the GC, the software asks if you want to disconnect and open the configuration file. Click **Yes**.

   The **Open** dialog displays. The default location is the same location as the current **Open** configuration.

2. Locate and select the configuration and diagnostic data file that you want to open and click **Open**.
   A **Diagnostic Data** dialog opens.
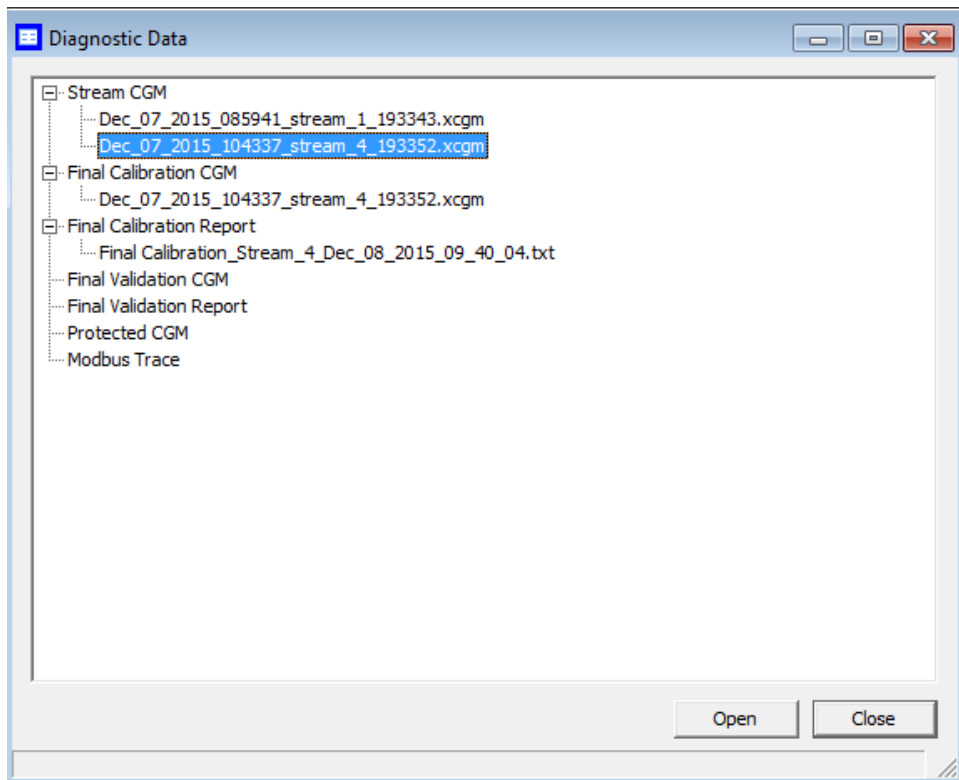
3. Select the data of interest and click **Open**.

4. Click **Save**.
   After the information is saved to the PC, a dialog diplays asking if you want to *Email config file and diagnostic data?*

5. Click **Yes**.
   Your email client launches with the configuration file and diagnostic data attached.
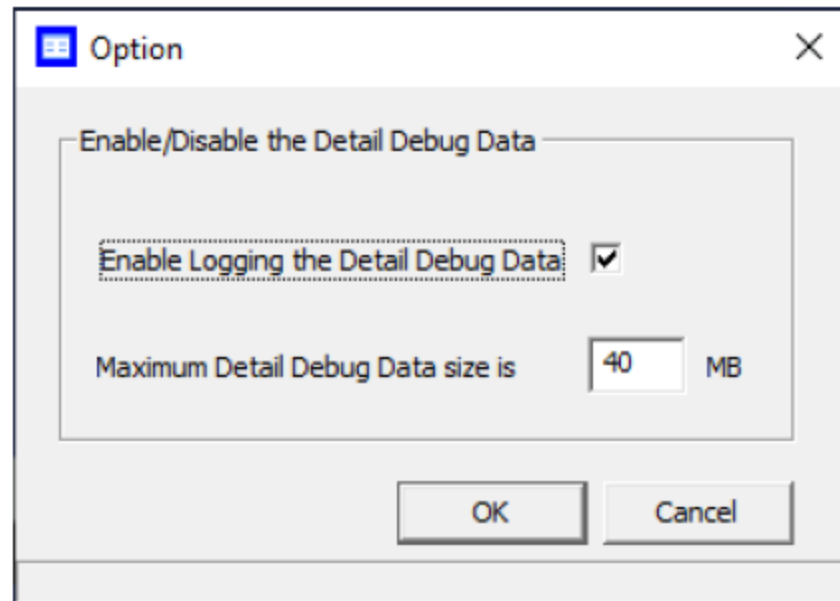
8.16   Enable debug data

