Operations Manual
2-3-9000-762, Rev G
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Rosemount™ 1500XA Gas Chromatograph

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Contents

Appendices and reference

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 should be protected by adequate username/password.
- With restricted admin privileges on PC - operating system (OS) configuration, install software, etc.
- Restrict 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 should be 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.
- All default users should be removed after XA GC commissioning or password upgrade to comply with the password complexity guidelines.
- Password policy level should be set 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

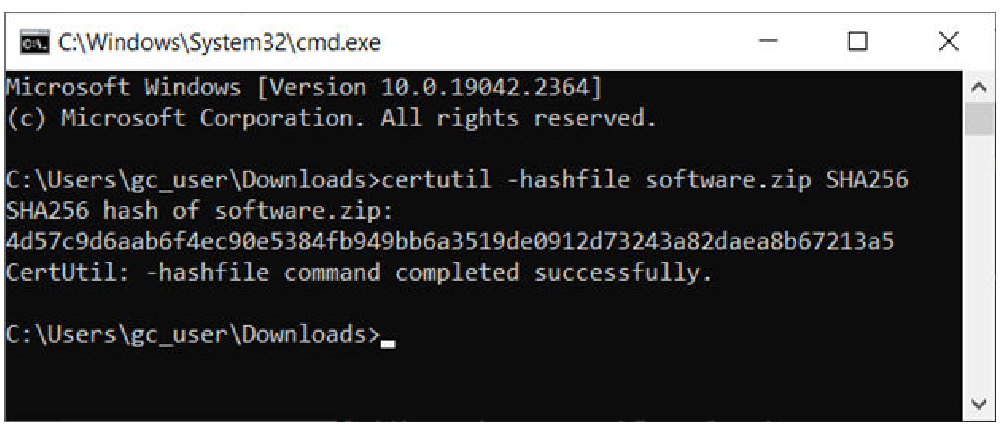
- The admin password length should be at least 10 alphanumeric characters.
- The admin password should include at least one number, mix of upper/lower case characters, and at least one special character (!@#$%^&*_-+=:?)
- The default admin password should be changed after GC commissioning by using the 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). The user can use a program of choice 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:



1 Rosemount™ 1500XA Gas Chromatograph (GC) safety

Your installation must comply with all certifications and safety instructions.

Rosemount™ 1500XA Gas Chromatograph System

Rosemount 1500XA Gas Chromatographs are designed to meet the specifications for Class 1, Division 2, Groups B, C, and D area classification using a Z-purge system. An optional Nationally Recognized Testing Laboratory (NRTL) 3rd party certification is available when ordering. This option ensures that an NRTL organization has reviewed, tested, and certified the Rosemount 1500XA Gas Chromatograph to the applicable product safety test standards.

NOTICE

The Rosemount 1500XA is field or type certified product by an National Recognized Testing Lab for both US and Canadian standards. Internal components or related assemblies may contain their own individual product certifications.

WARNING!

HAZARDOUS AREAS
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Do not restore power after the enclosure has been opened until the enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

WARNING!

HAZARDOUS AREAS
The safety of this equipment relies on the provision of proper purging and pressurizing when used in hazardous locations. It must not be put into use without "special permission" from the inspection authority having jurisdiction.

WARNING!

HOT INTERNAL PARTS

WARNING!

HIGH TEMPERATURE INTERNAL PARTS
Do not open this enclosure unless the area atmosphere is known to be below the ignitable concentration of combustible materials or unless all equipment within has been de-energized for 5 minutes.

WARNING!

AIR PURGE ADJUST
This valve must remain open unless area is non-hazardous.

WARNING!

SUPPLY MAINS
The unit is intended to be connected to supply mains by qualified personnel in accordance with national (e.g., NFPA 70, CEC 22.1, etc) and local codes.

WARNING!

MAINS POWER
A suitable "approved" switch and fuse or a circuit breaker shall be provided to facilitate the disconnection of the mains power.

WARNING!

All safety related precautions and warnings must be followed before dispensing and disposing of gas.

WARNING!

HAZARDOUS AREAS
Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

WARNING!

Substitution of components may impair suitability for Class I, Division 1 and 2.

WARNING!

SAFE ATMOSPHERE
Service connections can only be used when the atmosphere is known to be safe.

WARNING!

ELECTRIC SHOCK
Keep cover tight while circuits are alive. Do not open when energized. Conduits runs must have a sealing fitting adjacent to enclosure.

WARNING!

BURN HAZARD
Many parts of the analyzer may be heated to 120 °C (248 °F).

To prevent burns, do not touch any of the hot parts. Many parts of an analyzer are always hot unless it has been switched off and allowed to cool down.

- **Before fitting, removing, or performing any maintenance on the analyzer, make sure that it has been switched off and allowed to cool for at least two hours.**
- **When handling the analyzer, always use suitable protective gloves.**
- **If burned, seek medical treatment immediately.**

Schedule of limitations

1. The 1500XA and 4500XA backplanes are certified as components to be installed in the 1500XA or 4500XA Gas Chromatograph manufactured by Rosemount, Inc.
2. The 1500XA or 4500XA backplanes do not show a maximum surface temperature exceeding +185 °F (+85 °C) considering a maximum temperature of +131 °F (+55 °C) with 5K safety factor applied.
3. The 1500XA and 4500XA intrinsically safe (IS) backplanes are located in a Z or X purged electronics enclosure of the 1500XA and 4500XA Gas Chromatographs that provide IP54 ingress protection per IEC 60079-0.
4. Installation shall be per control drawing 9A00052G01 for 1500XA backplane and 9R00026 for 4500XA backplane.
5. A minimum clearance of 0.1 in. (3.0 mm) between live parts and earthed metal shall be maintained.
6. If other electrical circuits are fitted into the enclosure, then they shall be suitably approved for the hazardous area of installation and all live parts shall be protected to a minimum of IP30 when the enclosure is opened.
7. The 4500XA backplane shall only be used in an area of at least pollution degree 2, as defined in IEC 60664-1.
8. The 4500XA backplane shall be installed in a suitable enclosure that provides a minimum ingress protection of IP54 in accordance with IEC 60079-0, unless it is afforded an equivalent degree of protection by location.
9. Transient protection shall be provided that is set at a level not exceeding 140 percent of the peak rated voltage value 24 V of the supply terminals to the 4500XA backplane.
10. The unit shall be powered off before any maintenance is performed on it.
11. The 4500XA shall only be powered by an IEC/EN 60950-1 power source with an output not exceeding Um 24 V.

This manual provides the following information:

- *Chapter 1*: certification and safety information for the Rosemount 1500XA Gas Chromatograph.
- *Chapter 2*: a general description of the Rosemount 1500XA gas chromatograph (GC) system and its components, their configurations, and functions. Also, Chapter 2 gives guidelines for sampling system and gas connections, descriptions of the analyzer subsystems and components, and descriptions of the controller subsystems and components.
- *Chapter 3*: a description of site selection and necessary tools for installation.
- *Chapter 4*: instructions for installing the GC hardware.
- *Chapter 5*: instructions for regular maintenance and care of the GC hardware as well as instructions for troubleshooting, repairing, and servicing the GC.
- *Appendix A*: explanation of how the Rosemount 1500XA operates.
- *Appendix B*: description of and instructions for using the local operator interface (LOI)
- *Appendix*: instructions for installing and maintaining the carrier gas
- *Appendix D*: tables of Modbus map files
- *Appendix E*: a list of boards, valves, and other components suggested as spare parts.
- *Appendix F*: instructions for shipping and long-term storage recommendations.
- *Appendix G*: displays engineering drawings.
- *Appendix H*: provides a list of terms and abbreviations used in this manual.

2 About Rosemount™ 1500XA Gas Chromatographs

2.1 Description

The Rosemount™ 1500XA is a high-speed gas chromatograph (GC) that is factory engineered to meet specific field application requirements based on stream composition and the anticipated concentration of the components of interest.

This GC was fully inspected and tested before it left the factory. Program parameters were installed and documented in the *GC Config Report* furnished with the USB stick shipped in your gas chromatograph documentation package.

Components

The GC typically consists of two major components, the analyzer assembly and the sample conditioning system (SCS).

See *Figure 2-1* for analyzer details.

Analyzer assembly (XA series)

The assembly includes:

- Columns
- Detectors
- Preamplifier
- Valves
- Solenoids
- Analyzer, which includes:
  - Electronics and ports for signal processing
  - Instrument control
  - Data storage
  - Personal computer (PC) interface
  - Telecommunications

Sample conditioning system (SCS)

The SCS is located between the process stream and the analyzer sample inlet, usually mounted on the lower portion of the analyzer stand. Optionally, the SCS can be configured with Genie® bypass filters, liquid shut-off valves, and optional solenoids for stream switching, all of which can be enclosed in an electric (heat tape design) oven.

The standard configuration SCS includes:

- Mounting plate

- Block (or shutoff) valves
- Filters

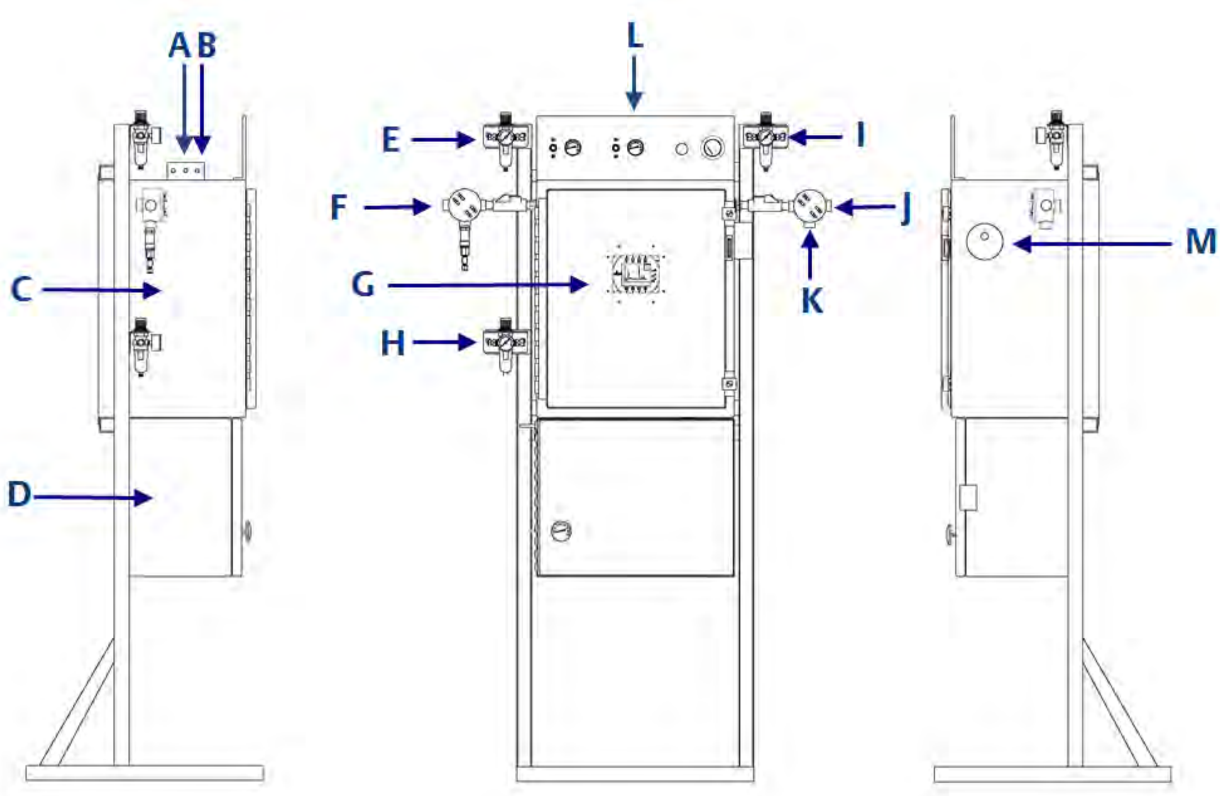
In its standard configuration, the Rosemount 1500XA can handle multiple streams.

Operation

Although the Rosemount 1500XA GC can be operated from the local operator interface (LOI) (see *Appendix B*), it is designed to be run primarily from a personal computer (PC) running MON2020 software (see *Section 2.2*). The PC provides you with the greatest capability, ease of use, and flexibility. One PC running MON2020 can connect with multiple gas chromatographs over a local area network. The GC's Ethernet capability makes it possible to interact with the GC even if it is located in a hazardous area. The PC can be used to display chromatograms and reports, which can then be stored as files on the PC's hard drive.

Typical installation

Figure 2-1: System Overview



A. 1/4 in. connector carrier in
B. 1/4 in. connector valve actuation gas
C. Electronics enclosure
D. Air-bath oven
E. 1/4 in. air regulator in
F. 3/4 in. customer connection
G. LOI display
H. 1/4 in. air regulator
I. Z-Purge pressure regulator
J. 3/4 in. customer connection
K. 3/4 in. customer connection
L. Mechanical pressure regulator panel
M. Cyclops Z-Purge indicator

Documentation

The *Rosemount 1500XA Gas Chromatograph Operations Manual* (P/N 2-3-9000-762) is intended as a user's guide to accompany the Rosemount 1500XA gas chromatograph system.

For software operation instructions, see the *MON2020 Software for Gas Chromatographs User Manual* (P/N 2-3-9000-745). The operations and software manuals are included on the MON2020 software USB stick that ships with the gas chromatograph or can be downloaded from: *Gas Chromatograph Software - MON2020 Download*.

2.2 MON2020

MON2020 provides operator control of the Rosemount 1500XA, monitors analysis results, and inspects and edits various parameters that affect Rosemount 1500XA operation. It also controls display and printout of the chromatograms and reports, and it stops and starts automatic analysis cycling or calibration runs.

After the equipment/software has been installed and the operation stabilized, automatic operation takes place over an Ethernet network.

MON2020 is a Windows™-based program that allows you to maintain, operate, and troubleshoot a gas chromatograph. Individual GC functions that can be initiated or controlled by MON2020 include, but are not limited to, the following:

- Valve activations
- Timing adjustments
- Stream sequences
- Calibrations
- Baseline runs
- Analyses
- Halt operation
- Stream/detector/heater assignments
- Stream/component table assignments
- Stream/calculation assignments
- Diagnostics
- Alarm and event processing
- Event sequence changes
- Component table adjustments
- Calculation adjustments
- Alarm parameters adjustments
- Analog scale adjustments
- LOI variable assignments (optional)

Reports and logs that can be produced, depending upon the GC application in use, include, but are not limited to, the following:

- Configuration report
- Parameter list
- Analysis chromatogram

- Chromatogram comparison
- Alarm log (unacknowledged and active alarms)
- Event log
- Various analysis reports

For a complete list of the GC functions, reports, and logs available through MON2020, consult the software manual (P/N 2-3-9000-745) available for download from: *Gas Chromatograph Software - MON2020 Download*.

2.3 Software description

The GC uses two distinct types of software. This enables total flexibility in defining the calculation sequence, report content, format, type and amount of data for viewing, control, and/or transmission to another computer or controller assembly. The two types are:

- Embedded GC firmware
- MON2020 software

The *RTOS* firmware and the application configuration software are installed when the Rosemount 1500XA is shipped.

The application configuration is tailored to the customer's process and shipped on a USB stick. The hardware and software are tested together as a unit before the equipment leaves the factory.

2.4 Embedded GC firmware

The GC's embedded firmware supervises operation of the Rosemount 1500XA through its internal microprocessor-based controller. All direct hardware interface is via this control software. It consists of a multi-tasking program that controls separate tasks in system operation, as well as hardware self-testing, user application downloading, startup, and communications. Once configured, the Rosemount 1500XA can operate as a stand alone unit.

2.5 Equipment description and specifications

The Rosemount 1500XA Gas Chromatograph combines the proven analytical components of the Rosemount 700XA Gas Chromatograph with the larger oven capacity and flexibility of a traditional air-bath oven design.

This section describes the various subsystems and components that make up the Rosemount 1500XA Gas Chromatograph. It also details the GC's equipment specifications.

2.5.1 Electronics enclosure

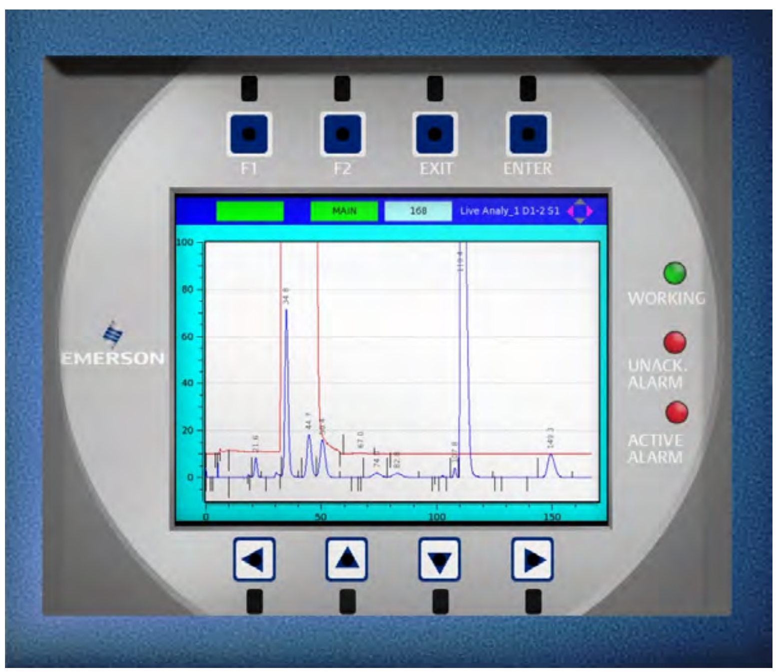
The Rosemount 1500XA electronics enclosure contains:

- Card cage assembly
- Local operator interface
- Backplane
- AC/DC power supply
- Circuit breaker
- Solenoid valves
- Methanator (optional)
- Oven heater
- Z-purge controller

Local operator interface

The local operator interface (LOI) gives you in-depth control over the GC's functions. It has a high resolution color display that is touch key activated and allows you to operate the GC without a laptop or a PC.

Figure 2-2: Local operator interface



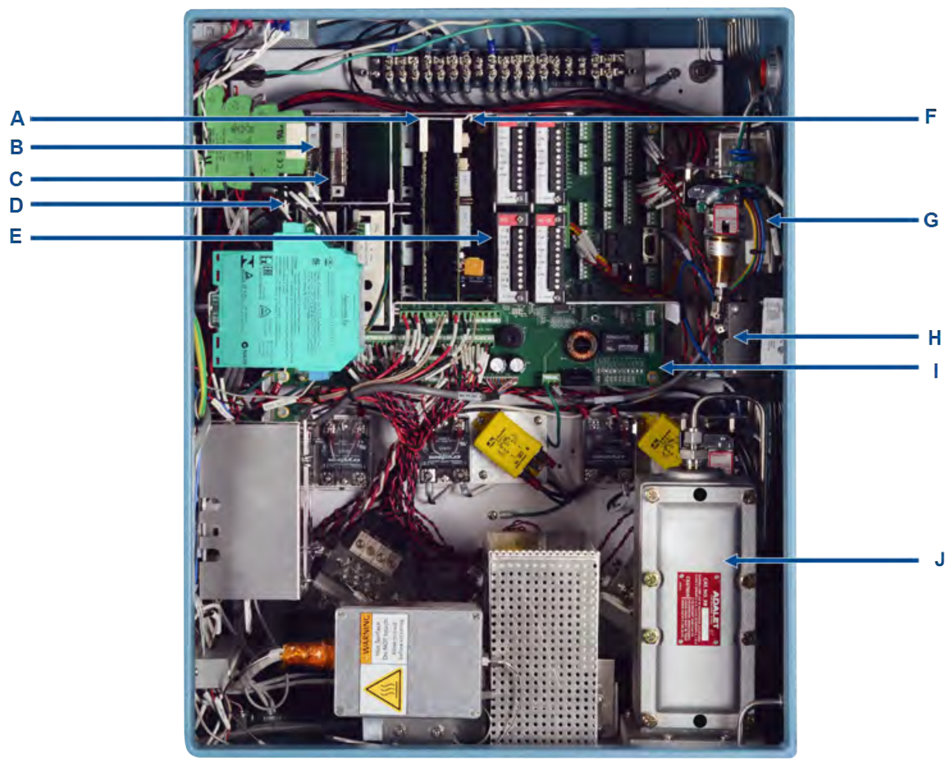
The LOI includes the following features:

- Color LCD display with VGA (640 x 480 pixels) resolution
- ASCII text and graphics modes
- Adjustable auto-backlighting
- 8 infrared-activated touch screen keys that eliminate the requirement for a magnetic pen
- Complete GC status, control, and diagnostics, including full chromatogram display

See *Appendix B* for more information about operating the LOI.

Electronics assembly

Figure 2-3: Electronics Assembly Components



A. *CPU board*
B. *Detector preamp board*
C. *Heater solenoid driver board*
D. *Card cage*
E. *ROC module slots*
F. *Base I/O board*
G. *Power supply*
H. *Circuit breaker*
I. *Backplane*
J. *Air bath heater*

The electronics assembly contains the following components:

- Card cage can support the following:
  - CPU board (1)
  - Base I/O board (1)
  - Heater/solenoid driver board (2)
  - Detector preamp board (3)
  - ROC Module slots (4)

- Backplane/field termination board (1)
- AC/DC power supply converter (1)
- Flame detector slots (2)

Note
Quantities referenced above are the maximum number of cards the Rosemount 1500XA can hold. Your GC may not include some of the electronics shown.

Pressure switch

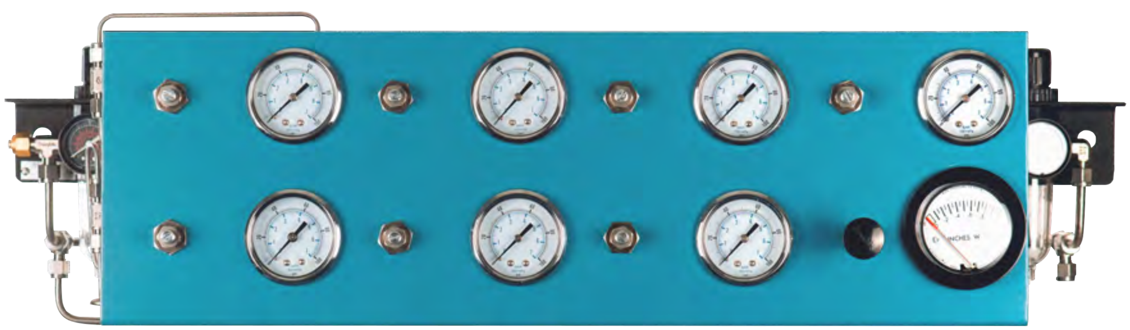
The pressure switch activates when the carrier pressure falls below a predetermined setpoint. When activated, the switch triggers a general alarm that displays on the LOI and in MON2020.

Mechanical pressure regulators

The mechanical pressure regulators and gauges are used to set and monitor the pressure of the carrier gas flow through the GC's columns, as well as the pressure of the FID air and fuel (H_2), if installed.

The regulators and gauges are typically located on the top or side of the electronics enclosure.

Figure 2-4: Regulators and Gauges



2.5.2 Air-bath oven

The air-bath oven uses a conventional instrument air heater design for maximum analytical flexibility. The oven has capacity for up to eight chromatograph valves and four detectors. There is also the capacity to install liquid sample valves for heavier samples. The oven can operate at temperatures up to 120 °C (248 °F) as the application dictates.

The air-bath oven contains the valves, the columns, the detectors, and the stream switching system.

Note
The analyzer can have a maximum of two flame detectors and/or four TCDs.

A more detailed component list for the oven compartment includes the following:

Table 2-1: Air-bath compartment components

Component	Description
Valves	A Rosemount 1500XA can have up to eight XA pneumatically actuated valves.
Column module	Columns are either capillary or micro-packed.
Thermal conductivity detector (TCD)	The Rosemount 1500XA supports a maximum of four TCDs.
Temperature switch	Switch for the heating element. The switch turns off its heating element if the heating element reaches 160 °C (257 °F).
Flame ionization detector (FID)	The optional flame ionization detector can be used in place of a TCD to detect trace levels of compounds.

2.5.3 Sample system

A well designed, properly adjusted sampling system is essential to optimum performance of any gas chromatograph. If a good sample is *not* obtained for analysis, the system is compromised.

The purpose of the sample handling system is to transfer a conditioned fluid sample that is compatible with gas chromatography requirements.

The sample conditioning system (SCS) is located between the process stream and the analyzer, and is usually mounted beneath the air-bath oven. It serves these purposes:

- Extracts final sample from the fast loop.
- Performs final filtration.
- Performs stream switching for a multi-stream analyzer.
- Adjusts the final pressure, temperature, and flow on the selected sample flowing to the sample valve.

The following points should be considered in selecting and installing a sampling system:

- Sample point
- Sample volume and flow rate
- Sample conditioning
- Contamination precautions
- Valving
- Calibration gas

2.5.4 Equipment specifications

Table 2-2: Utility specifications

Type	Specification
Dimensions (without sampling system)	H x W x D: 50 x 40 x 24 in. (127 x 102 x 61 cm)
Weight (without sampling system)	Approximately 150 lb (68 kg)
Mounting	Base mount (standard) Secure the bottom of the base mount to the ground using the ⅜-in. diameter holes.
Power	• 120 Vac ±10 % (type approval) • 220 Vac ±10 % (field certification) • 50/60 Hz 400 watts running • 1100 watts start-up
Instrument air	• 4 SCFM at 40 psig of oil-free instrument air for purge and oven heat
Valve actuation	• 100 - 110 psig for valve actuation
Environment	• -18 to 55 °C (0 to 130 °F) for 1500XA type-approved unit • -18 to 55 °C (0 to 130 °F) for TCD and FID
Area classification options (hardware dependent) C US	Optional certification (type approval only available for FID, TCD, and methanator configuration) • Class I, Division 2, Groups B, C, and D Rosemount 1500XA Gas Chromatograph intrinsically safe backplane • Class I, Division 2, Groups B, C, and D • Associated equipment for: Class I, Division 1, Groups B, C, and D • Ex nA [ic IIB + H2 Gc] IIB + H2 Gc • Zone 2 AEx nA [ic IIB + H2 Gc] IIB + H2 Gc Rosemount 1500XA Gas Chromatograph explosionproof flame ionization detector (FID) • Class I, Division 1, Groups B, C, and D • Ex db IIB + H2 Gb • Class I, Zone 1, AEx db IIB + H2 Gb
Equipment ratings	• Pollution degree: 2 • Installation category: II • Altitude: 2000 m (6562.7 ft.) • Humidity: 0-90% relative humidity non-condensing • Electrical supply: Mains supply voltage fluctuations are not to exceed ±10% of the nominal supply voltage.

Detail	IECEx	ATEX	UKCA
Certificate number	IECEx CSA 16.0046U	Sira 16ATEX4305U	CSAE 23UKEX1978U
Certification code	Ex nA [ic IIB +H2 Gc] IIB + H2 Gc for 1500XA intrinsically safe (IS) backplane with thermal conductivity detector (TCD) (Part number: 9A00051G01) Ex ec [ic IIB +H2 Gc] IIB +H2 Gc for 4500XA IS backplane (Part number: 9A000151G01)	Ex nA [ic IIB +H2 Gc] IIB +H2 Gc for 1500XA IS backplane with TCD (Part number 9A00051G01) Ex ec [ic IIB +H2 Gc] IIB + H2 Gc for 4500XA IS backplane (Part number: 9A00151G01)	Ex nA [ic IIB + H2 Gc] IIB +H2 Gc for 1500XA IS backplane with TCD (Part number 9A00051G01) Ex ec [ic IIB +H2 Gc] IIB + H2 Gc for 4500XA IS backplane (Part number: 9A00151G01)
Other marking	N/A	II 3G	II 3G
Ambient range	Ta + -20 °C to +55 °C		
Model number	1500XA IS backplane with TCD (Part number 9A00051G01) 4500XA IS backplane (Part number 9A00151G01)		
Manufacturer's name	Rosemount, Inc.		
Manufacturer's address	10241 West Little York, Suite 200 Houston, Texas 77040 USA		
Serial number and year of manufacture	Applied to the label		
Warnings	Warning: Do not separate when energized. Separate only in a non-hazardous area.		

Electronics hardware

Use the following table to determine the electronic hardware specifications:

Table 2-3: Communications and hardware specifications

Type	Specifications

Communications (standard)	• Analog inputs:
	  - Two standard 4-20 mA inputs filtered with transient protection
	• Analog outputs:
	  - Six isolated outputs, 4–20 mA
	• Serial communication ports:
	  - Three termination blocks
	  - Configurable as RS-232, RS-422, or RS-485
	  - One D-sub (9-pin) port for PC connection
	• Digital inputs:
	  - Five inputs, user assignable
	  - Optically isolated, rated to 30 Vdc at 0.5 A
	• Digital outputs:
	  - Five inputs, user assignable
	  - Form C and electro-mechanically isolated, 24 Vdc

Communications (Options)	Four expansion slots available for additional communications. Each slot has the capacity to add one of the following: • Four analog inputs (isolated) card • Four analog outputs (isolated) card • Eight digital inputs (isolated) card • Five digital outputs (isolated) card • One RS-232, RS-422, or RS-485 serial connection card (up to two maximum)
Ethernet	Two available connections • one RJ45 port • one four-wire termination – with 10/100 Mbps

Oven components

The following table lists the specifications for the components that are housed in the air bath oven.

Table 2-4: Oven components

Type	Specification
Valves	• 6-port or 10-port valves (8 maximum) - Piston-operated diaphragms with pneumatic actuation • Liquid injection valves (4 maximum)
Columns	Supports packed, micro-packed and capillary columns.
Solenoid actuation	• 24 Vdc • 80 - 120 psi
Wetted parts	316 stainless steel and diaphragm
Temperature	Maximum oven operating temperature of 120 °C (248 °F).

Software

The following table lists the specifications for the GC's software.

Table 2-5: Software specifications

Type	Specification
Software	Windows™-based MON2020
Firmware	Embedded firmware
Methods	Four timed event tables and four component data tables
Peak Integration	• Fixed time or auto slope and peak identification. • Update retention time upon calibration or during analysis.

Corrosion protection

The following table lists the specifications for corrosion protection.

Table 2-6: Corrosion protection

Type	Specification
Enclosure Material	Copper-free and aluminum-coated with industrial grade powder coat suitable for high humidity and salt-laden environments.
Process Wetted Materials	Stainless steel; if the function of an item excludes the use of stainless steel, such as the glass rotameter tubes, materials that are resistant to corrosion are used.
Electronics	All electronic circuit boards are tropicalized with a clear conformal coating.

Archived data storage capabilities

The archived data storage capabilities of the Rosemount 1500XA GC are shown in *Table 2-7*.

Table 2-7: Archived Data Storage

Type	Maximum number of records
Analysis results	31,744 (88 days with 4-minute cycle time)
Final calibration results	370
Calibration results	100 (per row in *Analysis Configuration* table)
Final validation results	370 (per row in *Analysis Configuration* table)
Validation results	100 (per row in *Analysis Configuration* table)
Analysis chromatograms	3,406 (approximately nine days assuming 4-minute cycle time and single entry in analysis)
Final calibration chromatograms	370 (per row in *Analysis Configuration* table)
Final validation chromatograms	370 (per row in *Analysis Configuration* table)
Protected chromatograms	100
Hourly averages (up to 256** variables)	2,400
Daily averages (up to 256** variables)	365

Table 2-7: Archived Data Storage *(continued)*

Type	Maximum number of records
Weekly averages (up to 256** variables)	58
Monthly averages (up to 256** variables)	12
Variable averages (up to 256** variables)	2,360
Every run (up to 256** variables)	2,360
Alarm logs	1,000
Event logs	1,000
* The GC can store final calibration or final validation chromatograms for up to one year, provided that no more than one calibration or validation is run per day, and the cycle time is less than 15 minutes. If the cycle time exceeds 15 minutes, the oldest final calibration or validation chromatograms will be deleted to make room for newer ones.	
** A total of 256 averages, including hourly, daily, weekly, monthly, variable, and every run averages are archived.	

3 Getting started

3.1 Site selection

The site selected for the gas chromatograph is important for measurement accuracy.

Install the GC as close as possible to the sample system but allow for adequate access space for maintenance tasks and adjustments. Allow a minimum of 3 ft (0.9 m) in front of the GC for operator access.

Ensure that exposure to radio frequency (RF) interference is minimal.

WARNING!

HAZARDOUS AREA EXPLOSION HAZARD
Do not use a PC or a printer in a hazardous area. Serial and Ethernet communications links are provided to connect the analyzer to the PC and to connect to other computers and printers in a safe area.

Failure to follow this warning may result in injury or death to personnel

WARNING!

VENTILATION
If you plan to place the GC in a sealed shelter, always vent the GC to atmosphere with ¼-in. tubing or larger. This will prevent the build up of gases.

3.2 Unpacking the unit

Unpack and inspect the Rosemount™ 1500XA gas chromatograph upon receipt.

Procedure

1. Unpack the equipment.
    - Remove the Rosemount 1500XA from the shipping crate.
    - Remove the memory stick containing the software, quick start guide, and manuals.

    Note
    The MON2020 version number is located on the back of the USB card.

2. Retain the shipping information.
3. Inspect all parts and assemblies for possible shipping damage.
4. If any parts or assemblies appear to have been damaged in shipment, first file a claim with the carrier.
5. Next, complete a full report describing the nature and extent of the damage and forward this report immediately to your Emerson Customer Care representative.
6. Include the GC's model number in the report.

    Disposition instructions will be provided as soon as possible.

    If you have any questions regarding the claim process, contact your Emerson Customer Care representative for assistance.

    Installation and startup should proceed only if all required materials are on hand and free from obvious defects.

3.3 Necessary tools and components

Observe the following list of tools and components that you will need for installing the analyzer:

- Chromatographic grade carrier gas: 99.995% pure with less than 5 ppm water and 0.5 ppm hydrocarbons. Possible carriers gases (application dependent) include:
  - Helium
  - Nitrogen
  - Argon
  - Hydrogen
- High pressure dual-stage regulator for the carrier gas cylinder, high side up to 3,000 pounds per square in., gauge (psig), low side capable of controlling pressure up to 150 psig.
- Calibration standard gas with correct number of components and concentrations.
- Dual-stage regulator for the calibration gas cylinder, low pressure side capable of controlling pressure up to 30 psig.
- Sample probe (fixture for procuring the stream, or sample gas for chromatographic analysis).
- Stainless steel tubing:
  - 1/8-in. for connecting calibration standard to analyzer
  - 1/8-in. for connecting stream gas to the analyzer
  - 1/4-in. for connecting carrier to the analyzer
- Sulfur-inert coated , stainless steel tubing for H_2S applications
- Miscellaneous Swagelok tube fittings, tubing benders and tubing cutter.
- 14 AWG (18 MWG) or larger electrical wiring and conduit to provide 115 or 220 volts AC, single phase, 50 to 60 Hertz (Hz), from an appropriate circuit breaker and power disconnect switch. See guidelines in *Section 4.2.1*.
- Digital volt-ohm meter with probe-type leads.
- A flow measuring device.

3.4 Optional tools and components

WARNING!

EXPLOSION HAZARD
Do not use a PC in a hazardous area. Electrostatic discharges may cause an explosion.

Serial port and Ethernet are provided to connect the unit to the PC and to connect to other computers and printers in a safe area.

Failure to follow this warning may result in injury or death to personnel.

Supporting tools and components include:

- A Windows™-based PC and either a direct or remote communications connection to interface with the Rosemount 1500XA. See the *MON2020* user manual for more information on specific PC requirements.
- The Rosemount 1500XA has a factory-wired Ethernet port on the backplane. Refer to *Section 4.3.7* for more information.
- Modbus communications are optional

4 Installation and startup

This section provides instructions for installing and setting up the Rosemount™ 1500XA.

Note

Because the Rosemount 1500XA is available in different configurations, it is possible that not all of the instructions in this section apply to your particular GC. In most cases, however, to install and set up a Rosemount 1500XA, Emerson recommends that you follow the instructions in the same order as they are presented in this manual.

4.1 Installing a gas chromatograph in hazardous environments

Follow these precautions if installing or operating the GC in a hazardous area:

Procedure

1. Do not operate a personal computer in a hazardous area. To interface with a GC in a hazardous area, use a PC that is remotely connected to the GC and that is located in a nonhazardous area.
2. Ensure that field connections to the analyzer and the GC are appropriately certified and made through purged conduit or flameproof glands.

   WARNING!

   Observe all applicable regulations when installing purged GC units.

   Failure to observe all regulations when installing purged GC units may result in noncompliance, equipment damage, or personal injury.

   The purged analyzer housing is designed for use in locations where fire and explosion hazards may exist, specifically areas that are classified by the National Fire Protection Association (NFPA) as Class I, Division 2, Group B, C, and D. However, other regulations do apply. Consult the authority having jurisdiction or appropriate site policies and procedures regarding wiring and installation practices.

4.2 Gas chromatograph wiring

4.2.1 Installing power source wiring

Follow these precautions when installing power source wiring:

- All wiring, as well as circuit breaker or power disconnect switch locations, must conform to the CEC or NEC; all local, state, or other jurisdictions; and company standards and practices.
- Provide single-phase, three-wire power at 115 or 220 Vac, 50-60 Hertz.

NOTICE

If you do not have a single phase, three-wire AC power source, you must purchase an isolation transformer.

- Locate a power shut-off or disconnect switch in a safe area.
- Provide the GC and any optionally installed devices with one 20-amp circuit breaker for protection.

CAUTION!

POWER

15 amps is the maximum current for 14 AWG (wire).

- Use multi-stranded copper conductor wire according to the following recommendations:
  - For power feed distances up to 250 ft (76 m), use 14 AWG (American Wire Gauge) (18 Metric Wire Gauge), stranded.
  - For power feed distances 250 to 500 ft (76 to 152 m), use 12 AWG (25 Metric Wire Gauge), stranded.
  - For power feed distances 500 to 1000 ft (152 to 305 m), use 10 AWG (30 Metric Wire Gauge), stranded.

4.2.2 Signal wiring

Follow these general precautions for field wiring digital and analog input/output (I/O) lines:

- Metal conduit or cable (according to local code) used for process signal wiring must be grounded at conduit support points, because intermittent grounding helps prevent the induction of magnetic loops between the conduit and cable shielding.
- All process signal wiring should be of a single, continuous length between field devices and the GC. If, however, the length of the conduit runs require that multiple wiring pulls be made, the individual conductors must be interconnected with suitable terminal blocks.
- Use suitable lubrication for wire pulls in conduit to prevent wire stress.

- Use separate conduits for AC voltage and DC voltage circuits.
- Do not place digital or analog I/O lines in the same conduit as AC power circuits.
- Use only shielded cable for digital I/O line connections.
    - Ground the shield at only one end.
    - Shield-drain wires must not be more than two AWG sizes smaller than the conductors for the cable.
- When inductive loads (relay coils) are driven by digital output lines, the inductive transients must be diode-clamped directly at the coil.
- Any auxiliary equipment wired to the GC must have its signal common isolated from earth/chassis ground.

CAUTION!

SIGNAL INTERFERENCE

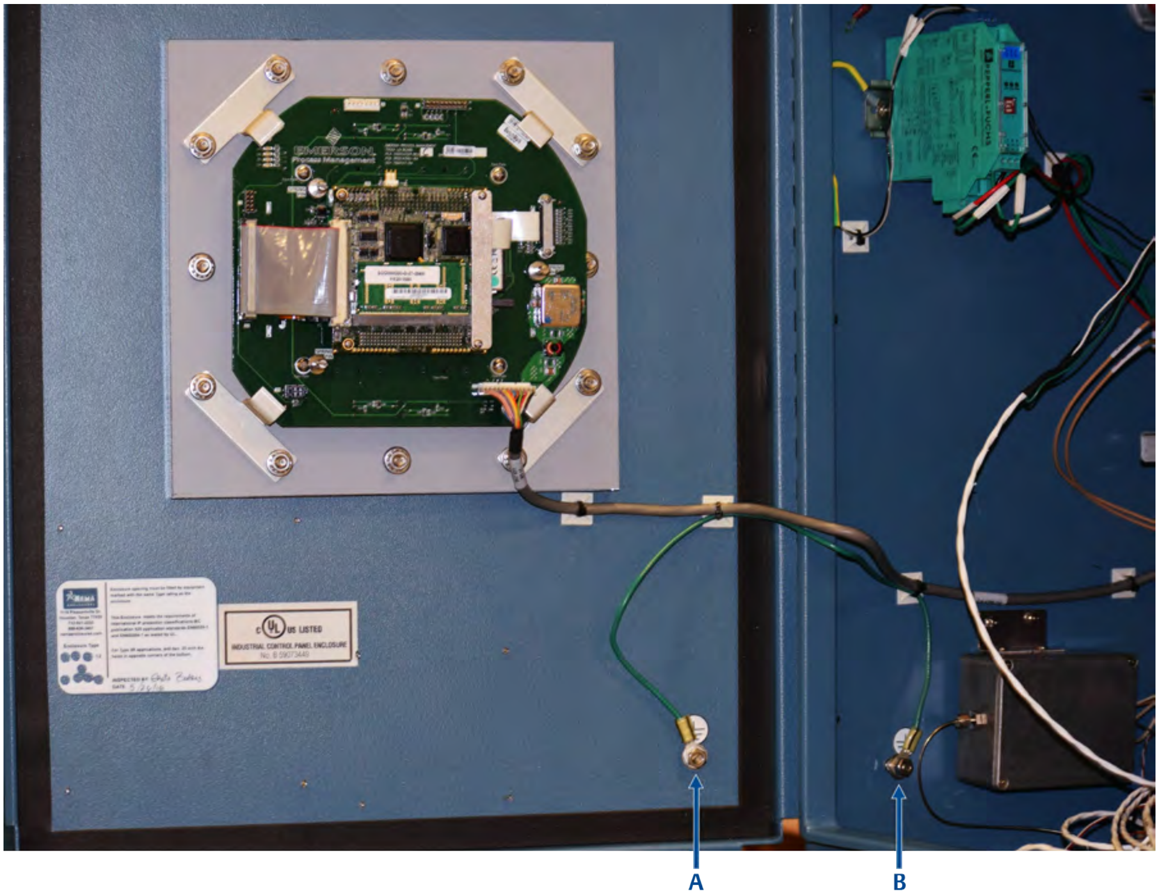
Any loop of extra cable left for service purposes inside the GC purged housing must not be placed near the conduit entry for AC power. This applies to all digital and analog I/O lines connecting to the GC. If the above precaution is not followed, the data and control signals to and from the GC can be adversely affected.

4.2.3 Installing electrical and signal line grounds

Follow these general precautions for grounding electrical and signal lines:

- For shielded signal conducting cables, shield-drain wires must not be more than two AWG sizes smaller than the conductors for the cable. Shielding is grounded at only one end.
- Metal conduit used for process signal wiring must be grounded at conduit support points (intermittent grounding of conduit helps prevent induction of magnetic loops between the conduit and cable shielding).
- A dedicated ground lug is located inside the GC's electronics enclosure on the side wall and the enclosure door. Chassis ground conductors (color code green) inside the electronics enclosure should be stranded, insulated copper wire. These device chassis ground conductors should all be connected to the dedicated ground lug.

Figure 4-1: Internal Ground Lugs

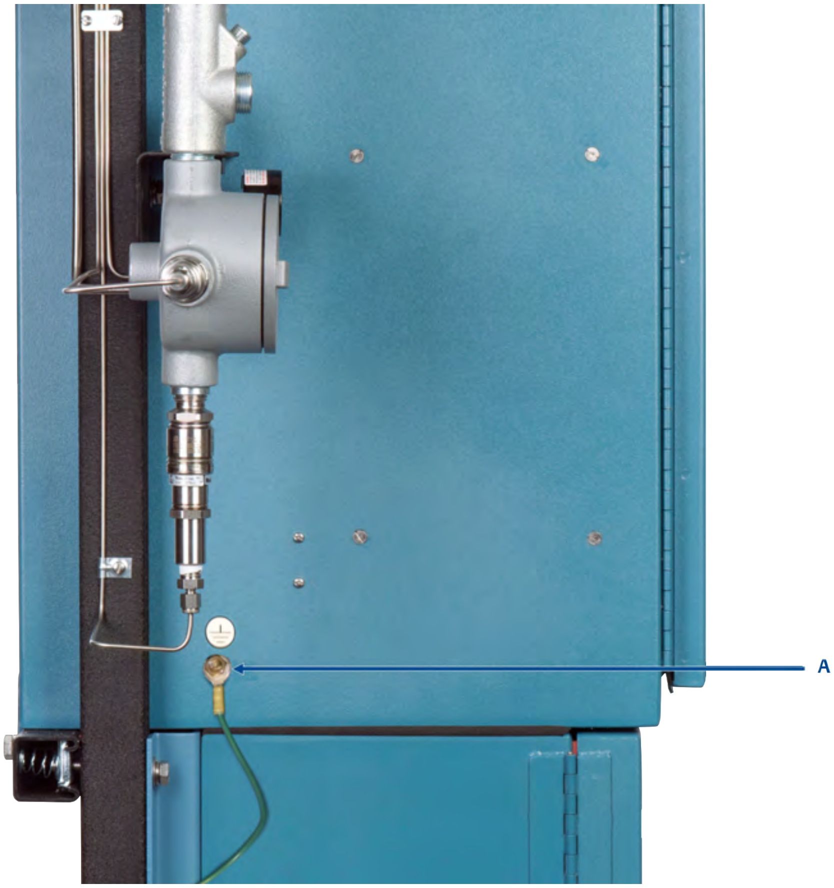


A. Upper electronics enclosure door - internal ground lug

B. Upper electronics enclosure wall - internal ground lug

- A dedicated ground lug is located on the outside of the GC's electronics enclosure. This ground point should be connected to a copper ground rod as described in the next bulleted item.

Figure 4-2: External Ground Lug



A. External earth ground

- A single-point ground must be connected to a copper-clad, 10-foot long, 3/4-in. diameter steel rod, which is buried, full-length, vertically into the soil as close to the equipment as is practical.

Note

The grounding rod is not furnished.

- Resistance between the copper-clad steel ground rod and the earth ground must not exceed 25 Ohms.
- The equipment-grounding conductors used between the GC and the copper-clad steel ground rod must be sized according to your local regulations.

Length	Wire
15 ft. (4.6 m) or less	8 AWG, stranded, insulated copper
15 to 30 ft. (4.6 to 9.1 m)	6 AWG, stranded, insulated copper
30 to 100 ft. (9.1 to 30.5 m)	4 AWG, stranded, insulated copper

- All interior enclosure equipment-grounding conductors must be protected by metal conduit.
- External equipment that is connected to the GC should be powered via isolation transformers to minimize the ground loops caused by the internally shared safety and chassis grounds.

4.2.4 Installing electrical conduit

Follow these general precautions for conduit installation:

- Conduit cutoffs must be cut at a 90-degree angle. Cutoffs must be made by a cold cutting tool, hacksaw, or by some other approved means that does not deform the conduit ends or leave sharp edges.
- All conduit fitting-threads, including factory-cut threads, must be coated with a metal-bearing conducting grease prior to assembly.
- Temporarily cap the ends of all conduit runs immediately after installation to prevent accumulation of water, dirt, or other contaminants. If necessary, swab out conduits prior to installing the conductors.
- Install drain fittings at the lowest point in the conduit run; install seals at the point of entry to the GC to prevent vapor passage and accumulation of moisture.
- Use liquid-tight conduit fittings for conduits exposed to moisture.

When a conduit is installed in hazardous areas, follow these general precautions for conduit installation:

- All conduit runs must have a fitting, which contains explosion-proof sealing (potting) located within three inches from the conduit entrance to the explosion-proof housing. The seal should have a minimum IP rating of IP54 or equivalent NEMA/Type rating on the conduit sealing devices.
- The conduit installation must be vapor tight, with threaded hub fittings, sealed conduit joints and gaskets on covers, or other approved vapor-tight conduit fittings.

WARNING!

Observe all precautionary signs posted on the certified explosion-proof equipment. Consult your company's policies and procedures and other applicable documents to determine wiring and installation practices that are appropriate for hazardous areas.

Failure to do so may result in serious injury or death to personnel.

4.2.5 Sample system requirements

Observe the following guidelines for installing GC sample systems:

Line length	If possible, avoid long sample lines. In case of a long sample line, flow velocity can be increased by decreasing downstream pressure and using by-pass flow via a fast loop. **CAUTION!** **Stream switching requires a sample pressure of 20 psig.**
Sample line tubing material	• Use sulfur-inert tubing for H_2S streams; for all other applications, use stainless steel tubing. • Ensure tubing is clean and free of grease.
Dryers and filters	Use small sizes to minimize time lag and prevent back diffusion. • Install a minimum of one filter to remove solid particles. Most applications require fine-element filters upstream of the GC. The GC includes a 2-micron filter. • Use ceramic or porous metallic type filters. Do not use cork or felt filters. ***NOTICE*** **Install the probe/regulator first, immediately followed by the coalescing filter and then the membrane filter. See *Appendix C* for a recommended natural gas installation.**
Pressure regulators and flow controllers	• Use stainless steel wetted materials. • Parts should be rated for sample pressure and temperature.
Pipe threads and dressings	Use PTFE tape. Do not use pipe thread compounds or pipe dope.
Valving	• Install a block valve downstream of sample takeoff point for maintenance and shutdown. • The block valve should be a needle valve or cock valve type, of proper material and packing, and rated for process line pressure.

4.3 Installing the analyzer

WARNING!

EXPLOSION HAZARD
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Power must not be restored after enclosure has been opened until enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

Failure to de-energize the analyzer may cause an explosion and severely injure personnel.

4.3.1 Connecting power to the GC

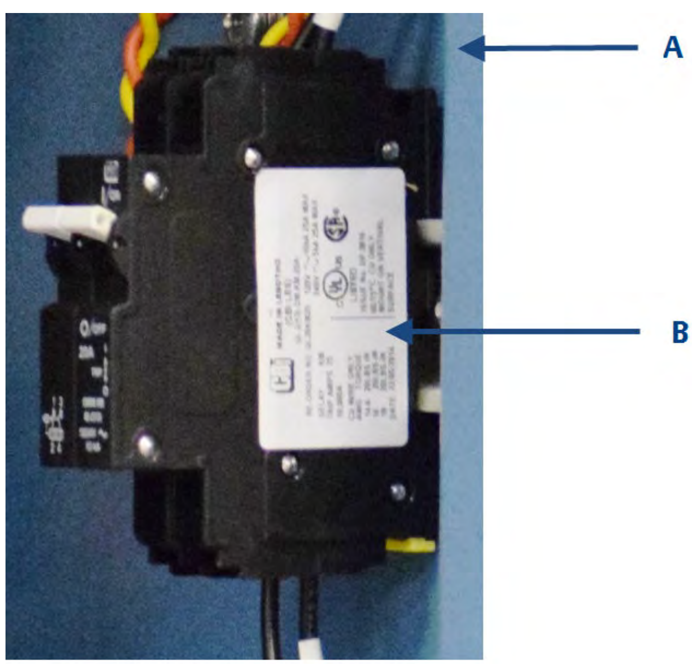
Connect power to the gas chromatograph.

WARNING!

ELECTRIC SHOCK
Do not connect AC power leads without first ensuring that AC power source is switched off.

Failure to observe all safety precautions could result in serious injury or death.

Figure 4-3: Circuit Breaker



A. Electronics enclosure
B. Circuit breaker

To connect power to the GC, follow these steps:

Procedure

1. Locate the three leads for connecting power to the GC. The leads are colored as follows:

GC power wiring	Color
Hot	Black
Neutral	White
Ground	Green

2. Connect the leads to the AC power source (i.e., with circuit breaker and power disconnect switch).

   Make power line splices and conduit seals that comply with applicable electrical code and hazardous area wiring requirements.

   WARNING!

   ELECTRIC SHOCK
   Do not apply power to the GC until all power, interconnection, and external signal connections have been verified, and proper grounds have been made.

   Failure to properly connect the GC unit may result in serious personal injury.

3. If necessary, connect the analyzer's chassis ground to an external copper ground rod (at remote locations).

   See *Section 4.2.3* for more information.

4. Close the electronics enclosure door and apply power to the GC.

4.3.2 Connecting the sample and other gas lines

To install GC sample and gas lines, do the following:

Procedure

1. Remove the plug from the 1/16 in. sample vent tubing marked *SV1* that is located on the flow panel assembly.

Figure 4-4: Sample Vent and Measure Vent Lines

A. Sample and gas line vents

- If desired, connect the sample vent lines to an external, ambient pressure vent. If the vent line is terminated in an area exposed to wind, protect the exposed vent with a metal shield.
- Use 1/4 in. or 3/8 in. tubing for vent lines longer than 10 feet.

At this stage in the installation, the GC measure vent (*MV*) lines (labeled on the side of the GC) should remain plugged until the GC has been checked for leaks. For regular operation, however, the *MV* lines must be unplugged.

Note

Do not discard the vent line plugs. They are useful when leak-checking the GC and its sample or gas line connections.

2. Connect the carrier gas to the GC. The carrier gas inlet is labeled *Carrier In* and is a 1/4 in. T-fitting.

WARNING!

EXPLOSION HAZARD

Do not turn on sample gas until you have completely checked the carrier lines for leaks.

Failure to follow this warning may result in injury or death to personnel.

- Use stainless steel tubing to convey carrier gas.
- Use a dual-stage regulator with high-side capacity of 3,000 psig and low-side capacity of 150 psig.
- Carrier gas is fed from two bottles (see *Appendix C*) for carrier gas plumbing.

3. Connect calibration standard gas to the GC.

   When installing the calibration standard gas line, ensure that the correct tubing connection is made.

   - Use 1/8-in. stainless steel tubing to connect calibration standard gas unless the application requires treated tubing.
   - Use a dual-stage regulator with low-side capacity of up to 30 psig.

4. Connect sample gas stream(s) to the GC.

   - Use 1/8 in. stainless steel tubing, as appropriate, to connect sample gas.
   - Unless stated otherwise in the product documentation, ensure that the pressure of the calibration and sample line is regulated at 15 psig to 20 psig.

5. After all lines have been installed, proceed with leak-checking the carrier and sample lines. See *Section 4.4*.

4.3.4 Maximum effective distance by communication protocol type

The table below lists the maximum distance at which the indicated protocol can transmit data without losing effectiveness. If longer runs are required, the use of a repeater or other type of extender will be necessary to maintain the protocol's efficiency.

Communication protocol	Maximum distance
RS-232	50 ft (15.24 m)
RS-422/RS-485	4,000 ft (1,219.2 m)
Ethernet (CAT5)	300 ft (91.44 m)

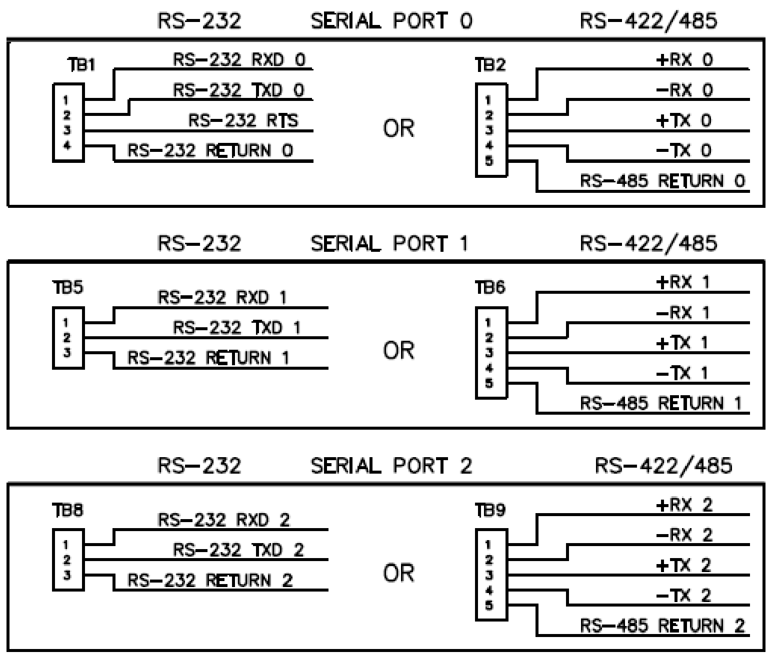
4.3.5 RS-485 serial port terminating resistors

To ensure correct communication with all hosts, place a 120-ohm terminating resistor across the GC serial port terminals on the RS-485 link. On a multi-dropped link, install the terminating resistor on the last controller link only.

4.3.6 Configuring GC Communications

The Rosemount 1500XA has four serial communications ports: Port 0, Port 1, Port 2, and Port 3, which is a dedicated PC-to-GC port. The mode for each of the first three ports can be set to RS-232, RS-422, or RS-485. These port configurations are normally specified by the customer at the time of order and then set at the factory, but they can be changed at any time with MON2020.

Figure 4-5: RS-232, RS-485 and RS-422 Port Configurations

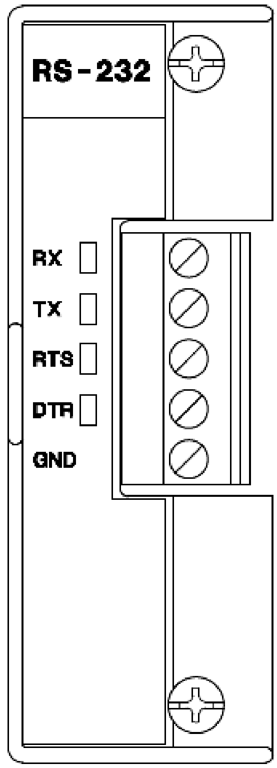


Optional RS-232 serial ports

It is possible to install an optional RS-232 board in one or both of the expansion I/O slots provided on the GC's card cage in the electronics enclosure.

This extra port can be used for Modbus ASCII/RTU communications or to connect directly to a computer installed with MON2020.

Figure 4-6: RS-232 Connections



Terminal	*Label*	*Definition*
1	*RX*	*Receive*
2	*TX*	*Transmit*
3	*RTS*	*Request to send*
4	*DTR*	*Data termininal ready*
5	*GND*	*Ground*

To install an optional RS-232 board, do the following:

Procedure

1. Start MON2020 and connect to the GC.
2. Select the **Tools → I/O Cards...** menu.
3. Identify the appropriate card slot under the *Label* column and then select Communications module - RS232 from the appropriate *Card Type* drop-down list.
4. Click **OK**.
5. Turn off the GC.

6. Install the RS-232 board into the appropriate I/O card slot in the GC's card cage.
7. Close and secure the electronics enclosure door.
8. Apply power to start the GC.

Optional RS-485/RS-422 serial ports

It is possible to install an optional RS-485 board in one or both of the expansion I/O slots provided on the GC's card cage in the electronics enclosure. This card can be configured in RS-422 (4-wire) or RS-485 (2-wire) mode. RS-485 mode is the default setting; to configure the card for RS-422 mode, see
Configuring the optional RS-485 serial port to function as an RS-422 serial port. Also see *ROC800-Series Discrete Input Module* at *ROC 800-Series* web site at
Emerson.com/ROC800-Series

This extra port can be used for Modbus ASCII/RTU communications or to connect directly to a computer installed with MON2020.

Installing an optional RS-485/RS-422 serial port card

To install an optional RS-485/RS-422 serial port card, do the following:

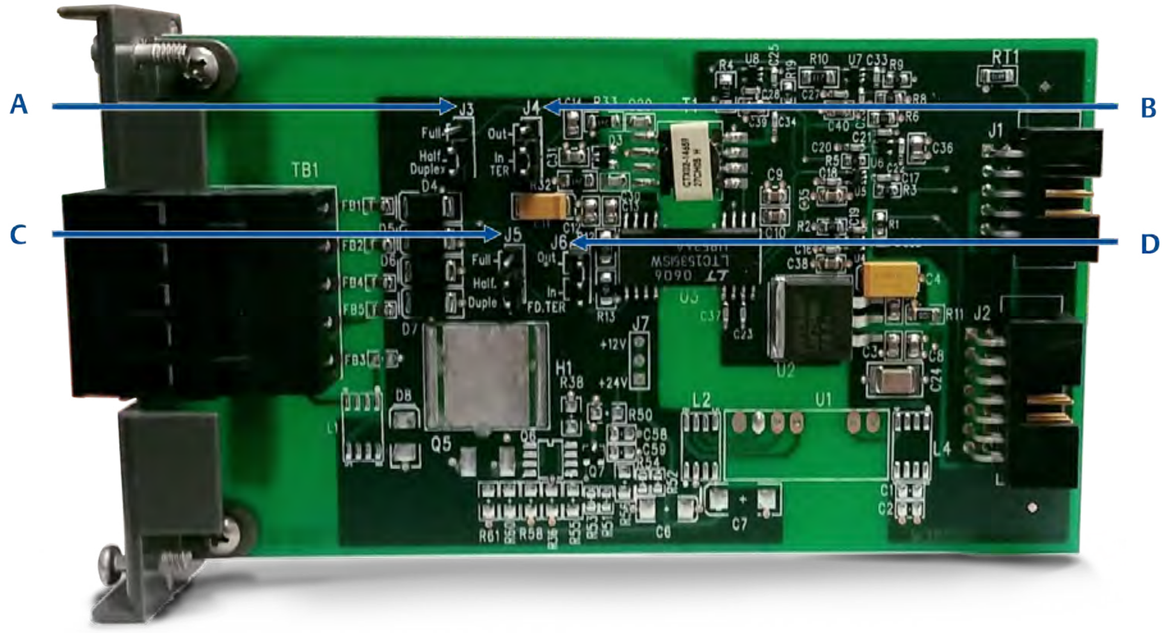
Procedure

1. Start MON2020 and connect to the GC.
2. Select **I/O Cards...** from the *Tools* menu. The *I/O Cards* window displays.
3. Identify the appropriate card slot under the *Label* column and then select **Communications module - RS422/485** from the appropriate *Card Type* drop-down list.
4. Click **OK**.
5. Turn off the GC.
6. Install the RS-485/RS-422 serial port card into the appropriate expansion slot in the GC's card cage.
7. Close the electronics enclosure door.
8. Start the GC.

Configuring the optional RS-485 serial port to function as an RS-422 serial port

See *Figure 4-7* and *Table 4-1* for the correct jumper settings to configure the optional RS-485 serial port to function as an RS-422 serial port:

Figure 4-7: RS-485/RS-422 Jumper Settings on Serial Board



A. *J3 (RS-485 2-wire) (RS-422 4-wire)*
B. *J4 (Termination OUT, IN)*
C. *J5 (RS-485 2-wire) (RS-422 4-wire)*
D. *J6 (Termination OUT, IN)*

Table 4-1: Configuring the Serial Connections for RS-485/RS-422 Serial Communications

Jumpers	RS-485 (half duplex/2-wire)	RS-422 (full duplex/4-wire)
J3	Half	Full
J5	Half	Full
	Termination IN	**Termination OUT**
J4	In	Out
J6	In	Out
	TB1 Wire Terminals	
	RS-485 (Half Duplex/2-Wire)	**RS-422 (Full Duplex/4-Wire)**
A	RxTx+	Rx+
B	RxTx-	Rx-
Y	NC	Tx+
Z	NC	Tx-

4.3.7 Connecting directly to a PC using the GC's Ethernet1 port

The GC's DHCP server feature and its Ethernet1 port on the backplane at J22 allows you to connect directly to the GC. This is a useful feature for GCs that are not connected to a local area network; all that is needed is a PC, typically a notebook computer, and a CAT5 Ethernet cable.

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 CAT5 or an Ethernet Crossover Cable of at least CAT5.

Note

The backplane has two switches located at SW1. The first switch is used for starting the DHCP server. See *Section 4.3.8* for more information. The second switch is reserved for future use.

Note

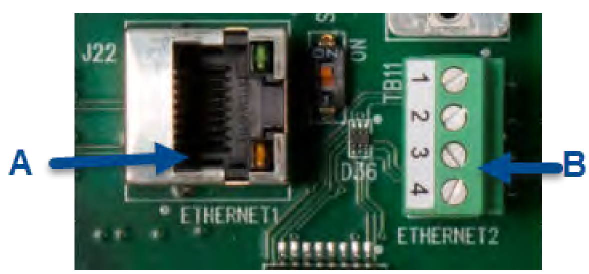
The GC can be connected (or remain connected) to the local network on Ethernet2 (TB11) on the backplane while the DHCP feature on Ethernete1 is being used.

The backplane has two Ethernet ports:

Table 4-2: Ethernet Connections on the Backplane

Name	Location	Connector Type
ETHERNET1	J22	RJ45 (DHCP-enabled)
ETHERNET2	TB11	4-wire terminal block

Figure 4-8: Ethernet Ports on the Backplane

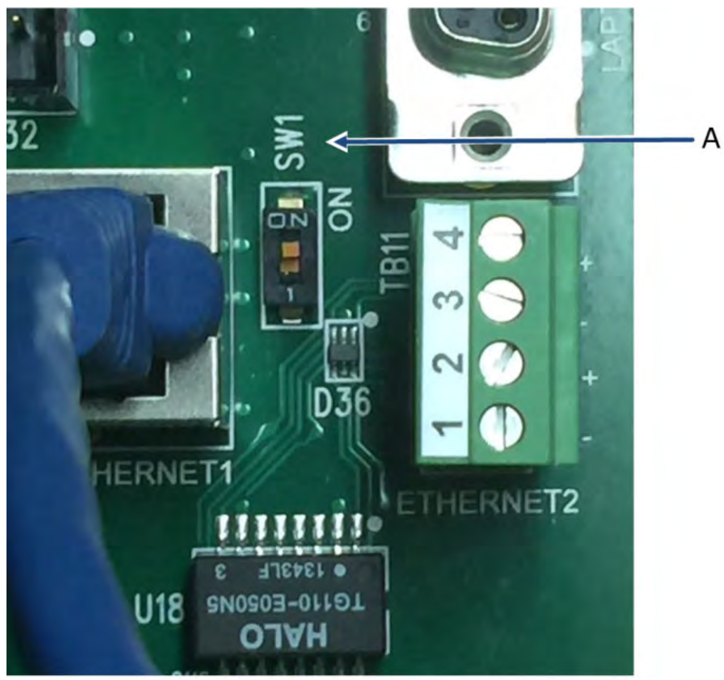


A. *Ethernet1 (RJ45) port*
B. *Ethernet2 (4-wire) port*

Procedure

1. Plug one end of the Ethernet cable into the PC's Ethernet port and the other end into the GC's RJ45 socket on J22 on the backplane.
2. Locate switch at SW1, directly between Ethernet1 and Ethernet2 ports on the backplane. Place SW1 in the **ON** position. This starts the GC's DHCP server feature. The server typically takes approximately 20 seconds to initialize and start up.

Figure 4-9: SW1 Switch on the Backplane



A. *Backplane SW1*

Note

The GC can be connected (or remain connected) to the local network on Ethernet2 (TB11) on the backplane while the DHCP feature on Ethernet1 is being used.

3. Wait for 20 seconds and then do the following to ensure that the server has provided an IP address to the PC:
   a. From the PC, go to **Start** → **Control Panel** → **Network Connections...**.
   b. The Network Connections window lists all dial-up and LAN / high-speed Internet connections installed on the PC. 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 `Local Area Connection`. It should show the status as **Connected**. The PC is now capable of connecting to the GC. See *Using MON2020 to connect to the GC*.

c. If the status is `Disconnected`, it may be that the PC is not configured to accept IP addresses; therefore, do the following:

4. Right-click the **Properties** icon. The Local Area Connection Properties window displays.
5. Scroll to the bottom of the `Connection` list box and select **Internet Protocol (TCP/IP)**.
6. 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** check boxes.
7. Click **OK** to save the changes and to close the Internet Protocol (TCP/IP) Properties window.
8. Click **OK** to close the Local Area Connection Properties window.
9. Return to the Network Connections window and confirm that the appropriate icon's status reads `Connected`. If the icon still reads `Disconnected` refer to *Section 5.6.4*.

NOTICE

If you power cycle the GC, then you will lose connectivity. After the GC initializes completely, refer to *Section 5.6.4* to learn how to repair the connection.

10. Click **Properties**. The *Internet Protocol (TCP/IP) Properties* window displays.

Using MON2020 to connect to the GC

To connect to the GC using the RJ45 Ethernet1 connection, do the following:

Procedure

1. Start MON2020. After starting, the *Connect to GC* window displays.
2. Locate the default *Direct-DHCP* under the *GC Name* column. This GC directory is created automatically when MON2020 is installed. The GC can be renamed, but the IP address that it references, 192.168.135.100, should not be changed.
3. Click the associated **Ethernet** button. MON2020 prompts you to enter a user name and password, after which you will be connected to the GC.

4.3.8 Connecting directly to a PC using the GC's wired Ethernet2 terminal

Connecting to a PC from the GC's wired Ethernet terminal.

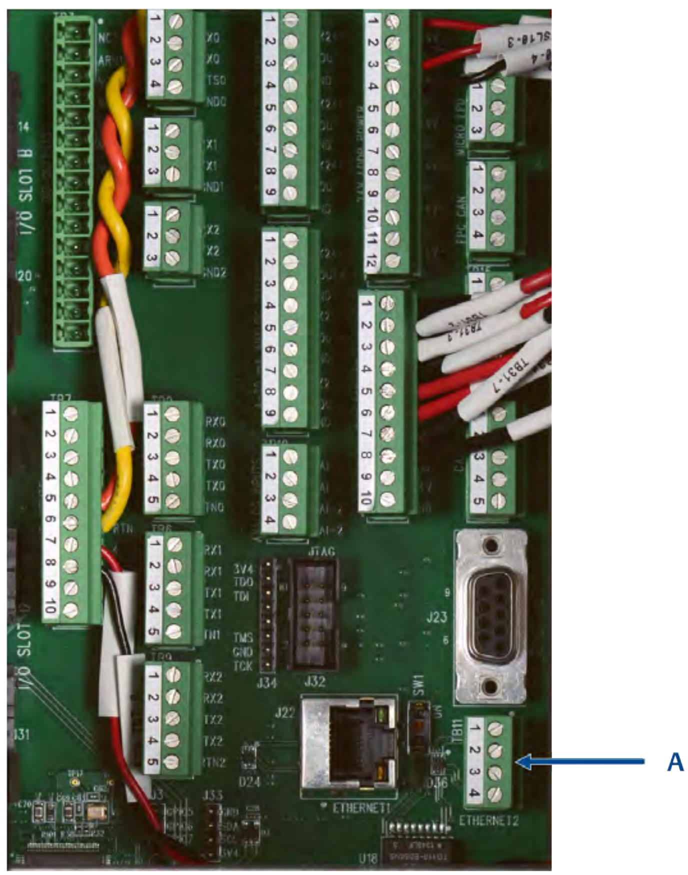
The Rosemount 1500XA has a wired Ethernet2 terminal at TB11 on the backplane that you can connect to with a static IP address. All that is needed is a PC, typically a notebook computer, and a 2-wire, twisted pair, CAT5 Ethernet cable with one of its plugs removed to expose the wires.

Figure 4-10: Crimped CAT5 Cable

Note

The GC can be connected (or remain connected) to the local network on Ethernet2 (TB11) on the backplane while the DHCP feature is being used.

Figure 4-11: Wired Ethernet2 Terminal Block on the Backplane



A. *TB11 four-wire Ethernet2 connector*

Use the following schematics as a guide to wiring the GC via its four wire connector at TB11. *Figure 4-12* shows the traditional wiring scheme. *Figure 4-13* shows how to wire a CAT5 cable without the RJ45 plug.

Figure 4-12: Field Wiring to TB11

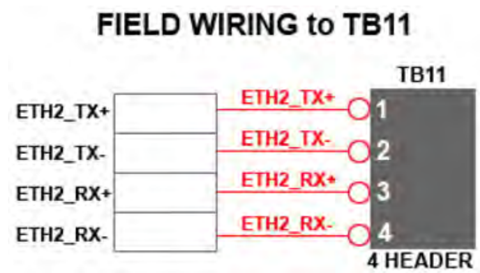
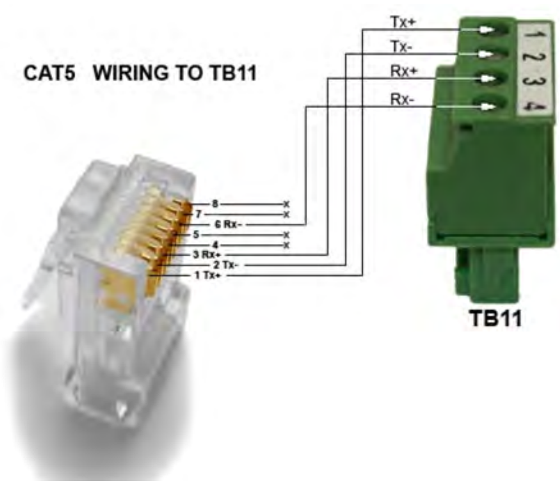


Figure 4-13: CAT5 Wiring to TB11



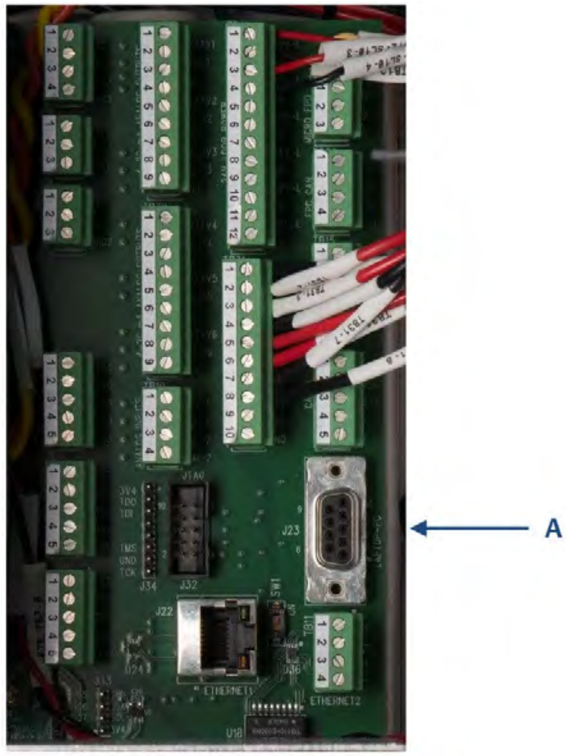
Once you have wired the cable to the Ethernet terminal, plug the other end into a PC or a wall jack. See *Section 4.3.10* to continue configuring the GC.

4.3.9 Connecting directly to a PC using the GC's serial port

Connecting to a PC from the 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 Microsoft® Windows™, a notebook computer, and a straight-through serial cable.

Figure 4-14: J23 Serial Port on the Backplane



A. *Backplane RS-232 serial port*

To set up the PC for the direct connection, do the following:

Procedure

1. Do the following to install the communications cable between two computers:

   a. Navigate to **Start** → **Control Panel** and select the **Phones and Modem Options** icon.

      The Phones and Modem Options dialog displays.

   b. Select the *Modem* tab and click **Add...**.

      The Add Hardware Wizard displays.

   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 appears.

   e. Click **Browse**.

The Browse dialog displays.

f. Navigate to the MON2020 install directory (typically *C:\Program Files (x86)\Emerson Process Management\MON2020*) and select Emerson Direct Connection.inf.

g. Click **Open**.

You will be returned to the Install from Disk dialog.

h. Click **OK**.

You will be returned to the Add Hardware Wizard.

i. Click **Next**.

j. Select an available serial port and click **Next**.

The Hardware Installation dialog displays.

k. Click **Continue Anyway**.

After the driver is installed, you will be returned to the Add Hardware Wizard.

l. Click **Finish**.

You will be returned to the Phones and Modems dialog. The *Emerson Direct Connect* modem should be listed in the Modem column.

2. Start MON2020 and do the following to create a GC connection for the *Emerson Direct Connection* modem:

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

The GC Directory window displays.

b. Select Add from the GC Directory window's **File** menu.

A *New GC* row will be added to the bottom of the table.

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

d. Select the new GC's **Direct** check box.

e. Click the **Direct** button located at the bottom of the GC Directory window.

The Direct Connection Properties window displays.

f. Select Communications cable between two computers (COM n) from the **Port** drop-down list.

Note

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

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

h. Click **OK** to save the settings.

   You will be returned to the GC Directory window.

i. Click **OK** to save the new GC connection and to close the GC Directory window.

3. Connect one end of the 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. Select **Connect...** from the **Chromatograph** menu.

   The Connect to GC window displays.

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

4.3.10 Assigning a static IP address to the GC

To configure the GC with a static IP address, do the following:

Procedure

1. Start MON2020 and log on to GC using a direct Ethernet connection. For more information, refer to *Section 4.3.7*.
2. Select **Application** → **Ethernet ports...**.

   The Ethernet Ports window displays.

3. Depending upon the Ethernet port to which you want to assign a static IP address, do the following:

   a. The Ethernet port at TB11: Enter the appropriate values in the **Ethernet2 IP Address**, the **Ethernet 2 Subnet**, and the **Default Gateway** fields.

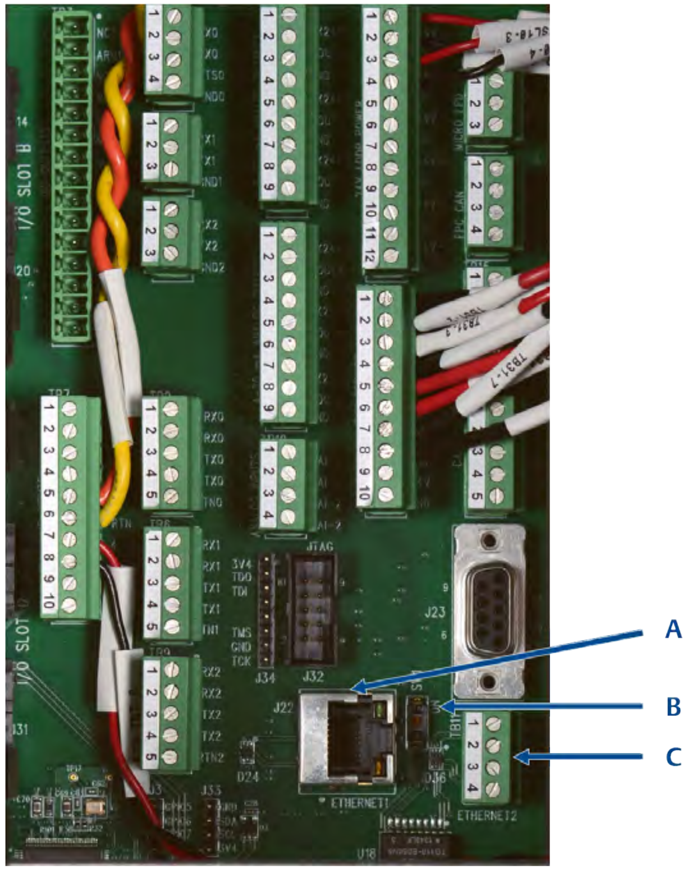
   b. The RJ45 Ethernet port at J22: Enter the appropriate values in the **Ethernet1 IP Address**, the **Ethernet1 Subnet**, and the Default Gateway fields.

   Note
   IP, Subnet, and Gateway addresses can usually be obtained from a member of your IT staff.

   Important
   To configure a Ethernet IP address using the LOI, refer to *Figure B-44* .

4. Click **OK**.
5. Log off the GC.
6. Access the backplane, which is located in the GC's upper enclosure.

Figure 4-15: Port Locations on the Backplane



A. J22 Ethernet 1
B. Switch SW1
C. TB11 Ethernet2

7. If you are setting up a static IP address for the Ethernet1 port at J22, and you also intend to connect to your company's local area network, do the following:

   a. Locate the switch, at SW1 on the backplane.

      SW1 is located between the Ethernet port at J22 and TB11, four-wire connector.

Figure 4-16: SW1 on the Backplane

A. Switch SW1 on the backplane

b. Use a Phoenix screwdriver and move the dip switch to the **OFF** position.

This disables the DHCP server.

8. To connect to the GC, do the following:

   a. Start MON2020 and select **File → GC Directory...**.

      The GC Directory window displays.

   b. Select **Add**, and a new GC profile will be added to the end of table.

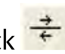
Note

You can name the GC's profile as well as add a short description.

   c. Select the new profile and click **Ethernet...** Enter the GC's static IP address in the *IP address* field.

   d. Click **OK**.

The Ethernet Connection Properties for New GC window closes.

9. Click **Save** to save the new profile.
10. Click **OK** to close the GC Directory window.
11. Select **Chromatograph** → **Connect...** to connect to the GC or click .

    The Connect to GC window displays. The newly created GC profile should be listed in the table.

12. Locate the new GC profile and click the **Ethernet** button that is associated with it.

    The Login window displays.

13. Enter a **User Name** and **User Pin** and click **OK**.

4.3.11 Wiring the discrete digital inputs and outputs

The GC's backplane has five discrete outputs and five discrete inputs.

If more than five digital outputs are required, see *Typical field wiring of a ROC800 DO module* to add the ROC800 Digital Output Module.

Wiring the discrete digital inputs

DANGER!

ELECTRIC SHOCK

The equipment operates using mains voltage that is dangerous to life. Make sure that the circuit breakers are set to OFF, and tagged-off, before opening the electronics enclosure.

Failure to observe this precaution will cause serious personal injury or death.

WARNING!

EXPLOSION HAZARD
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Power must not be restored after enclosure has been opened until enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

Failure to de-energize the analyzer may cause an explosion and severely injure personnel.

To connect digital signal input lines to the GC, See *Appendix G* drawing 9R00004, Sheet 2 and do the following:

Procedure

1. Disconnect power to the analyzer and allow the components to cool for at least five minutes.
2. Open the electronics enclosure door and access the backplane.
3. Make the digital input wiring connections on the backplane at TB7.

Figure 4-17: Digital inputs - TB7 on the Backplane

A

A. TB7 connector

Note

The discrete digital input terminals on the backplane are self-powered. Devices connected to the digital input will be powered by the GC's dedicated isolated 24 V power supply.

Note

The discrete digital input terminals are optically isolated from the GC's other circuitry.

4. Route digital I/O lines away from the sensitive detector lines (on the left side of the backplane) and away from the analog inputs and outputs.

   There are connections for five digital inputs on the backplane at TB7, as indicated in the following table.

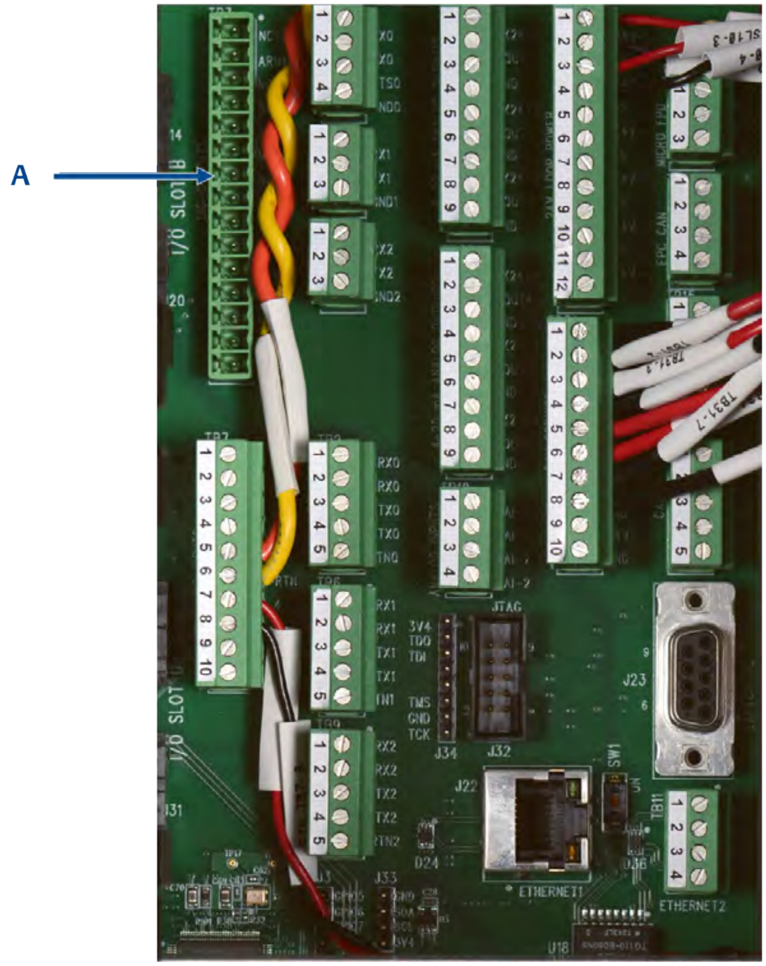
Table 4-3: Discrete Digital Inputs TB7

TB7	Function
Pin 1	DI1
Pin 2	DI-RTN
Pin 3	DI2
Pin 4	DI-RTN
Pin 5	DI3
Pin 6	DI-RTN
Pin 7	DI4
Pin 8	DI-RTN
Pin 9	F_DIG_IN5
Pin 10	DI5

Wiring the discrete digital outputs

The discrete outputs are located on TB3, which is a 15-pin connector, and have five Form-C relays on the back plane. All contact outputs have a rating of 1A at 30 Vdc. Refer to drawing P/N 9R00004 in *Section G.1*.

Figure 4-18: Digital outputs - TB3 on the Backplane



A. TB3 Discrete digital output termination block

Table 4-4 lists the discrete digital output function for each pin on the TB3 connector.

Table 4-4: Discrete Digital Outputs - TB3

TB3	Function
Pin 1	NC1 DIG_OUT NC1
Pin 2	ARM1 DIG_OUT ARM1
Pin 3	NO1 DIG_OUT NO1
Pin 4	NC2 DIG_OUT NC2

Table 4-4: Discrete Digital Outputs - TB3 *(continued)*

TB3	Function
Pin 5	ARM 2 DIG_OUT ARM2
Pin 6	NO2 DIG_OUT NO2
Pin 7	NC3 DIG_OUT NC3
Pin 8	ARM3 DIG_OUT ARM3
Pin 9	NO3 DIG_OUT NO3
Pin 10	NC4 DIG_OUT NC4
Pin 11	ARM4 DIG_OUT ARM4
Pin 12	NO4 DIG_OUT NO4
Pin 13	NC5 DIG_OUT NC5
Pin 14	ARM5 DIG_OUT ARM5
Pin 15	NO5 DIG_OUT NO5

Note

Form-C relays are single-pole double-throw (SPDT) relays that have three positions: normally closed (NC); an intermediate position, also called the *make-before-break* position (ARM); and normally open (NO).

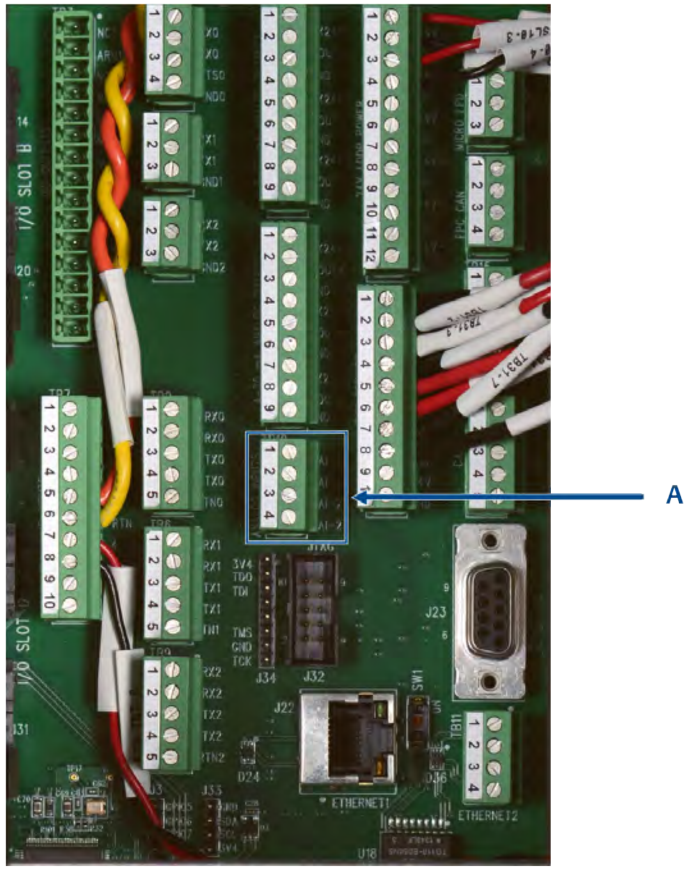
4.3.12 Wiring the analog inputs

All Rosemount 1500XAs have at least two analog inputs. An additional four analog inputs are available with a ROC800 AI-16 card (see *Typical field wiring of a ROC800 DO module*) that can be installed into one of the optional slots in the card cage.

Analog inputs on the backplane

There are two analog input connections on the backplane at TB10.

Figure 4-19: Analog inputs - TB10 on the Backplane



A. TB10

Table 4-5: Analog Inputs TB10

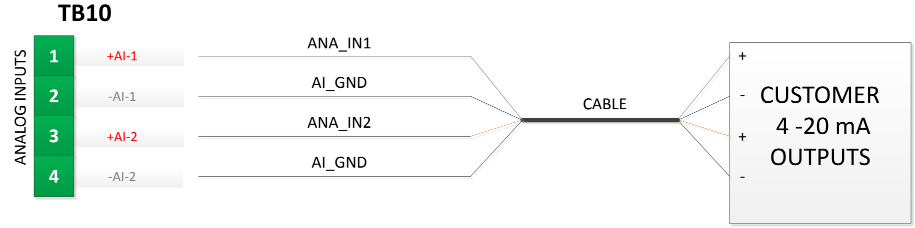
TB10	Function
Pin 1	+AI_1
Pin 2	-AI_1
Pin 3	+AI_2
Pin 4	-AI_2

Analog inputs settings

Figure 4-20 shows how to wire two analog inputs (TB10).

These analog inputs are set to accept a current (4-20 mA) source.

Figure 4-20: Customer Wiring for Analog Inputs



Selecting the input type for an analog input

An analog input can be set to either voltage (0-10 V) or current (4-20 mA) accessed from the MON2020 **Hardware | Analog Inputs** menu.

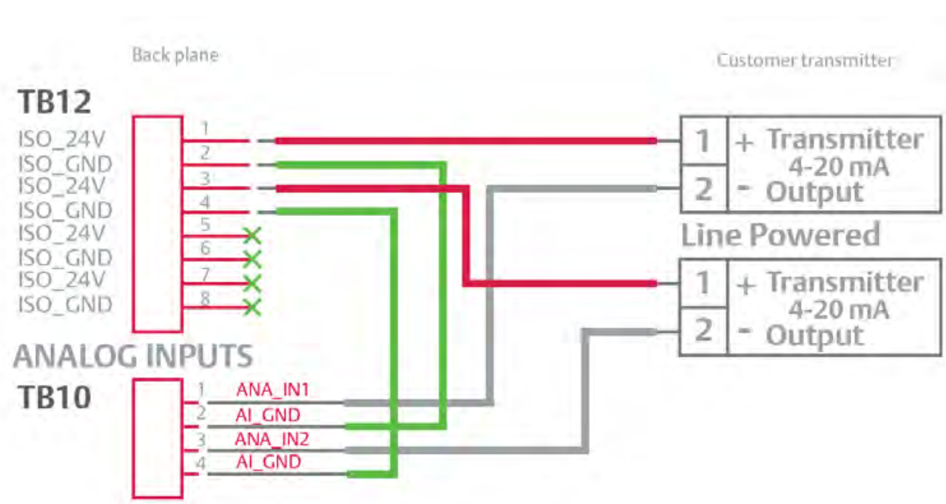
Procedure

1. Start MON2020 and connect to the GC.
2. Select **Hardware** → **Analog Inputs...**. The Analog Inputs window displays.
3. Click **Save** to save the changes and keep the window open, or click **OK** to save the changes and close the window.

Typical wiring for line-powered transmitters

The following drawing shows the most common wiring plan for supplying power to two 4-20 mA transmitters, such as pressure sensor transmitters.