There is an option within the software to collect debug data (core files). If problems arise, you can send these files to a software engineer to troubleshoot.

To collect debug data:

Procedure

1. Go to **Tools → Option**.

Figure 8-3: Option screen

2. Select the check box next to **Enable Logging the Detail Debug Data**.
3. Enter a number in the **Maximum Debug Data** size field.
   The maximum number is 50 MB.
4. Click **OK**.

A   Custom calculations

To create or edit a customized calculation using gas chromatograph (GC) analysis data:

Procedure

1. Go to **Application** → **Calculations** → **User Defined...**.
   The ***User Defined Calculations*** window appears, containing a list of all the user-defined calculations that are available to the GC.

2. Double-click the Label cell and enter a name for the calculation you are about to create.

   Note
   If you want to enter a short description for the new calculation, double-click the Comment cell and enter it there.

3. Click **Edit**.

    The **Edit User-Defined Calculation** window displays.

Figure A-1: Edit User-Defined Calculation Window
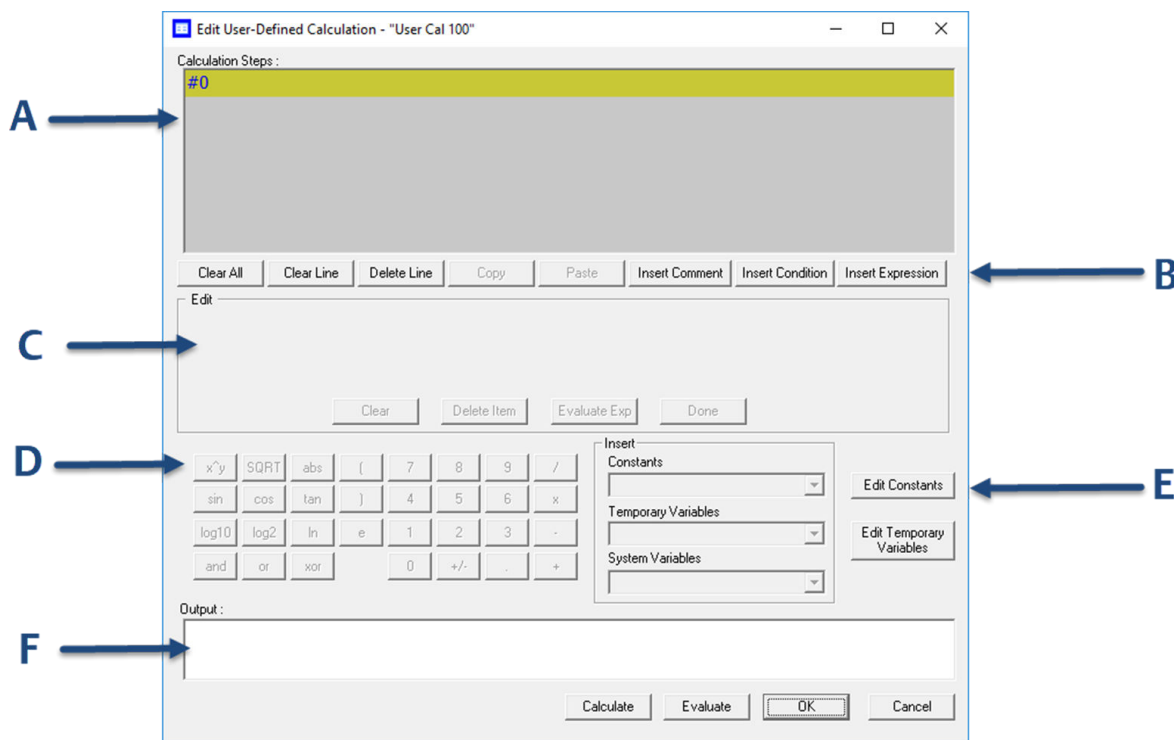
A. *Calculation Steps viewer*
B. *Command buttons*
C. *Expression editor*
D. *Calculator*
E. *Edit Constants and Variables creator*
F. *Output display*