Figure 4-21: Typical Wiring for Line-Powered Transmitters



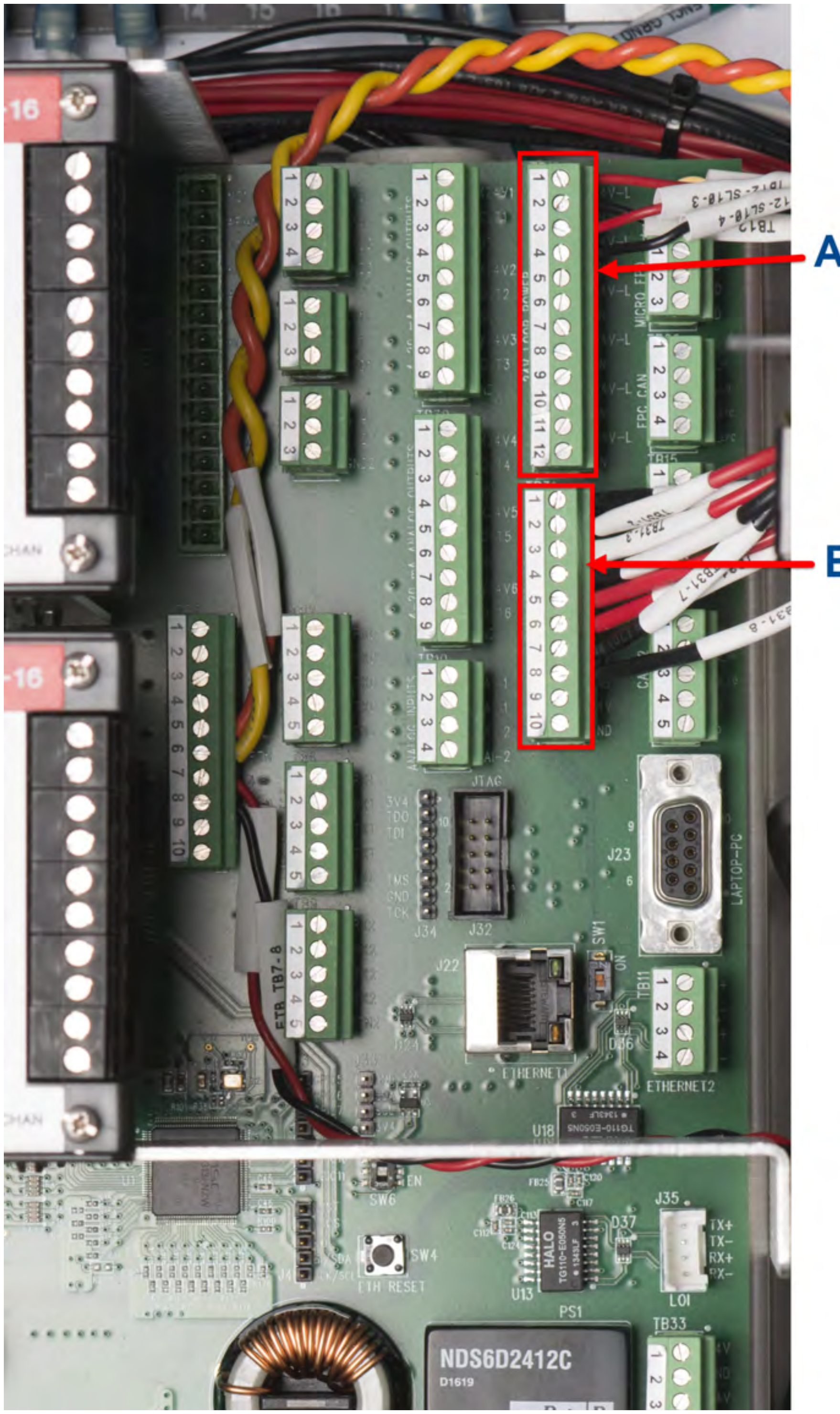
4.3.13 Analog output wiring

The Rosemount 1500XA has at least six analog outputs. An additional four analog inputs are available with an ROC800 AO card that can be installed into one of the optional slots in the card cage.

Analog outputs on the backplane

There are six analog output connections on the backplane at TB4 and TB30.

Figure 4-22: Analog Outputs TB4 and TB30



A. TB4
B. TB30

Table 4-6: Analog Outputs - Backplane TB4 24 V External Power

TB4	Function
Pin1	EXT_PWR_1
Pin2	4-20mA_1+
Pin3	GND
Pin4	EXT_PWR_2
Pin5	4-20mA_2+
Pin6	GND
Pin7	EXT_PWR_3
Pin8	4-20mA_3+
Pin9	GND

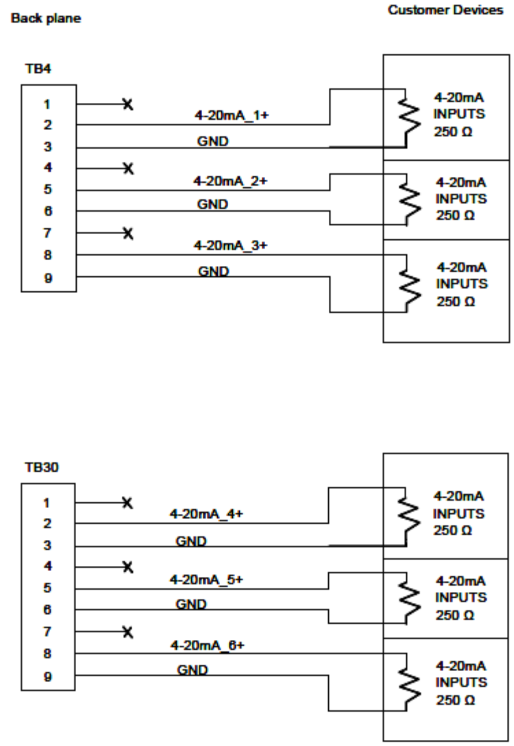
Table 4-7: Analog Outputs - Backplane TB30 24 V External Power

TB30	Function
Pin1	EXT_PWR_4
Pin2	4-20mA_4+
Pin3	GND
Pin4	EXT_PWR_5
Pin5	4-20mA_5+
Pin6	GND
Pin7	EXT_PWR_6
Pin8	4-20mA_6+
Pin9	GND

Factory settings for analog outputs

This drawing shows how to wire up to six devices to the analog outputs that are located on the backplane.

Figure 4-23: Wiring for Six Analog Outputs (Powered Internally)



Wiring for customer externally-powered analog outputs

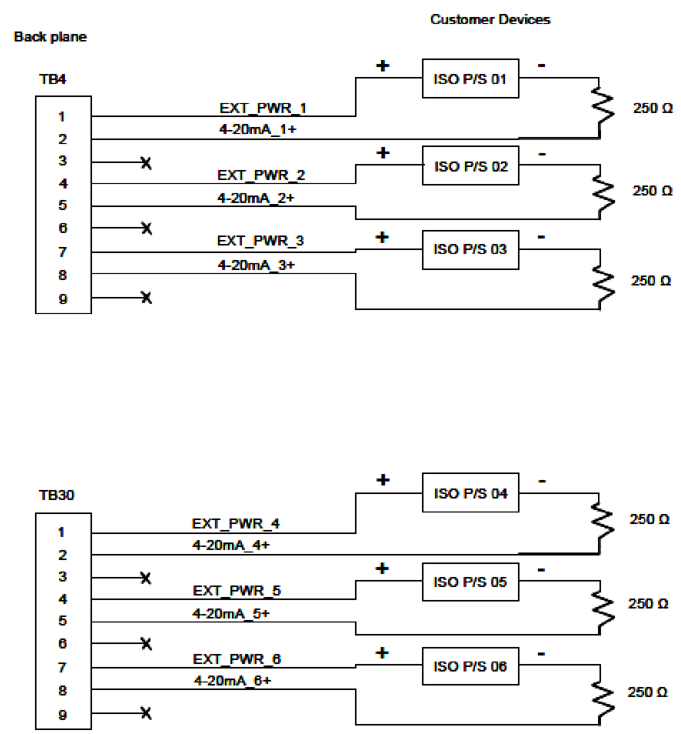
It is possible to furnish power to each analog output while maintaining isolation between channels.

Consult the following diagrams before wiring a customer-powered device:

Procedure

1. Use this drawing to provide power wiring to each analog output while maintaining isolation between channels.

Figure 4-24: TB4 Wiring for Customer-Powered Analog Outputs



2. *Figure 4-24* shows the settings for the analog outputs connections, located on the backplane, that are necessary to provide power to each analog output while maintaining isolation between channels.

   Refer to *Table 4-8* and *Table 4-9* for External 24 V loop power.

Table 4-8: Analog Outputs - Backplane TB4 24 V External Power

TB4	Function
Pin1	EXT_PWR_1
Pin2	4-20mA_1+
Pin3	GND
Pin4	EXT_PWR_2
Pin5	4-20mA_2+
Pin6	GND
Pin7	EXT_PWR_3
Pin8	4-20mA_3+
Pin9	GND

Table 4-9: Analog Outputs - Backplane TB30 24 V External Power

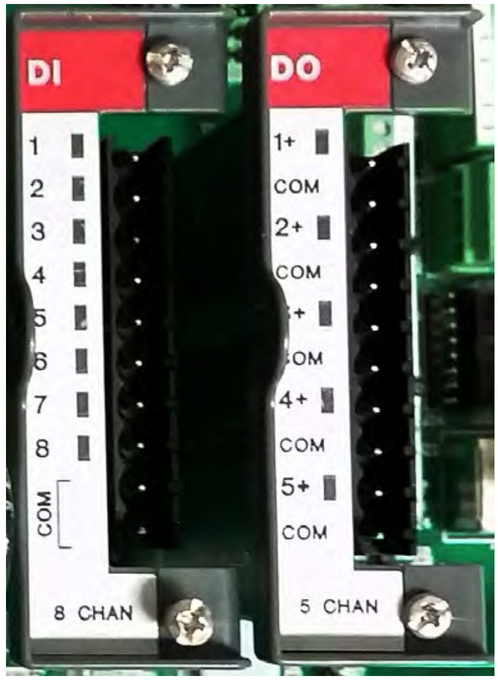
TB30	Function
Pin1	EXT_PWR_4
Pin2	4-20mA_4+
Pin3	GND
Pin4	EXT_PWR_5
Pin5	4-20mA_5+
Pin6	GND
Pin7	EXT_PWR_6
Pin8	4-20mA_6+
Pin9	GND

4.3.14 Optional digital and analog inputs and outputs

Optional discrete digital inputs

When plugged into one of the optional card slots in the card cage, the Emerson ROC800 DI card provides eight additional discrete digital inputs. The discrete digital inputs can monitor the status of relays, open-collector or open-drain type solid-state switches, and other two-state devices. For more information, see *ROC800-Series Discrete Input Module* at Emerson's *ROC 800-Series* web site at *Emerson.com/ROC800-Series*

Figure 4-25: Optional Digital I/O Modules



Typical field wiring of a ROC800 DI module

To connect the ROC800 DI module to a field device, do the following:

Procedure

1. Expose the end of the wire to a maximum length of ¼ in. (6.3 mm).

Note

Twisted-pair cables are recommended for I/O signal wiring. The module's terminal blocks accept wire sizes between 12 and 22 AWG. Allow some slack when making connections to prevent strain.

CAUTION!

ELECTRICAL HAZARD

Allow only a minimum exposure of bare wires to prevent short circuits.

Failure to do so may cause a short circuit and damage equipment.

2. Insert the exposed end into the clamp beneath the termination screw.
3. Tighten the screw.

Figure 4-26: Typical Wiring

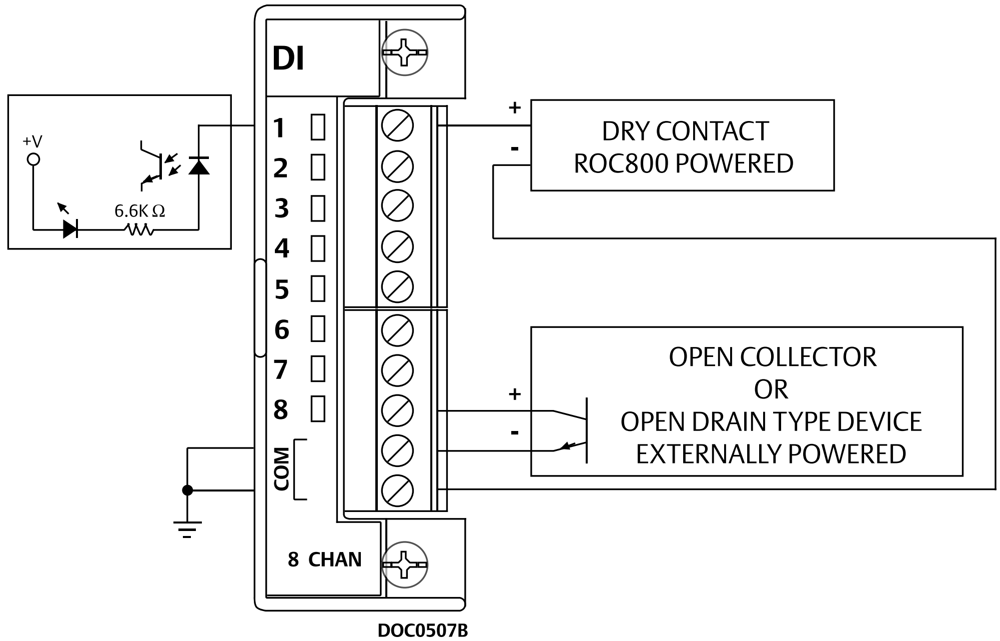
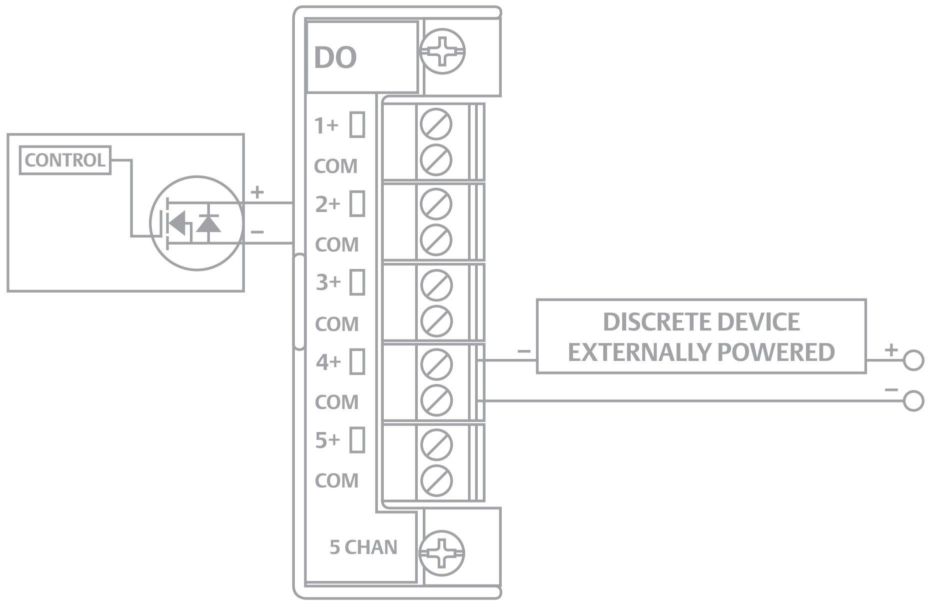


Table 4-10: ROC800 Discrete digital wiring

Terminal	Label	Definition
1	1	CH 1 Positive
2	2	CH 2 Positive
3	3	CH 3 Positive
4	4	CH 4 Positive
5	5	CH 5 Positive
6	6	CH 6 Positive
7	7	CH 7 Positive
8	8	CH 8 Positive
9	COM	Common
10	COM	Common

Typical field wiring of a ROC800 DO module

Figure 4-27: ROC800 Discrete Digital Output Wiring



Terminal	Label	Definition
1	1+	Positive discrete output
2	COM	Discrete output return
3	2+	Positive discrete output
4	COM	Discrete output return
5	3+	Positive discrete output
6	COM	Discrete output return
7	4+	Positive discrete output
8	COM	Discrete output return
9	5+	Positive discrete output
10	COM	Discrete output return

To connect the ROC800 DO module to a field device, do the following:

Procedure

1. Expose the end of the wire to a maximum length of ¼ in. (6.3 mm).

Note

Twisted-pair cables are recommended for I/O signal wiring. The module's terminal blocks accept wire sizes between 12 and 22 AWG. Allow some slack when making connections to prevent strain.

CAUTION!

ELECTRICAL HAZARD

Allow only a minimum exposure of bare wires to prevent short circuits.

Failure to do so may cause a short circuit and damage equipment .

2. Insert the exposed end into the clamp beneath the termination screw.
3. Tighten the screw.

Optional analog inputs

When plugged into one of the optional card slots on the card cage, the ROC800 AI-16 card provides four additional analog inputs. The AI channels are scalable, but are typically used to measure either a 4-20 mA analog signal or a 1-5 V dc signal. If required, the low end of the AI module's analog signal can be calibrated to zero. For more information, see *Analog Input Modules (ROC800-Series)* at *Emerson's ROC 800-Series* website.

Figure 4-28: Optional Analog Expansion Card Slots

A. Optional I/O expansion card slots

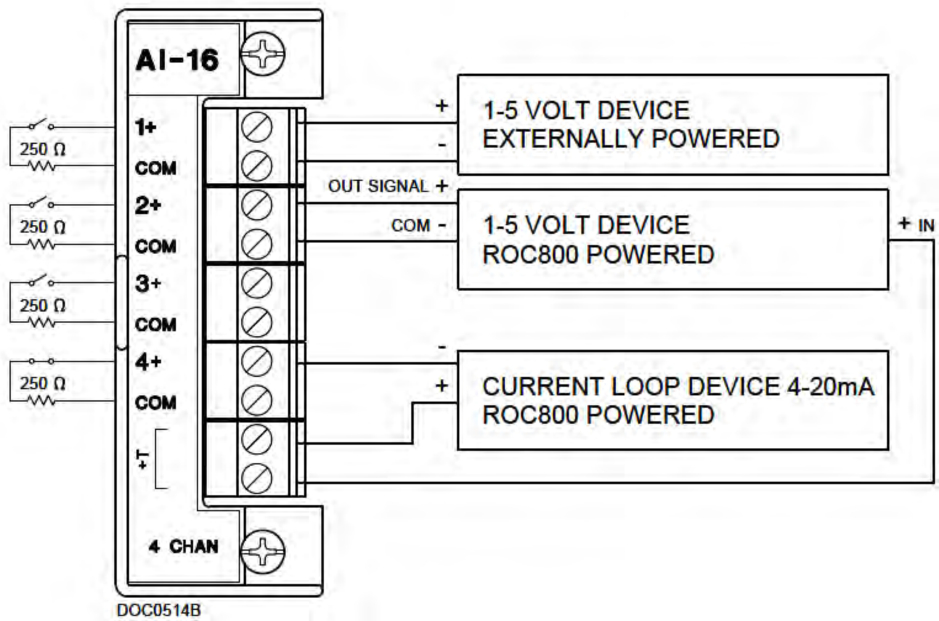
Typical field wiring of a ROC800 AI-16 module

CAUTION!

ELECTROSTATIC DISCHARGE (ESD) HAZARD

Operators and technicians must wear an electrostatic wrist strap when handling printed circuit cards to prevent shorting the boards through static electricity.

Figure 4-29: Typical ROC800 Wiring



To connect the ROC800 AI-16 module to a device, do the following:

Procedure

1. Expose the end of the wire to a maximum length of ¼ in. (6.3 mm).

Note

Twisted-pair cables are recommended for I/O signal wiring. The module's terminal blocks accept wire sizes between 12 and 22 AWG. Allow some slack when making connections to prevent strain.

CAUTION!

ELECTRICAL HAZARD

Allow only a minimum exposure of bare wires to prevent short circuits.

Failure to do so may cause a short circuit and damage equipment.

2. Insert the exposed end into the clamp beneath the termination screw.
3. Tighten the screw.

There are two dip switches on the terminal block side of the module that can be used to set a 250 Ω resistor in or out of circuit for each analog input.

To put an analog input's resistor *in circuit*, flip the appropriate dip switch to I; to put an analog input's resistor *out of circuit*, flip the appropriate dip switch to V.

Calibrating a ROC800 AI-16 module

To calibrate the ROC800 AI-16 module you must have a PC with the *ROCLINK™ 800 Configuration* software installed and open.

See *Emerson's ROC 800-Series* for details, downloads and manuals.

Procedure

1. Select the **Configure** → **I/O** → **RTD Points** → **Calibration** tab.
2. Select an analog input.
3. Click **Update** to request one value update from the input.
4. Click **Freeze** to stop the values of the input from being updated during calibration.

> **Note**
> If you are calibrating a temperature input, disconnect the RTD sensor and connect a decade box or comparable equipment to the RTD terminals of the ROC card.

5. Click **Calibrate**.
6. Enter a value for **Set Zero** after stabilization.
7. Enter a value for **Set Span** after stabilization.
8. Enter values for up to three **Midpoints** one at a time or click **Done** if you are not configuring midpoints.
9. Click **OK** to close the main calibration window and unfreeze the associated inputs. To calibrate the inputs for another analog input, return to *Step 1*.

Optional analog outputs

When plugged into one of the optional card slots on the card cage, the ROC800 AO card provides four additional analog outputs. Each channel provides a 4 to 20 mA current signal for controlling analog current loop devices. For more information, see *Emerson's ROC 800-Series* at Emerson Process Management's ROC 800-Series website.

Typical field wiring of a ROC800 AO module

Procedure

1. Expose the end of the wire to a maximum length of ¼ in. (6.3 mm).

> **Note**
> Twisted-pair cables are recommended for I/O signal wiring. The module's terminal blocks accept wire sizes between 12 and 22 AWG. A minimum of bare wire should be exposed to prevent short circuits. Allow some slack when making connections to prevent strain.

2. Insert the exposed end into the clamp beneath the termination screw.
3. Tighten the screw.
4. Close the electronics enclosure door and apply power to the GC.

5. Run MON2020 and connect to the GC.

4.4 Leak checking and purging for first calibration

CAUTION!

EQUIPMENT DAMAGE

Make sure all tubing is clean and dry internally. Prior to installation, blow the tubing free of internal moisture, dust, or other contaminants.

Failure to clean and dry the tubing may compromise the integrity of the analyzer/or warranty.

Verify that all electrical connections are correct and safe and then turn the unit on.

4.4.1 Checking the GC for leaks

Leak checking carrier and calibration gas lines requires power and a PC connected to the GC.

Note

Refer to the analyzer's drawing documentation package that shipped with the GC for leak checking and identifying vents.

The GC and fittings were factory tested for leaks prior to shipment.

To perform a leak check, do the following:

Procedure

1. Plug the measure vent (labeled *MV*) vent line if it is open.

   Leave the *SV* or sample vent line open or unplugged).
2. Slowly pressurize each line in turn; then block-in the line, making sure the pressure holds.

   For example, the carrier gas line should be slowly brought up to 110 psig (± 2%) with the dual-stage regulator at the carrier gas cylinder.
3. After two minutes, shut the carrier gas bottle valve and observe the high side regulator gauge on the carrier gas bottle.

   a. The gauge should not bleed down more than 115 psig in ten minutes.
   b. If helium is lost at a faster rate, leaks are usually found between the carrier gas bottle and the analyzer. Check and tighten all connections, as well as the dual-stage regulator.
4. When the leak check is complete, reopen the helium bottle valve. Remove the plug from the MV line.
5. Shut the metering valve below the rotameter on the front of the flow panel.

The metering valve is left shut for now, but will be reopened later during initial purging and the analyzer's first calibration.

6. Repeat the procedure with sample gas and stream gas.

Note
Do not use a liquid leak detector such as Snoop® on the valves or components in the oven.

Note
Refer to the *Flow Configuration* schematic in the documentation packet that shipped with the GC for detailed instructions to plug the FID vents.

4.4.2 Purging carrier gas lines

Use this procedure to purge the carrier gas lines.

Purging carrier and calibration gas lines requires power and a PC connected to the GC.

To purge the carrier gas lines, do the following:

Procedure

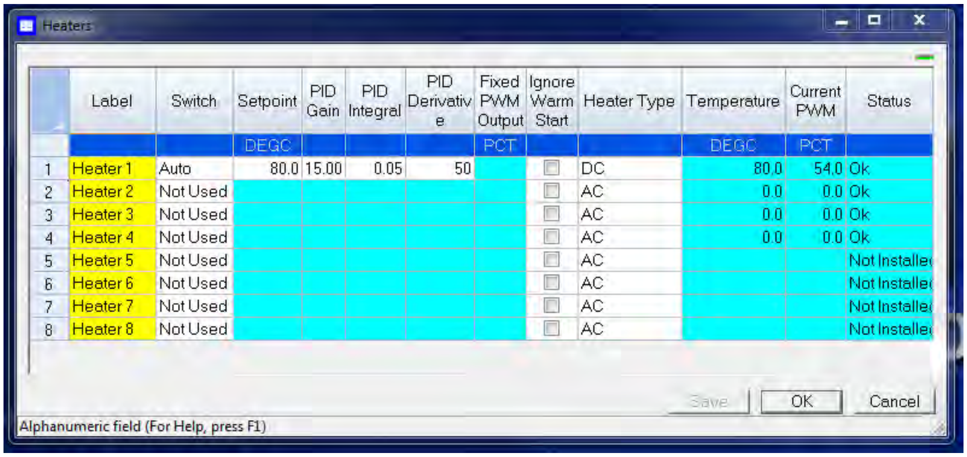
1. Ensure that the vent line plugs have been removed, and the vent lines are open.
2. Ensure that the carrier gas bottle valve is open.
3. Set the *GC side* of the carrier gas to 115 psig.
4. Turn on the GC and the PC.
5. Start MON2020 and connect to the GC.

NOTICE

Consult the *MON2020 Software for Gas Chromatograph* manual for information about connecting to a GC.

6. Select the **Hardware** → **Heaters...** menu. The Heaters window displays.

Figure 4-30: Heaters Window



	Label	Switch	Setpoint	PID Gain	PID Integral	PID Derivative	Fixed PWM Output	Ignore Warm Start	Heater Type	Temperature	Current PWM	Status
			DEGC				PCT			DEGC	PCT	
1	Heater 1	Auto	80.0	15.00	0.05	50		☐	DC	80.0	54.0	Ok
2	Heater 2	Not Used						☐	AC	0.0	0.0	Ok
3	Heater 3	Not Used						☐	AC	0.0	0.0	Ok
4	Heater 4	Not Used						☐	AC	0.0	0.0	Ok
5	Heater 5	Not Used						☐	AC			Not Installe
6	Heater 6	Not Used						☐	AC			Not Installe
7	Heater 7	Not Used						☐	AC			Not Installe
8	Heater 8	Not Used						☐	AC			Not Installe

7. Allow the GC system temperature to stabilize and the carrier gas lines to become fully purged with carrier gas, which usually takes at least an hour.

   The temperature values for the heaters should indicate that the unit is warming up.

   The **Status** column displays `OK`.

8. Select **Control → Auto Sequence...**.

   For more information about this function, refer to the *MON2020 Software for Gas Chromatographs* manual.

Note

Step 6 through *Step 8* may be performed using the LOI.

Important

A continuous operation without sample gas for a period of four to eight hours (or overnight) is recommended, during which no changes should be made to the settings described in *Step 1* through *7*.

4.4.3 Purging calibration gas lines

Use this procedure to purge the calibration gas lines.

Purging carrier and calibration gas lines requires power and a PC connected to the GC.

To purge the calibration gas lines, do the following:

Procedure

1. Ensure that the carrier gas lines have been fully purged and that the sample vent plugs have been removed.
2. Close the calibration gas bottle valve.

3. Fully open the block valve associated with the calibration gas feed. Refer to the *MON2020 Software for Gas Chromatographs* manual for instructions on selecting streams.
4. Open the calibration gas bottle valve.
5. Increase the outlet pressure to 15 psig, plus or minus 5 percent, at the calibration gas bottle regulator.
6. Close the calibration gas bottle valve.
7. Let both gauges on the calibration gas bottle valve bleed down to 0 psig.
8. Repeat *Step 4* through *Step 7*, five times.
9. Open the calibration gas bottle valve.

Note

This applies to vapor calibration standard.

WARNING!

Observe all safety precautions defined in the calibration gas Safety Data Sheet (SDS)., especially for hazardous locations.

Failure to follow the safety instructions may cause injury to personnel.

4.5 System startup

Use this procedure to perform a system startup.

1. For system startup, run a *Single-Stream* analysis of the calibration gas.

   a. Verify the calibration stream is set to *Auto*.

   a. Use MON2020 to run a single stream analysis on the calibration stream. Once proper operation of the GC is verified, halt the analysis by selecting Control → Halt....

   Note

   Example - use the MON2020 → Control → Single Stream → Calibrate menu path and select the associated analysis stream.

   Unless stated otherwise in the product documentation, ensure that the pressure of the calibration and sample line is regulated at 10 to 30 psig (15 psig is recommended).

   b. Validate calibration gas and retention times and run a manual calibration.

   c. Use MON2020 → Application → Component Data... menu path and select the associated stream. Check the Component Data table for calibration gas validation information and retention times.

   d. Use MON2020 → Control → Calibration... menu path and select the analysis stream to run a manual calibration. Select the Purge stream for 60 seconds checkbox and Normal calibration type radio button; then click OK.

Refer to the *MON2020 Software for Gas Chromatographs* manual for more information.

2. Select **Control** → **Auto Sequence...** to start auto sequencing of the line gas stream(s).

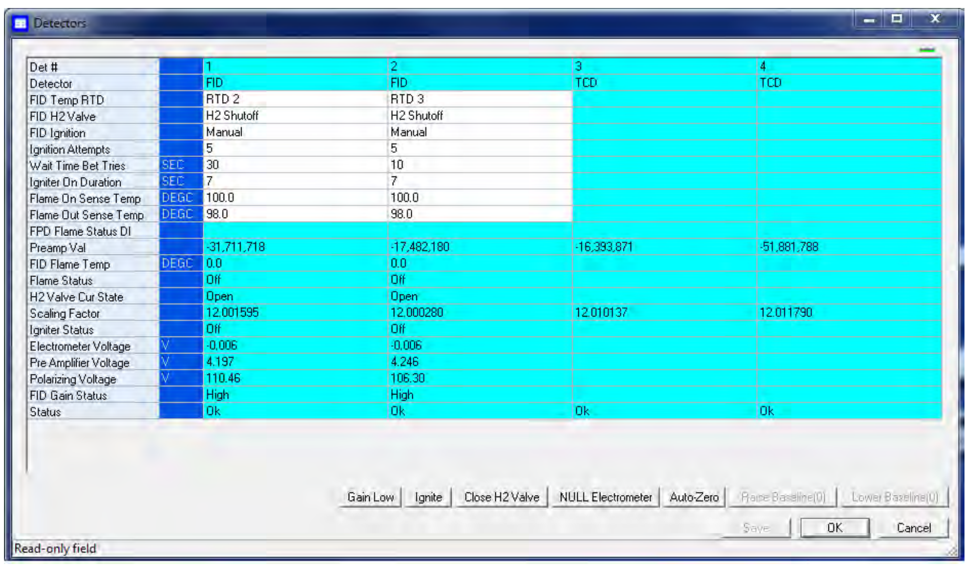
   Refer to the *MON2020 Software for Gas Chromatographs* manual for more information.

   The GC will begin the auto sequence analysis.

4.5.1 FID configuration

When connected to the GC via MON2020, select **Hardware** → **Detectors** menu to access the Detectors dialog. Refer to the *MON2020 Software User Manual* for additional configuration details.

Figure 4-31: MON2020 - Detectors Window



Halt the analysis: **Control** → **Halt (F3)**.

Configure the following fields from the Detectors dialog:

- FID Ignition - Manual or Automatic
- Ignition Attempts
- Wait Time Bet (between) Tries
- Igniter On duration
- Flame On Sense Temp
- Flame Out Sense Temp
- Electrometer Voltage

Note
If the FID does not appear in the Detectors window your GC may not be fitted with an FID.

5 Maintaining and troubleshooting the gas chromatograph

5.1 Maintenance and repairs in hazardous environments

DANGER!

SAFETY PRECAUTIONS

Observe all precautionary signs posted on the Rosemount™ 1500XA. Failure to do so can result in injury or death to personnel.

Observe and follow all safety precautions and warnings before performing maintenance or equipment repairs.

The Rosemount 1500XA enclosure is rated for a general purpose area and is certified by CSA for Class I Division 2 Groups B, C, and D locations with a Type Z purge controller.

WARNING!

EXPLOSION HAZARD
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Power must not be restored after enclosure has been opened until enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

Failure to de-energize the analyzer may cause an explosion and severely injure personnel.

Before opening the GC, reduce the risk of igniting hazardous atmospheres by disconnecting the equipment from all power sources. Keep the assembly closed tightly when in operation to reduce the risk of igniting hazardous atmospheres.

Incoming inlet wiring must meet local standards (i.e. in conduit with seal fitting within 18 in. or via cable glands). Seal all unused entries with blanks.

Please direct all health, safety, and certification related questions to your Emerson Customer Care representative.

5.2 Troubleshooting and repair concept

The most efficient method for maintaining and repairing the Rosemount 1500XA is a component-replacement concept that allows you to return the system to operation as quickly as possible. Sources of trouble, such as printed-circuit assemblies, valves, etc., are identified during troubleshooting test procedures and should be replaced with units in known good working order.

5.3 Routine maintenance

The Rosemount 1500XA will perform accurately for long periods with very little attention (except for maintaining the carrier gas cylinders). A bi-monthly record of certain parameters will greatly assist in assuring that the Rosemount 1500XA is operating to specifications. The maintenance checklist should be filled out bi-monthly, dated, and kept on file for access by maintenance technicians as necessary. This gives a historical record of the operation of the Rosemount 1500XA, enables a maintenance technician to schedule replacement of gas cylinders at a convenient time, and allows quick troubleshooting and repair when necessary.

A diagnostic file, which contains calibration and analysis chromatograms, alarm and event logs, analysis reports, and the complete configuration file, should also be made and filed with the checklist, furnishing a positive dated record of the Rosemount 1500XA. The chromatograms and reports can also be compared to the chromatograms and reports run during the troubleshooting process.

Before contacting Customer Care, connect to your GC and save the diagnostics data file. From the **MON2020 → Tools → Save Diagnostic Data...** menu, save the diagnostic data file.

MON2020 prompts you to send an email to Customer Care (at *gc.csc@emerson.com*) with the diagnostic data file.

5.3.1 Maintenance checklist

Print the sample maintenance checklist on the following page as necessary for your files. If you have a problem, please complete the checklist first and have the results available, as well as the sales order number, when calling your Emerson Customer Care representative for technical assistance. The sales order number can be found on the nameplate located on the front of the Rosemount 1500XA. The chromatograms and reports archived when your GC left the factory are filed by this number.

Note

To find the default measurements for the parameters on the checklist, use MON2020 to view the GC's Parameter List.

MAINTENANCE CHECKLIST

Date Performed: ________________ Sales Order Number: ________________

System Parameters	As Found	As Left
Carrier Gas Cylinder		
Cylinder Pressure Reading (High)	_____ psig	_____ psig
Cylinder Pressure Outlet Reading	_____ psig	_____ psig
Cylinder Pressure Panel Regulator	_____ psig	_____ psig
Sample System		
Sample Line Pressure(s)	(1)_____ psig	_____ psig
	(2)_____ psig	_____ psig
	(3)_____ psig	_____ psig
	(4)_____ psig	_____ psig
	(5)_____ psig	_____ psig
Sample Flows	(1)___ cc/min	___ cc/min
Sample Vent 1 (SV1)	(2)___ cc/min	___ cc/min
Sample Vent 2 (SV2)	(3)___ cc/min	___ cc/min
	(4)___ cc/min	___ cc/min
	(5)___ cc/min	___ cc/min
Calibration Gas		
High Pressure Reading	_____ psig	_____ psig
Outlet Pressure Reading	_____ psig	_____ psig
Flow	___ cc/min	___ cc/min

5.3.2 Routine maintenance procedures

At least bi-monthly, create and save a diagnostic data file and check carrier and calibration gas supplies.

Diagnostic data file

The diagnostic data file is a small data file that contains the last chromatogram from each stream, the final calibration chromatogram, calibration reports, validation reports, protected chromatograms, the maintenance log, and the event log. To create the diagnostic data file in MON2020, go to **Tools → Save Diagnostic Data...** and save the file to your computer.

5.3.3 Service programs

Rosemount Lifecycle Services offers maintenance service programs that are tailored to fit specific requirements. Contracts for service and repair can be arranged by contacting Lifecycle Services at the address or telephone number on the back of this manual or visiting the website at: *Lifecycle Services*

5.4 Access to GC components

Review *Section 2.5* to familiarize yourself with the locations and placement of the GC's core components.

5.5 Precautions for handling PC assemblies

Printed circuit assemblies contain CMOS integrated circuits, which can be damaged if the assemblies are not properly handled.

CAUTION!

ELECTROSTATIC DISCHARGE (ESD) HAZARD

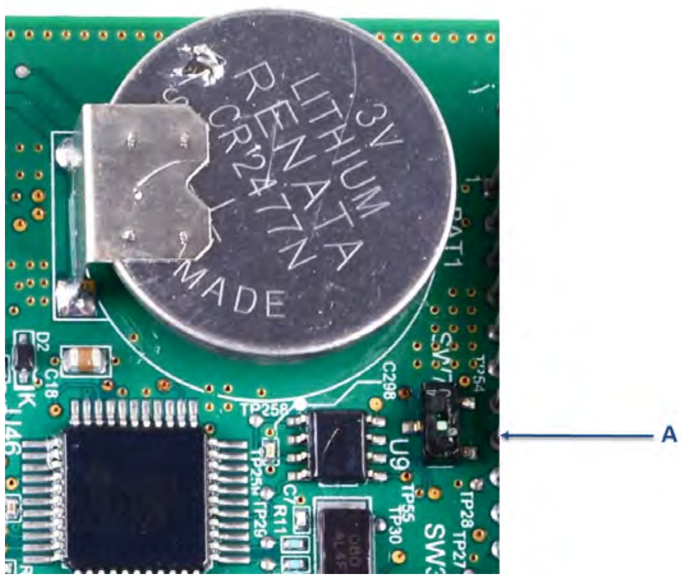
Operators and technicians must wear an electrostatic wrist strap when handling printed circuit cards to prevent shorting the boards through static electricity.

The following precautions must be observed when working with the assemblies:

- Do not install or remove the printed circuit assemblies while power is applied to the units.
- Keep electrical components and assemblies in their protective (conductive) carriers or wrapping until ready for use.
- Use the protective carrier as a glove when installing or removing printed circuit assemblies.

- Wear an ESD wrist strap to prevent static discharge when installing or removing printed circuit assemblies.

Figure 5-1: SW7 on the CPU board



A. SW7 switch (ON is towards the dot.)

5.6 General troubleshooting

This section contains general troubleshooting information for the Rosemount 1500XA. The information is arranged either by major subsystems or by major functions of the instrument. Refer to *Section 5.6.1* for frequent causes of hardware alarms.

Note

Correct ALL alarms before re-calibration.

5.6.1 Hardware alarms

Use the following table to identify the alarm and possible cause and solution for the problem.

Alarm name	Possible causes/solution
LTLOI Failure	Recommended actions: 1. Power the GC down completely. 2. Check that the LOI board ribbon cable is correctly terminated at J6 on the backplane board at one end and on the LOI board at the other end. 3. Power up the GC. 4. If message appears again, replace the LOI board.
Maintenance Mode	A technician has put the GC into *Maintenance* mode for servicing. To disable *Maintenance* mode, deselect the Maintenance Mode check box in the System dialog.
Power Failure	The GC has experienced a restart, caused by power failure, since alarms were last cleared. The GC automatically starts in *Warm Start* mode. During *Warm Start* mode, the GC does the following: 1. Waits for the heaters to stabilize. 2. Purges the sample loop. 3. Actuates the valves for two cycles. After completing these actions, the GC switches to auto-sequence mode.
User Calculation Failure	One or more errors were detected while parsing a user-defined calculation. This usually happens when a user-defined calculation attempts to use a system variable that does not exist. Recommended action: Fix the calculation that is referring to the undefined system variable.
Low Battery Voltage	A low battery voltage has been detected on the CPU board. Replace the CPU board immediately to avoid losing GC configuration data. Recommended actions: 1. Save the diagnostic data file (on MON2020, go to **Tools → Save Diagnostic Data...**). 2. Power down the GC. 3. Check SW7 on the CPU board is in the **ON** position. 4. Replace the CPU Board. 5. Restore Configuration back to the GC. In MON2020, go to **File → Restore Configuration to GC...** .
Preamp Board 1 Comm Failure(1)	Preamp board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot (Preamp1) on the backplane. 3. Power up the GC. 4. If message appears again, replace the preamp board.

Alarm name	Possible causes/solution
Preamp Board 2 Comm Failure	Preamp board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot (Preamp2) on the backplane. 3. Power up the GC. 4. If message appears again, replace the preamp board.
Preamp Board 3 Comm Failure	Preamp board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot (Preamp3) on the backplane. 3. Power up the GC. 4. If message appears again, replace the heater/solenoid board.
Heater Solenoid Board 1 Comm Failure	Heater/Solenoid board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot (Heater Solenoid 1) on the backplane. 3. Power up the GC. 4. If message appears again, replace the heater/solenoid board.
Heater Solenoid Board 2 Comm Failure	Heater/Solenoid board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot (Heater Solenoid 2) on the backplane. 3. Power up the GC. 4. If message appears again, replace the heater/solenoid board.
BaseIO Board Comm Failure	Base I/O (Multifunction I/O) board not detected. Recommended actions: 1. Power the GC down completely. 2. Check that the board is properly seated in the correct slot on the backplane. 3. Power up the GC. 4. If message appears again, replace the Base IO board.
Stream Skipped • <Analysis 1 Label> Stream Skipped • <Analysis 2 Label> Stream Skipped • <Analysis 3 Label> Stream Skipped • <Analysis 4 Label> Stream Skipped	One or more streams in the stream sequence cannot be analyzed because their *Usage* option is set to **Unused**. <Analysis *n* Label> added for concurrent analysis configurations. Recommended actions: 1. Use MON2020 to do one of the following: 2. Remove the unused stream(s) from the stream sequence. 3. Change the *Usage* option of the stream(s) in the Streams dialog to something other than **Unused**.

Alarm name	Possible causes/solution
GC Idle • <Analysis 1 Label> GC Idle • <Analysis 2 Label> GC Idle • <Analysis 3 Label> GC Idle • <Analysis 4 Label> GC Idle	The GC has been placed in Idle mode and is not running an analysis. <Analysis *n* Label> added for concurrent analysis configurations.
Warm Start Failed • <Analysis 1 Label> Warm Start Failed • <Analysis 2 Label> Warm Start Failed • <Analysis 3 Label> Warm Start Failed • <Analysis 4 Label> Warm Start Failed	The GC failed to achieve desired operating condition after power up. Unable to regulate heater zone temperature(s). <Analysis *n* Label> added for Concurrent Analysis configurations. Recommended actions: 1. Check heater settings in MON2020 or the LOI. 2. Check that the carrier gas cylinder pressure is 10 psi (or greater) above the mechanical regulator set point. 3. Confirm that carrier cylinder has flow to the GC. 4. Check for leaks in the carrier gas sample path. 5. Confirm that RTDs are not open. 6. If necessary, replace RTD(s), heater(s) and/or regulator(s).
Heater 1 Out Of Range Heater 2 Out Of Range Heater 3 Out Of Range Heater 4 Out Of Range Heater 5 Out Of Range Heater 6 Out Of Range Heater 7 Out Of Range Heater 8 Out Of Range	The GC failed to regulate heater zone temperatures for the indicated heater to within preset limits. Recommended actions: 1. Check temperatures within the GC, using MON2020 or the LOI. Be aware that the GC may generate this alarm during start up or if the set point has been changed. 2. Check wiring, looking for splits or loose connections at the termination board (for both the heaters and the RTDs). 3. If necessary, replace the defective heater and/or RTD.

Alarm name	Possible causes/solution
Flame Out • Detector 1 Flameout • Detector 2 Flameout	The FID flame will not light or has extinguished. If the FID is out, follow the steps below. Recommended actions: 1. Use the LOI or MON2020 to ignite the FID. 2. If unable to sustain the flame, confirm that both fuel and air cylinders are connected and contain sufficient pressure. 3. Confirm that fuel and air set points are set to achieve factory-desired mixture. 4. Confirm that there is no blockage at the FID exhaust outlet - such as a cap or ice. 5. Check that the wiring connections are secure for the FID, both on the FID cap and at the termination board. 6. If necessary, replace the FID module.

<table>
<tr><th>Alarm name</th><th>Possible causes/solution</th></tr>
<tr><td>Flame Over Temperature
Detector 1 Flame Over Temperature
Detector 2 Flame Over Temperature</td><td>The FID flame temperature is above safe limits set at the factory, and the FID flame has been extinguished, the fuel supply valve closed, and automatic analyses halted.
<u>Recommended actions</u>:
Confirm that both fuel and air cylinders are connected and contain sufficient pressure.
Confirm that fuel and air set points are set to achieve desired mixture.
Use the LOI or MON2020 to ignite the FID.</td></tr>
<tr><td>Detector 1 Scaling Factor Failure
Detector 2 Scaling Factor Failure
Detector 3 Scaling Factor Failure
Detector 4 Scaling Factor Failure
Detector 5 Scaling Factor Failure
Detector 6 Scaling Factor Failure</td><td>The GC detected an excess scaling factor deviation for Detector #n.
<u>Recommended action</u>: Replace the preamp board:
Detectors 1 and 2 are preamp boards located in Preamp1.
Detectors 3 and 4 are preamp boards located in Preamp2.
Detectors 5 and 6 are preamp boards located in Preamp3</td></tr>
<tr><td>No sample flow 1
No sample flow 2
(Applies to the optional sample flow switch)</td><td>The corresponding flow switch indicates that there is no sample flow in the GC.
<u>Recommended actions</u>:
Check sample gas rotameter in the sample conditioning system for flow and do one of the following:
If no gas flow or no rotameter is present, do the following:<ol type="a">
Confirm that there is gas flow at the sample point location.
Check that the sample valves in the sample conditioning system are open.
Check that the bypass return vent path is free of obstruction.
Confirm that the sample line is connected from the sample point to the GC's sample conditioning system and is free of obstructions.
Close the valve at the sample tap, remove pressure from the line and check the filters at the probe or the sample conditioning system or both. If they are filled with liquids or particulates, replace the filtering elements.
If automatic stream selection valves are present, confirm that they are operating properly.
If a slight sample gas flow is present at the rotameter in the sample conditioning system, drain or replace all filters.
If flow is observed in the rotameter, replace the sample flow switch.</td></tr>
</table>

Alarm name	Possible causes/solution
Loss of Purge	There is a failure in the purge operation. Recommended actions: 1. Check that there is inert purge gas flowing into the electronic enclosure of the gas chromatograph. If not, check the plant instrument air is connected or repair the source of purge gas. 2. Confirm that the door to the electronic enclosure is shut and that there is positive pressure (above setpoint) present in the enclosure. If there is no positive pressure, and purge gas is flowing into the enclosure, look for damage to the door gasket and/or bulkheads and sealing materials. Repair as needed. 3. Look for loose or disconnected terminations on the purge controller assembly. Note that the purge controller assembly is mounted on the exterior of the GC but its terminations can be accessed from the interior of the electronics enclosure. Repair as required. 4. Replace purge controller assembly.
Low Carrier Pressure 1 Low Carrier Pressure 2 Low Carrier Pressure 3 Low Carrier Pressure 4 Input carrier pressure for detector is below the preset limit.	Input carrier pressure for the named detector is below the preset limit. Recommended action: 1. Check that the carrier cylinder pressure is 10 psi (or greater) above the mechanical regulator set point. 2. If input carrier pressure is low, check the carrier cylinder pressure. 3. Replace carrier gas cylinder if required.
Analog Input 1 High Signal Analog Input 2 High Signal Analog Input 3 High Signal Analog Input 4 High Signal Analog Input 5 High Signal Analog Input 6 High Signal Analog Input 7 High Signal Analog Input 8 High Signal Analog Input 9 High Signal Analog Input 10 High Signal	Measured value for the indicated analog input is greater than the user-defined full scale range.
Analog Input 1 Low Signal Analog Input 2 Low Signal Analog Input 3 Low Signal Analog Input 4 Low Signal Analog Input 5 Low Signal Analog Input 6 Low Signal Analog Input 7 Low Signal Analog Input 8 Low Signal Analog Input 9 Low Signal Analog Input 10 Low Signal	Measured value for the indicated analog input is lower than the user-defined full scale range.

Alarm name	Possible causes/solution
Analog Output 1 High Signal Analog Output 2 High Signal Analog Output 3 High Signal Analog Output 4 High Signal Analog Output 5 High Signal Analog Output 6 High Signal Analog Output 7 High Signal Analog Output 8 High Signal Analog Output 9 High Signal Analog Output 10 High Signal Analog Output 11 High Signal Analog Output 12 High Signal Analog Output 13 High Signal Analog Output 14 High Signal	Measured value for the indicated analog output is greater than the user-defined full scale range.
Analog Output 1 Low Signal Analog Output 2 Low Signal Analog Output 3 Low Signal Analog Output 4 Low Signal Analog Output 5 Low Signal Analog Output 6 Low Signal Analog Output 7 Low Signal Analog Output 8 Low Signal Analog Output 9 Low Signal Analog Output 10 Low Signal Analog Output 11 Low Signal Analog Output 12 Low Signal Analog Output 13 Low Signal Analog Output 14 Low Signal	Measured value for the indicated analog output is lower than the user-defined zero range.

Alarm name	Possible causes/solution
Stream 1 Validation Failure Stream 2 Validation Failure Stream 3 Validation Failure Stream 4 Validation Failure Stream 5 Validation Failure Stream 6 Validation Failure Stream 7 Validation Failure Stream 8 Validation Failure Stream 9 Validation Failure Stream 10 Validation Failure Stream 11 Validation Failure Stream 12 Validation Failure Stream 13 Validation Failure Stream 14 Validation Failure Stream 15 Validation Failure Stream 16 Validation Failure Stream 17 Validation Failure Stream 18 Validation Failure Stream 19 Validation Failure Stream 20 Validation Failure	The most recent validation sequence for the indicated stream failed. Recommended actions: 1. Check that the validation gas cylinder isolation valves are open. 2. Check that the validation gas regulators are set properly. 3. If the validation gas regulator pressure is below the set point, replace the gas bottle with a full one. 4. If the gas used for validation is the same as the gas that is used for calibration, ensure that the cylinder gas composition value listed on the cylinder's tag or on the certificate of analysis received from the supplier matches the value displayed in MON2020's Component Data table. 5. Re-run the validation sequence. 6. If still unsuccessful contact your Emerson representative.
Stream 1 RF Deviation Stream 2 RF Deviation Stream 3 RF Deviation Stream 4 RF Deviation Stream 5 RF Deviation Stream 6 RF Deviation Stream 7 RF Deviation Stream 8 RF Deviation Stream 9 RF Deviation Stream 10 RF Deviation Stream 11 RF Deviation Stream 12 RF Deviation Stream 13 RF Deviation Stream 14 RF Deviation Stream 15 RF Deviation Stream 16 RF Deviation Stream 17 RF Deviation Stream 18 RF Deviation Stream 19 RF Deviation Stream 20 RF Deviation	The most recent calibration sequence failed. Recommended actions: 1. Check that the calibration gas cylinder isolation valves are open. 2. Check that the calibration gas regulators' pressures are set properly and that the cylinder is not below the set point. If the cylinder is below the set point, replace it with a full cylinder. 3. Verify that the calibration cylinder gas composition value listed on the cylinder tag or on the certificate of analysis received from supplier matches the calibration cylinder gas composition value displayed in MON2020's Component Data table. If there is a mismatch, edit the Component Data table to reflect the correct value. Re-run the calibration sequence. 4. If still unsuccessful contact your Emerson representative.

Alarm name	Possible causes/solution
Energy Value Invalid <Analysis 1 Label> Energy Value Invalid <Analysis 2 Label> Energy Value Invalid	For each configured Analysis (Analysis *n* Label added if a concurrent analysis configuration) perform a check of the analyzed energy value of calibration gas against known value as part of the warm start sequence. The **Energy Value Invalid** alarm is raised to instruct the associated DCS that the analyzer has failed and all data should be ignored until a successful calibration run has been performed to verify the analysis of the GC. On completing warmup, the GC will perform a single analysis of the calibration stream. Using results of this analysis, the GC will calculate the energy value and compare it against the previously entered value stored in the tables. If the calculated energy value is within the allowable limits set up by the user, the **Energy Value Invalid** alarm is cleared, and the GC returns to normal operation; otherwise the **Energy Value Invalid** alarm remains active and the GC returns to normal operation. <u>Recommended actions</u> 1. Ensure that correct **Calibration Gas Energy Value** and limits have been entered in Component Data Table - Edit Energy Value dialog. 2. Ensure calibration gas bottle is open and not low or empty. 3. Check analyzed concentration results for each individual component versus calibration gas concentrations in the Component Data table. 4. Adjust timed events if necessary.
Calibration Energy Check Fail <Analysis 1 Label> Calibration Energy Check Fail <Analysis 2 Label> Calibration Energy Check Fail	Upon completion of a calibration sequence, a **Calibration Gas Energy Value** check is performed. If the calculated energy value fails the check, the software automatically runs the calibration again. If the second calibration also fails this check, the calibration is failed and a system aAlarm, **Calibration Energy Value Check Fail**, is raised. <u>Recommended action(s)</u> 1. Ensure calibration gas bottle is open and not low or empty. 2. Check analyzed concentration results for each individual component versus calibration gas concentrations in the component data table. 3. Adjust timed events if necessary.

Alarm name	Possible causes/solution
Stored Data Integrity Failure	Archived results, event logs and alarm logs are stored as records in the instrument database along with a CRC16 checksum. When the data is retrieved, the checksum is recomputed and the stored checksum is checked against the calculated checksum. If they don't match the instrument raises a **Stored Data Integrity Failure** alarm. Recommended actions 1. Reset archives using dialog under **MON2020 Log/Reports Menu** . **Note** All archived data in the GC will be lost. If this problem recurs, the CPU board should be replaced.
ROM Checksum Failure	ROM Checksum Validation – The firmware checksum is recomputed at periodic intervals. If the calculated checksum varies from original value, a **ROM Checksum Failure** Alarm is raised. Recommended action(s) 1. Re-flash the GC controller firmware using MON2020 from the **Tools → Upgrade Firmware** **Note** All archived data in the GC will be lost. If this problem recurs, the CPU board should be replaced.
Sample Fluid Unavailable • <Analysis 1 Label> Sample Fluid Unavailable • <Analysis 2 Label> Sample Fluid Unavailable • <Analysis 3 Label> Sample Fluid Unavailable • <Analysis 4 Label> Sample Fluid Unavailable	Stream switching sequence defined in *Custom Logic* configuration failed to successfully execute. <Analysis *n* Label> is added for Concurrent Analysis configurations. Recommended action(s) 1. Confirm proper operation of all sample system components and ability to provide adequate sample flow.

*(1) In MON2020, select **Hardware → Installed Hardware** for hardware slot locations.*

5.6.2 Voltage LEDs

A set of LEDs can be found on the backplane. These LEDs are a quick way to visually inspect the voltage status of some of the GC's electrical components.

The following LEDs are associated with the following GC components:

Table 5-1: Voltage LEDs and associated GC electrical component

<table>
<tr><th></th><th>GC Component</th></tr>
<tr><td>
</td><td>

- VIN - fuse open - Glows red when the fuse has blown or been removed; otherwise, it is not lit.
- 1 RTN - 24 loop (Power) - Glows green when the power supply for the analog outputs is functioning properly; otherwise, it is not lit.
- 24V (Regulated) - GC Power - Glows green when the GC power is functioning properly; otherwise, it is not lit.
- 17V - (Input for the preamp) - Glows green when the power supply for the Preamp is functioning properly; otherwise, it is not lit.
- 12V - (Input for the I/O cards) - Glows green when the optional ROC expansion card's power supply is functioning properly; otherwise, it is not lit.
- 5V1 - Glows green when the System chip's 5.1 V power supply is functioning properly; otherwise, it is not lit.
- 3V4 - Glows green when the 3.4 V power supply for the System chips is functioning properly; otherwise, it is not lit.

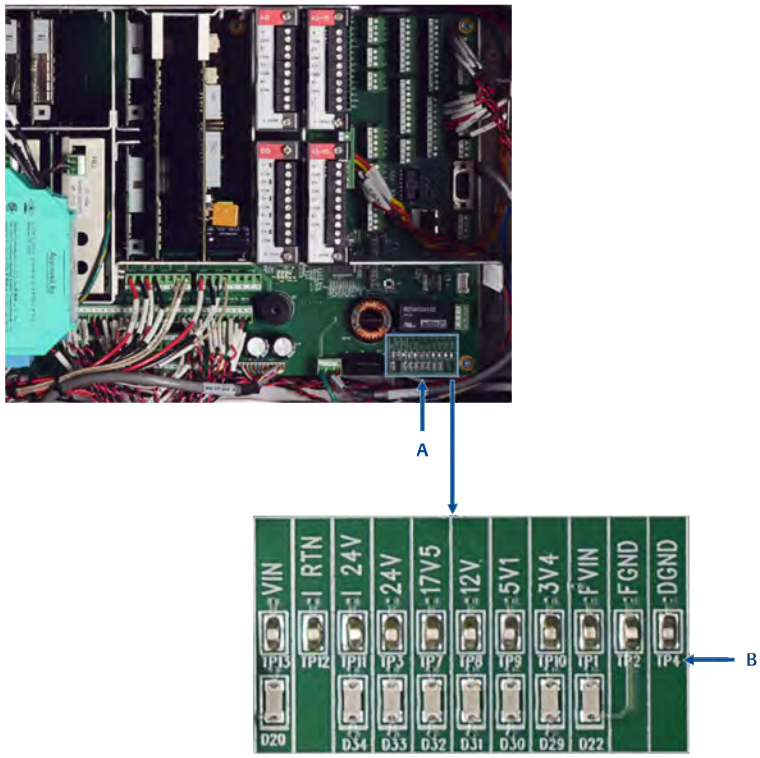
Note

Some boards have a different shade of green for this LED.

- Power ON - Glows green when the GC is on; otherwise, it is not lit.
</td></tr>
</table>

5.6.3 Test points

Figure 5-2: Upper Enclosure Showing Test Points on the Backplane



A. *Backplane test points*
B. *Test points - exploded view*

The backplane has a set of test points that allow you to measure the voltage output of the base I/O card. Each test point is labeled with a voltage value that, when measured with a voltmeter, should give a measurement equal to what is displayed on the label. A reading that does not match this label may indicate a faulty base I/O card. Try swapping out the suspect card with a different one, and take another measurement. To get a measurement for a test point, touch the voltmeter's negative probe to the *DGND* test point, and touch the voltmeter's positive probe to the desired test point.

The test points are associated with the following GC components:

Table 5-2: Backplane Test Points and Associated GC Components

Test Point	GC Component	Tolerances
VIN	Voltage in	
I RTN	Isolated return	
I 24V (Regulated)	Isolated voltage (loop power)	24 V (±2.4 V)

Table 5-2: Backplane Test Points and Associated GC Components *(continued)*

Test Point	GC Component	Tolerances
24V (Regulated)	GC power	24 V (±2.4 V)
17V5	Preamp (input for the bridge circuit)	17.5 V ±0.5 V
12V	Optional I/O cards	12 V ±0.6 V
5V1	System chips	5.1 V ±0.25 V
3V4	System chips	3.4 V ±0.15 V
FVIN	Field voltage input	±0 V - 3 V
FVGND	Field voltage ground	21 V - 30 V

The input voltage range for DC/DC power supply is between 21 and 30 volts. The input range for AC/DC power supply is 90 - 264 volts (auto-ranging).

5.6.4 Troubleshooting DHCP connectivity issues

Use the following tips to troubleshoot server connectivity issues:

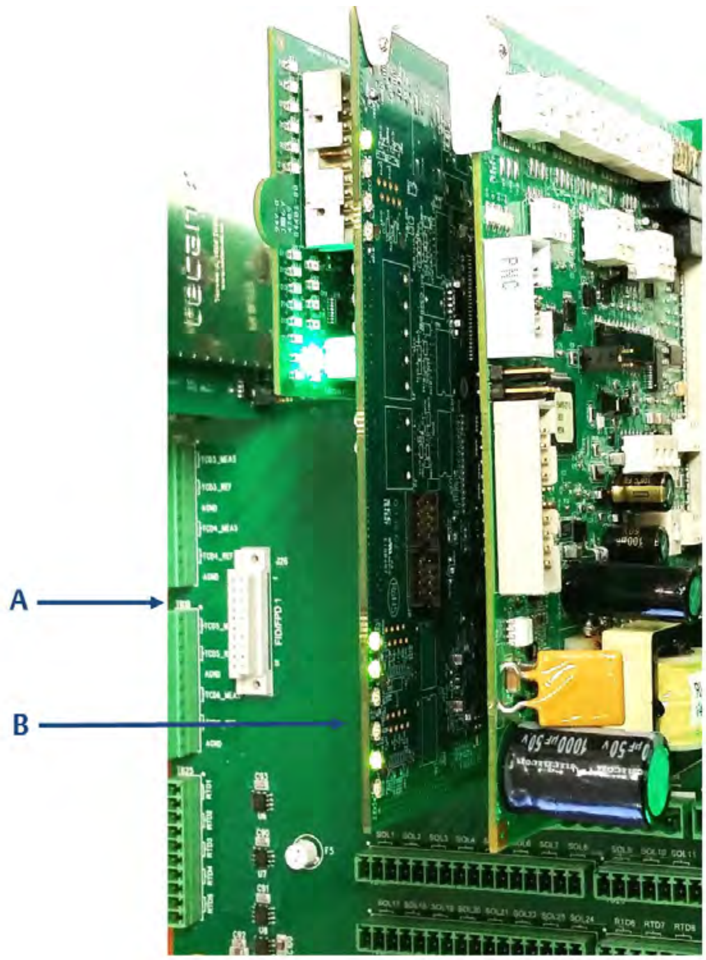
1. Ensure that the GC is up and running. If equipped with a front panel, check the *CPU LED* on the front panel; a green light means that the GC is operational. If equipped with an LOI, ensure that the LOI is communicating with the GC.
2. Check that the SW1 switch is in the ON position.
3. Check the following connections:

    a. If you are using a Ethernet straight-through cable, ensure that the PC has an Ethernet network interface card with auto-MDIX.

    b. If your Ethernet network interface card does not support auto-MDIX, ensure that you are using an Ethernet crossover patch cable.

    c. Check to see if the GC's CPU board link lights are on (see *Figure 5-3*. The three Ethernet1 LEDs are located on the front bottom edge of the card. Three Ethernet2 LEDs are just above the Ethernet1 LEDs. If link lights are off, then check your connections. (see *Figure 5-3*).

Figure 5-3: CPU Board Link Lights



A. CPU board
B. Ethernet link lights

4. Do the following to ensure that your network adapter is enabled:
   a. Go to **Start** → **Control Panel** → **Network Connections...**.
   b. Check the status of the *Local Area Connection* icon. If the status appears as **Disabled**, right-click the icon and select **Enable** from the context menu.
5. Do the following to try to repair the network connection:
   a. **Go to Start** → **Control Panel** → **Network Connections...**.
   b. Right-click the *Local Area Connection* icon and select **Repair** from the context menu.

5.6.5 Sample flow balance check

Ensure that the flow panel gauge is properly set. Flow should be as specified on the Parameter List for the Rosemount 1500XA. To access the list, start MON2020, connect to the GC and select **Logs/Reports** → **Parameter List...**.

5.6.6 Carrier flow balance check

Check the flow at the measure vent using a portable electronic flow meter or a mechanical flow meter.

If your reading is out of range as shown in the MON2020 **Logs/Reports** → **Parameters List...**, do not adjust the pressure regulators; instead, consult with your local the Emerson Customer Care representative.

5.6.7 Monitoring the detector(s) and columns temperature

Use MON2020 to monitor the temperature of the detector(s) and columns to determine if the GC is thermally stable.

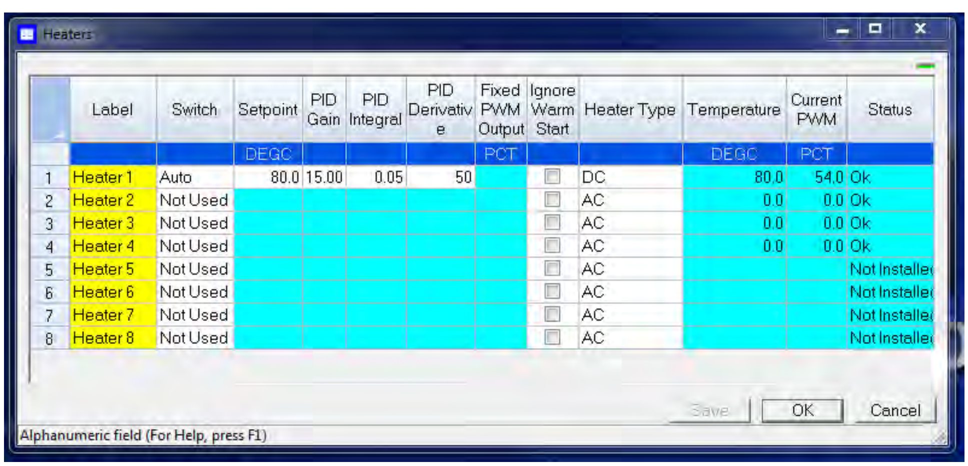
When connected to the GC via MON2020, select **Hardware** → **Heaters...** menu to access this function.

When viewing the Heater window, the typical heater configuration is as follows:

The *Temperature* column on the Heaters window displays the current temperature; the *Current PWM* column displays the percentage of power being used to run the heater.

The settings and values shown in the Heaters window and described below, are preset at the factory and are based on the specific customer application. These values should not be changed unless recommended by Application Engineering, Customer Service personnel, or as part of a factory application requirement.

Figure 5-4: Hardware - Heaters Configuration

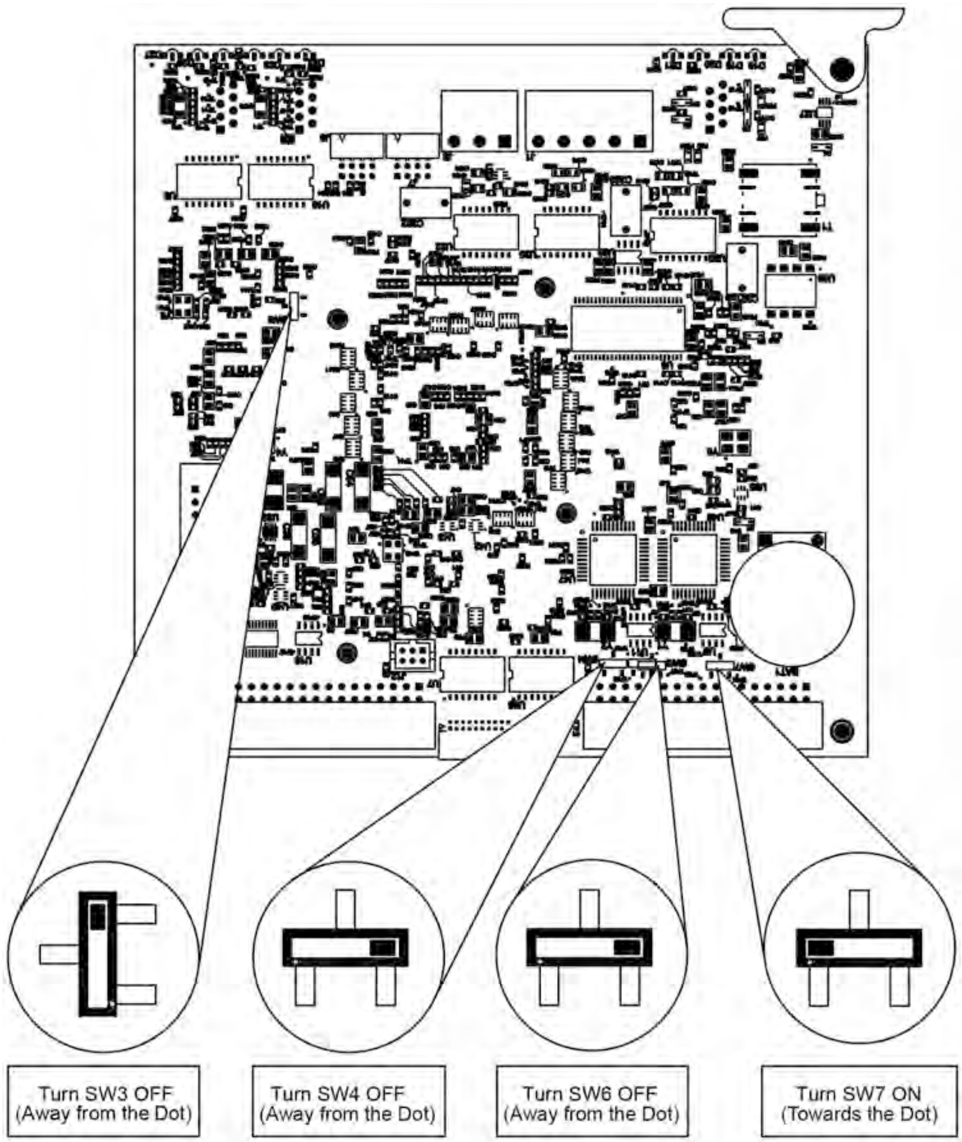


5.6.8 Replacing the CPU

Use the following procedure to replace a CPU.

1. Save the GC configuration file. In MON2020, go to **File → Save Configuration (to PC)...**.
2. Power down the GC.
3. Open the GC cover.
4. Remove the clear plastic cover that holds the boards in place.
5. Remove the CPU board.
6. On the new CPU board, set up switches as shown in the following image:

Figure 5-5: CPU Switch Settings



7. Install the new CPU board back in the card cage.

   Ensure the board is seated firmly in place.
8. Place the clear plastic cover back over the boards.
9. Close the GC cover.
10. Power up the GC and connect to it through MON2020.

    See *Using MON2020 to connect to the GC* for more information.
11. In MON2020, go to **Chromatograph** → **View/Set Date_Time...**. Set the date and time for the GC.

See the *MON2020* reference manual for more information.

12. In MON2020, go to **Tools** → **Cold Boot...**. Cold boot the GC.

    The GC reboots automatically and disconnects from MON2020.

13. Wait for the GC to reboot.
14. Reconnect to the GC using MON2020.
15. In MON2020, go to **File** → **Restore Configuration (to GC)...**. Use the configuration file you saved in step 1 or use the last known good configuration.
16. Wait for the heaters to stabilize.
17. Go to **Control** → **Auto Sequence...** to auto sequence the GC.

5.6.9 Recover the CPU

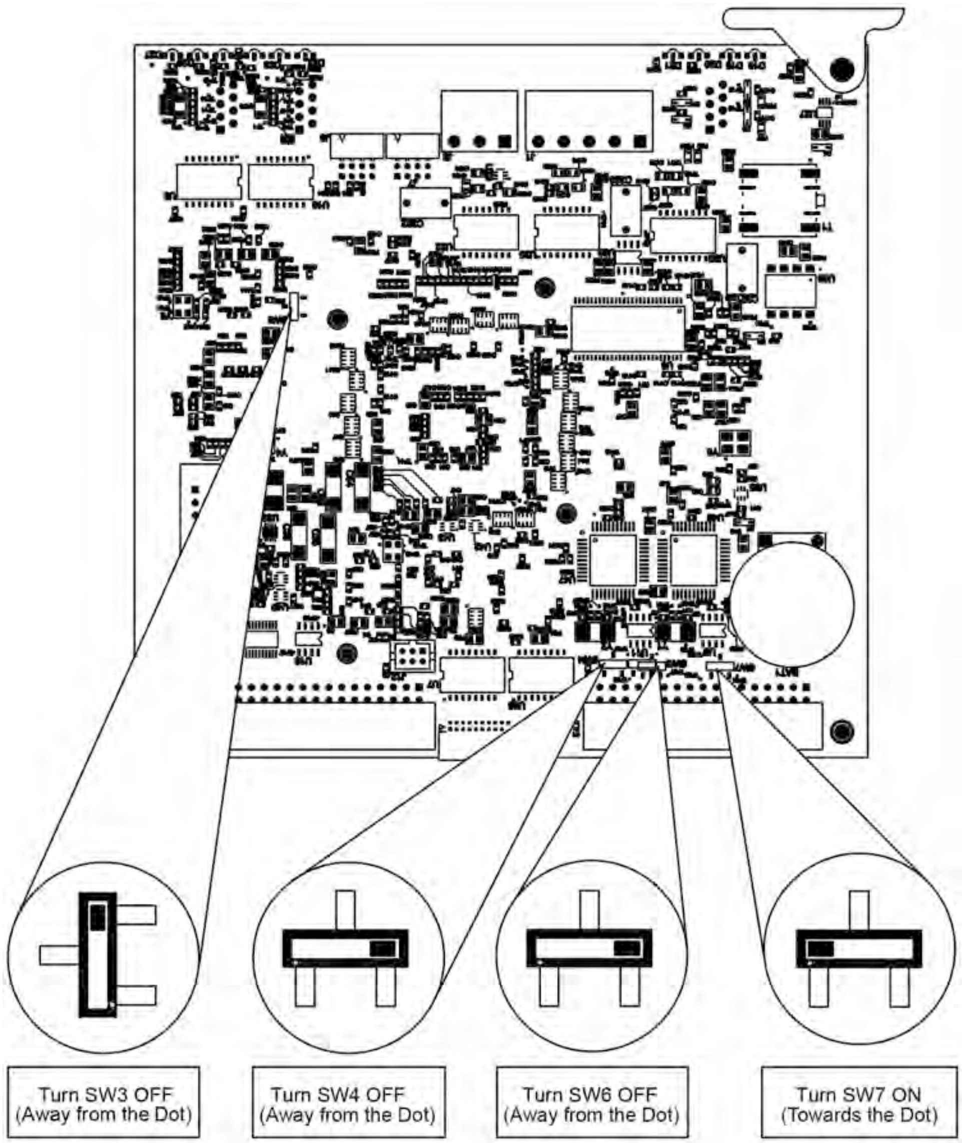
Follow this procedure if you have accidentally installed a CPU board with the switch in the **Off** position or if unusual things are happening to the analyzer and you suspect a corrupt CPU.

Important

Do not use a config file saved from a suspect CPU.

Procedure

1. Power down the GC.
2. Open the GC cover.
3. Remove the cover from the card cage.
4. Remove the CPU board from the card cage.
5. Ensure the switches on the CPU board are as shown below:
6. Set the CPU board aside for ten minutes to bleed the contents of the battery backed RAM.
7. On the CPU board, set up the switches as shown below:



8. Install the CPU board.

   Ensure that the board is firmly seated in the card cage.

9. Install the cover on the card cage.
10. Close the GC cover.
11. Power up the GC
12. Connect to the GC using MON2020.

    See *Using MON2020 to connect to the GC* for more information.

13. Go to **Chromatograph** → **View/Set Date Time...**.
14. Set the date and time for the GC. Save your changes.
15. Go to **Tools** → **Cold Boot...**. Cold boot the GC.

The GC reboots automatically and disconnects from MON2020.

16. Wait for the GC to boot.
17. Connect to the GC using MON2020.
18. Go to **File → Restore Configuration (to GC)...** and restore configuration to the GC.
19. Wait for the heaters to stabilize.
20. In MON2020, go to **Control → Auto Sequence...** to return the GC to normal operation.

5.7 Checking the GC for leaks

Leak checking is a standard component of any maintenance protocol. See *Section 4.4.1*.

5.7.1 Plugged lines, columns, and valves

If the lines, columns, or valves are plugged, check the gas flow at valve ports. For a reference, use the flow diagram in the drawing package that shipped with your GC, and remember these points about flow diagrams:

- Port-to-port flow paths are indicated by solid or dashed lines on the valve symbol in the drawing.
- A dashed line indicates flow direction when the valve is **ON**, that is, energized.
- A solid line indicates flow direction when the valve is **OFF**, i.e., not energized.

5.8 Repairing and maintaining the valves

Only minimal valve repair and maintenance is required (e.g., replacing the diaphragms).

5.8.1 Required tools for valve maintenance

The tools required for performing repair and general maintenance on the XA Series valve assemblies are:

- Torque wrench, scaled in foot-pounds
- 1/2-in. socket for 10-port valves
- 7/16-in. socket for 6-port valves
- 1/4-in. open-ended wrench
- 5/16-in. open-ended wrench
- 5/32-in. Allen wrench

5.8.2 Valve replacement parts

Replacement parts required for each XA Series valves consist of the following parts:

- Diaphragm kit 6-port XA valve (P/N 2-4-0710-248)
- Diaphragm kit 10-port XA valve (P/N 2-4-0710-171)

Figure 5-6: XA Series Valves

5.8.3 Valve overhaul

Note
Rosemount valves have a lifetime warranty. Replacement factory-built XA Series valves are available. Call your local Emerson Customer Care representative for more information.

Use the following procedure to overhaul a valve:

Procedure

1. If you are overhauling a 6-port valve, refer to drawing #CE-22260; If you are overhauling a 10-port valve, refer to drawing #CE-22300. Both drawings are available in *Appendix G*.
2. Shut off the carrier and sample gas streams entering the unit.

WARNING!

HOT SURFACES
Power down the GC and allow to cool for at least five minutes.

Failure to allow the analyzer to cool may cause burns from hot surfaces in the enclosure.

3. Open the door to the lower enclosure to access the valves.
4. Disconnect tubing and fittings that attach to the valve from other locations.

5. Loosen the attaching bolt on the valve to be replaced or serviced.
6. Loosen the valve's torque bolt.

Figure 5-7: Valve

A. *Torque bolt*

7. Holding the lower piston plate, pull the valve straight off the block. The alignment pins may stick slightly.
8. Remove and discard the old valve diaphragms and gaskets.
9. Clean the sealing surface as required using a non-lint-forming cloth and isopropyl alcohol. Blow the sealing surface with clean, dry instrument air or carrier gas. Dirt, including dust and lint, can cause troublesome leakage.

Note

Do not use an oil-based cleaner on the valve.

10. Replace the old diaphragms and gaskets, in the same order, with the new ones supplied.
11. Reassemble the valve using the following steps:
    a. Align the pins with holes in the block and push the valve assembly into place.
    b. Tighten the valve's torque bolt. The 6-port valve requires 20 ft/lb of torque; the 10-port valve requires 30 ft/lb of torque.
    c. Reinstall the valve using the two mounting screws and reconnect all fittings and tubing.

5.8.4 Valve cleaning

Use isopropyl alcohol to clean a valve.

Note

Do not use an oil-based cleaner on valves.

5.9 Repairing and maintaining the detectors

When a TCD fails to perform normally it should be replaced. Signs that a TCD may be faulty include, but are not limited to, the following:

- A chromatogram with a wandering or drifting baseline
- A chromatogram with a noisy baseline
- A chromatogram with a no peaks
- No chromatogram

A test for a faulty TCD involves measuring the resistance of each filament using a multimeter. A pair of thermistors should give the same resistance reading; therefore, if a thermistor reading is significantly different from the reading of its mate, the pair should be replaced. Otherwise, the TCD bridge will be unbalanced, noisy, and drifty.

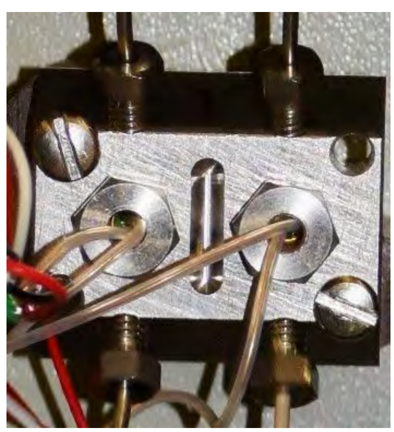
5.9.1 Required tools for TCD maintenance

A flat-head screwdriver is required for removing and replacing TCDs. Use a multimeter to test the thermistor pair.

5.9.2 TCD replacement parts

Consult the parameter list that was provided with the GC for the thermistor kit required to replace one TCD. A new thermistor seal (2-3-0500-391) is also required.

Figure 5-8: TCD



5.9.3 Replacing a TCD

Use the following procedure to remove a TCD assembly from the GC for repair or replacement.

WARNING!

EXPLOSION HAZARD
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Power must not be restored after enclosure has been opened until enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

Failure to de-energize the analyzer may cause an explosion and severely injure personnel.

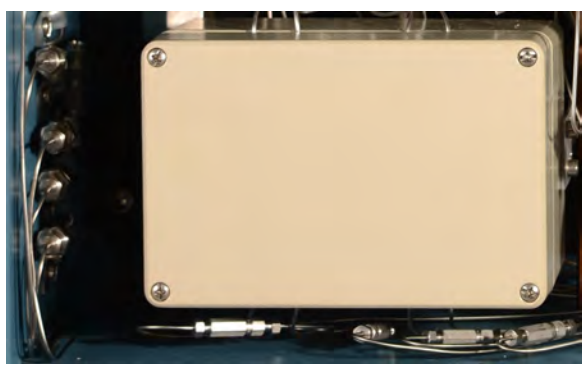
WARNING!

EXPLOSION HAZARD
Disconnect all electrical power to the unit and ensure the area is free of explosive gases. Failure to follow this warning may result in injury or death to personnel or cause damage to the equipment.

Procedure

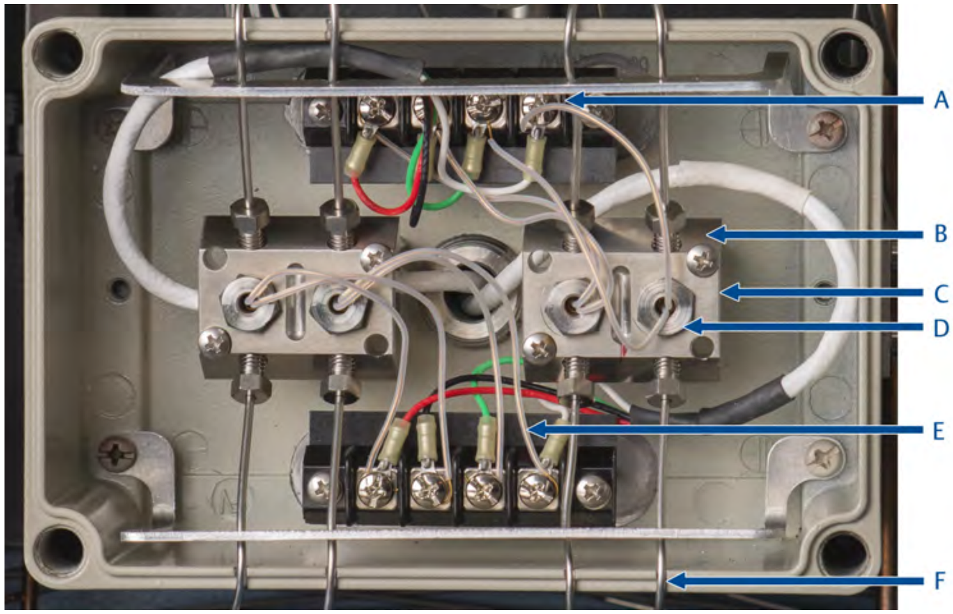
1. Disconnect all power to the unit and allow the unit to cool.
2. Open the door of the lower enclosure to gain access to the TCD housing(s).

Figure 5-9: TCD Housing



3. Unscrew the four TCD cover screws and remove the cover to the housing .

Figure 5-10: Components of a TCD



A. TCD termination block
B. Gas tubing connectors
C. TCD block
D. TCD retainer nut
E. Thermistor leads
F. TCD housing grooves

4. The TCD thermistor is held within the TCD block by the retainer nut. To replace the thermistor, do the following:

a. Unscrew and release the thermistor leads from the termination block.

b. Unscrew the retainer nut from the TCD block.

c. Remove the old PFTE™ seals, thermistor, and its wires from the retainer nut.

d. Remove the PFTE shields from the old thermistor wires and place on the new thermistor wires.

e. Insert a new PFTE seal into the TCD block.

f. Thread the thermistor through the retainer nut.

g. Screw the retainer nut back into the TCD block. Ensure a tight fit (quarter turn after finger tight); otherwise a potential leak path might open.

h. Reconnect the thermistor leads to the termination block, taking care to reconnect the thermistor leads to the corresponding terminal block screws.

Note

The thermistors are a matched pair and must be replaced as such. Step 4 needs to be done for each thermistor in a pair.

5. Check the gas tubings in the TCD housing grooves. Make sure tubing is properly seated and reattach the TCD housing cover with the four screws.

   Note

   Not properly setting the tubing into the grooves may cause the tubing to get pinched when the cover is reattached.

6. Close the enclosure door and apply power to the analyzer.

5.9.4 Removing the flame ionization detector (FID)

The FID has no replaceable parts. Damage such as a broken RTD or igniter coil will require that the unit be removed and replaced.

DANGER!

EXPLOSION HAZARD

Disconnect all electrical power to the unit and ensure the area is free of explosive gases.

Failure to follow this warning may result in injury or death to personnel.

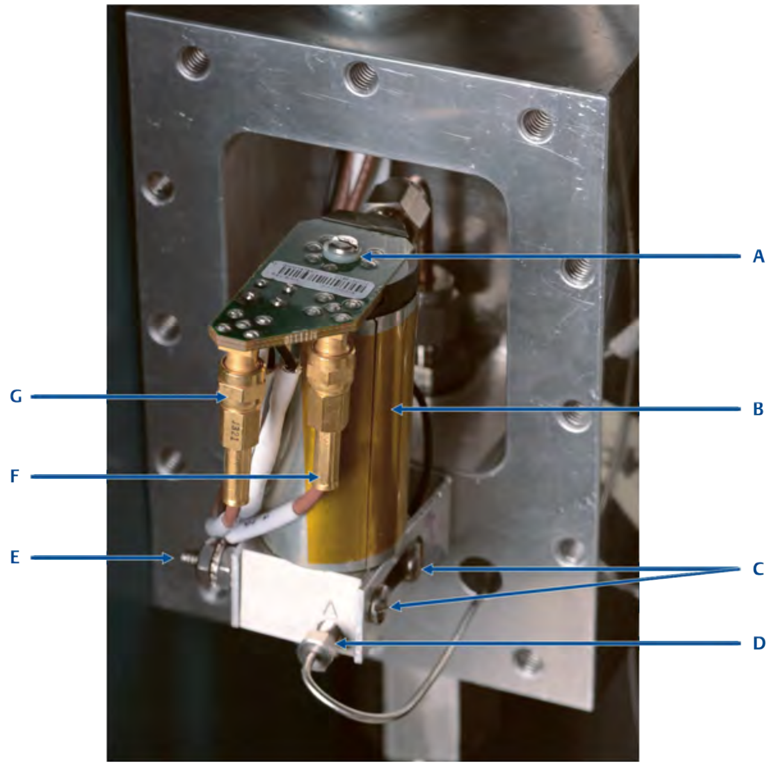
Use the following procedure to remove an FID from the GC:

Procedure

1. Disconnect all power to the unit.

   Allow at least 10 minutes for the components to cool-down.
2. Open the door of the air-bath oven (lower enclosure) to gain access to the FID housing and allow components to cool down so that they can be handled.
3. Unscrew and remove the eight screws which secure the explosion-proof housing cover to gain access to the FID.
4. Unscrew the tubing nut connecters (E and D) located at the base of the FID (keeping them separate for installation later).

Figure 5-11: FID Components



A. FID exhaust
B. FID cap
C. FID board
D. Shield
E. FID block screws
F. Tubing nut (sample in)
G. Signal
H. Polarization voltage

5. Loosen the tubing nut connector securing the FID exhaust tube (A).

6. Remove the screw from the top of the FID assembly.

CAUTION!

ELECTROSTATIC DISCHARGE (ESD) HAZARD

Operators and technicians must wear an electrostatic wrist strap when handling printed circuit cards to prevent shorting the boards through static electricity.

7. Grasp the edges of the FID board and gently pull and wiggle to remove the six socket tubes that extend into the pins in the cap.
8. Unscrew the two FID block bolts which secure the old FID base to the bracket and remove the FID.

5.9.5 Maintaining the FID

The FID cap (B in *Figure 5-11*) has no replaceable parts. Damage, like a broken RTD or broken igniter coil, requires a replacement cap.

Figure 5-12: FID

A. *Flame tip assembly*

The flame tip assembly can be removed for cleaning.

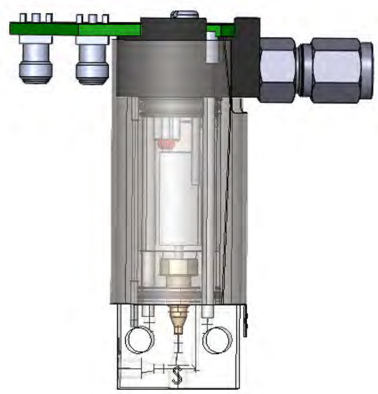
Prerequisites

Before cleaning the flame tip assembly, remove the FID (see *Section 5.9.4*).

Procedure

1. Loosen the flame tip isolator one turn.
2. Gently lift and remove the flame tip assembly. Use short needle nose pliers if it is stubborn, taking care not to bend the tube.

Figure 5-13: Flame Tip Assembly



5.9.6 Reassembling the FID

Procedure

1. Insert the FID into the mounting bracket and secure with the two block screws.
2. Grasp the edges of the FID board and align with the six socket tubes that extend into the pins in the cap. Replace the screw at the top of the FID assembly.
3. Tighten the tubing nut connector, securing the FID exhaust tube.
4. Screw in the tubing nut connectors located at the base of the FID.
5. Install the explosion-proof cover over the FID assembly and secure to the base with eight bolts.
6. Close the air-bath oven enclosure door and apply power to restart the GC.

5.10 Replacing the methanator

Use this procedure to replace the methanator assembly and replace the RTD.

The optional methanator, which is a catalytic converter, converts CO_2 and/or CO into methane by adding hydrogen and heat to the sample. The methanator requires little maintenance.

WARNING!

BURN HAZARD
Enclosure contains hot internal parts. This enclosure must not be opened unless the area atmosphere is known to be below the ignitable concentration of combustible materials or unless all equipment within has been de-energized for thirty-five minutes.

Failure to allow the components to cool down may cause thermal injuries to personnel.

Note
Be sure to insulate the methanator assembly to prevent heat loss.

See drawing 9R00004 in *Section G.1* for wiring connections.

Procedure

1. Order the Rosemount MethanatorKit P/N 2-3-0710-265.
2. Inspect the packaging for damage. If damaged in shipping, contact your local Customer Care representative.
3. Power down the GC and allow to cool thirty-five minutes before opening the electronics enclosure door.

   See the wiring diagram sent with your GC to determine where the wires are connected.
4. Disconnect the RTD wires.
5. Disconnect the heater wires from TB25 on the backplane.
6. Loosen and remove the two flat head screws and nuts from the methanator bracket.
7. Remove the methanator assembly from the electronics enclosure.
8. Install the new methanator by attaching it to the methanator bracket using two flat head screws and nuts.
9. Reconnect the RTD and heater wires.
10. Close the electronics enclosure door and apply power to the GC.

5.11 Measure vent flow

You will need an accurate flow meter for this measurement.

Figure 5-14: Measure Flow Vents

A. Measure and sample vents

Procedure

1. Consult the parameter list that was provided with the GC to learn the appropriate flow rate.
2. Attach a flow meter to each measurement vent output on the side of the GC that is labeled *MVn*, where *n* is for each vent.. The flow should match the value displayed in the parameter list.

5.12 Electrical components

The GC is designed to operate for long periods of time without the need for preventive or regularly scheduled maintenance.

WARNING!

EXPLOSION HAZARD
Do not open the enclosure unless the area is known to be non-hazardous or unless all devices within the enclosure have been de-energized. Power must not be restored after enclosure has been opened until enclosure has been purged for 60 minutes at a pressure of 0.3 in. w.c.

Failure to de-energize the analyzer may cause an explosion and severely injure personnel.