In Rosemount MON2020, building a calculation is similar to building a simple program. You have constants and two types of variables available, as well as two calculation-building commands. You can also add comments that will be ignored by the application but that can help you explain the logic and structure of the calculation you are designing.

The following is a description of the design elements of the **Edit User-defined Calculation** window:

Calculation Steps viewer (A)   This element displays the line-by-line construction of the calculation as it is being built. The following commands allow you to interact with this area:

- Click **Clear All** to clear the content of the **Calculation Steps** viewer.

- Click **Clear Line** to clear the content of the selected line.

> **Note**
>
> If the selected line is an *If-Then* statement, then the entire condition is cleared. If the cursor is on an *Else* or *Endif* condition, a message box is displayed to confirm that the whole *If-Then* block is deleted.

- Click **Delete Line** to delete the selected line.

> **Note**
>
> If the selected line is the beginning of a conditional statement, then the entire *If-Then* block is deleted along with the expressions that constitute the *If-Then* construct. If the selected line is part of the conditional *If-Then* construct (that is, the line only has *Else* or *Endif* in it), a message box is displayed to confirm that the whole *If-Then* block is deleted.

- Click **Copy** to copy the selected line to the clipboard. You cannot copy keywords such as *Else* or *Endif*.

- Click **Paste** to paste the content of the clipboard into a selected line. If the line already has a calculation in it, it is cleared before the content of the clipboard is pasted into it.

Command buttons (B)

This section displays three buttons you can use to insert commands.

- **Insert Comment** - Adds a comment to the calculation. Each comment is preceded by *//*.

- **Insert Condition** - Adds an *If-Then* statement to the calculation.

- **Insert Expression** - Adds a mathematical expression to the calculation.

Expression editor (C)

This section is the work area where the comment, condition or expression is built before being added to the ***Calculation Steps*** viewer. There are four modes of the ***Expression*** editor, depending upon what action is being performed: No Action mode, Insert Comment mode, Insert Condition mode, and Insert Expression mode.

The following commands allow you to interact with the ***Expression*** editor:

- Click **Clear** to clear the content of the entire line. The line itself is not deleted.

- Click **Delete Item** to delete the currently active token. Each mathematical function, numeric data, and mathematical operation is treated as a token. The token to the right of the current cursor location is treated as the currently active token.

- Click **Evaluate Exp** to check the validity of the expression. If any errors are detected in the syntax, then an error is reported in the ***Output*** window.

> **Note**
>
> This button is only active when the line being edited is an expression.

- Click **Done** to evaluate the expression and copy it to the ***Calculations Steps*** viewer. If there are any errors in the expression, they are reported in the ***Output*** window.