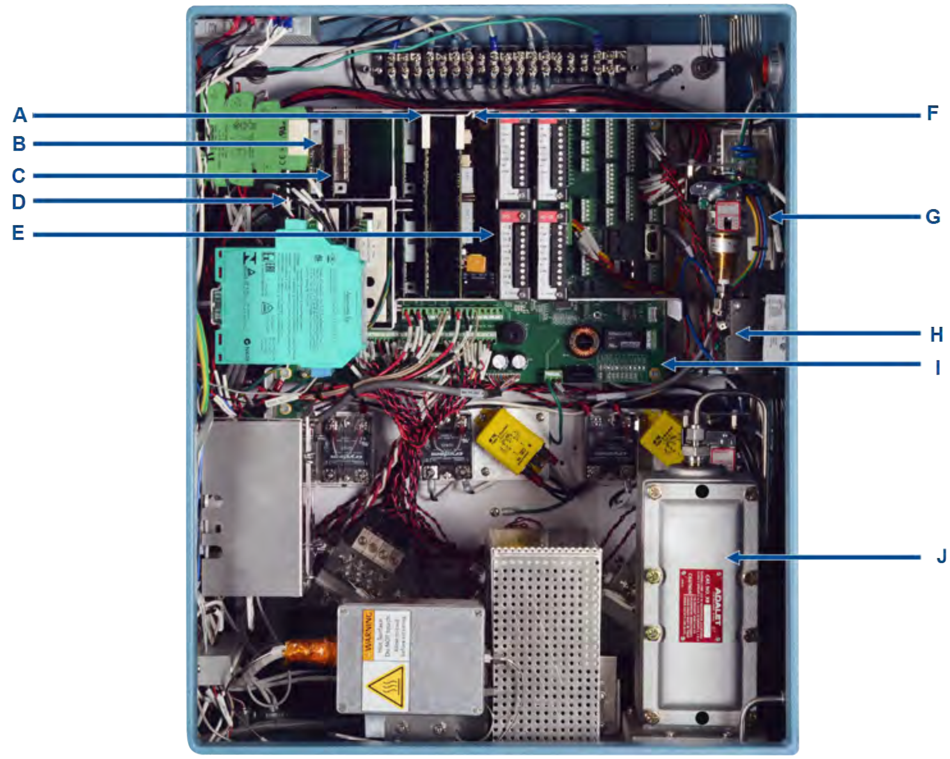
Prior to opening the GC, use MON2020 to ensure that there are no configuration or parameter errors.

To access the card cage, do the following:

Procedure

1. Ensure electrical power is disconnected from the unit and the environment is safe.
2. Allow the unit to cool.
3. Open the electronics enclosure door and access the card cage assembly holding the circuit boards.

Figure 5-15: Electronics Components



A. CPU board
B. Detector preamp board
C. Heater solenoid driver board
D. Card cage
E. ROC Module slots
F. Base I/O board
G. Power supply
H. Circuit breaker
I. Backplane
J. Air bath heater

4. Note the location and direction of any board removed. Release the catch(es) and remove/replace the circuit board(s) as necessary.
5. Close and latch the electronics enclosure door.
6. Apply power to the GC.

5.13 Analog inputs and outputs

The analog outputs can be calibrated or adjusted with MON2020. However, these outputs should be measured with a calibrated digital meter upon initial installation at zero scale and full scale. Then the span can be set with MON2020 so that it represents values from 0 to 100 percent of the user-defined units in use.

Nominally, calibration is made within a range of 4-20 milliamperes (mA) output from each analog channel. To set a reference point to trigger an alarm condition, configure zero scale calibration with a 0 mA output, and full scale calibration set up to 22.5 mA output.

If there is reason to suspect that the span on any particular channel might be off after a period of time and heavy use, then the analog output for that channel should be recalibrated.

5.13.1 Analog output adjustment

The initial analog output adjustments are set at the factory, before shipment, at standard values (4-20 mA). It may be necessary to check and/or adjust these values depending on output cabling/impedance. The adjustment may require two people if the units are some distance apart. It requires a calibrated digital meter to check the zero and full scale values at the receiving end. The scale or span value can then be adjusted with MON2020.

It is possible to calibrate the analog outputs using different engineering units, volts, and percentages.

5.14 Upgrading the embedded software

The base GC firmware performs functions similar to operating systems such as DOS, Windows™, or Linux®. The base GC firmware provides the basic resources and interfaces to run the user's applications. There is no direct user-level interface to the firmware.

If a firmware upgrade is required for your system, refer to the *MON2020 Gas Chromatograph Software* manual for additional information.

The GC's applications use the tools provided by firmware to perform the desired gas chromatograph applications for the user. There are different applications to facilitate different gas chromatographic needs. To load a new application or to upgrade an existing application, refer to the *MON2020 Gas Chromatograph Software* manual for details.

Appendix A
Theory of operation

The following sections discuss the theory of operation for the GC, the engineering principles and the concepts used.

Note

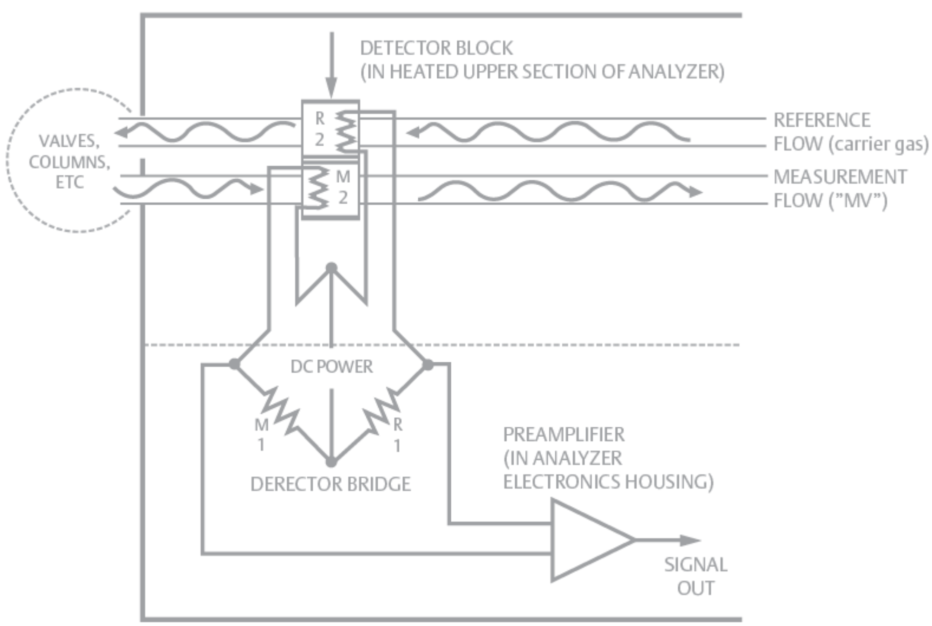
See *Appendix H* for definitions of the terminology used in this document.

A.1 Thermal conductivity detector (TCD)

One of the detectors available on the GC is a thermal conductivity detector (TCD) that consists of a balanced bridge network with heat sensitive thermistors in each leg of the bridge. Each thermistor is enclosed in a separate chamber of the detector block.

One thermistor is designated the reference element, and the other thermistor is designated the measurement element. See *Figure A-1* for a schematic diagram of the thermal conductivity detector.

Figure A-1: Analyzer Assembly with TCD Bridge



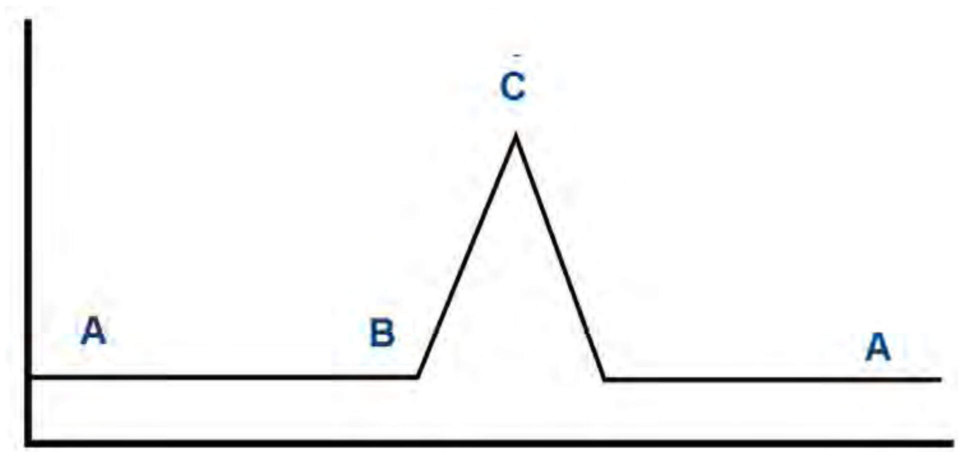
In the quiescent condition, prior to injecting a sample, both legs of the bridge are exposed to pure carrier gas. In this condition, the bridge is balanced, and the bridge output is electrically nulled.

The analysis begins when the sample valve injects a fixed volume of sample into the column. The continuous flow of carrier gas moves the sample through the column. As successive components elute from the column, the temperature of the measurement element changes.

The temperature change unbalances the bridge and produces an electrical output proportional to the component concentration.

The differential signal developed between the two thermistors is amplified by the preamplifier. *Figure A-2* illustrates the change in detector electrical output during elution of a component.

Figure A-2: Detector output during component elution



A. *Detector bridge balanced.*
B. *Component begins to elute from column and is measured by thermistor.*
C. *Peak concentration of component.*

In addition to amplifying the differential signal developed between the two thermistors, the preamplifier supplies drive current to the detector bridge.

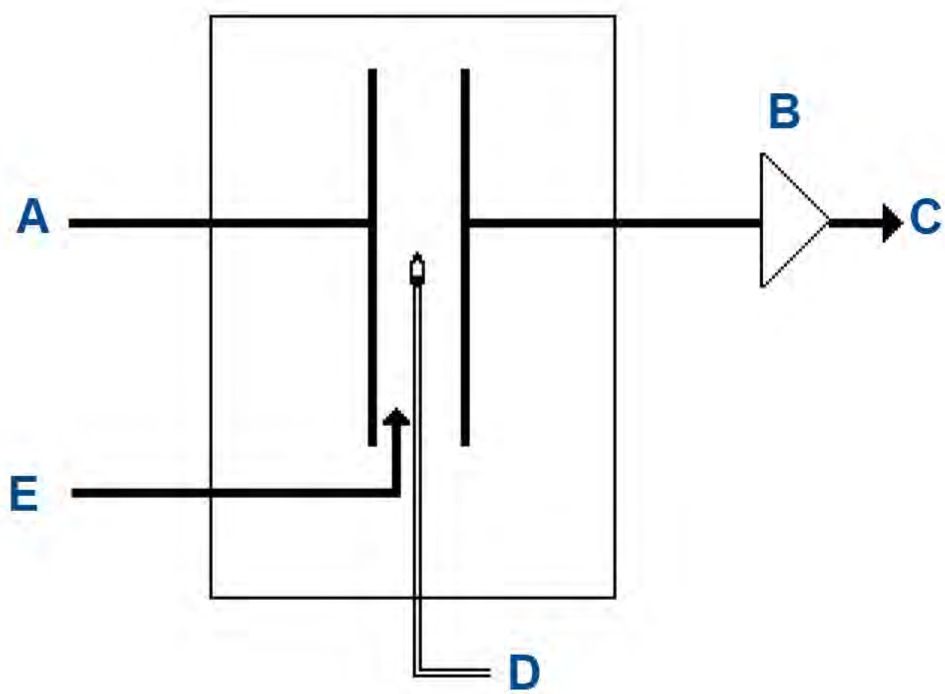
The signal is proportional to the concentration of a component detected in the gas sample. The preamplifier provides twodifferent gain channels as well as compensation for baseline drift.

The signals from the preamplifier are sent to the electronic assembly for component concentration computation, recording, or viewing on a PC monitor with MON2020.

A.2 Flame ionization detector (FID)

Another detector available for the Rosemount™ 1500XA is the flame ionization detector (FID). The FID requires a polarization voltage, and its output is connected to the input to a high impedance amplifier that is called an electrometer. The burner uses a mixture of hydrogen and air to maintain the flame. The sample of gas to be measured is also injected into the burner. See *Figure A-3* for a schematic diagram of the FID.

Figure A-3: Analyzer assembly with FID detector bridge



A. *Polarizing voltage*
B. *Electrometer*
C. *Signal out*
D. *Sample/H_2*
E. *Air*

A.3 Data acquisition

Every second, exactly 50 equally spaced data samples are taken (i.e., one data sample every 20 milliseconds) for analysis by the controller assembly.

As a part of the data acquisition process, groups of incoming data samples are averaged together before the result is stored for processing. Non-overlapping groups of N samples are averaged and stored, and thus reduce the effective incoming data rate to 40/N samples per second. For example, if N = 5, then a total of 40/5 or 8 (averaged) data samples are stored every second.

The value for the variable *N* is determined by the selection of a peak width parameter (*PW*). The relationship is

$N = PW$

where *PW* is given in seconds. Allowable values of *N* are 1 to 63; this range corresponds to *PW* values of 2 to 63 seconds.

The variable *N* is known as the integration factor. This term is used because *N* determines how many points are averaged, or integrated, to form a single value. The integration of data upon input, before storing, serves two purposes:

- The statistical noise on the input signal is reduced by the square root of *N*. In the case of $N = 4$, a noise reduction of 2 would be realized.
- The integration factor controls the bandwidth of the chromatograph signal. It is necessary to match the bandwidth of the input signal to that of the analysis algorithms in the controller assembly. This prevents small, short-duration perturbations from being recognized as true peaks by the program. It is therefore important to choose a peak width that corresponds to the narrowest peak in the group under consideration.

A.4 Peak detection

For normal area or peak height concentration evaluation, the determination of a peak's start point and end point is automatic. The manual determination of start and end points is used only for area calculations in the *Forced Integration* mode. Automatic determination of peak onset or start is initiated whenever Integrate Inhibit is turned off. Analysis is started in a region of signal quiescence and stability, such that the signal level and activity can be considered as baseline values.

Note

The controller assembly software assumes that a region of signal quiescence and stability will exist.

Having initiated a peak search by turning Integrate Inhibit off, the controller assembly performs a point by point examination of the signal slope. This is achieved by using a digital slope detection filter, a combination low pass filter and differentiator. The output is continually compared to a user-defined system constant called *Slope Sensitivity*. A default value of 8 is assumed if no entry is made. Lower values make peak onset detection more sensitive, and higher values make detection less sensitive. Higher values (20 to 100) would be appropriate for noisy signals, (e.g., high amplifier gain).

Onset is defined where the detector output exceeds the baseline constant, but peak termination is defined where the detector output is less than the same constant.

Sequences of fused peaks are also automatically handled. This is done by testing each termination point to see if the region immediately following it satisfies the criteria of a baseline. A baseline region must have a slope detector value less than the magnitude of the baseline constant for a number of sequential points. When a baseline region is found, this terminates a sequence of peaks.

A zero reference line for peak height and area determination is established by extending a line from the point of the onset of the peak sequence to the point of the termination. The values of these two points are found by averaging the four integrated points just prior to the onset point and just after the termination points, respectively.

The zero reference line will, in general, be non-horizontal, and thus compensates for any linear drift in the system from the time the peak sequence starts until it ends.

In a single peak situation, peak area is the area of the component peak between the curve and the zero reference line. The peak height is the distance from the zero reference line to the maximum point on the component curve. The value and location of the maximum point is determined from quadratic interpolation through the three highest points at the peak of the discrete value curve stored in the controller assembly.

For fused peak sequences, this interpolation technique is used both for peaks, as well as valleys (minimum points). In the latter case, lines are dropped from the interpolated valley points to the zero reference line to partition the fused peak areas into individual peaks.

The use of quadratic interpolation improves both area and height calculation accuracy and eliminates the effects of variations in the integration factor on these calculations.

For calibration, the controller assembly may average several analyses of the calibration stream.

A.5 Basic analysis computations

Two basic analysis algorithms are included in the controller assembly:

- Area Analysis – calculates area under component peak
- Peak Height Analysis – measures height of component peak

Note

MON2020 can perform a variety of other calculations. For more information, see the *MON2020 Gas Chromatograph Software* manual.

A.5.1 Concentration analysis - response factor

Concentration calculations require a unique response factor for each component in an analysis. These response factors may be manually entered by an operator or determined automatically by the system through calibration procedures (with a calibration gas mixture that has known concentrations).

The response factor calculation, using the external standard, is:

$$ARF_n = \frac{Area_n}{Cal_n} \; or \; HRF_n \frac{Ht_n}{Cal_n}$$

where

ARF_n	area response factor for component *n* in area per mole percent
$Area_n$	area associated with component *n* in calibration gas
Cal_n	amount of component *n* in mole percent in calibration gas
Ht_n	peak height associated with component *n* mole percent in calibration gas
HRF_n	peak height response factor for component *n*

Calculated response factors are stored by the controller assembly for use in the concentration calculations, and are printed out in the configuration and calibration reports.

Average response factor is calculated as follows:

$$RFAVG_n = \frac{\sum_{i=1}^{k} RF_i}{k}$$

where

$RFAVG_n$	area or height average response factor for component *n*
RF_i	area or height average response factor for component *n* from the calibration run
k	number of calibration runs used to calculate the response factors

The percent deviation of new *RF* averages from old *RF* average is calculated in the following manner:

$$deviation = \left[\frac{RF_{new} - RF_{old}}{RF_{old}} \times 100\right]$$

where the absolute value of percent deviation has been previously entered by the operator.

A.5.2 Concentration calculation - mole percentage (without normalization)

After response factors have been determined by the controller assembly or entered by the operator, component concentrations are determined for each analysis by using the following equations:

$$CONC_n = \frac{Area_n}{ARF_n} \text{ or } CONC_n = \frac{Ht_n}{HRF_n}$$

where

ARF_n	Area response factor for component *n* in area per mole percent
$Area_n$	Area associated with component *n* in unknown sample
$CONC_n$	Concentration of component *n* in mole percent
Ht_n	Peak height associated with component *n* mole percent in unknown sample
HRF_n	Peak height response factor for component *n*

Component concentrations may also be input through analog inputs 1 to 4 or may be fixed. If a fixed value is used, the calibration for that component is the mole percent that will be used for all analyses.

A.5.3 Concentration calculation in mole percentage (with normalization)

The normalized concentration calculation is:

$$CONCN_n = \frac{CONC_n}{\sum_{i=1}^{k} CONC_i} \times 100$$

where

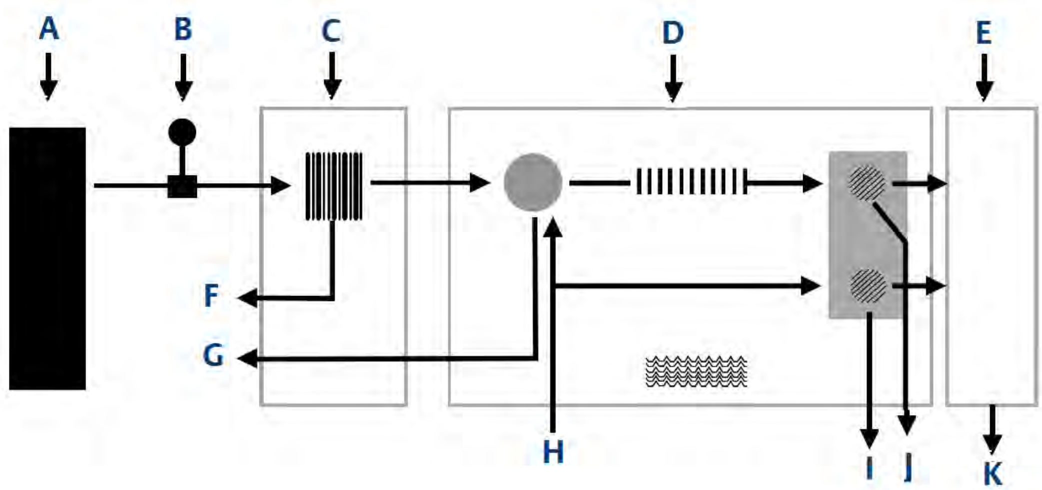
$CONCN_n$	Normalized concentration of component *n* in percent of total gas concentration
$CONC_i$	Non-normalized concentration of component *n* in mole percent for each *k* component
$CONC_n$	Non-normalized concentration of component *n* in mole percent
k	Number of components to be included in the normalization

Note
The average concentration of each component will also be calculated when data averaging is requested.

A.6 Functional description

A sample of the gas to be analyzed is taken from the process stream by a sample probe installed in the process line. The sample passes through a sample line to the SCS where it is filtered or otherwise conditioned. After conditioning, the sample flows to the analyzer assembly for separation and detection of the gas components.

Figure A-4: Gas chromatography process model



- A. *Process line*
- B. *Probe*
- C. *Sample system*
- D. *Chromatograph oven*
- E. *GC Controller*
- F. *Sample return*
- G. *Slip stream*
- H. *Carrier gas*
- I. *Reference vent*
- J. *Detector vent*
- K. *Analysis results*

Separation and analysis

The chromatographic separation of the sample gas into its components is accomplished in the following manner.

1. A precise volume of sample gas is injected into one of the analytical columns. The column contains a stationary phase (packing) that is either an active solid or an inert solid support that is coated with a liquid phase (absorption partitioning).
2. The sample gas is moved through the column by means of a mobile phase (carrier gas).
3. The selective retardation of the components takes place in the column, causing each component to move through the column at a different rate. This separates the sample into its constituent gases and vapors.
4. A detector located at the outlet of the analytical column senses the elution of components from the column and produces electrical outputs proportional to the concentration of each component.

Output from the electronic assembly is normally displayed on a remotely located PC or in a Distributed Control system (or Flow computer).

Connection between the GC and the PC can be accomplished from a direct serial line, an optional Ethernet cable, or via a Modbus-compatible communication interface.

Several chromatograms may be displayed via MON2020 with separate color schemes, allowing you to compare present and past data.

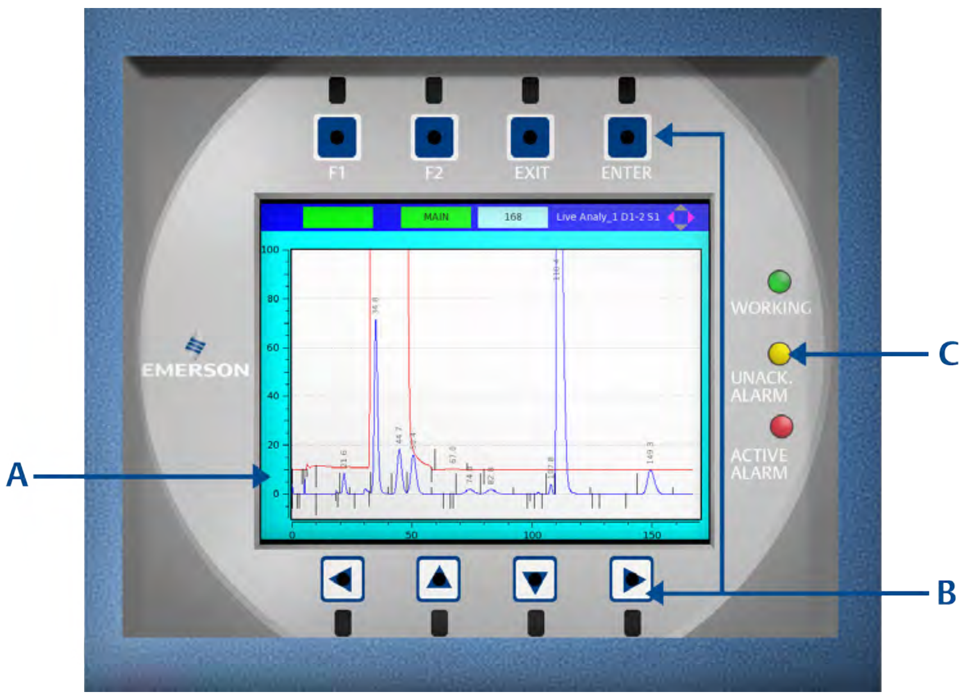
In most cases, it is essential to use MON2020 to configure and troubleshoot the GC. The PC may be remotely connected via Ethernet, telephone, radio or satellite communications. Once installed and configured, the GC can operate independently for long periods of time.

Appendix B
Local operator interface (LOI)

B.1 LOI for displaying and entering data

The LOI has multiple components that you can use to interact with the unit.

Figure B-1: LOI Components



A. LCD screen
B. Keypads
C. LED indicators

B.2 LOI components

B.2.1 Light emitting diode (LED) indicators

There are three LED status indicators on the LOI that show the overall status of the gas chromatograph. These LEDs are positioned to the right of the display screen. Each LED, when lit, indicates a specific condition.

	The GC is currently running an analysis.
	The GC has at least one unacknowledged alarm.
	The GC has an out-of-tolerance or alarm condition that requires an operator action.

LCD display screen

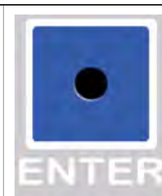
The LCD display screen measures 4.4 by 3.3 in. (111.4 x 83.5 mm) and is capable of 640 by 480 VGA pixel resolution, supporting both text and full graphics. The backlighting, boost, and brightness are all under software control. The boost and brightness levels are user-adjustable.

Keypad

The keypad consists of eight infrared keys.

Command keys

The four keys located above the LCD display screen are *command* keys. See *Section B.3.3* for more information.

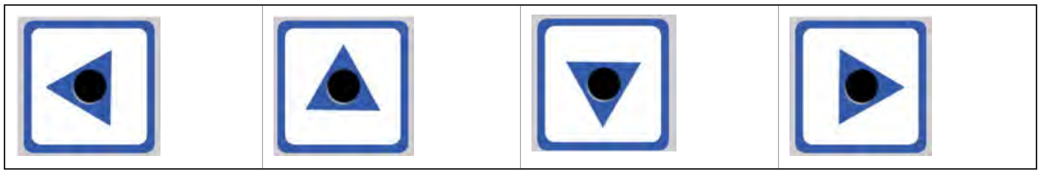
			

Arrow keys

The four keys below the LCD display screen are arrow keys that allow you to navigate within the screen by scrolling or moving the cursor from field to field. These keys function in the same way as a computer keyboard's arrow keys.

- Left
- Up

- Down
- Right



Pressing a key

A key is *pressed* by placing a finger on the glass over the associated key hole and then removing the finger. Holding a finger over the key hole will cause that key to repeat until the finger is removed.

B.3 Using the LOI

B.3.1 Startup

Upon starting the GC, the LOI automatically runs in *Status Display* mode, in which it scrolls through a predefined series of screens, displaying each screen for approximately 30 seconds.

Screen	Description
Status	Displays information about the operational state of the analyzer, including a scrolling list of up to 25 user-selectable parameters that can be defined or modified using the MON 2020 software. **Note** There is more than one Status screen if the GC is configured with more than one analysis/cycle clock.
Live Chromatogram	Displays the chromatogram for the current analysis in real time. **Note** There is more than one Live Chromatogram screen if the GC is configured with more than one analysis/cycle clock. **Note** This screen does not display if the GC is not currently analyzing a sample.
Active Alarms	Lists active alarms, if any.

Screen	Description
Heater	Displays information about the PID temperature control loops.
Valves	Displays the settings and states of the stream and analyzer valves.

In *Status Display* mode, you can manually scroll to the next screen using the **RIGHT** key, or to the previous screen using the **LEFT** key. You can pause automatic scrolling at any time by pressing the **EXIT** key, and you can resume automatic scrolling by pressing either the **LEFT** or the **RIGHT** key. Automatic scrolling resumes after ten minutes of keypad inactivity.

Pressing **F1** when *MOVE* is displayed in the green box below it takes the focus inside the screen so that you can navigate through the controls of the screen using the **LEFT**, **RIGHT**, **UP** and **DOWN** keys. Pressing **EXIT** returns the focus to the top level—that is, outside of the screen. Pressing **LEFT** or **RIGHT** at the top level resumes automatic scrolling in addition to moving to the previous or next screen.

At any time, while in *Status Display* mode, you can press **ENTER** or **F2** to enter the Main Menu. Use the **EXIT** key to leave the Main Menu and return the LOI to *Status Display* mode. If you log onto the GC from the Main Menu to perform operations or edit data, when you exit the menu you will automatically be logged off the LOI.

B.3.2 Navigating menus

At any time while in *Status Display* mode, you can press **ENTER** or **F2** to enter the Main Menu.

Use the **UP** or **DOWN** keys to navigate between fields or controls within each drop-down menu. Pressing the **DOWN** key while focus is on the last field of a drop-down menu moves the focus to the first field on a screen. Alternatively, pressing the **UP** key while focus is on the first field of the drop down menu causes the focus to move to the last field.

Use the **ENTER** key from the Main Menu to activate submenus and individual menu items.

Press **EXIT** to leave the Main Menu and return the LOI to *Status Display* mode if no menu is dropped down. If a menu is dropped down, then pressing **EXIT** closes that menu.

If you log onto the GC from the Main Menu to perform operations or edit data, when you exit the menu you will automatically be logged off the LOI.

The Main Menu allows you access to all of the available LOI screens; however, you must be logged on to make changes. If you are not logged on and you attempt to edit a field, the Login screen will appear first.

After a period of fifteen minutes of inactivity, you will be automatically logged off.

B.3.3 Navigating the screen

LOI screens have several functions. They can display data for review; they can display data for editing; and they can be used to initiate activities.

Within any given screen, the function of the **ENTER** key depends upon the context. It can be used to validate and save changes or to initiate an action.

If a validation error is found after pressing **ENTER**, an `Invalid Entry` message displays. Press **ENTER** again to close the message and then re-enter your data.

Pressing **EXIT** closes the currently open screen. If you have made changes to the screen, the LOI will display a confirmation message asking if you want to save your changes. Use the arrow keys to select the appropriate button and press **ENTER**. If you select **No**, your changes will be discarded and the Main Menu will display; if you select **Cancel**, the message window will close and you will be returned to the current screen; if you select Yes, your changes will be validated and saved and then you will be returned to the Main Menu.

The **F1** and **F2** keys are context dependent. A one-word description of the function of each of these keys displays in a green prompt box directly under the key in the title bar of the top-level full-sized screen.

In some cases, **F1** acts as a toggle between scrolling either a line or a page at a time. When this is true, the currently selected option (LN or PG) displays with a green background and black text, while the non-selected option displays with a black background and green text. The table below lists the possible functions of the **F1** key:

MOVE	Press **F1** to move the cursor around within the boundary of the screen.
EDIT	Press **F1** to open the edit dialog for the field that contains the cursor. The type of dialog that displays depends upon the type of field to be edited. See *Section B.3.4* and *Section B.3.5* for more information.
SELECT	Press **F1** to select the field to be edited.
BACKSP	Press **F1** to delete the character to the left of the cursor.
LN PG	Press **F1** to scroll line by line within a screen.
LN PG	Press **F1** to scroll page by page within a screen.
EXECUTE	Press **F1** to click the button and execute the command

Note
Throughout this appendix, when referring to the **F1** key, the key's current valid function will be indicated in parenthesis—for instance, **F1 (MOVE)** or **F1 (SELECT)**.

The **F2** key, when `MAIN` is displayed in the prompt box, closes all screens and goes back to the Main Menu.

There is a navigation icon in the upper right corner of the screen that indicates which navigation keys are active for the currently displayed screen.

			
None	Left	Up	Right
			
Down	Left/Right	Up/Down	All

When you press a key, a green check will flash in the upper left corner if the key is valid; if the key is not valid, a red cross (`X`) will flash in the upper left corner.

B.3.4 Editing numeric fields

When the focus is on an editable field, pressing **F1 (EDIT)** will display the Edit dialog containing the field's original text.

Use the **LEFT** or **RIGHT** keys to move through the individual characters within the field and to select the character to be changed. Use the **UP** or **DOWN** keys to select the value of each digit. The possible values are `1`, `2`, `3`, `4`, `5`, `6`, `7`, `8`, `9`, `0`, "–" (minus), " . " (period), and `E`.

The "–" value is available for signed numbers.

The " . " and the `E` values are available for floating-point numbers, except for retention times and timed event values.

The following rules apply when entering a floating-point value:

- More than one `E` is not allowed.
- More than one " . " is not allowed.
- If the previous position is an `E`, then a " . " and a `0` is not allowed.
- A "–" is allowed only after an `E` or at the first position only.
- If the previous position is " . ", then an `E` is not allowed.
- If the first character is a "–" and the current index is `1`, then a " . " is not allowed.
- If the previous position is a "–", then a `0` is not allowed.
- If the next character is an `E`, then a " . " is not allowed at the previous location.

The **DOWN** key moves backward in the list from the current value of the selected digit.

The **UP** key moves forward in the list from the current value of the selected digit.

The **F1 (BACKSP)** key acts as a backspace and deletes the digit immediately to the left of the current position.

The **ENTER** key validates and saves the entry and then closes the Edit dialog. The new entry will display in the field.

The **EXIT** key cancels any changes that were entered and closes the Edit dialog, restoring the previous value to the field.

B.3.5 Editing non-numeric fields

The function of the keys when editing non-numeric data is context-dependent.

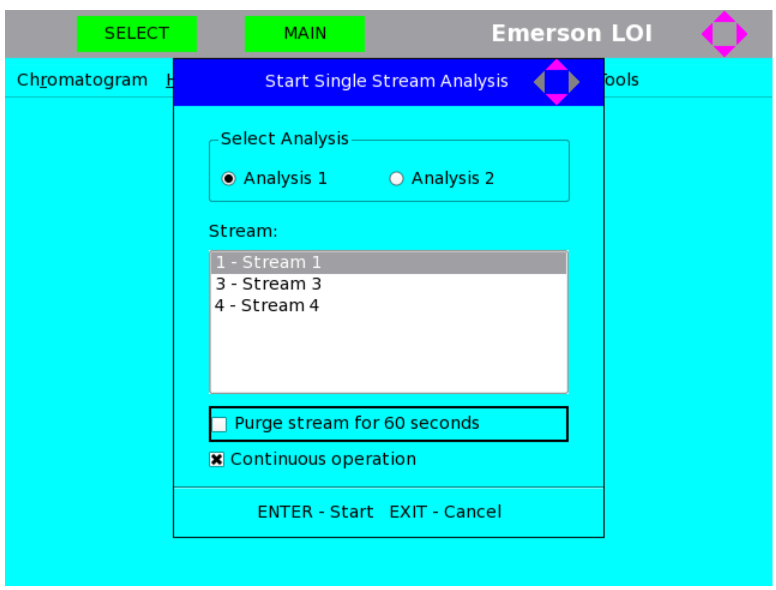
Editing alphanumeric fields

Alphanumeric fields take numbers (0 - 9) and letters (a - z, A - Z).

Selecting check boxes

Press **F1 (SELECT)** to select or clear a checkbox.

Figure B-2: Selecting a Checkbox



Clicking buttons

Press **F1 (EXECUTE)** to click the button and execute the command.

Selecting radio buttons

Procedure

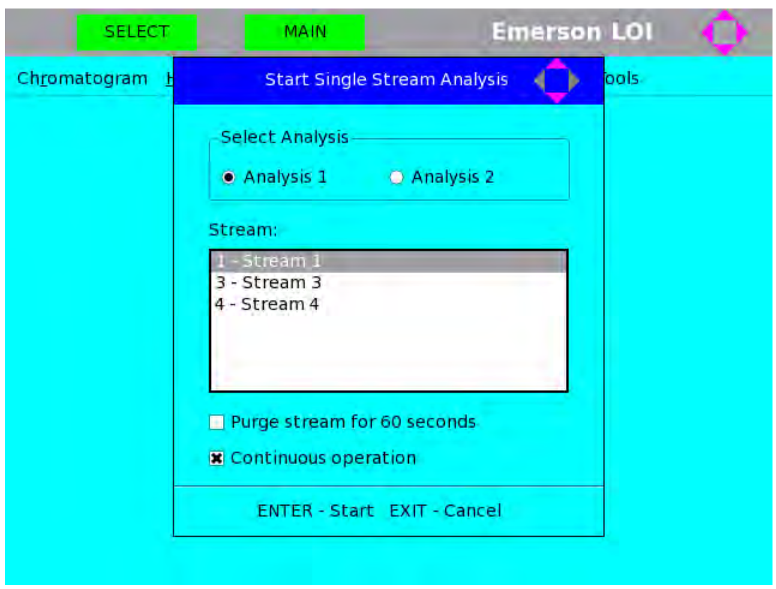
1. Press **F1 (SELECT)** to select a group of radio buttons.
2. Use the **UP/ DOWN** or **LEFT/RIGHT** keys to move through the various radio buttons within the group.
3. Press **ENTER** to accept the current selection or press **EXIT** to abort any changes and to restore the previous selection.

Selecting an item from a list box

Procedure

1. Press **F1 (SELECT)** while focused on the list box to switch it to *Edit* mode.

Figure B-3: Selecting a List Box



2. Use the **UP** and **DOWN** keys to move between the values within the list box.
3. Press **ENTER** to accept the current selection or press **EXIT** to abort the new selection, and the list box will revert to the previous selection.

Selecting an item from a combo box

Procedure

1. Press **F1 (SELECT)** while focused on the combo field.

   A combo dialog opens and displays a list of available selections.

Figure B-4: Selecting a Combo Box

2. Use the **UP** and **DOWN** keys to move between the selections.
3. Press **ENTER** to select the desired value or press **EXIT** to restore the combo box's initial value.

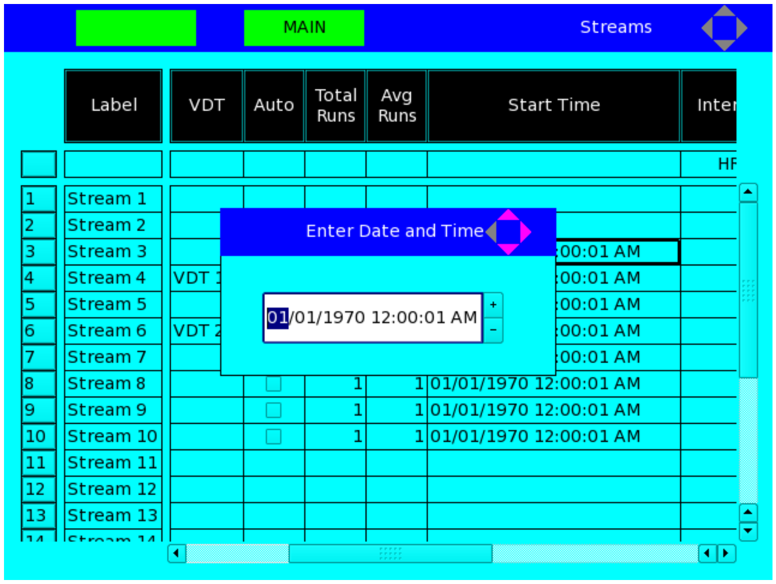
Entering a date and time

Procedure

1. Press **F1 (SELECT)** while focused on the *Date and Time* field

   The Enter the Date and Time dialog displays. By default, the focus is set on the *Month* unit.

Figure B-5: Entering a Date and Time



2. Use the **UP** and **DOWN** keys to change the value of the unit—that is, to go from January to February, or from 1 to 2.
3. Use the **LEFT** and **RIGHT** arrow keys to change units—that is, to go from months to years or hours to minutes.

Note

If the focus is on the leftmost section, the **LEFT** key will be inactive, and similarly if the focus is on the rightmost section, the **RIGHT** arrow key will be inactive.

4. Press **ENTER** to save the change or press **EXIT** to discard the change and restore the original value.

Setting the time

Procedure

1. Press **F1 (SELECT)** while focused on the *Time* field

   The Enter the Time dialog displays. By default, the focus is set on the *Hour* unit.
2. Use the **UP** and **DOWN** keys to change the value of the unit.
3. Use the **LEFT** and **RIGHT** arrow keys to change units—to go from hours to minutes, for example.

Note

If the focus is on the leftmost section, the **LEFT** key will be inactive, and similarly if the focus is on the rightmost section, the **RIGHT** arrow key will be inactive.

4. Press **ENTER** to save the change or press **EXIT** to discard the change and restore the original value.

B.4 Screen navigation and interaction tutorial

This tutorial, which guides you through the procedure for editing data on a screen, will incorporate all of the preceding information to demonstrate the typical method of navigating and interacting with the LOI. You will learn how to perform the following actions:

- Open and close screens
- Navigate through tables
- Select fields for editing
- Save data

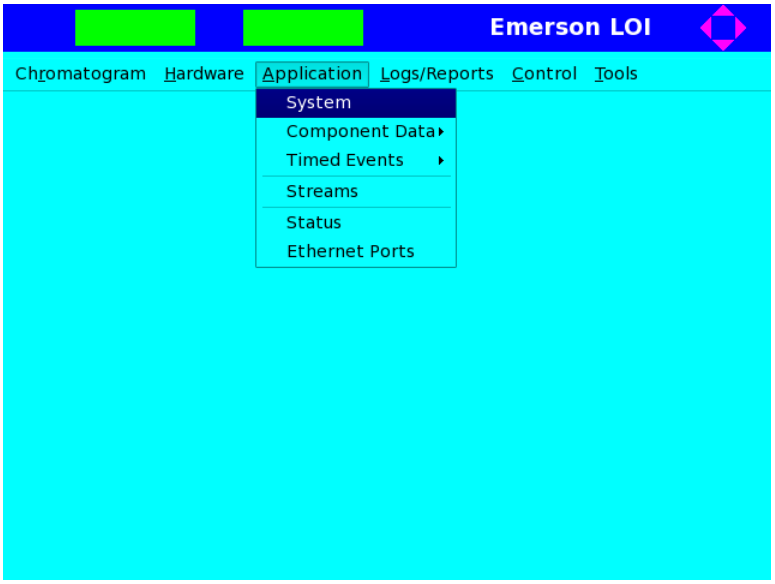
Procedure

1. From the Main Menu, click the **RIGHT** key enough times to navigate to the **Application** menu. The **System** submenu, as it is the first item in the list, is already selected.

Note

In this instance, the term *click* means to tap the glass on the spot directly above the arrow's keyhole.

Figure B-6: Navigate to the Application Menu



Note

Notice the navigation icon in the upper right corner, which indicates that all four arrow keys are active. This allows you to navigate to all of the menu items and sub menu items.

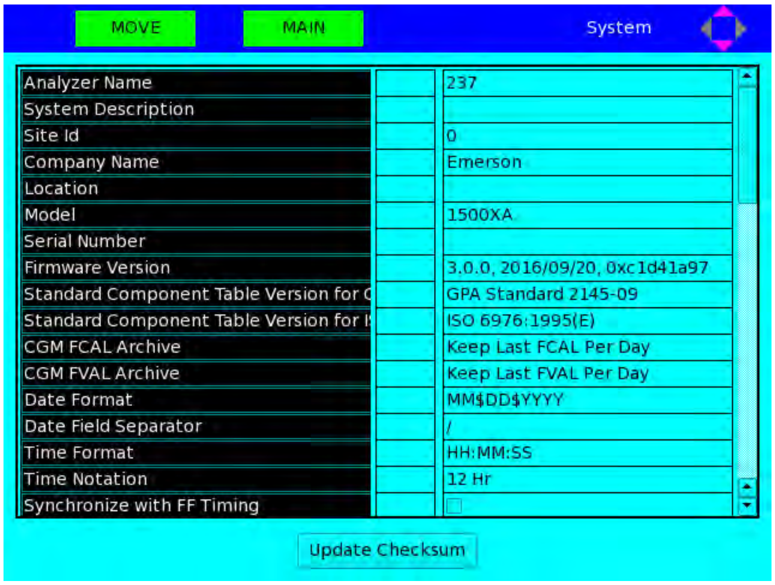
Note

Notice that the green prompt boxes are empty. This means that the **F1** and **F2** keys are inactive from the Main Menu.

2. Click **ENTER**.

   The System screen displays.

Figure B-7: System screen



Note

Notice the navigation icon in the upper right corner, which indicates that no arrow keys are active.

Notice that the green prompt boxes now display function keywords. `MAIN` means that if you click the **F2** key, the LOI will close the current screen and return you to the Main Menu. `MOVE` means that if you click the **F1** key, the arrow keys are enabled for navigation within the System screen.

3. Click **F1**.

   The LOI switches to *Edit* mode. Notice that the navigation icon in the upper right corner of the screen indicates that the **DOWN** key is active.

4. Click the **DOWN** key once.

Now the navigation icon indicates that both the **UP** and **DOWN** keys are active.

5. Click the **UP** arrow once to return to the previous cell.

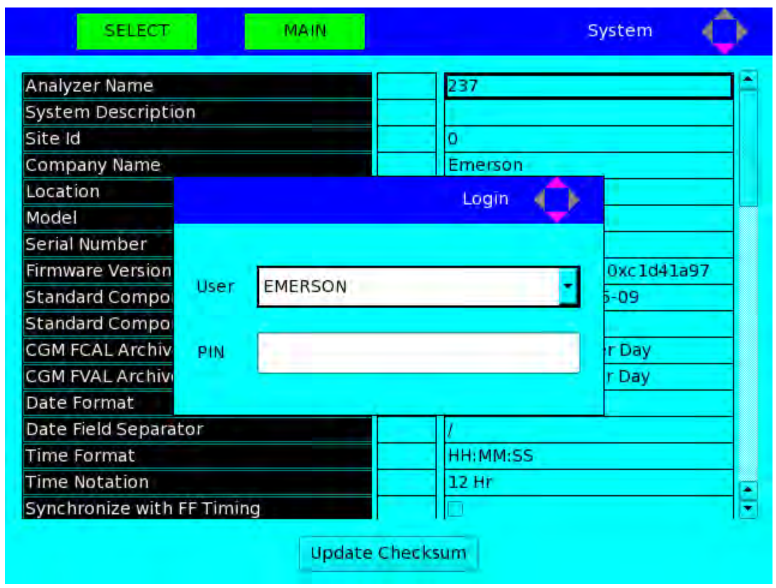
   The navigation icon again indicates that only the **DOWN** key is active.

   Notice that the green F1 prompt box reads `EDIT`.

6. Click **F1**.

   You must be logged in to the GC to make a change to any screen. If you try to edit a field before logging in—as you just did—the LOI displays the Login dialog to prompt you to log in.

Figure B-8: Login Screen (Edit Mode Prompt)



Note
Notice that there is also a navigation icon on the Login dialog.

7. Click **F1 (SELECT)** and navigate up or down the list to highlight your user name.

Note
For the remainder of this tutorial, when referring to the **F1** key, the key's current valid function will be indicated in parenthesis—for instance, **F1 (MOVE)** or **F1 (SELECT)**.

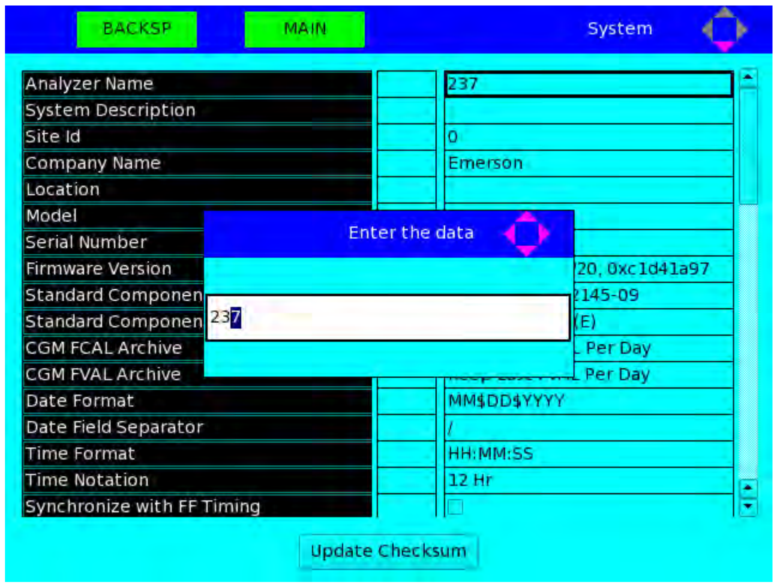
8. Click **ENTER**.
9. Navigate to the *Pin* field, press **F1 (EDIT)**, and enter your password.
10. Click **ENTER** twice.

    Now that you are logged in, you can edit the fields on the screen.

11. Click **F1 (EDIT)**. The Enter the data dialog displays.

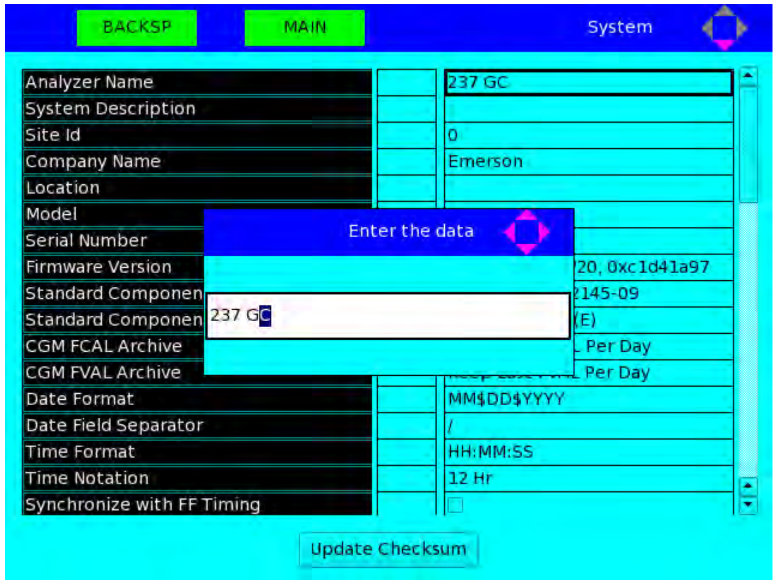
    The Enter the data dialog allows you to edit the selected field.

Figure B-9: Enter the Data Dialog



12. To delete a character, press **F1 (BACKSP)**. To enter new data, use the **UP** and **DOWN** keys to cycle through the available characters, and use the **RIGHT** key to add a new character to the field.
13. When you are finished entering data, press **ENTER** to validate and save the new information. To discard the information, press **EXIT**.

Figure B-10: New Data Displayed

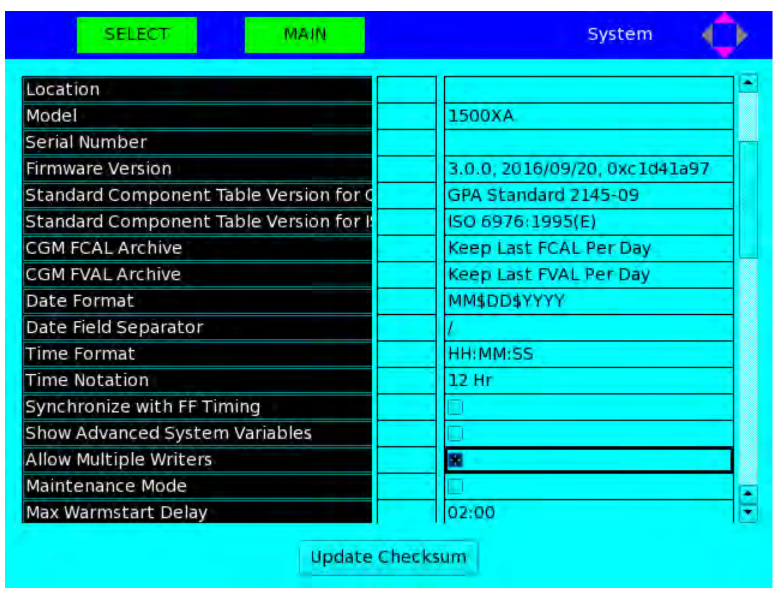


Note

If a validation error is found after pressing **ENTER**, an `Invalid Entry` message displays. Press **ENTER** to close the message and then re-enter your data.

14. Use the **DOWN** arrow to move to the Allow Multiple Writers checkbox.

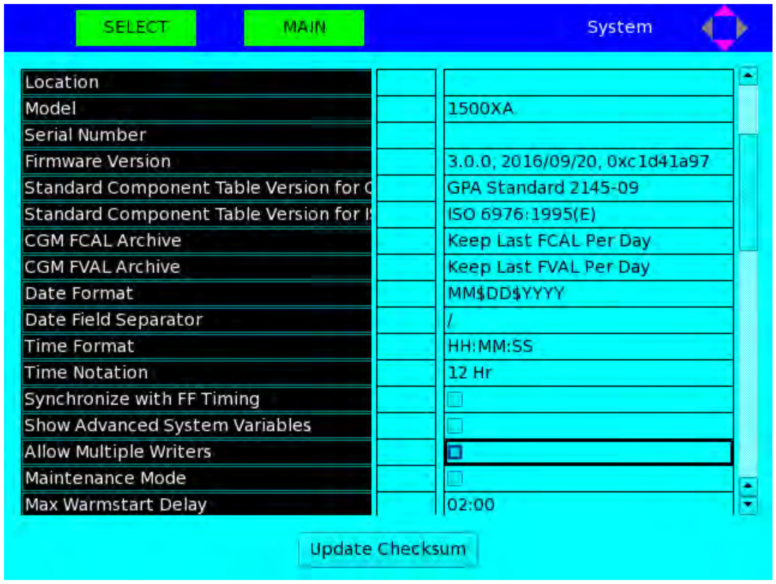
Figure B-11: Allow Multiple Writers Checkbox Selected



15. Press **F1 (SELECT)**.

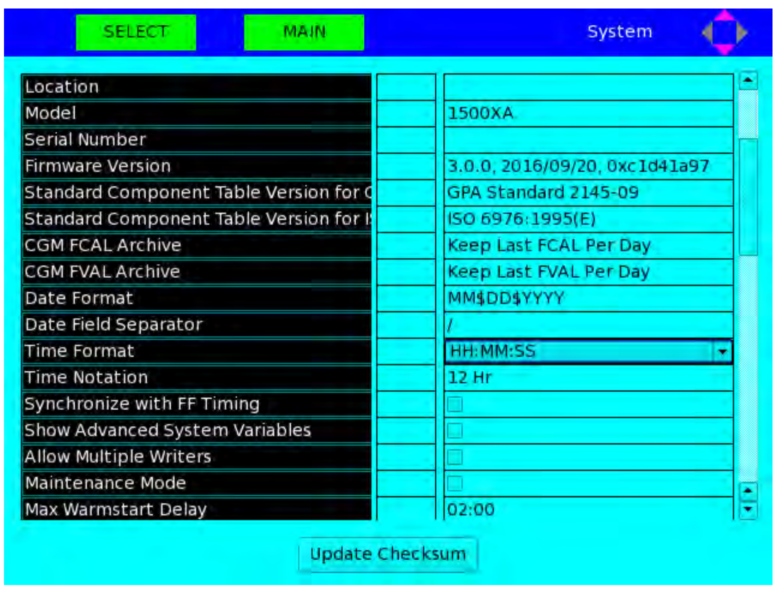
    This clears the checkbox.

Figure B-12: Allow Multiple Writers Checkbox Unselected



16. Click **F1 (SELECT)** again to reselect the check box.
17. Navigate to the *Time Format* field.

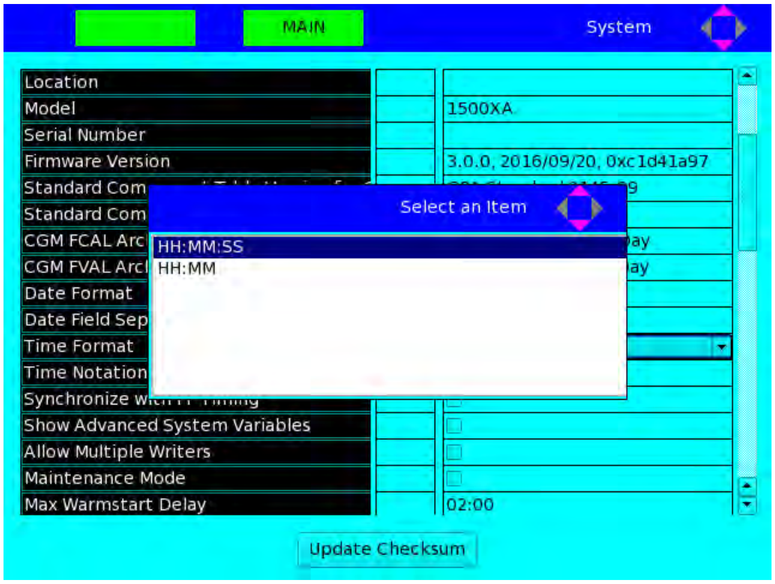
Figure B-13: Time Format Field



18. Press **F1 (SELECT)**.

    The Select an Item combo box displays.

Figure B-14: Select an Item Combo Box



19. Use the **DOWN** key to scroll down to the last item in the combo box. Press **ENTER**.
20. Press **ENTER** a second time to save all the changes that were made to the table.

Note

If you neglect to press **ENTER** at this point, all of your changes will be lost.

21. Press **F2 (MAIN)** to return to the Main Menu.

B.5 LOI screens

The Main Menu has six top-level submenus: **Chromatogram**, **Hardware**, **Application**, **Control**, **Logs/Reports**, and **Tools**.

Refer to the *MON2020 Gas Chromatograph Software* user manual for detailed information regarding the commands in *Table B-1* to *Table B-4*.

The tables below list the submenus and commands that are available from the Main Menu.

Table B-1: Chromatogram Menu

Submenu	Command	Subcommands	Reference
Chromatogram			*Section B.5.1*
	View		*Section B.5.1*
		Select Chromatogram	*Figure B-16*
		Live Chromatogram View Screen (Status Mode)	*Figure B-17*
		Live Chromatogram Screen (Advanced Mode)	*Figure B-18*
		Archived Chromatogram Screen (Advanced Mode)	*Figure B-19*
		Live & Archived Chromatogram Viewer Options Menu	*Figure B-20*
		CGM Scaling Screen	*Figure B-21*
		Select Detector Screen	*Figure B-22*
		Chromatogram TEV Table	*Figure B-23*
		Chromatogram CDT Table	*Figure B-24*
		Chromatogram Raw Data Table	*Figure B-25*

Table B-2: Hardware and Application Menus

Submenu	Command	Subcommands	Reference
Hardware			*Section B.5.2*
	Heaters		*Figure B-27*
	Valves		*Figure B-28*
	Detectors		*Figure B-29*
	Discrete Inputs		*Figure B-30*
	Discrete Outputs		*Figure B-31*
	Analog Inputs		*Figure B-32*
	Analog Outputs		*Figure B-33*
	Installed Hard-ware		*Figure B-34*
Application			*Section B.5.3*
	System		*Figure B-36*
	Component Data		*Figure B-37*

Table B-2: Hardware and Application Menus *(continued)*

Submenu	Command	Subcommands	Reference
		CDT 1	
		CDT 2	
		CDT 3	
		CDT 4	
	Timed Events		*Figure B-38*
		TEV 1	
		TEV 2	
		TEV 3	
		TEV 4	
	Streams		*Figure B-42*
	Status		*Figure B-43*
	Ethernet Ports		*Figure B-44*

Table B-3: Logs/Reports and Control Menus

Submenu	Command	Subcommands	Reference
Logs/Reports			*Section B.5.4*
	Maintenance Log		*Figure B-46*
	Event Log		*Figure B-47*
	Alarm Log		*Figure B-48*
	Unack Alarms		*Figure B-49*
	Active Alarms		*Figure B-50*
	Report Display		*Figure B-51*
Control			*Section B.5.5*
	Auto Sequence		*Figure B-53*
	Single Stream		*Figure B-54*
	Halt		*Figure B-55*
	Calibration		*Figure B-56*
	Validation		*Figure B-57*
	Stop Now		*Figure B-58*

Table B-4: Tools Menu

Submenu	Command	Subcommands	Reference
Tools			*Section B.5.6*
	Screen Control		*Figure B-60*
	Change PIN		*Figure B-61*
	Diagnostics		*Figure B-62*
	Log out		no screen

B.5.1 Chromatogram menu

The **Chromatogram** menu enables you to view live and archived chromatograms and their associated CDT and TEV tables, as well as to edit the display properties if the chromatogram screens.

Refer to the *Using the chromatograph functions* section of the MON2020 Gas Chromatograph Software manual for detailed information regarding the Chromatogram menu screens.

Figure B-15: Chromatogram Menu

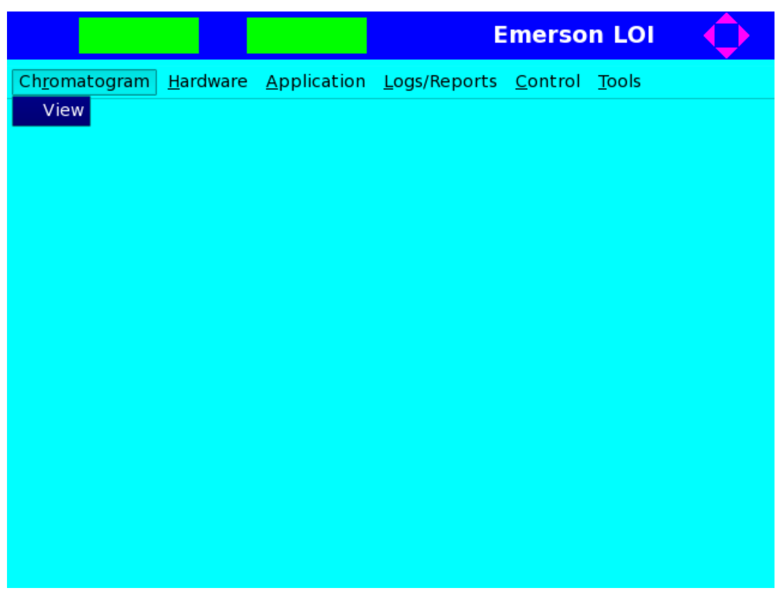


Figure B-16: Select Chromatogram Screen

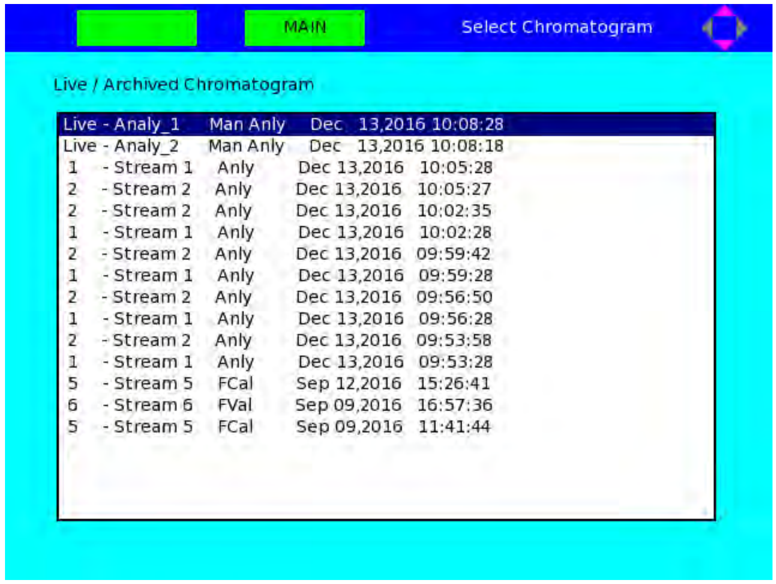
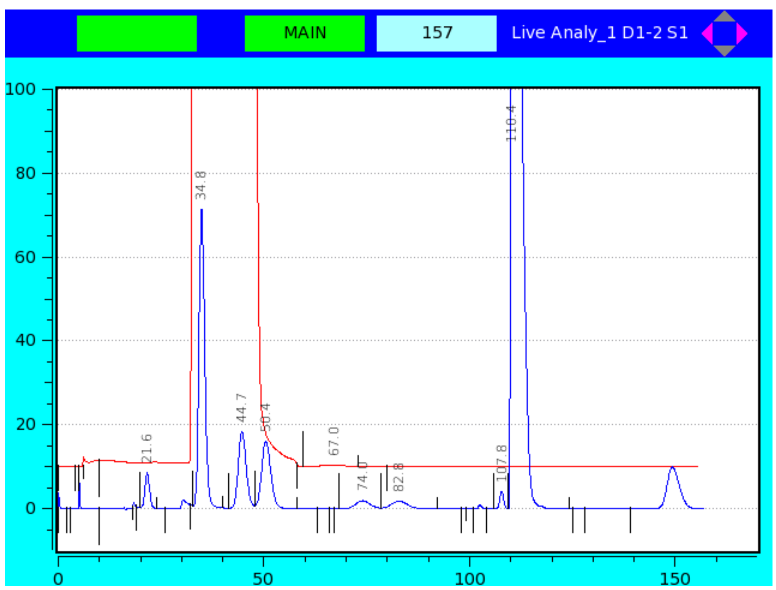


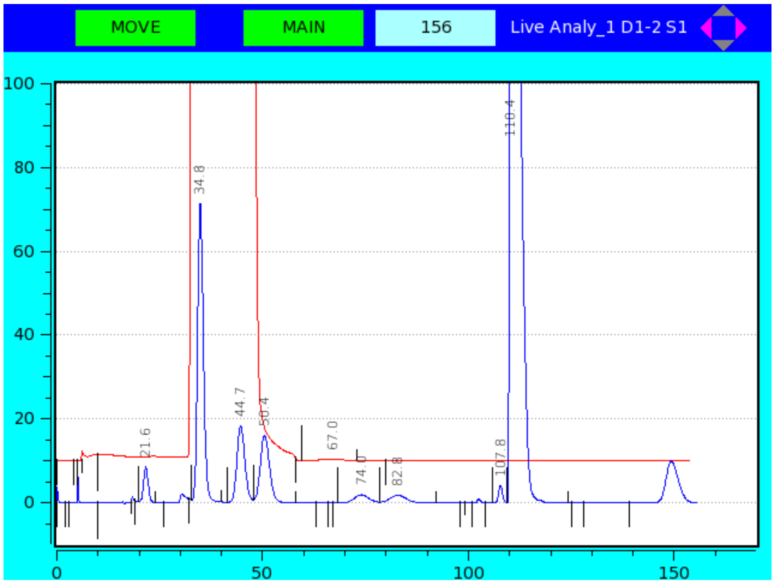
Figure B-17: Live Chromatogram View (Status Mode) Screen



Note

The blue box displays the current analysis time.

Figure B-18: Live Chromatogram View (Advanced Mode) Screen



Note
The blue box displays the current analysis time.

Figure B-19: Archived Chromatogram (Advanced Mode) Screen

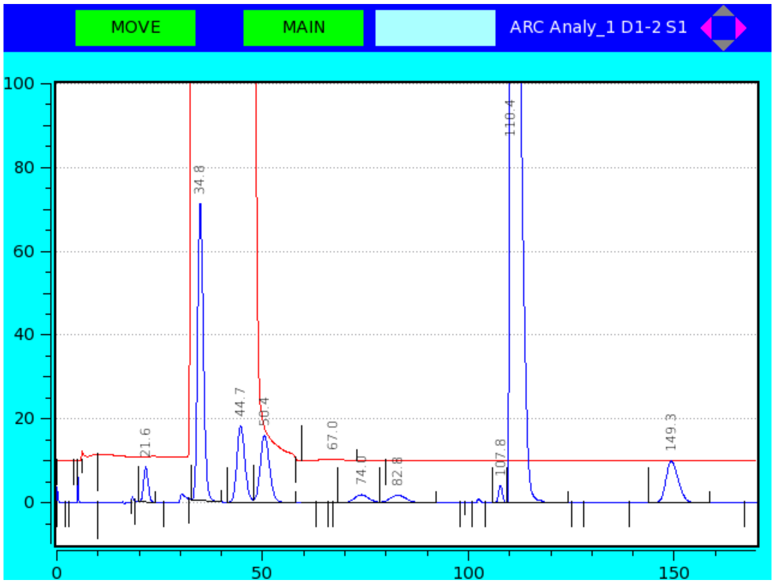
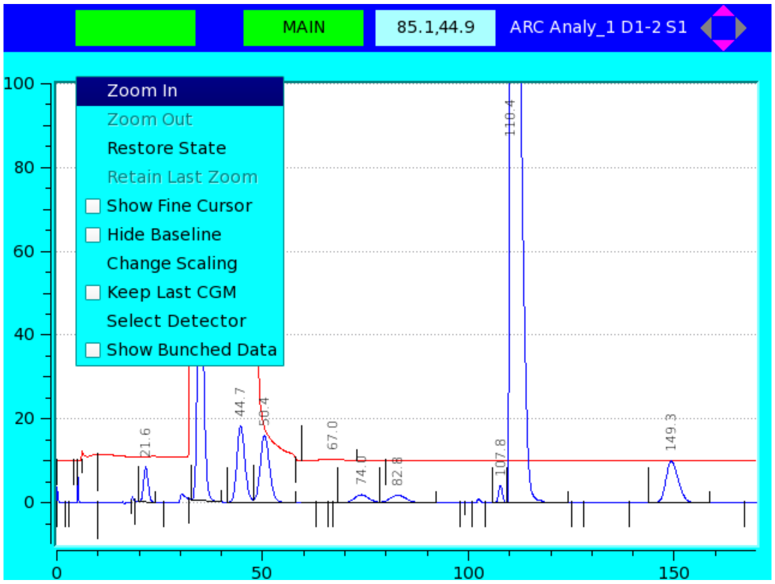


Figure B-20: Live and Archived Chromatogram Viewer Options Screen



Note
The blue box displays the cursor's X- (analysis time) and Y- (amplitude) coordinates.

Figure B-21: CGM Scaling Screen

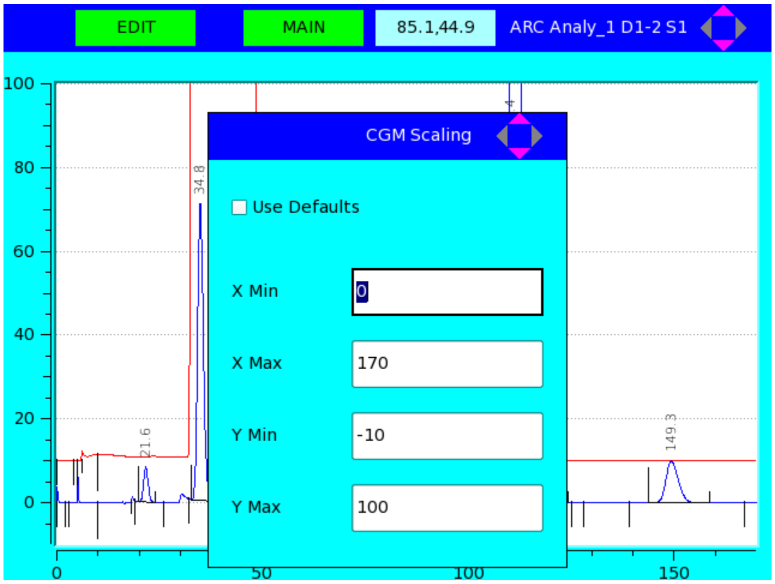


Figure B-22: Select Detector Screen

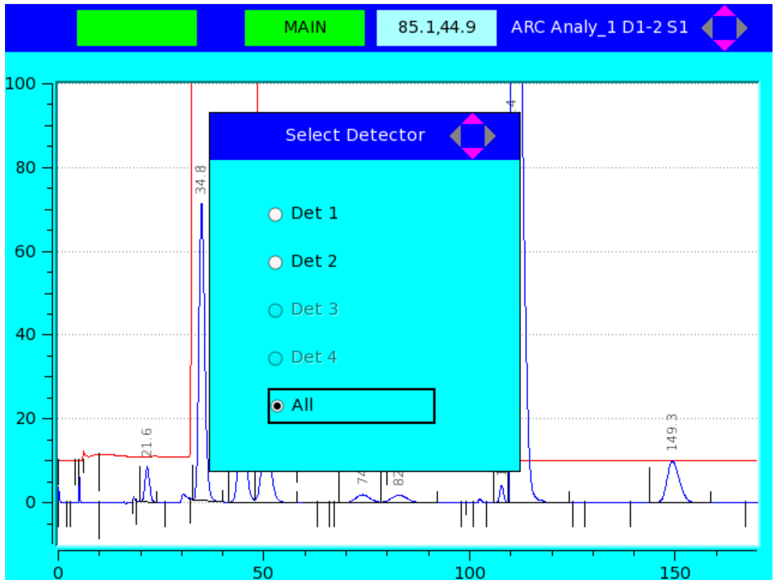
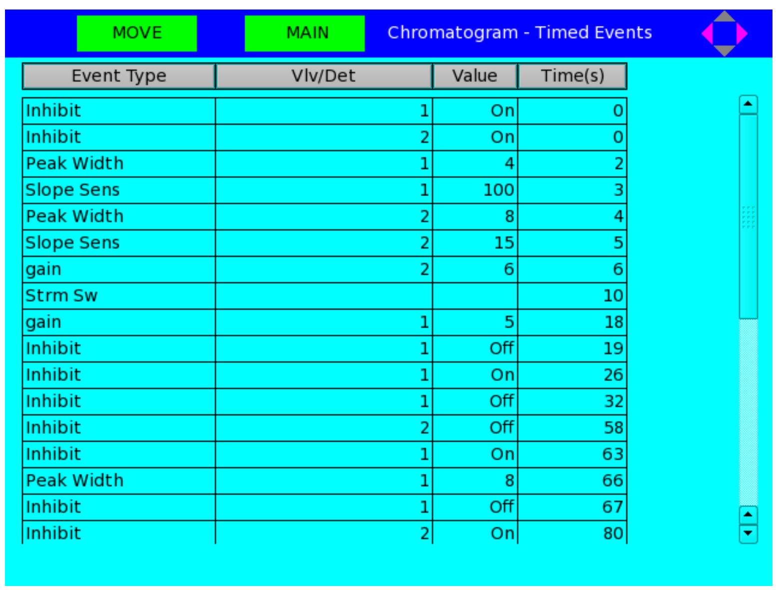
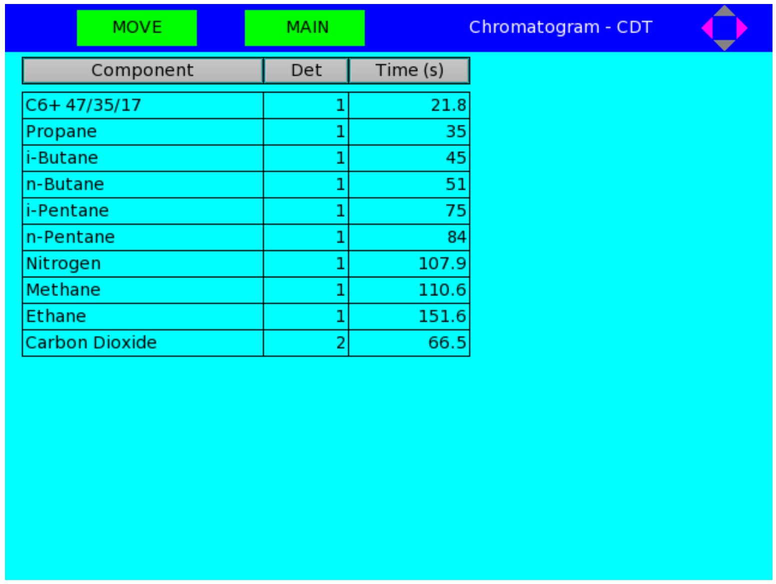


Figure B-23: Chromatogram TEV Table Screen



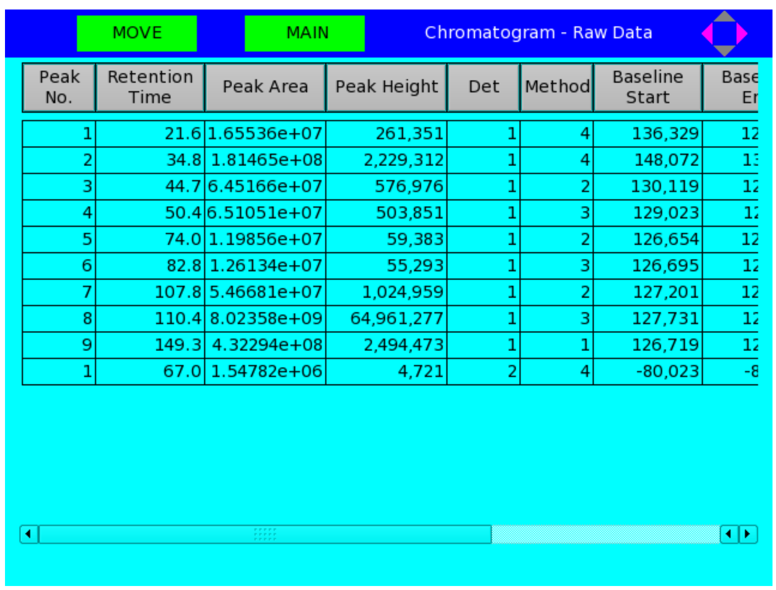
Event Type	Vlv/Det	Value	Time(s)
Inhibit	1	On	0
Inhibit	2	On	0
Peak Width	1	4	2
Slope Sens	1	100	3
Peak Width	2	8	4
Slope Sens	2	15	5
gain	2	6	6
Strm Sw			10
gain	1	5	18
Inhibit	1	Off	19
Inhibit	1	On	26
Inhibit	1	Off	32
Inhibit	2	Off	58
Inhibit	1	On	63
Peak Width	1	8	66
Inhibit	1	Off	67
Inhibit	2	On	80

Figure B-24: Chromatogram CDT Table Screen



Component	Det	Time (s)
C6+ 47/35/17	1	21.8
Propane	1	35
i-Butane	1	45
n-Butane	1	51
i-Pentane	1	75
n-Pentane	1	84
Nitrogen	1	107.9
Methane	1	110.6
Ethane	1	151.6
Carbon Dioxide	2	66.5

Figure B-25: Chromatogram Raw Data Table Screen



Peak No.	Retention Time	Peak Area	Peak Height	Det	Method	Baseline Start	Base En
1	21.6	1.65536e+07	261,351	1	4	136,329	12
2	34.8	1.81465e+08	2,229,312	1	4	148,072	13
3	44.7	6.45166e+07	576,976	1	2	130,119	12
4	50.4	6.51051e+07	503,851	1	3	129,023	12
5	74.0	1.19856e+07	59,383	1	2	126,654	12
6	82.8	1.26134e+07	55,293	1	3	126,695	12
7	107.8	5.46681e+07	1,024,959	1	2	127,201	12
8	110.4	8.02358e+09	64,961,277	1	3	127,731	12
9	149.3	4.32294e+08	2,494,473	1	1	126,719	12
1	67.0	1.54782e+06	4,721	2	4	-80,023	-8

B.5.2 Hardware menu

The **Hardware** menu enables you to view and manage the GC's hardware components.

Refer to the *Using the hardware functions* section of the *MON2020 Gas Chromatograph Software* manual for detailed information regarding the **Hardware** menu screens.

Figure B-26: Hardware Menu

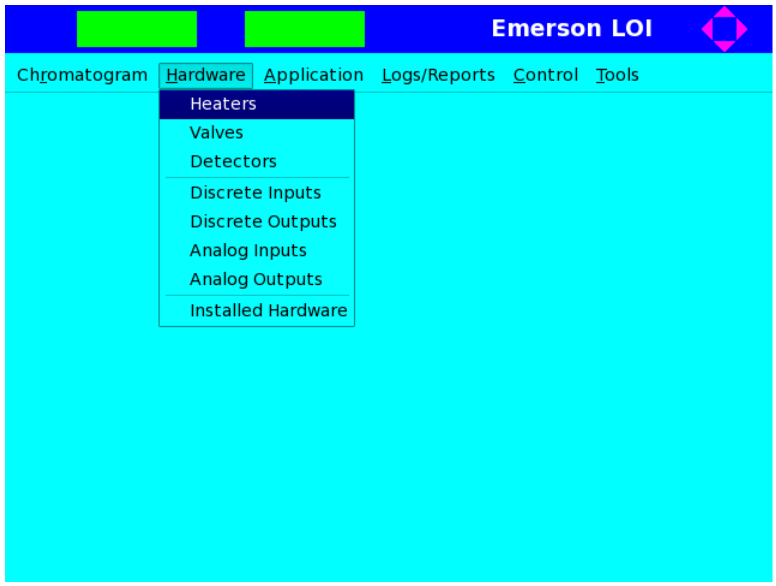


Figure B-27: Heaters Screen

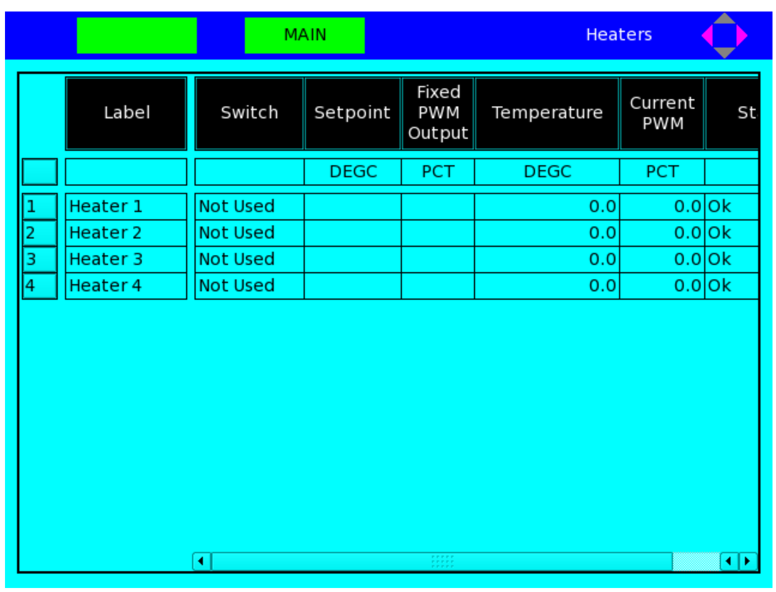


Figure B-28: Valves Screen

Note

The mode (**Auto**, **ON**, **OFF**), and state (**Green** = **ON**, **Black** = **OFF**, **Red** = **ERROR**) of each valve is displayed. See the *Configuring the valves* section of the *MON2020 Gas Chromatograph Software* manual for more information.

Figure B-29: Detectors Screen

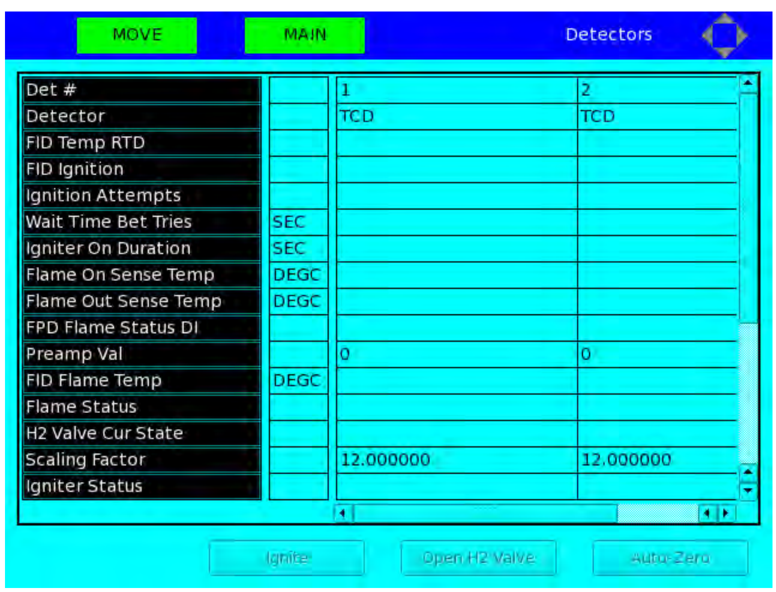


Figure B-30: Discrete Inputs Screen

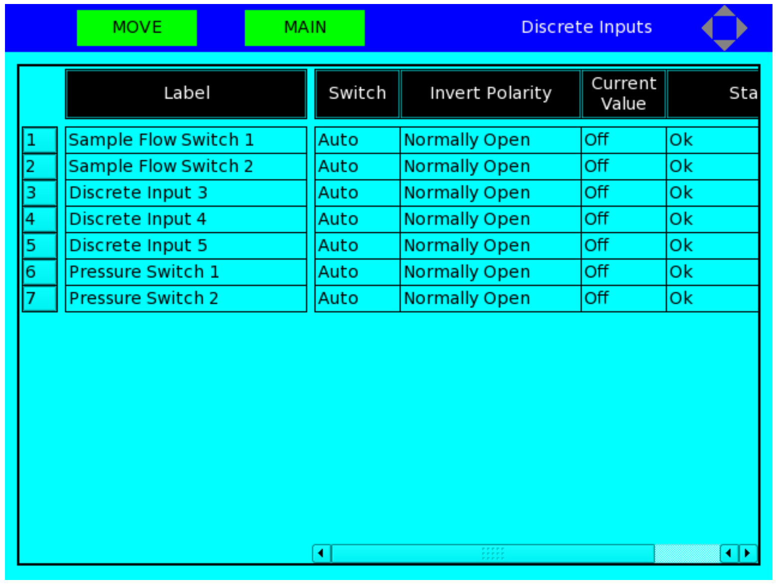


Figure B-31: Discrete Outputs Screen

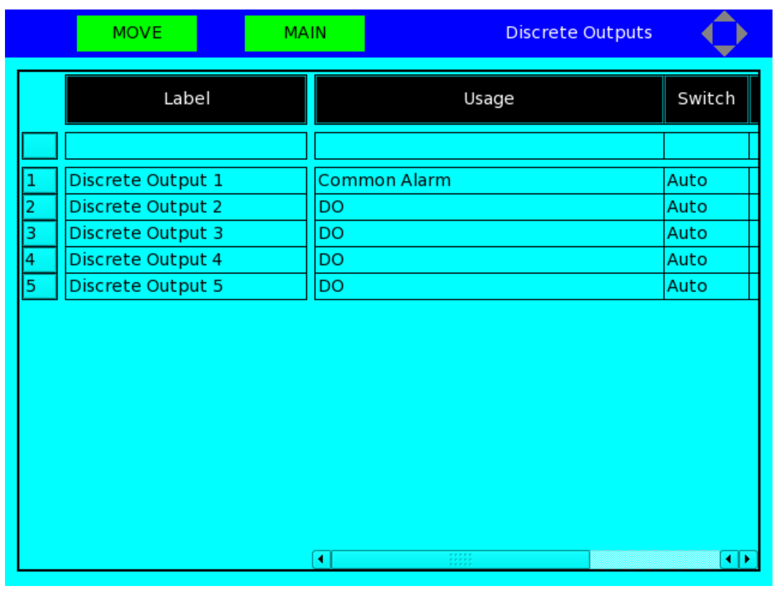


Figure B-32: Analog Inputs Screen

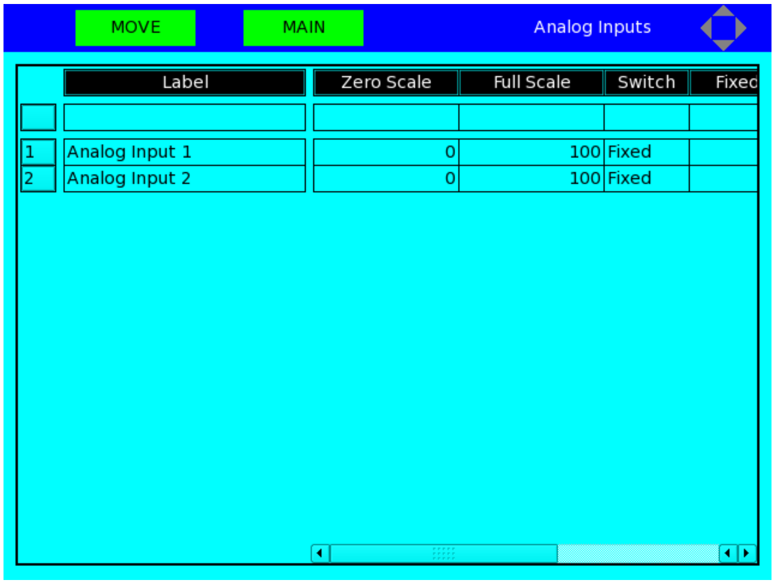


Figure B-33: Analog Outputs Screen

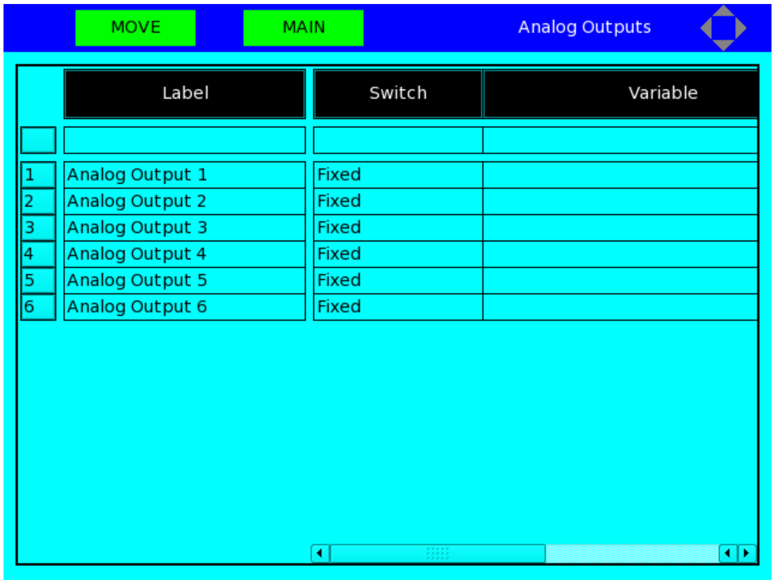
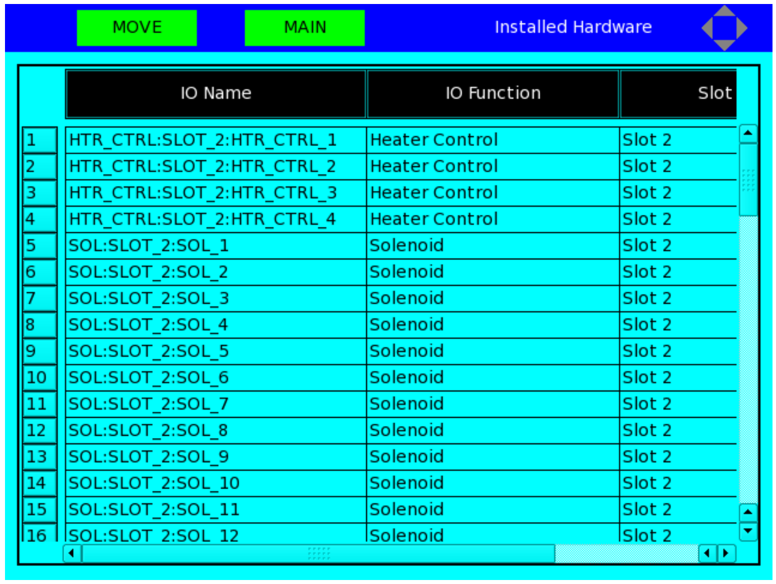


Figure B-34: Installed Hardware Screen



B.5.3 Application menu

The **Application** menu allows you to view the Component Data, Timed Events, and Streams tables for the GC. The System, Status, and Ethernet Ports screens are also accessible from this menu.

Refer to the *Using the application functions* section of the *MON2020 Gas Chromatograph Software* manual for detailed information regarding the **Application** menu screens.