Calculator (D)

This section contains calculator functions that can be used to build a mathematical expression. This section can be divided into two parts:

Figure A-2: Calculator Functions
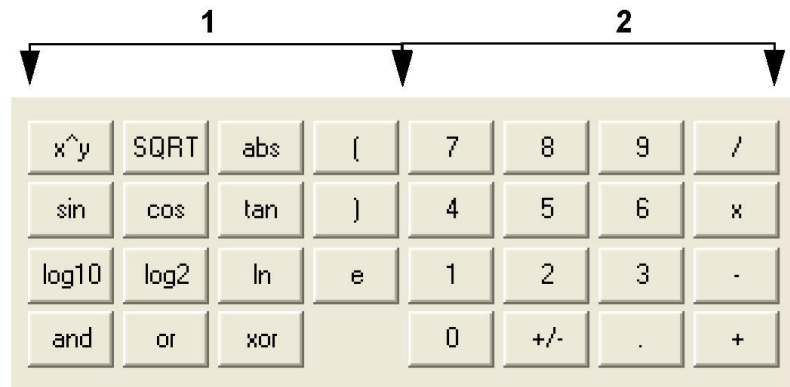
- Section 1 - This section contains the following keys:

x^y	x to the power of y
SQRT	Square root
abs	Absolute value
sin	Sine
cos	Cosine
tan	Tangent
log10	Logarithm to the base 10
log2	Logarithm to the base 2
ln	Logarithm to the base e
and	Logical AND
or	Logical OR
xor	Logical XOR
(	Open bracket
)	Close bracket

- Section 2 - This section contains the traditional calculator keys and can be used with your keyboard's number pad, if it has one.

Note

Make sure to engage your keyboard's **Numlock** before using the number pad.

Constants and Variables Creator (E)	This section contains drop-down lists and buttons that allow you to create and select constants and variables that can be added to your mathematical expressions.

- Constants - Allows you to select constants from a drop-down list.

- Temporary Variables - Allows you to select temporary, user-created variables from a drop-down list.

- System Variables - Allows you to select system variables.

- Edit Temporary Variables - Allows you to create variables.

- Edit Constants - Allows you to create system-wide constants that can be used in user-defined calculations.

Output display (F)	Displays status information.

4. Build your calculation.

5. To see the result of the calculation, click **Calculate**.
   The results display in the *Output* window.

6. To validate the calculation for errors, click **Evaluate**.
   The results of the validation check display in the *Output* window.

7. To save the calculation and close the *Edit User-Defined Calculation* window, click **OK**.
   You return to the *Edit User-Defined Calculation* window.

8. To save the changes on the *Edit User-defined Calculation* window and close it, click **OK**.

Related information

Insert a comment
Insert a conditional statement
Insert an expression
Create a constant
Create a temporary variable
Insert a system variable

A.1   Insert a comment

Procedure

1. Click the *Insert* drop-down list and select Insert Comment.
   A new line is added to the *Calculation Steps* viewer, and the *Expression Editor* switches to Edit Comment mode.

2. Enter the comment into the *Edit Comment* text box and then click **Done**.
   The comment is added to the *Calculation Steps* viewer.