Figure B-35: Application Menu

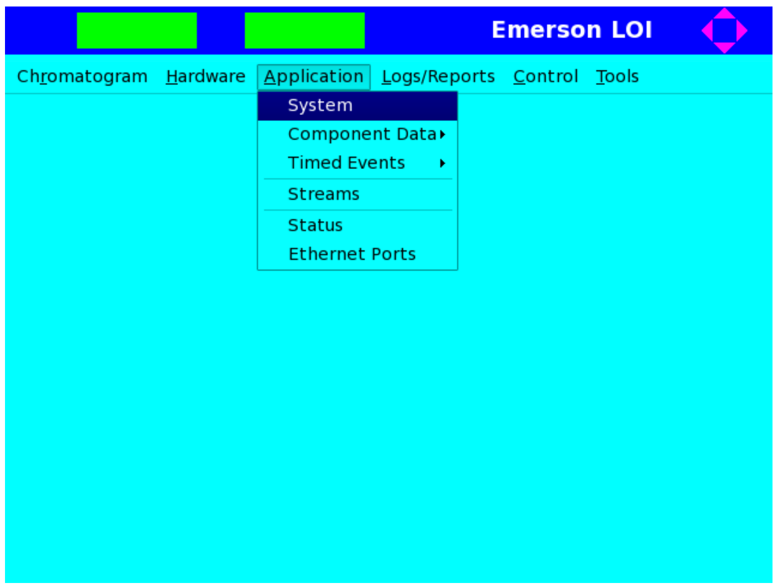


Figure B-36: System Screen

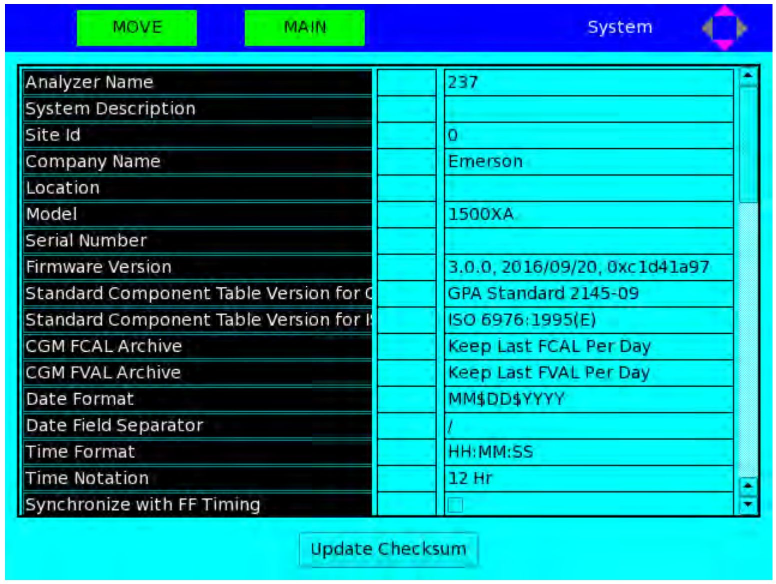


Figure B-37: CDT Screen

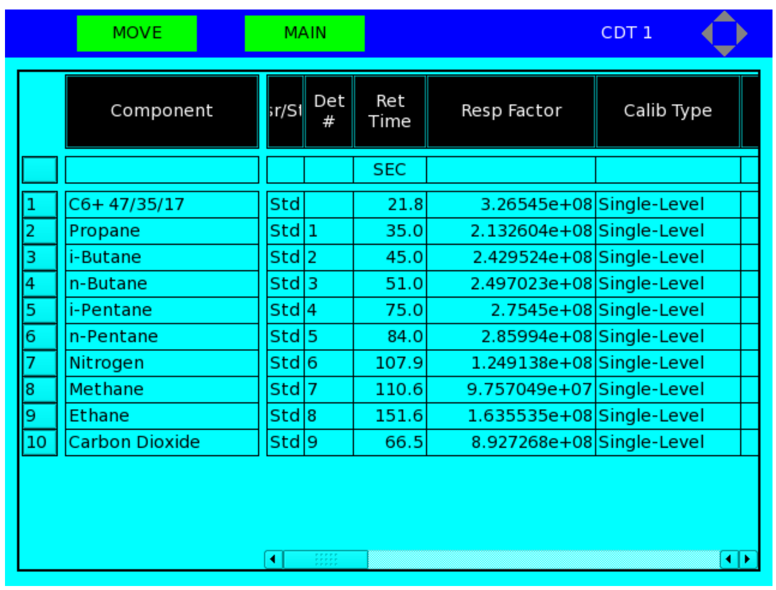
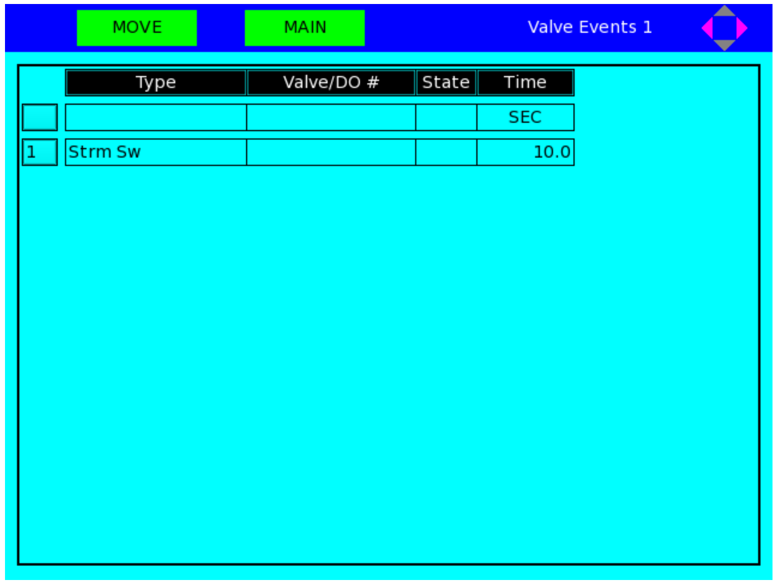
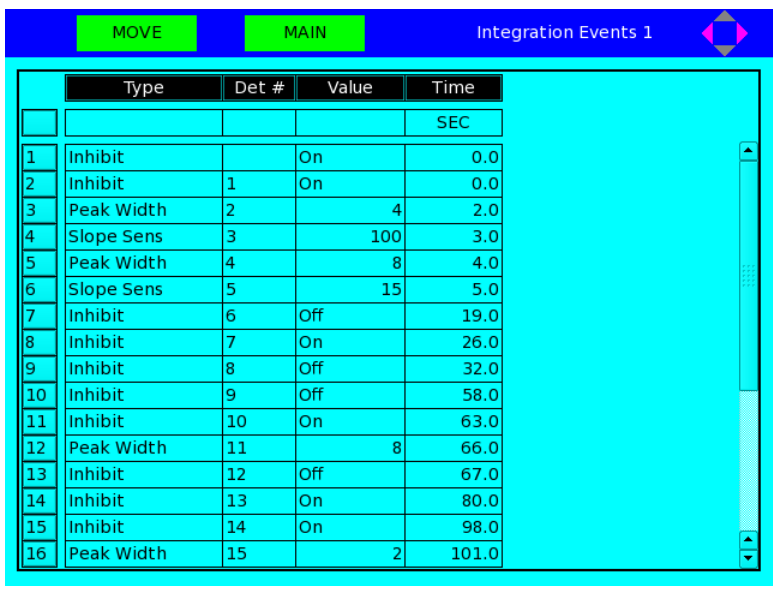


Figure B-38: TEV - Valve Events Screen



	Type	Valve/DO #	State	Time
				SEC
1	Strm Sw			10.0

Figure B-39: TEV - Integration Events Screen



	Type	Det #	Value	Time
				SEC
1	Inhibit		On	0.0
2	Inhibit	1	On	0.0
3	Peak Width	2	4	2.0
4	Slope Sens	3	100	3.0
5	Peak Width	4	8	4.0
6	Slope Sens	5	15	5.0
7	Inhibit	6	Off	19.0
8	Inhibit	7	On	26.0
9	Inhibit	8	Off	32.0
10	Inhibit	9	Off	58.0
11	Inhibit	10	On	63.0
12	Peak Width	11	8	66.0
13	Inhibit	12	Off	67.0
14	Inhibit	13	On	80.0
15	Inhibit	14	On	98.0
16	Peak Width	15	2	101.0

Figure B-40: TEV - Spectrum Gain Events Screen

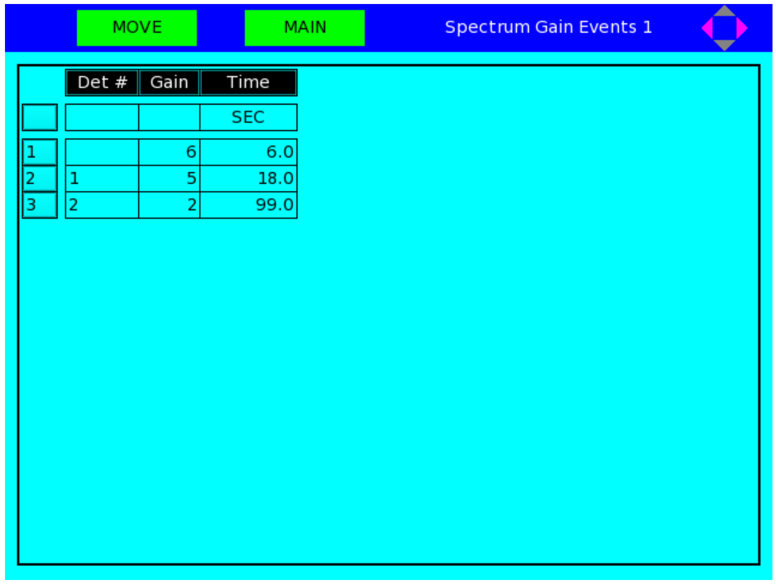


Figure B-41: TEV - Analysis Time Screen

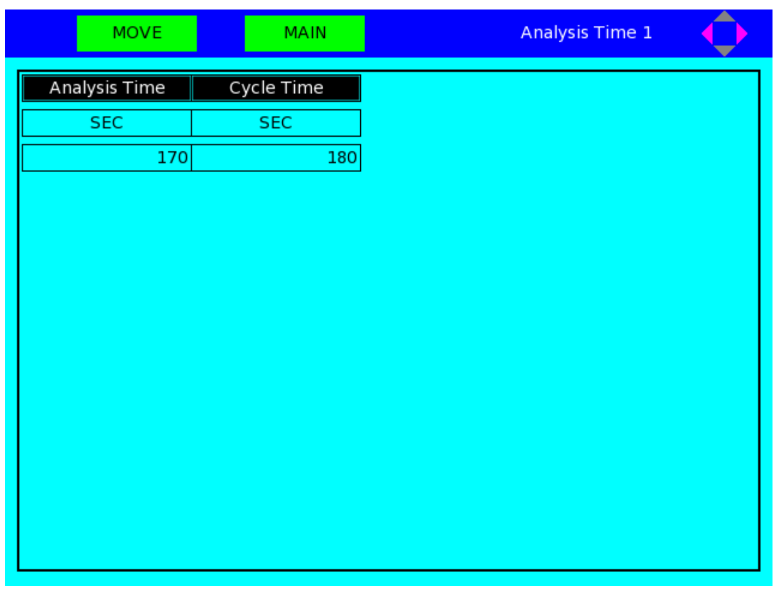


Figure B-42: Streams Screen

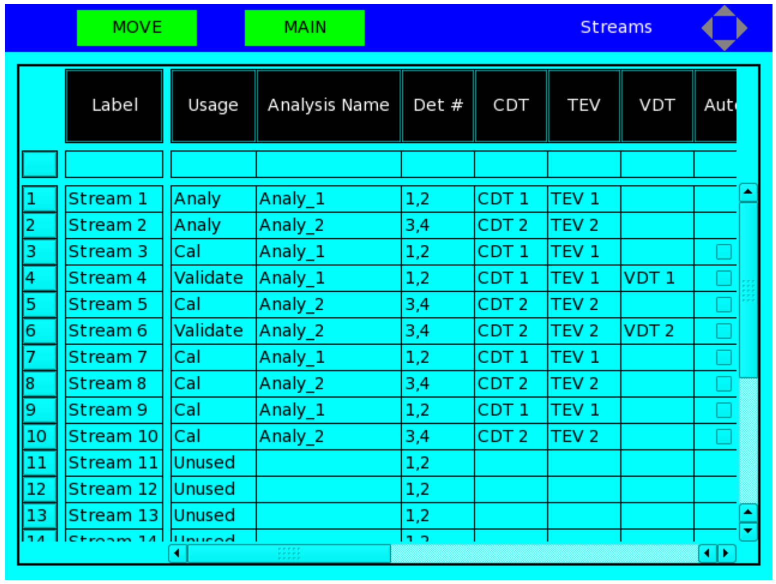


Figure B-43: Status Screen

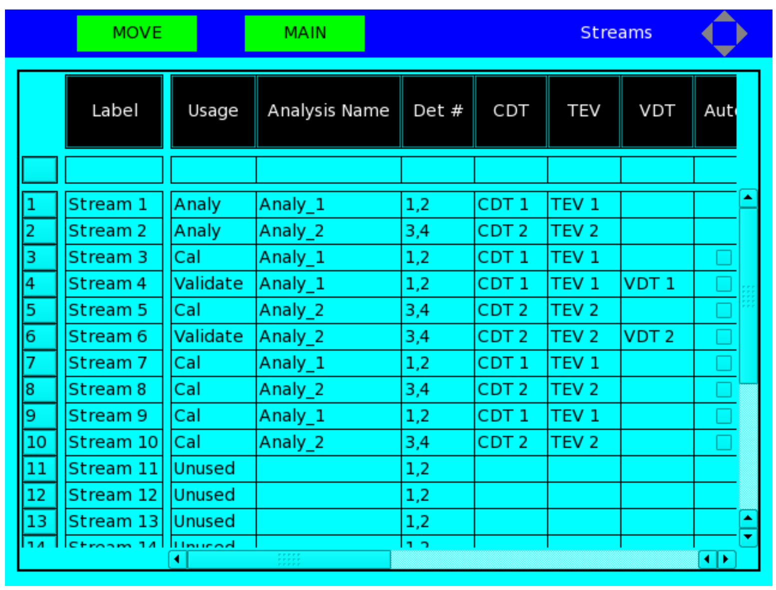
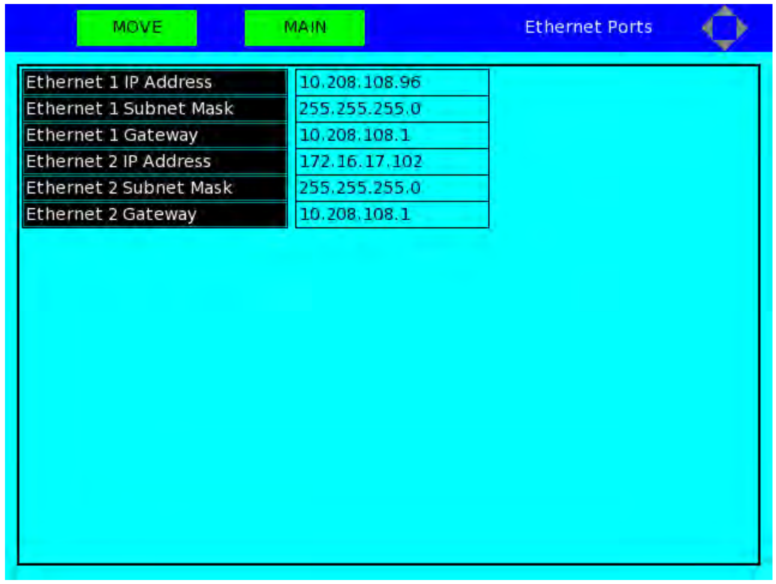


Figure B-44: Ethernet Ports Screen



B.5.4 Logs/Reports menu

The **Logs/Reports** menu enables you to view the various reports that are available from the GC.

Refer to the *Logs/Reports* section of the *MON2020 Gas Chromatograph Software* manual for detailed information regarding the **Logs/Reports** menu screens.

Figure B-45: Logs/Reports Menu

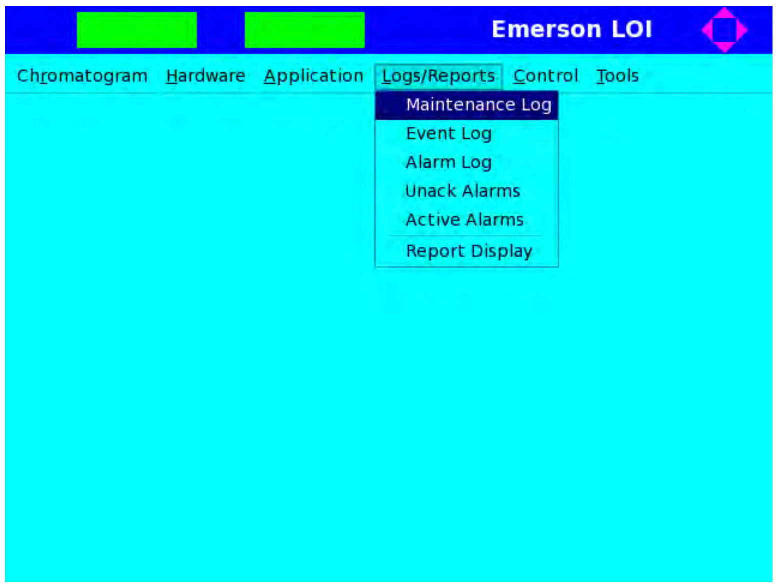


Figure B-46: Maintenance Log Screen

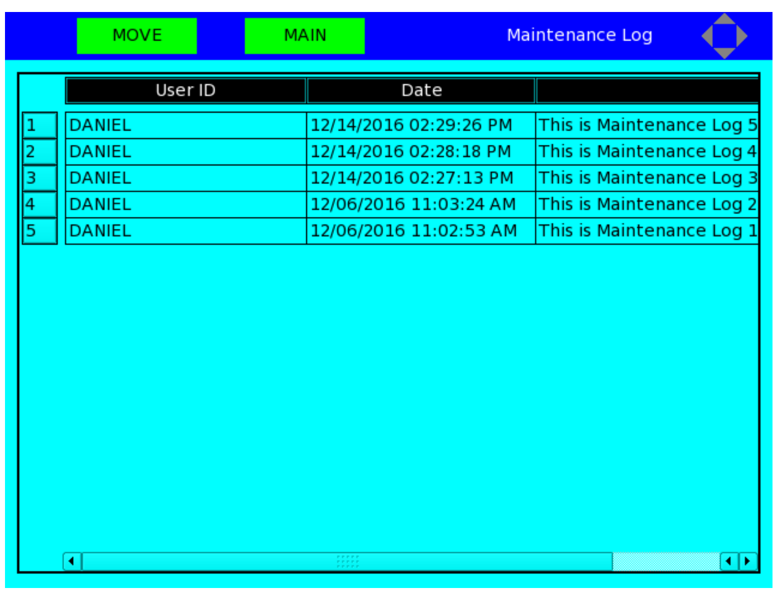
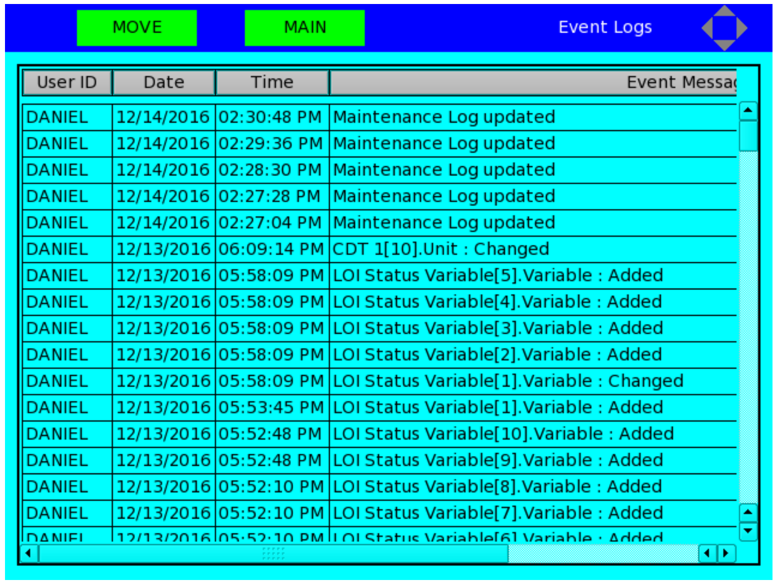


Figure B-47: Event Logs Screen



User ID	Date	Time	Event Messa
DANIEL	12/14/2016	02:30:48 PM	Maintenance Log updated
DANIEL	12/14/2016	02:29:36 PM	Maintenance Log updated
DANIEL	12/14/2016	02:28:30 PM	Maintenance Log updated
DANIEL	12/14/2016	02:27:28 PM	Maintenance Log updated
DANIEL	12/14/2016	02:27:04 PM	Maintenance Log updated
DANIEL	12/13/2016	06:09:14 PM	CDT 1[10].Unit : Changed
DANIEL	12/13/2016	05:58:09 PM	LOI Status Variable[5].Variable : Added
DANIEL	12/13/2016	05:58:09 PM	LOI Status Variable[4].Variable : Added
DANIEL	12/13/2016	05:58:09 PM	LOI Status Variable[3].Variable : Added
DANIEL	12/13/2016	05:58:09 PM	LOI Status Variable[2].Variable : Added
DANIEL	12/13/2016	05:58:09 PM	LOI Status Variable[1].Variable : Changed
DANIEL	12/13/2016	05:53:45 PM	LOI Status Variable[1].Variable : Added
DANIEL	12/13/2016	05:52:48 PM	LOI Status Variable[10].Variable : Added
DANIEL	12/13/2016	05:52:48 PM	LOI Status Variable[9].Variable : Added
DANIEL	12/13/2016	05:52:10 PM	LOI Status Variable[8].Variable : Added
DANIEL	12/13/2016	05:52:10 PM	LOI Status Variable[7].Variable : Added
DANIEL	12/13/2016	05:52:10 PM	LOI Status Variable[6].Variable : Added

Figure B-48: Alarm Logs Screen

Date & Time	Alarm Message	Status	Type	Limit
12/09/2016 01:34:46 PM	GC Idle	CLR		
12/09/2016 11:08:54 AM	GC Idle	SET		
12/05/2016 01:35:28 PM	GC Idle	CLR		
12/01/2016 06:09:57 PM	GC Idle	SET		
12/01/2016 06:09:56 PM	Warm Start Failed	SET		
12/01/2016 06:09:56 PM	Power Failure	CLR		
12/01/2016 03:08:43 PM	Power Failure	SET		
11/29/2016 02:48:54 PM	GC Idle	CLR		
11/29/2016 02:44:22 PM	GC Idle	SET		
11/29/2016 02:44:21 PM	Warm Start Failed	SET		
11/29/2016 02:44:14 PM	Power Failure	CLR		
11/29/2016 02:32:25 PM	Power Failure	SET		
11/28/2016 10:20:41 AM	GC Idle	CLR		
11/23/2016 01:56:12 PM	GC Idle	SET		
11/23/2016 01:56:12 PM	Warm Start Failed	SET		
11/23/2016 01:56:12 PM	Power Failure	CLR		
11/22/2016 04:37:09 PM	Power Failure	SET		

Figure B-49: Unack Alarms Screen

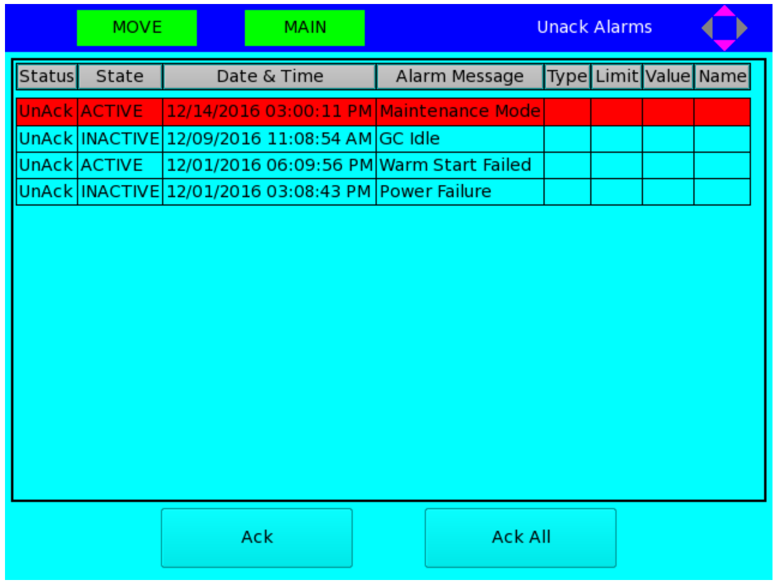


Figure B-50: Active Alarms Screen

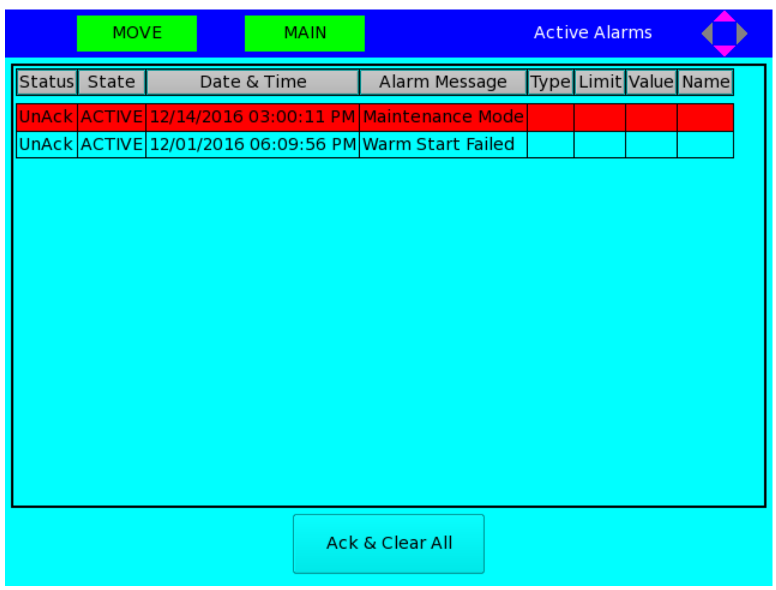
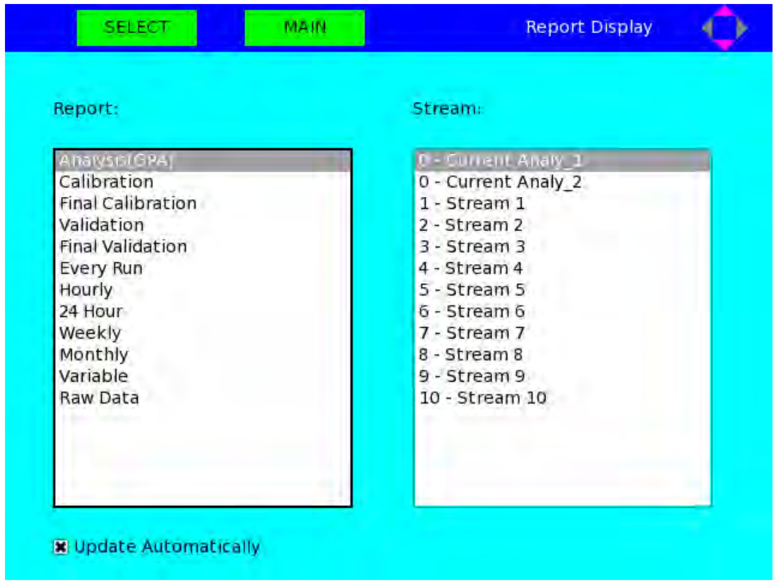


Figure B-51: Report Display Screen



B.5.5 Control menu

The **Control** menu enables you to stop, calibrate, or place on automatic control a sample stream from the analyzer.

Refer to the *Control menu* section of the *MON2020 Gas Chromatograph Software* manual for detailed information regarding the **Control** menu screens.

Figure B-52: Control Menu

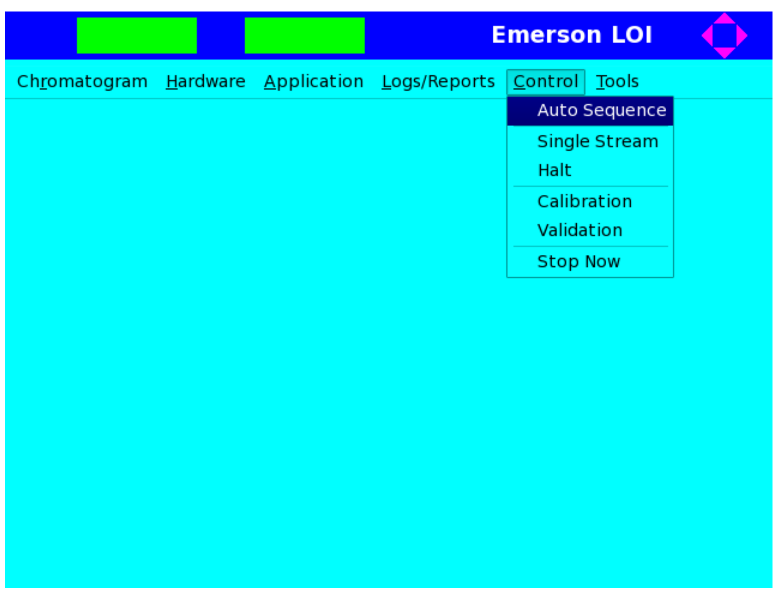
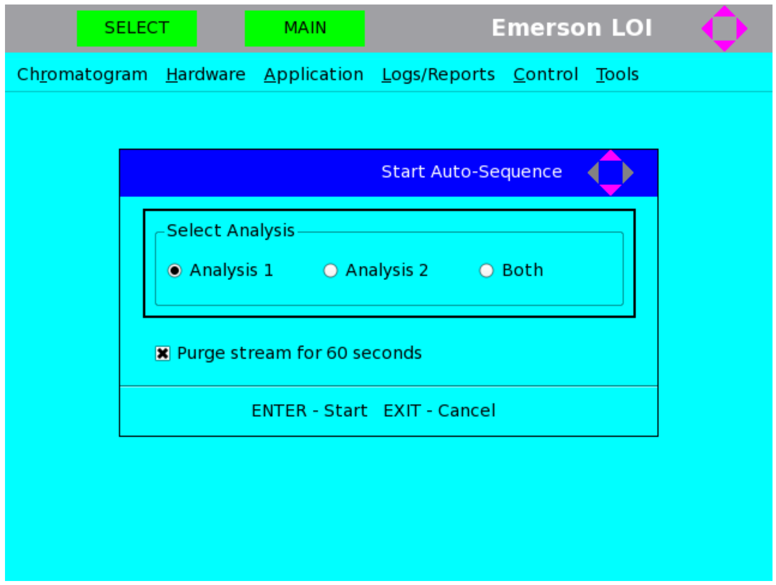
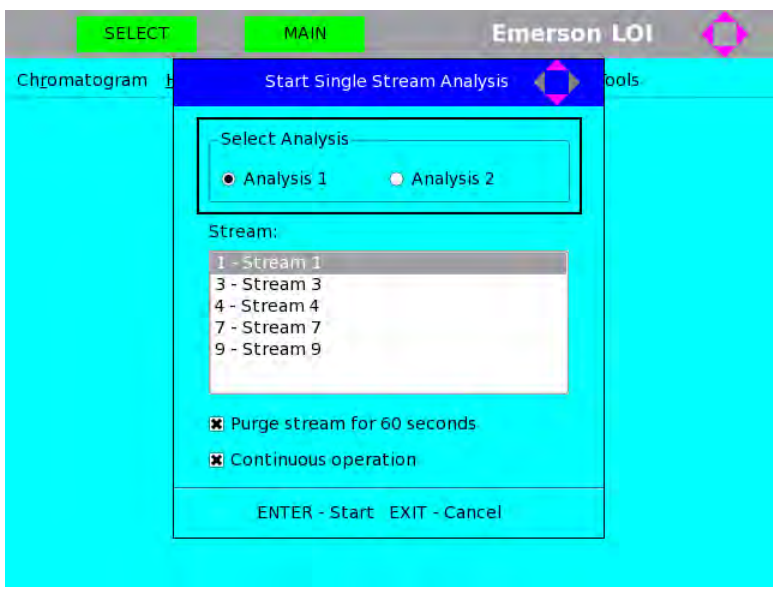


Figure B-53: Auto Sequence Screen



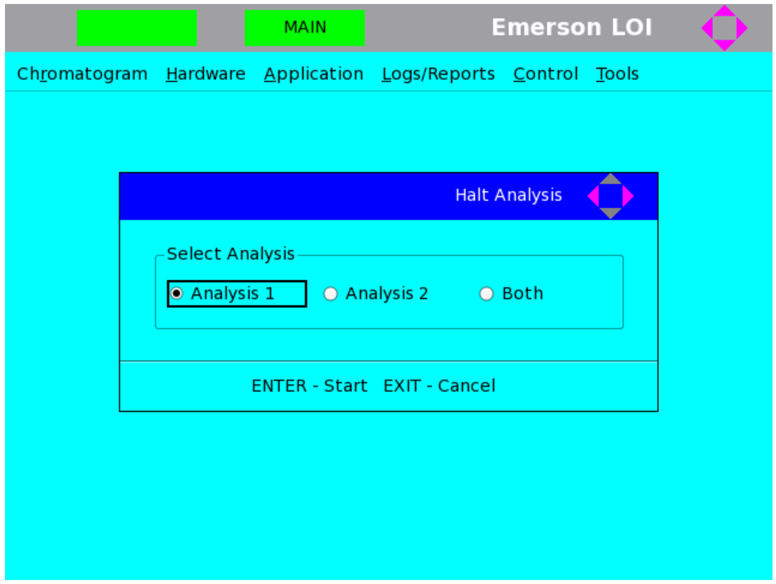
The Auto Sequence screen provides selections for Analysis 1, Analysis 2 or Both. Select the radio button and press **ENTER** to begin auto sequencing. Press **EXIT** to abort the process.

Figure B-54: Single Stream Screen



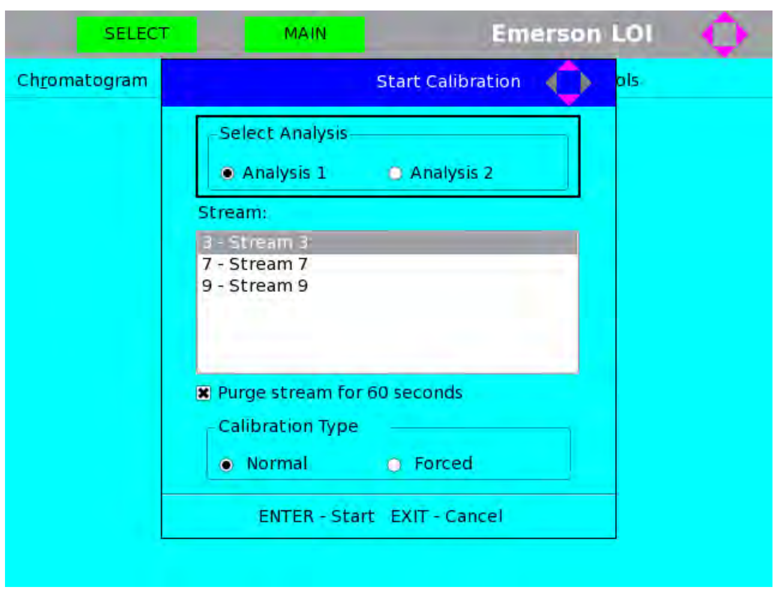
The Single Stream screen provides selections for Analysis 1 or Analysis 2. Select the radio button and press **ENTER** to begin the analysis. Press **EXIT** to abort the process.

Figure B-55: Halt Screen



The Halt screen provides selections to halt the analysis for Analysis 1, Analysis 2, or Both. Select the radio button and press **ENTER** to halt the current analysis. Press **EXIT** to abort the process.

Figure B-56: Calibration Screen

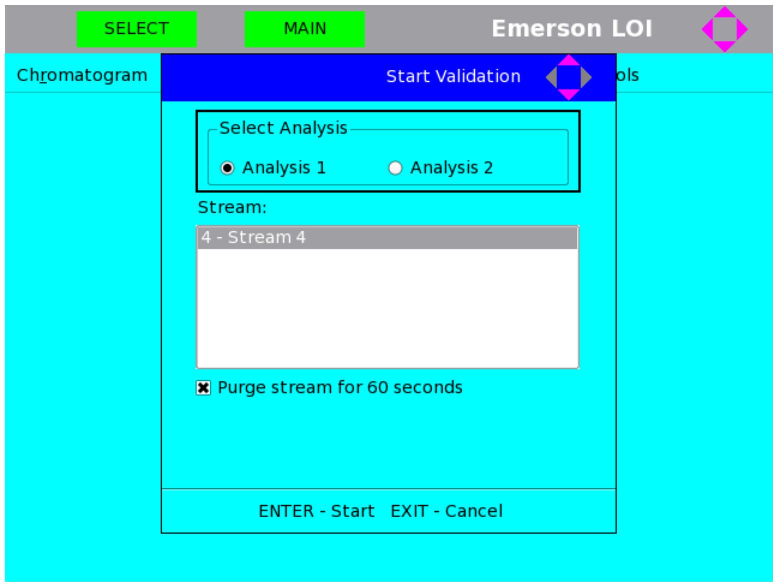


The Calibration screen provides selections for Analysis 1 or Analysis 2.

1. Select the radio button and press **ENTER**.

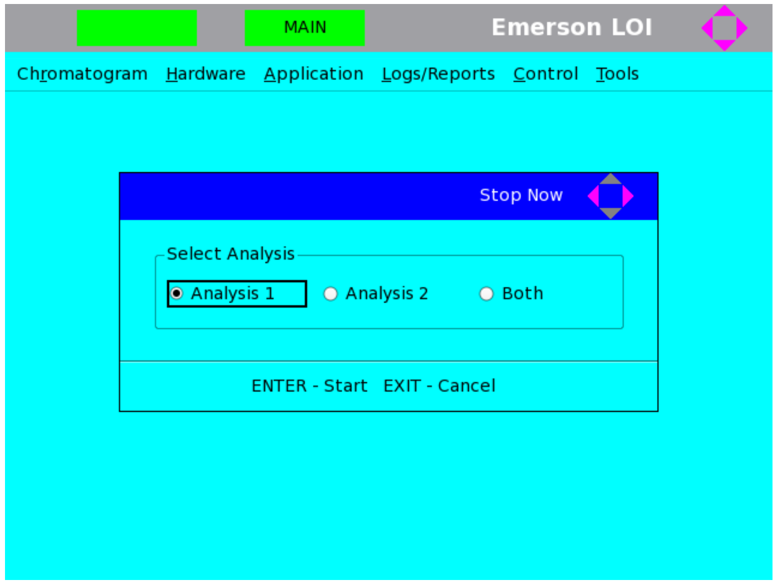
2. Select the *Calibration Type*, Normal or Forced.
3. Press ENTER to begin the calibration.
4. Press EXIT to abort the process.

Figure B-57: Validation Screen



The Validation screen provides selections for Analysis 1 or Analysis 2. Select the radio button and press ENTER to begin the validation. Press EXIT to abort the process.

Figure B-58: Stop Now Screen



The Stop Now screen provides selections for Analysis 1, Analysis 2 or Both. Select the radio button and press ENTER *to stop the analysis. Press* EXIT *to abort the process*

B.5.6 Tools menu

The Tools menu enables you to change the screen control, change a user's password, and log off of the GC to which you are connected.

Refer to the Tools menu section of the *MON2020 Software for Gas Chromatographs User Manual* for detailed information regarding the Tools menu screens.

Figure B-59: Tools menu

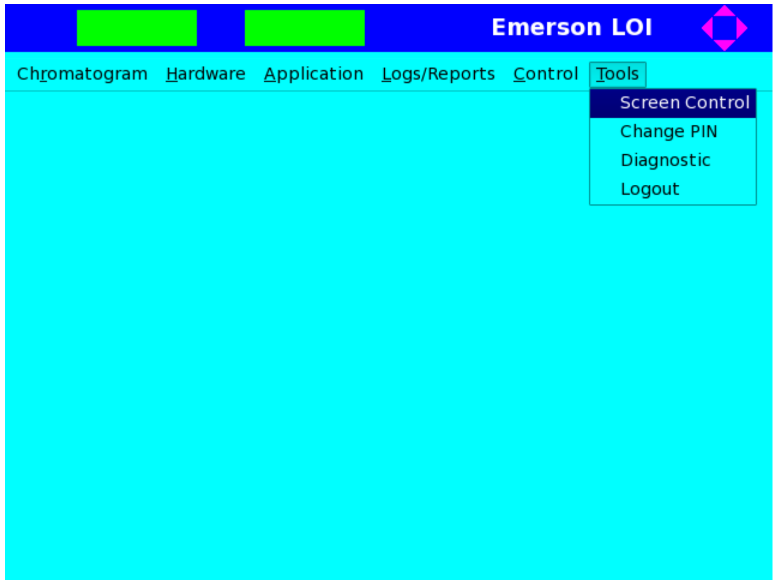


Figure B-60: The Screen Control screen

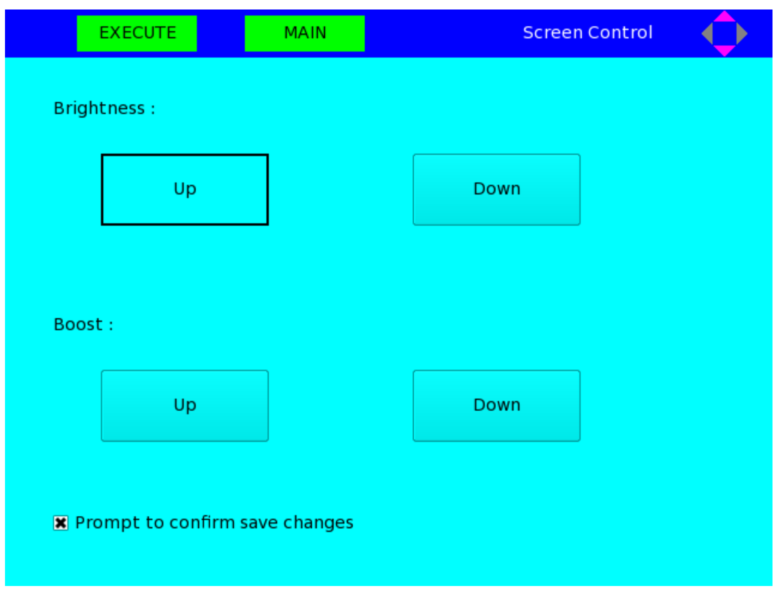


Figure B-61: The Change PIN screen

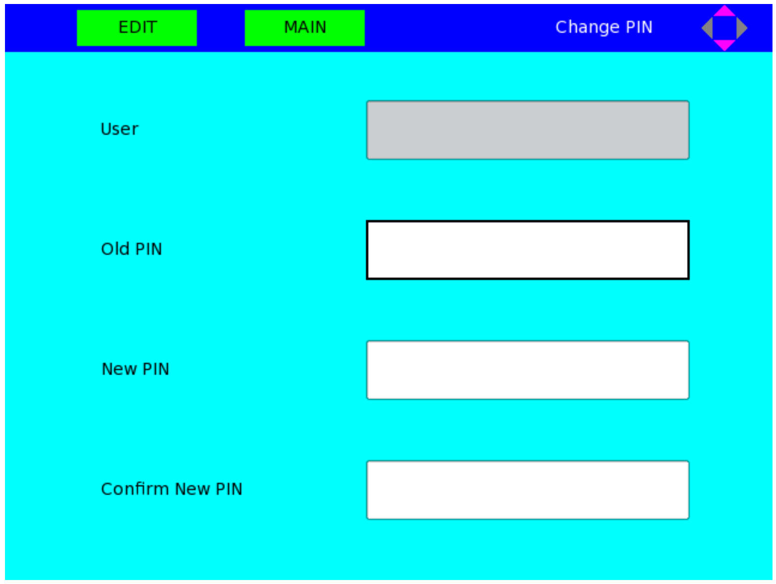
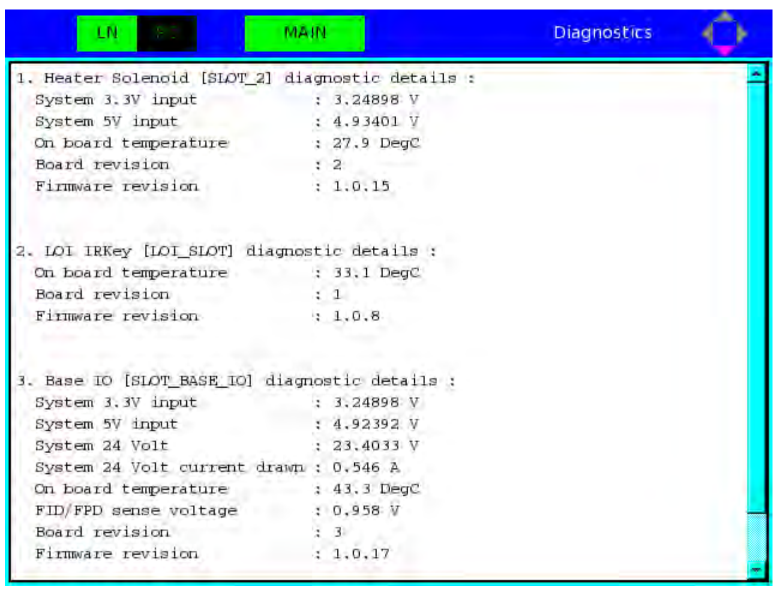


Figure B-62: The Diagnostic screen



B.6 Troubleshooting a blank LOI display screen

If the LOI is powered up but the LCD display screen is blank, do the following:

Procedure

1. Power down the gas chromatograph and allow to cool before opening the upper enclosure door.
2. Unscrew and remove the LOI board.
3. Flip the LOI over to expose its motherboard and associated electronics. Make sure the J12 connector is tightly connected to the motherboard via ribbon cable.

Figure B-63: LOI motherboard

If the screen is still blank, replace the board.

For assistance, contact your local Emerson Service Representative.

Appendix C
Carrier gas installation and maintenance

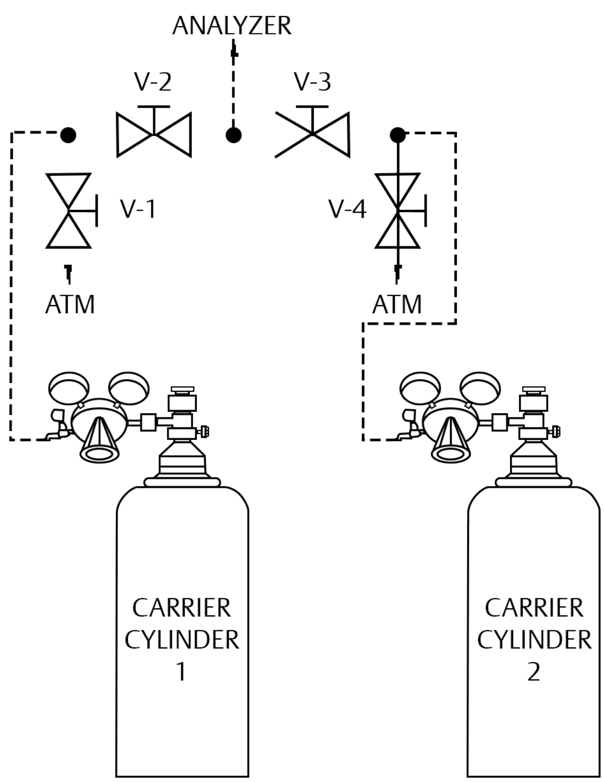
C.1 Carrier gas

This appendix provides a description of the optional carrier manifold (P/N 2-3-5000-050) that permits the connection of two carrier gas bottles, or cylinders, to a gas chromatograph (GC) system. The benefits of this manifold are as follows:

Note
The illustration and information in this appendix are adapted from drawing AE-10098.