A.2 Insert a conditional statement

Use the **Expression Editor** in Edit Condition mode to build a conditional statement:
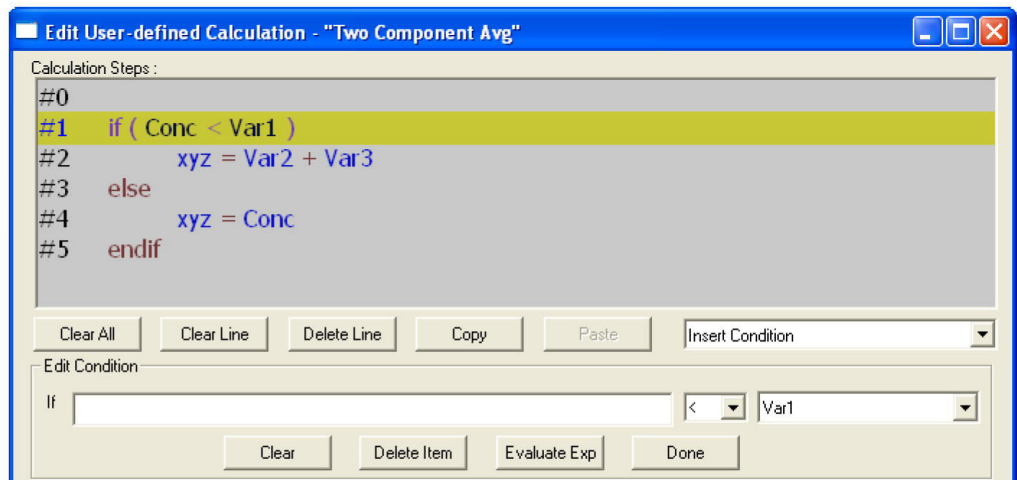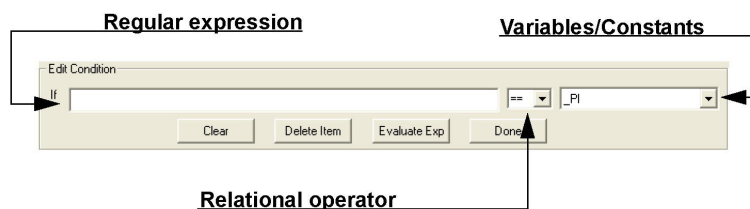
Figure A-3: Example of a conditional statement

Figure A-4: Expression Editor in Edit Condition mode

Procedure

1. Click **Insert Condition**.
   A new line is added to the **Calculation Steps** viewer, and the **Expression Editor** switches to Edit Condition mode.

2. Add a condition.

   Note
   You can use constants, temporary variables, system variables, and the calculator functions to build the condition.
   To insert a constant or temporary variable to the left of the condition, select it from the respective drop-down list.

   To select a constant or temporary variable on the right side of the condition, click the arrow on the right side of the condition, click **+** to expand the list, and select from the respective list.
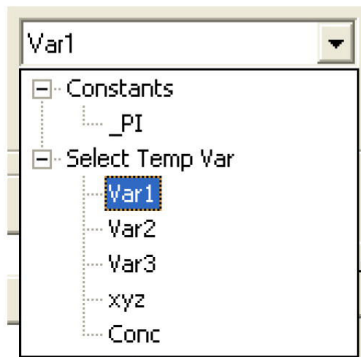
Figure A-5: Edit Condition area
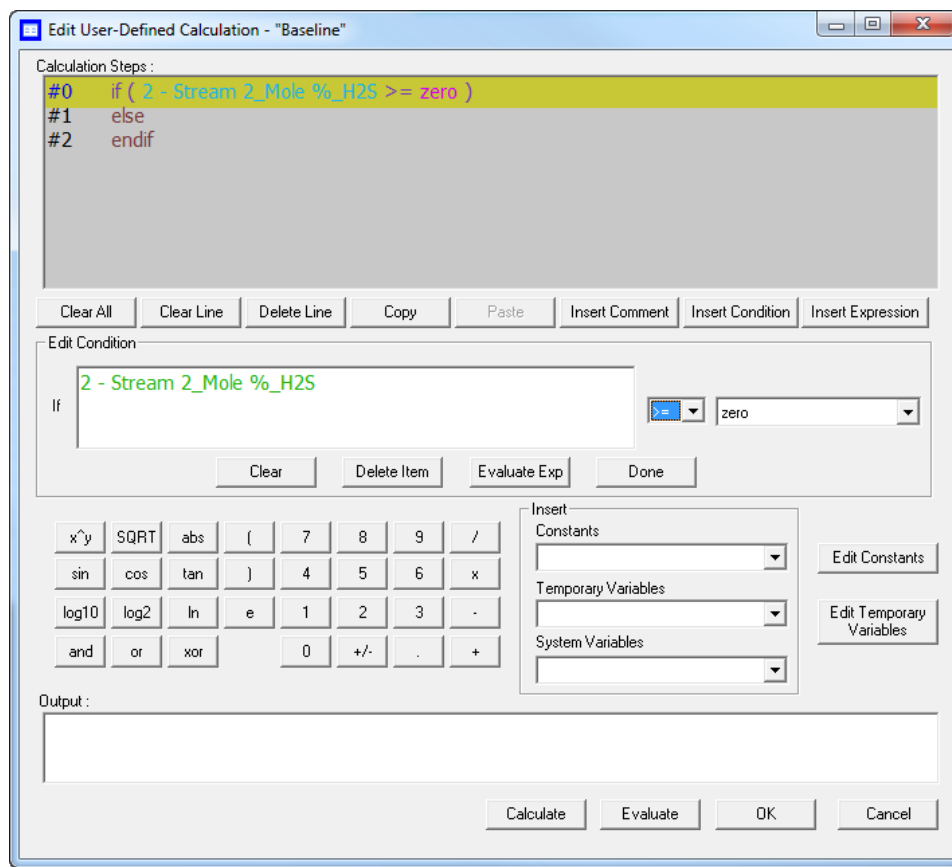
3. Select a relational operator from the drop-down list.
   You have the following options:

<	Less than
<=	Less than or equal
>	Greater than
>=	Greater than or equal
==	Equal
!=	Not equal

4. To add a variable or constant to the expression, click the **Variable/Constant** drop-down list and select the appropriate item.

Figure A-6: Variable/Constant drop-down list

5. Click **Done**.
   Rosemount MON2020 validates the statement, and if there are no errors, it adds it to the **Calculation Steps** viewer.

Postrequisites

To complete the conditional statement, use the **Expression Editor** in Edit Expression mode to add the necessary mathematical expressions.

A.3   Insert an expression

A mathematical expression has the following structure:

Variable = Regular expression

Figure A-7: Edit Expression area

Procedure

1. Go to **Insert → Insert Expression**.
   A new line is added to the *Calculation Steps* viewer, and the *Expression Editor* switches to Edit Expression mode.

2. Select a variable from the *Variable* drop-down list.

   You can select either a temporary variable, or you can set the expression you are building as the final result of your new user-defined calculation. For instance, if the user-defined calculation you are building is called *User Calc 1*, then you can select *User Calc 1* from the *Final Result* tree view.

3. Add a regular expression.

   To select a temporary variable on the left side of the expression, click **+** to expand the list and select from the respective list. To insert a constant or temporary variable to the right of the expression, select it from the respective drop-down list. You can use constants, temporary variables, system variables, and the calculator functions to build the expression.

4. Click **Done**.
   Rosemount MON2020 validates the statement, and if there are no errors, it adds it to the *Calculation Steps* viewer.

A.4   Create a constant

Procedure

1. From the *Edit User-defined Calculation* dialog, click **Edit Constants**.
   The *Edit Constants* dialog displays, showing all the constants that have been created so far for the gas chromatograph (GC).

2. Click **Insert before**.
   A new row is added to the *USER_CALC_CONSTANTS* table.

   Note
   To delete a constant, select it in the *USER_CALC_CONSTANTS* table and click **Delete**.

3. Double-click the Label cell and enter a name for the constant.

   Note
   To edit any cell, double-click it.

4. Double-click the Value cell and enter a value for the constant.

5. Use the Comment cell to store information that is relevant for the constant.

6. Click **OK** to save the changes and close the window. To save the changes without closing the window, click **Save**.

A.5   Create a temporary variable

Procedure

1. From the *Edit User-defined Calculation* window, click **Edit Temporary Variables**.
   The *Edit Temporary Variables* window displays, showing all the temporary variables that have been created so far for the user-defined calculation.

2. Click **Insert**.
   A new row is added to the table.

   Note
   To delete a variable from this window, select it in the table and click **Delete**.

3. Double-click the Name cell and enter a name for the variable.

4. Use the Comment cell to store information that is relevant for the variable.

5. Click **OK** to save the changes and close the window. To save the changes without closing the window, click **Save**.
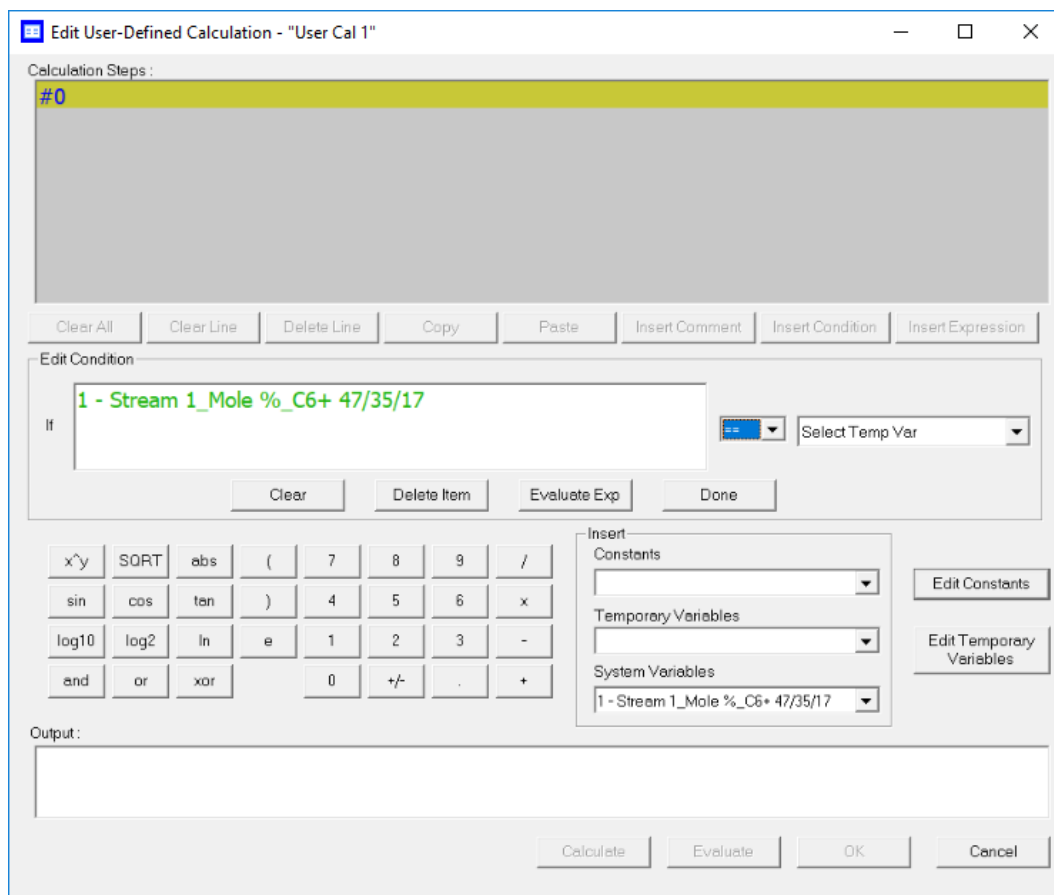
A.6   Insert a system variable

To insert a system variable into the *Expression* or *Condition* editor:

Procedure

From the **Application** → **Calculations** → **User-defined...** → **Edit (F2)** menu, click the *System Variables* drop-down list.

The selected system variable displays in the *System Variables* drop-down list and in the *Expression* or *Condition* editor.

Figure A-8: Expression Editor

Related information

Use the context-sensitive variable selector

B Pre-defined Modbus® map files

For the Modbus map files used with the gas chromatograph, see the Pre-Defined Modbus Map Files Reference Manual.

For more information: **Emerson.com/global**

ROSEMOUNT™

EMERSON™