- When one bottle is nearly empty (i.e., 100 psig remaining), the other bottle becomes the primary supply.
- Each bottle can be disconnected for refilling without interrupting GC operation.

Figure C-1: Manifold for two carrier gas bottles to GC system



Valve	Carrier gas cylinder	Valve description
V-1	Carrier Cylinder 1	Bleed valve
V-2	Carrier Cylinder 1	Block valve
V-3	Carrier Cylinder 2	Block valve
V-4	Carrier Cylinder 2	Bleed valve

C.2 Installation and line purging

To install and purge the dual-bottle carrier gas manifold, proceed as follows:

Procedure

1. Install manifold as shown in *Figure C-1*. Close all valves and tighten all fittings. Run tubing to the GC, but do not connect.
2. Back off pressure regulator (counter clockwise) fully.
3. Open cylinder valve for Carrier Cylinder 1.

   The pressure indicator will read the cylinder pressure.

4. Open the shut-off valve attached to the carrier regulator.
5. Regulate pressure out of the cylinder to 20 psig, then close the cylinder valve.
6. Open V-1 (bleed valve) and let the carrier gas bleed to atmosphere until both gauges read 0 psig, then close V-1.
7. Repeat *Step 4* and *Step 5* twice to purge the line to V-2.
8. Purge the line to V-3 by repeating *Step 2* through *Step 6*; but this time, use bleed valve V-4 and Carrier Cylinder 2.
9. With valves 1-4 closed, open both cylinder valves and regulate both carriers to approximately 10 psig.
10. Open V-2 and V-3 simultaneously, then turn both cylinder valves off and let the carrier gasses bleed through the line to the GC until all gauges read 0 psig.
11. Repeat *Step 8* and *Step 9* twice to purge the line to the GC.
12. Close V-3, leave V-2 open.
13. Open the cylinder valve of Carrier Cylinder 1 and, with carrier gas flowing at 10 psig or below, connect the carrier line to the GC.
14. Slowly regulate Carrier Cylinder 1 to 110 psig.
15. Open V-3 and slowly regulate Carrier Cylinder 2 to 100 psig.

    By doing this, all but 100 pounds of Carrier Cylinder 1 will be used before any of Carrier Cylinder 2 is used. When Carrier Cylinder 1 gets to 100 pounds, replace the cylinder.

16. Leak-check all of the fittings carefully.

17. Let the GC run overnight before calibrating.

C.3 Replacing carrier cylinder

To replace one carrier cylinder without interrupting GC operation, proceed as follows:

Procedure

1. Turn cylinder valve off.
2. Back off on cylinder pressure regulator until handle turns freely.
3. Remove cylinder.
4. Attach new cylinder to regulator and repeat *Step 3* through *Step 7* of *Section C.2*, using appropriate bleed valve to purge line.
5. Leak-check the fitting.
6. Open the appropriate block valve to the analyzer (V-2 or V-3) and regulate outlet pressure to appropriate level. (see *Step 14* and *Step 15* of *Section C.2*.)

Appendix D
Pre-defined Modbus® Map Files

D.1 Definitions of Terms

Register: Modbus register number

Data type: The following data types are supported:

1. INT - 16-bit integer value
2. FLOAT - 32-bit IEEE single precision floating point value
3. Bitmap (INT) - 16 Boolean values packed into a single 16-bit integer. Each bit represents one Boolean value.
4. Long - 32-bit long integer value
5. Bitmap (long) - 32 Boolean values packed into a 32-bit long integer. Each bit represents one Boolean value.
6. SCALED_FP_1 ... SCALED_FP_32 - Scaled floating point data type is also referred to as *Ranged Integers*. A 32-bit floating point value is converted to a 16-bit integer. For more details, refer to Edit Scales.

Variable: System variable that is mapped to a Modbus register.

Record #: This field is applicable only for Archive Average System Variables. The record # tells the GC which historical average value to retrieve. For example, Record #1 refers to the most recent average, Record #2 refers to the second most recent average and so on.

Access: Can either be *Read only* or *Read-Write*. A small fraction of GC system variables can be updated from a Modbus Master. Writable registers have to be set to *RD_WR* in the mapping before they can be written from a Modbus Master.

Format: This field is applicable for system variables that hold date/time. Date/time is internally stored in a 32-bit Unix time_t format. The format field is used to convert the date/time to human readable form. The available format modifiers are:

- MM - 2 digit month (1-12)
- DD - 2 digit day of the month (1-31)
- YY - 2 digit year (0-99)
- YYYY - 4 digit year (1970 - 2038)
- hh - 2 digit hour in 24 hour format (0-23)
- mm - 2 digit minutes (0-59)
- SS - 2 digit seconds (0-59)
- MMDDYY - 6 digit date. If the date is January 4, 2010, the register reads 010410. If the date is November 7, 2012, the register reads 110712.

- DDMMYY - 6 digit date. If the date is January 4, 2010, the register reads 040110. If the date is November 7, 2012, the register reads 071112.
- YYMMDD - 6 digit date. If the date is April 17, 2007, the register reads 070417. If the date is January 31, 2014, the register reads 140131.
- hhmmss - 6 digit time in 24 hour format
- hhmm - 4 digit time in 24 hour format

D.2 SIM2251 map file (with GPA results)

Register #	Data Type	Variable	Record #	Access	Format
3001	INT	Last Analy_Component Code(US)[1 - Component 1]		RD_ONLY	
3002	INT	Last Analy_Component Code(US)[2 - Component 2]		RD_ONLY	
3003	INT	Last Analy_Component Code(US)[3 - Component 3]		RD_ONLY	
3004	INT	Last Analy_Component Code(US)[4 - Component 4]		RD_ONLY	
3005	INT	Last Analy_Component Code(US)[5 - Component 5]		RD_ONLY	
3006	INT	Last Analy_Component Code(US)[6 - Component 6]		RD_ONLY	
3007	INT	Last Analy_Component Code(US)[7 - Component 7]		RD_ONLY	
3008	INT	Last Analy_Component Code(US)[8 - Component 8]		RD_ONLY	
3009	INT	Last Analy_Component Code(US)[9 - Component 9]		RD_ONLY	
3010	INT	Last Analy_Component Code(US)[10 - Component 10]		RD_ONLY	
3011	INT	Last Analy_Component Code(US)[11 - Component 11]		RD_ONLY	
3012	INT	Last Analy_Component Code(US)[12 - Component 12]		RD_ONLY	
3013	INT	Last Analy_Component Code(US)[13 - Component 13]		RD_ONLY	
3014	INT	Last Analy_Component Code(US)[14 - Component 14]		RD_ONLY	
3015	INT	Last Analy_Component Code(US)[15 - Component 15]		RD_ONLY	
3016	INT	Last Analy_Component Code(US)[16 - Component 16]		RD_ONLY	
3017	INT	Last Analy_Component Code(US)[1 - Component 1]		RD_ONLY	
3018	INT	Last Analy_Component Code(US)[2 - Component 2]		RD_ONLY	
3019	INT	Last Analy_Component Code(US)[3 - Component 3]		RD_ONLY	
3020	INT	Last Analy_Component Code(US)[4 - Component 4]		RD_ONLY	
3021	INT	Last Analy_Component Code(US)[5 - Component 5]		RD_ONLY	
3022	INT	Last Analy_Component Code(US)[6 - Component 6]		RD_ONLY	
3023	INT	Last Analy_Component Code(US)[7 - Component 7]		RD_ONLY	
3024	INT	Last Analy_Component Code(US)[8 - Component 8]		RD_ONLY	
3025	INT	Last Analy_Component Code(US)[9 - Component 9]		RD_ONLY	
3026	INT	Last Analy_Component Code(US)[10 - Component 10]		RD_ONLY	
3027	INT	Last Analy_Component Code(US)[11 - Component 11]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
3028	INT	Last Analy_Component Code(US)[12 - Component 12]		RD_ONLY	
3029	INT	Last Analy_Component Code(US)[13 - Component 13]		RD_ONLY	
3030	INT	Last Analy_Component Code(US)[14 - Component 14]		RD_ONLY	
3031	INT	Last Analy_Component Code(US)[15 - Component 15]		RD_ONLY	
3032	INT	Last Analy_Component Code(US)[16 - Component 16]		RD_ONLY	
3033	INT	Run Time(1/30th Sec)		RD_ONLY	
3034	INT	Last Analy_Stream Number		RD_ONLY	
3035	INT	Last Analy_CDT Stream Mask		RD_ONLY	
3036	INT	Current Time(time_t)		RD_WR	MM
3037	INT	Current Time(time_t)		RD_WR	DD
3038	INT	Current Time(time_t)		RD_WR	YY
3039	INT	Current Time(time_t)		RD_WR	hh
3040	INT	Current Time(time_t)		RD_WR	mm
3041	INT	Last Analy_Start Time		RD_ONLY	MM
3042	INT	Last Analy_Start Time		RD_ONLY	DD
3043	INT	Last Analy_Start Time		RD_ONLY	YY
3044	INT	Last Analy_Start Time		RD_ONLY	hh
3045	INT	Last Analy_Start Time		RD_ONLY	mm

Register #	Data Type	Variable	Record #	Access	Format
3046	Bit-map(INT)	0:Unused, 1:Unused, 2:System Alarm_Alarm On - Last Analysis_Analog Input 1 Low Signal, 3:System Alarm_Alarm On - Last Analysis_Analog Input 1 High Signal, 4:System Alarm_Alarm On - Last Analysis_Analog Input 2 Low Signal, 5:System Alarm_Alarm On - Last Analysis_Analog Input 2 High Signal, 6:Unused, 7:Unused, 8:System Alarm_Alarm On - Last Analysis_Analog Output 1 Low Signal, 9:System Alarm_Alarm On - Last Analysis_Analog Output 1 High Signal, 10:System Alarm_Alarm On - Last Analysis_Analog Output 2 Low Signal, 11:System Alarm_Alarm On - Last Analysis_Analog Output 2 High Signal, 12:System Alarm_Alarm On - Last Analysis_Analog Output 3 Low Signal, 13:System Alarm_Alarm On - Last Analysis_Analog Output 3 High Signal, 14:Analyzer Failure, 15:Unused		RD_ONLY	
3047	Bit-map(INT)	0:System Alarm_Alarm On - Current Analysis_Power Failure, 1:Calibration Failed, 2:Preamp Failure, 3:Unused, 4:Unused, 5:Unused, 6:Unused, 7:Unused, 8:Unused, 9:Unused, 10:Unused, 11:Unused, 12:Unused, 13:Unused, 14:Unused, 15:Unused		RD_ONLY	
3048	INT	1 – Stream 1_Active Low Limit Alarms		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
3049	INT	1 - Stream 1_Active High Limit Alarms		RD_ONLY	
3050	INT	2 - Stream 2_Active Low Limit Alarms		RD_ONLY	
3051	INT	2 - Stream 2_Active High Limit Alarms		RD_ONLY	
3052	INT	3 - Stream 3_Active Low Limit Alarms		RD_ONLY	
3053	INT	3 - Stream 3_Active High Limit Alarms		RD_ONLY	
3054	INT	4 - Stream 4_Active Low Limit Alarms		RD_ONLY	
3055	INT	4 - Stream 4_Active High Limit Alarms		RD_ONLY	
3056	INT	5 - Stream 5_Active Low Limit Alarms		RD_ONLY	
3057	INT	5 - Stream 5_Active High Limit Alarms		RD_ONLY	
3058	INT	New Data Flag		RD_WR	
3059	INT	Analy/Calib Flag		RD_ONLY	
5001	LONG	Last Analy_Cycle Time (1/30th sec)		RD_ONLY	
5002	LONG	Last Cal_Cycle Time (1/30th sec)		RD_ONLY	
7001	FLOAT	Last Analy_Mole %[1 - Component 1]		RD_ONLY	
7002	FLOAT	Last Analy_Mole %[2 - Component 2]		RD_ONLY	
7003	FLOAT	Last Analy_Mole %[3 - Component 3]		RD_ONLY	
7004	FLOAT	Last Analy_Mole %[4 - Component 4]		RD_ONLY	
7005	FLOAT	Last Analy_Mole %[5 - Component 5]		RD_ONLY	
7006	FLOAT	Last Analy_Mole %[6 - Component 6]		RD_ONLY	
7007	FLOAT	Last Analy_Mole %[7 - Component 7]		RD_ONLY	
7008	FLOAT	Last Analy_Mole %[8 - Component 8]		RD_ONLY	
7009	FLOAT	Last Analy_Mole %[9 - Component 9]		RD_ONLY	
7010	FLOAT	Last Analy_Mole %[10 - Component 10]		RD_ONLY	
7011	FLOAT	Last Analy_Mole %[11 - Component 11]		RD_ONLY	
7012	FLOAT	Last Analy_Mole %[12 - Component 12]		RD_ONLY	
7013	FLOAT	Last Analy_Mole %[13 - Component 13]		RD_ONLY	
7014	FLOAT	Last Analy_Mole %[14 - Component 14]		RD_ONLY	
7015	FLOAT	Last Analy_Mole %[15 - Component 15]		RD_ONLY	
7016	FLOAT	Last Analy_Mole %[16 - Component 16]		RD_ONLY	
7017	FLOAT	Last Analy_Weight %[1 - Component 1]		RD_ONLY	
7018	FLOAT	Last Analy_Weight %[2 - Component 2]		RD_ONLY	
7019	FLOAT	Last Analy_Weight %[3 - Component 3]		RD_ONLY	
7020	FLOAT	Last Analy_Weight %[4 - Component 4]		RD_ONLY	
7021	FLOAT	Last Analy_Weight %[5 - Component 5]		RD_ONLY	
7022	FLOAT	Last Analy_Weight %[6 - Component 6]		RD_ONLY	
7023	FLOAT	Last Analy_Weight %[7 - Component 7]		RD_ONLY	
7024	FLOAT	Last Analy_Weight %[8 - Component 8]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7025	FLOAT	Last Analy_Weight %[9 - Component 9]		RD_ONLY	
7026	FLOAT	Last Analy_Weight %[10 - Component 10]		RD_ONLY	
7027	FLOAT	Last Analy_Weight %[11 - Component 11]		RD_ONLY	
7028	FLOAT	Last Analy_Weight %[12 - Component 12]		RD_ONLY	
7029	FLOAT	Last Analy_Weight %[13 - Component 13]		RD_ONLY	
7030	FLOAT	Last Analy_Weight %[14 - Component 14]		RD_ONLY	
7031	FLOAT	Last Analy_Weight %[15 - Component 15]		RD_ONLY	
7032	FLOAT	Last Analy_Weight %[16 - Component 16]		RD_ONLY	
7033	FLOAT	Last Analy_HV Gross BTU Dry		RD_ONLY	
7034	FLOAT	Last Analy_HV Gross BTU Sat		RD_ONLY	
7035	FLOAT	Last Analy_GPA Real Rel Den Gas		RD_ONLY	
7036	FLOAT	Last Analy_GPA Z Factor		RD_ONLY	
7037	FLOAT	Last Analy_GPA Wobbe Index		RD_ONLY	
7038	FLOAT	Last Analy_Total Unnormalized Conc		RD_ONLY	
7039	FLOAT	Last Analy_Gal/1000 SCF C2+		RD_ONLY	
7040	FLOAT	Calc Result[1 - User Cal 01]		RD_ONLY	
7041	FLOAT	Calc Result[2 - User Cal 02]		RD_ONLY	
7042	FLOAT	Calc Result[3 - User Cal 03]		RD_ONLY	
7043	FLOAT	Calc Result[4 - User Cal 04]		RD_ONLY	
7044	FLOAT	Calc Result[5 - User Cal 05]		RD_ONLY	
7045	FLOAT	Unused		RD_ONLY	
7046	FLOAT	Unused		RD_ONLY	
7047	FLOAT	Unused		RD_ONLY	
7048	FLOAT	Unused		RD_ONLY	
7049	FLOAT	Unused		RD_ONLY	
7050	FLOAT	Unused		RD_ONLY	
7051	FLOAT	Unused		RD_ONLY	
7052	FLOAT	Unused		RD_ONLY	
7053	FLOAT	Unused		RD_ONLY	
7054	FLOAT	Last Analy_HV Gross BTU Act		RD_ONLY	
7055	FLOAT	Avg[1 - Average 1]		RD_ONLY	
7056	FLOAT	Avg[2 - Average 2]		RD_ONLY	
7057	FLOAT	Avg[3 - Average 3]		RD_ONLY	
7058	FLOAT	Avg[4 - Average 4]		RD_ONLY	
7059	FLOAT	Avg[5 - Average 5]		RD_ONLY	
7060	FLOAT	Avg[6 - Average 6]		RD_ONLY	
7061	FLOAT	Avg[7 - Average 7]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7062	FLOAT	Avg[8 - Average 8]		RD_ONLY	
7063	FLOAT	Avg[9 - Average 9]		RD_ONLY	
7064	FLOAT	Avg[10 - Average 10]		RD_ONLY	
7065	FLOAT	Avg[11 - Average 11]		RD_ONLY	
7066	FLOAT	Avg[12 - Average 12]		RD_ONLY	
7067	FLOAT	Avg[13 - Average 13]		RD_ONLY	
7068	FLOAT	Avg[14 - Average 14]		RD_ONLY	
7069	FLOAT	Avg[15 - Average 15]		RD_ONLY	
7070	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
7071	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
7072	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
7073	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
7074	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
7075	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
7076	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
7077	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
7078	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	
7079	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
7080	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
7081	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	
7082	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
7083	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
7084	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
7085	FLOAT	Current Value[1 - Analog Input 1]		RD_ONLY	
7086	FLOAT	Current Value[2 - Analog Input 2]		RD_ONLY	
7087	FLOAT	Last FCalib_HV Gross BTU Act		RD_ONLY	
7088	FLOAT	Last FCalib_HV Gross BTU Dry		RD_ONLY	
7089	FLOAT	Last FCalib_HV Gross BTU Sat		RD_ONLY	
7090	FLOAT	Last FCalib_GPA Wobbe Index		RD_ONLY	
7091	FLOAT	Last FCalib_GPA Real Rel Den Gas		RD_ONLY	
7092	FLOAT	Last FCalib_GPA Z Factor		RD_ONLY	
7093	FLOAT	Last FCalib_Gal/1000 SCF C2+		RD_ONLY	
7094	FLOAT	Last FCalib_Total Unnormalized Conc		RD_ONLY	
7095	FLOAT	Last Analy_Response Factor[1 - Component 1]		RD_ONLY	
7096	FLOAT	Last Analy_Response Factor[2 - Component 2]		RD_ONLY	
7097	FLOAT	Last Analy_Response Factor[3 - Component 3]		RD_ONLY	
7098	FLOAT	Last Analy_Response Factor[4 - Component 4]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7099	FLOAT	Last Analy_Response Factor[5 - Component 5]		RD_ONLY	
7100	FLOAT	Last Analy_Response Factor[6 - Component 6]		RD_ONLY	
7101	FLOAT	Last Analy_Response Factor[7 - Component 7]		RD_ONLY	
7102	FLOAT	Last Analy_Response Factor[8 - Component 8]		RD_ONLY	
7103	FLOAT	Last Analy_Response Factor[9 - Component 9]		RD_ONLY	
7104	FLOAT	Last Analy_Response Factor[10 - Component 10]		RD_ONLY	
7105	FLOAT	Last Analy_Response Factor[11 - Component 11]		RD_ONLY	
7106	FLOAT	Last Analy_Response Factor[12 - Component 12]		RD_ONLY	
7107	FLOAT	Last Analy_Response Factor[13 - Component 13]		RD_ONLY	
7108	FLOAT	Last Analy_Response Factor[14 - Component 14]		RD_ONLY	
7109	FLOAT	Last Analy_Response Factor[15 - Component 15]		RD_ONLY	
7110	FLOAT	Last Analy_Response Factor[16 - Component 16]		RD_ONLY	
7111	FLOAT	Last Analy_Response Factor[1 - Component 1]		RD_ONLY	
7112	FLOAT	Last Analy_Response Factor[2 - Component 2]		RD_ONLY	
7113	FLOAT	Last Analy_Response Factor[3 - Component 3]		RD_ONLY	
7114	FLOAT	Last Analy_Response Factor[4 - Component 4]		RD_ONLY	
7115	FLOAT	Last Analy_Response Factor[5 - Component 5]		RD_ONLY	
7116	FLOAT	Last Analy_Response Factor[6 - Component 6]		RD_ONLY	
7117	FLOAT	Last Analy_Response Factor[7 - Component 7]		RD_ONLY	
7118	FLOAT	Last Analy_Response Factor[8 - Component 8]		RD_ONLY	
7119	FLOAT	Last Analy_Response Factor[9 - Component 9]		RD_ONLY	
7120	FLOAT	Last Analy_Response Factor[10 - Component 10]		RD_ONLY	
7121	FLOAT	Last Analy_Response Factor[11 - Component 11]		RD_ONLY	
7122	FLOAT	Last Analy_Response Factor[12 - Component 12]		RD_ONLY	
7123	FLOAT	Last Analy_Response Factor[13 - Component 13]		RD_ONLY	
7124	FLOAT	Last Analy_Response Factor[14 - Component 14]		RD_ONLY	
7125	FLOAT	Last Analy_Response Factor[15 - Component 15]		RD_ONLY	
7126	FLOAT	Last Analy_Response Factor[16 - Component 16]		RD_ONLY	
7127	FLOAT	Avg[1 - Average 1]		RD_ONLY	
7128	FLOAT	Avg[2 - Average 2]		RD_ONLY	
7129	FLOAT	Avg[3 - Average 3]		RD_ONLY	
7130	FLOAT	Avg[4 - Average 4]		RD_ONLY	
7131	FLOAT	Avg[5 - Average 5]		RD_ONLY	
7132	FLOAT	Avg[6 - Average 6]		RD_ONLY	
7133	FLOAT	Avg[7 - Average 7]		RD_ONLY	
7134	FLOAT	Avg[8 - Average 8]		RD_ONLY	
7135	FLOAT	Avg[9 - Average 9]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7136	FLOAT	Avg[10 - Average 10]		RD_ONLY	
7137	FLOAT	Avg[11 - Average 11]		RD_ONLY	
7138	FLOAT	Avg[12 - Average 12]		RD_ONLY	
7139	FLOAT	Avg[13 - Average 13]		RD_ONLY	
7140	FLOAT	Avg[14 - Average 14]		RD_ONLY	
7141	FLOAT	Avg[15 - Average 15]		RD_ONLY	
7142	FLOAT	Avg[16 - Average 16]		RD_ONLY	
7143	FLOAT	Avg[17 - Average 17]		RD_ONLY	
7144	FLOAT	Avg[18 - Average 18]		RD_ONLY	
7145	FLOAT	Avg[19 - Average 19]		RD_ONLY	
7146	FLOAT	Avg[20 - Average 20]		RD_ONLY	
7147	FLOAT	Avg[21 - Average 21]		RD_ONLY	
7148	FLOAT	Avg[22 - Average 22]		RD_ONLY	
7149	FLOAT	Avg[23 - Average 23]		RD_ONLY	
7150	FLOAT	Avg[24 - Average 24]		RD_ONLY	
7151	FLOAT	Avg[25 - Average 25]		RD_ONLY	
7152	FLOAT	Avg[26 - Average 26]		RD_ONLY	
7153	FLOAT	Avg[27 - Average 27]		RD_ONLY	
7154	FLOAT	Avg[28 - Average 28]		RD_ONLY	
7155	FLOAT	Avg[29 - Average 29]		RD_ONLY	
7156	FLOAT	Avg[30 - Average 30]		RD_ONLY	
7157	FLOAT	Avg[31 - Average 31]		RD_ONLY	
7158	FLOAT	Avg[32 - Average 32]		RD_ONLY	
7159	FLOAT	Avg[33 - Average 33]		RD_ONLY	
7160	FLOAT	Avg[34 - Average 34]		RD_ONLY	
7161	FLOAT	Avg[35 - Average 35]		RD_ONLY	
7162	FLOAT	Avg[36 - Average 36]		RD_ONLY	
7163	FLOAT	Max[1 - Average 1]		RD_ONLY	
7164	FLOAT	Max[2 - Average 2]		RD_ONLY	
7165	FLOAT	Max[3 - Average 3]		RD_ONLY	
7166	FLOAT	Max[4 - Average 4]		RD_ONLY	
7167	FLOAT	Max[5 - Average 5]		RD_ONLY	
7168	FLOAT	Max[6 - Average 6]		RD_ONLY	
7169	FLOAT	Max[7 - Average 7]		RD_ONLY	
7170	FLOAT	Max[8 - Average 8]		RD_ONLY	
7171	FLOAT	Max[9 - Average 9]		RD_ONLY	
7172	FLOAT	Max[10 - Average 10]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7173	FLOAT	Max[11 - Average 11]		RD_ONLY	
7174	FLOAT	Max[12 - Average 12]		RD_ONLY	
7175	FLOAT	Max[13 - Average 13]		RD_ONLY	
7176	FLOAT	Max[14 - Average 14]		RD_ONLY	
7177	FLOAT	Max[15 - Average 15]		RD_ONLY	
7178	FLOAT	Max[16 - Average 16]		RD_ONLY	
7179	FLOAT	Max[17 - Average 17]		RD_ONLY	
7180	FLOAT	Max[18 - Average 18]		RD_ONLY	
7181	FLOAT	Max[19 - Average 19]		RD_ONLY	
7182	FLOAT	Max[20 - Average 20]		RD_ONLY	
7183	FLOAT	Max[21 - Average 21]		RD_ONLY	
7184	FLOAT	Max[22 - Average 22]		RD_ONLY	
7185	FLOAT	Max[23 - Average 23]		RD_ONLY	
7186	FLOAT	Max[24 - Average 24]		RD_ONLY	
7187	FLOAT	Max[25 - Average 25]		RD_ONLY	
7188	FLOAT	Max[26 - Average 26]		RD_ONLY	
7189	FLOAT	Max[27 - Average 27]		RD_ONLY	
7190	FLOAT	Max[28 - Average 28]		RD_ONLY	
7191	FLOAT	Max[29 - Average 29]		RD_ONLY	
7192	FLOAT	Max[30 - Average 30]		RD_ONLY	
7193	FLOAT	Max[31 - Average 31]		RD_ONLY	
7194	FLOAT	Max[32 - Average 32]		RD_ONLY	
7195	FLOAT	Max[33 - Average 33]		RD_ONLY	
7196	FLOAT	Max[34 - Average 34]		RD_ONLY	
7197	FLOAT	Max[35 - Average 35]		RD_ONLY	
7198	FLOAT	Max[36 - Average 36]		RD_ONLY	
7199	FLOAT	Min[1 - Average 1]		RD_ONLY	
7200	FLOAT	Min[2 - Average 2]		RD_ONLY	
7201	FLOAT	Min[3 - Average 3]		RD_ONLY	
7202	FLOAT	Min[4 - Average 4]		RD_ONLY	
7203	FLOAT	Min[5 - Average 5]		RD_ONLY	
7204	FLOAT	Min[6 - Average 6]		RD_ONLY	
7205	FLOAT	Min[7 - Average 7]		RD_ONLY	
7206	FLOAT	Min[8 - Average 8]		RD_ONLY	
7207	FLOAT	Min[9 - Average 9]		RD_ONLY	
7208	FLOAT	Min[10 - Average 10]		RD_ONLY	
7209	FLOAT	Min[11 - Average 11]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7210	FLOAT	Min[12 - Average 12]		RD_ONLY	
7211	FLOAT	Min[13 - Average 13]		RD_ONLY	
7212	FLOAT	Min[14 - Average 14]		RD_ONLY	
7213	FLOAT	Min[15 - Average 15]		RD_ONLY	
7214	FLOAT	Min[16 - Average 16]		RD_ONLY	
7215	FLOAT	Min[17 - Average 17]		RD_ONLY	
7216	FLOAT	Min[18 - Average 18]		RD_ONLY	
7217	FLOAT	Min[19 - Average 19]		RD_ONLY	
7218	FLOAT	Min[20 - Average 20]		RD_ONLY	
7219	FLOAT	Min[21 - Average 21]		RD_ONLY	
7220	FLOAT	Min[22 - Average 22]		RD_ONLY	
7221	FLOAT	Min[23 - Average 23]		RD_ONLY	
7222	FLOAT	Min[24 - Average 24]		RD_ONLY	
7223	FLOAT	Min[25 - Average 25]		RD_ONLY	
7224	FLOAT	Min[26 - Average 26]		RD_ONLY	
7225	FLOAT	Min[27 - Average 27]		RD_ONLY	
7226	FLOAT	Min[28 - Average 28]		RD_ONLY	
7227	FLOAT	Min[29 - Average 29]		RD_ONLY	
7228	FLOAT	Min[30 - Average 30]		RD_ONLY	
7229	FLOAT	Min[31 - Average 31]		RD_ONLY	
7230	FLOAT	Min[32 - Average 32]		RD_ONLY	
7231	FLOAT	Min[33 - Average 33]		RD_ONLY	
7232	FLOAT	Min[34 - Average 34]		RD_ONLY	
7233	FLOAT	Min[35 - Average 35]		RD_ONLY	
7234	FLOAT	Min[36 - Average 36]		RD_ONLY	
7235	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
7236	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
7237	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
7238	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
7239	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
7240	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
7241	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
7242	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
7243	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	
7244	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
7245	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
7246	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7247	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
7248	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
7249	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
7250	FLOAT	Archive_Avg[16 - Average 16]	1	RD_ONLY	
7251	FLOAT	Archive_Avg[17 - Average 17]	1	RD_ONLY	
7252	FLOAT	Archive_Avg[18 - Average 18]	1	RD_ONLY	
7253	FLOAT	Archive_Avg[19 - Average 19]	1	RD_ONLY	
7254	FLOAT	Archive_Avg[20 - Average 20]	1	RD_ONLY	
7255	FLOAT	Archive_Avg[21 - Average 21]	1	RD_ONLY	
7256	FLOAT	Archive_Avg[22 - Average 22]	1	RD_ONLY	
7257	FLOAT	Archive_Avg[23 - Average 23]	1	RD_ONLY	
7258	FLOAT	Archive_Avg[24 - Average 24]	1	RD_ONLY	
7259	FLOAT	Archive_Avg[25 - Average 25]	1	RD_ONLY	
7260	FLOAT	Archive_Avg[26 - Average 26]	1	RD_ONLY	
7261	FLOAT	Archive_Avg[27 - Average 27]	1	RD_ONLY	
7262	FLOAT	Archive_Avg[28 - Average 28]	1	RD_ONLY	
7263	FLOAT	Archive_Avg[29 - Average 29]	1	RD_ONLY	
7264	FLOAT	Archive_Avg[30 - Average 30]	1	RD_ONLY	
7265	FLOAT	Archive_Avg[31 - Average 31]	1	RD_ONLY	
7266	FLOAT	Archive_Avg[32 - Average 32]	1	RD_ONLY	
7267	FLOAT	Archive_Avg[33 - Average 33]	1	RD_ONLY	
7268	FLOAT	Archive_Avg[34 - Average 34]	1	RD_ONLY	
7269	FLOAT	Archive_Avg[35 - Average 35]	1	RD_ONLY	
7270	FLOAT	Archive_Avg[36 - Average 36]	1	RD_ONLY	
7271	FLOAT	Archive_Max[1 - Average 1]	1	RD_ONLY	
7272	FLOAT	Archive_Max[2 - Average 2]	1	RD_ONLY	
7273	FLOAT	Archive_Max[3 - Average 3]	1	RD_ONLY	
7274	FLOAT	Archive_Max[4 - Average 4]	1	RD_ONLY	
7275	FLOAT	Archive_Max[5 - Average 5]	1	RD_ONLY	
7276	FLOAT	Archive_Max[6 - Average 6]	1	RD_ONLY	
7277	FLOAT	Archive_Max[7 - Average 7]	1	RD_ONLY	
7278	FLOAT	Archive_Max[8 - Average 8]	1	RD_ONLY	
7279	FLOAT	Archive_Max[9 - Average 9]	1	RD_ONLY	
7280	FLOAT	Archive_Max[10 - Average 10]	1	RD_ONLY	
7281	FLOAT	Archive_Max[11 - Average 11]	1	RD_ONLY	
7282	FLOAT	Archive_Max[12 - Average 12]	1	RD_ONLY	
7283	FLOAT	Archive_Max[13 - Average 13]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7284	FLOAT	Archive_Max[14 - Average 14]	1	RD_ONLY	
7285	FLOAT	Archive_Max[15 - Average 15]	1	RD_ONLY	
7286	FLOAT	Archive_Max[16 - Average 16]	1	RD_ONLY	
7287	FLOAT	Archive_Max[17 - Average 17]	1	RD_ONLY	
7288	FLOAT	Archive_Max[18 - Average 18]	1	RD_ONLY	
7289	FLOAT	Archive_Max[19 - Average 19]	1	RD_ONLY	
7290	FLOAT	Archive_Max[20 - Average 20]	1	RD_ONLY	
7291	FLOAT	Archive_Max[21 - Average 21]	1	RD_ONLY	
7292	FLOAT	Archive_Max[22 - Average 22]	1	RD_ONLY	
7293	FLOAT	Archive_Max[23 - Average 23]	1	RD_ONLY	
7294	FLOAT	Archive_Max[24 - Average 24]	1	RD_ONLY	
7295	FLOAT	Archive_Max[25 - Average 25]	1	RD_ONLY	
7296	FLOAT	Archive_Max[26 - Average 26]	1	RD_ONLY	
7297	FLOAT	Archive_Max[27 - Average 27]	1	RD_ONLY	
7298	FLOAT	Archive_Max[28 - Average 28]	1	RD_ONLY	
7299	FLOAT	Archive_Max[29 - Average 29]	1	RD_ONLY	
7300	FLOAT	Archive_Max[30 - Average 30]	1	RD_ONLY	
7301	FLOAT	Archive_Max[31 - Average 31]	1	RD_ONLY	
7302	FLOAT	Archive_Max[32 - Average 32]	1	RD_ONLY	
7303	FLOAT	Archive_Max[33 - Average 33]	1	RD_ONLY	
7304	FLOAT	Archive_Max[34 - Average 34]	1	RD_ONLY	
7305	FLOAT	Archive_Max[35 - Average 35]	1	RD_ONLY	
7306	FLOAT	Archive_Max[36 - Average 36]	1	RD_ONLY	
7307	FLOAT	Archive_Min[1 - Average 1]	1	RD_ONLY	
7308	FLOAT	Archive_Min[2 - Average 2]	1	RD_ONLY	
7309	FLOAT	Archive_Min[3 - Average 3]	1	RD_ONLY	
7310	FLOAT	Archive_Min[4 - Average 4]	1	RD_ONLY	
7311	FLOAT	Archive_Min[5 - Average 5]	1	RD_ONLY	
7312	FLOAT	Archive_Min[6 - Average 6]	1	RD_ONLY	
7313	FLOAT	Archive_Min[7 - Average 7]	1	RD_ONLY	
7314	FLOAT	Archive_Min[8 - Average 8]	1	RD_ONLY	
7315	FLOAT	Archive_Min[9 - Average 9]	1	RD_ONLY	
7316	FLOAT	Archive_Min[10 - Average 10]	1	RD_ONLY	
7317	FLOAT	Archive_Min[11 - Average 11]	1	RD_ONLY	
7318	FLOAT	Archive_Min[12 - Average 12]	1	RD_ONLY	
7319	FLOAT	Archive_Min[13 - Average 13]	1	RD_ONLY	
7320	FLOAT	Archive_Min[14 - Average 14]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7321	FLOAT	Archive_Min[15 - Average 15]	1	RD_ONLY	
7322	FLOAT	Archive_Min[16 - Average 16]	1	RD_ONLY	
7323	FLOAT	Archive_Min[17 - Average 17]	1	RD_ONLY	
7324	FLOAT	Archive_Min[18 - Average 18]	1	RD_ONLY	
7325	FLOAT	Archive_Min[19 - Average 19]	1	RD_ONLY	
7326	FLOAT	Archive_Min[20 - Average 20]	1	RD_ONLY	
7327	FLOAT	Archive_Min[21 - Average 21]	1	RD_ONLY	
7328	FLOAT	Archive_Min[22 - Average 22]	1	RD_ONLY	
7329	FLOAT	Archive_Min[23 - Average 23]	1	RD_ONLY	
7330	FLOAT	Archive_Min[24 - Average 24]	1	RD_ONLY	
7331	FLOAT	Archive_Min[25 - Average 25]	1	RD_ONLY	
7332	FLOAT	Archive_Min[26 - Average 26]	1	RD_ONLY	
7333	FLOAT	Archive_Min[27 - Average 27]	1	RD_ONLY	
7334	FLOAT	Archive_Min[28 - Average 28]	1	RD_ONLY	
7335	FLOAT	Archive_Min[29 - Average 29]	1	RD_ONLY	
7336	FLOAT	Archive_Min[30 - Average 30]	1	RD_ONLY	
7337	FLOAT	Archive_Min[31 - Average 31]	1	RD_ONLY	
7338	FLOAT	Archive_Min[32 - Average 32]	1	RD_ONLY	
7339	FLOAT	Archive_Min[33 - Average 33]	1	RD_ONLY	
7340	FLOAT	Archive_Min[34 - Average 34]	1	RD_ONLY	
7341	FLOAT	Archive_Min[35 - Average 35]	1	RD_ONLY	
7342	FLOAT	Archive_Min[36 - Average 36]	1	RD_ONLY	
7343	FLOAT	Archive_Avg[1 - Average 1]	2	RD_ONLY	
7344	FLOAT	Archive_Avg[2 - Average 2]	2	RD_ONLY	
7345	FLOAT	Archive_Avg[3 - Average 3]	2	RD_ONLY	
7346	FLOAT	Archive_Avg[4 - Average 4]	2	RD_ONLY	
7347	FLOAT	Archive_Avg[5 - Average 5]	2	RD_ONLY	
7348	FLOAT	Archive_Avg[6 - Average 6]	2	RD_ONLY	
7349	FLOAT	Archive_Avg[7 - Average 7]	2	RD_ONLY	
7350	FLOAT	Archive_Avg[8 - Average 8]	2	RD_ONLY	
7351	FLOAT	Archive_Avg[9 - Average 9]	2	RD_ONLY	
7352	FLOAT	Archive_Avg[10 - Average 10]	2	RD_ONLY	
7353	FLOAT	Archive_Avg[11 - Average 11]	2	RD_ONLY	
7354	FLOAT	Archive_Avg[12 - Average 12]	2	RD_ONLY	
7355	FLOAT	Archive_Avg[13 - Average 13]	2	RD_ONLY	
7356	FLOAT	Archive_Avg[14 - Average 14]	2	RD_ONLY	
7357	FLOAT	Archive_Avg[15 - Average 15]	2	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7358	FLOAT	Archive_Avg[16 - Average 16]	2	RD_ONLY	
7359	FLOAT	Archive_Avg[17 - Average 17]	2	RD_ONLY	
7360	FLOAT	Archive_Avg[18 - Average 18]	2	RD_ONLY	
7361	FLOAT	Archive_Avg[19 - Average 19]	2	RD_ONLY	
7362	FLOAT	Archive_Avg[20 - Average 20]	2	RD_ONLY	
7363	FLOAT	Archive_Avg[21 - Average 21]	2	RD_ONLY	
7364	FLOAT	Archive_Avg[22 - Average 22]	2	RD_ONLY	
7365	FLOAT	Archive_Avg[23 - Average 23]	2	RD_ONLY	
7366	FLOAT	Archive_Avg[24 - Average 24]	2	RD_ONLY	
7367	FLOAT	Archive_Avg[25 - Average 25]	2	RD_ONLY	
7368	FLOAT	Archive_Avg[26 - Average 26]	2	RD_ONLY	
7369	FLOAT	Archive_Avg[27 - Average 27]	2	RD_ONLY	
7370	FLOAT	Archive_Avg[28 - Average 28]	2	RD_ONLY	
7371	FLOAT	Archive_Avg[29 - Average 29]	2	RD_ONLY	
7372	FLOAT	Archive_Avg[30 - Average 30]	2	RD_ONLY	
7373	FLOAT	Archive_Avg[31 - Average 31]	2	RD_ONLY	
7374	FLOAT	Archive_Avg[32 - Average 32]	2	RD_ONLY	
7375	FLOAT	Archive_Avg[33 - Average 33]	2	RD_ONLY	
7376	FLOAT	Archive_Avg[34 - Average 34]	2	RD_ONLY	
7377	FLOAT	Archive_Avg[35 - Average 35]	2	RD_ONLY	
7378	FLOAT	Archive_Avg[36 - Average 36]	2	RD_ONLY	
7379	FLOAT	Archive_Max[1 - Average 1]	2	RD_ONLY	
7380	FLOAT	Archive_Max[2 - Average 2]	2	RD_ONLY	
7381	FLOAT	Archive_Max[3 - Average 3]	2	RD_ONLY	
7382	FLOAT	Archive_Max[4 - Average 4]	2	RD_ONLY	
7383	FLOAT	Archive_Max[5 - Average 5]	2	RD_ONLY	
7384	FLOAT	Archive_Max[6 - Average 6]	2	RD_ONLY	
7385	FLOAT	Archive_Max[7 - Average 7]	2	RD_ONLY	
7386	FLOAT	Archive_Max[8 - Average 8]	2	RD_ONLY	
7387	FLOAT	Archive_Max[9 - Average 9]	2	RD_ONLY	
7388	FLOAT	Archive_Max[10 - Average 10]	2	RD_ONLY	
7389	FLOAT	Archive_Max[11 - Average 11]	2	RD_ONLY	
7390	FLOAT	Archive_Max[12 - Average 12]	2	RD_ONLY	
7391	FLOAT	Archive_Max[13 - Average 13]	2	RD_ONLY	
7392	FLOAT	Archive_Max[14 - Average 14]	2	RD_ONLY	
7393	FLOAT	Archive_Max[15 - Average 15]	2	RD_ONLY	
7394	FLOAT	Archive_Max[16 - Average 16]	2	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7395	FLOAT	Archive_Max[17 - Average 17]	2	RD_ONLY	
7396	FLOAT	Archive_Max[18 - Average 18]	2	RD_ONLY	
7397	FLOAT	Archive_Max[19 - Average 19]	2	RD_ONLY	
7398	FLOAT	Archive_Max[20 - Average 20]	2	RD_ONLY	
7399	FLOAT	Archive_Max[21 - Average 21]	2	RD_ONLY	
7400	FLOAT	Archive_Max[22 - Average 22]	2	RD_ONLY	
7401	FLOAT	Archive_Max[23 - Average 23]	2	RD_ONLY	
7402	FLOAT	Archive_Max[24 - Average 24]	2	RD_ONLY	
7403	FLOAT	Archive_Max[25 - Average 25]	2	RD_ONLY	
7404	FLOAT	Archive_Max[26 - Average 26]	2	RD_ONLY	
7405	FLOAT	Archive_Max[27 - Average 27]	2	RD_ONLY	
7406	FLOAT	Archive_Max[28 - Average 28]	2	RD_ONLY	
7407	FLOAT	Archive_Max[29 - Average 29]	2	RD_ONLY	
7408	FLOAT	Archive_Max[30 - Average 30]	2	RD_ONLY	
7409	FLOAT	Archive_Max[31 - Average 31]	2	RD_ONLY	
7410	FLOAT	Archive_Max[32 - Average 32]	2	RD_ONLY	
7411	FLOAT	Archive_Max[33 - Average 33]	2	RD_ONLY	
7412	FLOAT	Archive_Max[34 - Average 34]	2	RD_ONLY	
7413	FLOAT	Archive_Max[35 - Average 35]	2	RD_ONLY	
7414	FLOAT	Archive_Max[36 - Average 36]	2	RD_ONLY	
7415	FLOAT	Archive_Min[1 - Average 1]	2	RD_ONLY	
7416	FLOAT	Archive_Min[2 - Average 2]	2	RD_ONLY	
7417	FLOAT	Archive_Min[3 - Average 3]	2	RD_ONLY	
7418	FLOAT	Archive_Min[4 - Average 4]	2	RD_ONLY	
7419	FLOAT	Archive_Min[5 - Average 5]	2	RD_ONLY	
7420	FLOAT	Archive_Min[6 - Average 6]	2	RD_ONLY	
7421	FLOAT	Archive_Min[7 - Average 7]	2	RD_ONLY	
7422	FLOAT	Archive_Min[8 - Average 8]	2	RD_ONLY	
7423	FLOAT	Archive_Min[9 - Average 9]	2	RD_ONLY	
7424	FLOAT	Archive_Min[10 - Average 10]	2	RD_ONLY	
7425	FLOAT	Archive_Min[11 - Average 11]	2	RD_ONLY	
7426	FLOAT	Archive_Min[12 - Average 12]	2	RD_ONLY	
7427	FLOAT	Archive_Min[13 - Average 13]	2	RD_ONLY	
7428	FLOAT	Archive_Min[14 - Average 14]	2	RD_ONLY	
7429	FLOAT	Archive_Min[15 - Average 15]	2	RD_ONLY	
7430	FLOAT	Archive_Min[16 - Average 16]	2	RD_ONLY	
7431	FLOAT	Archive_Min[17 - Average 17]	2	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7432	FLOAT	Archive_Min[18 - Average 18]	2	RD_ONLY	
7433	FLOAT	Archive_Min[19 - Average 19]	2	RD_ONLY	
7434	FLOAT	Archive_Min[20 - Average 20]	2	RD_ONLY	
7435	FLOAT	Archive_Min[21 - Average 21]	2	RD_ONLY	
7436	FLOAT	Archive_Min[22 - Average 22]	2	RD_ONLY	
7437	FLOAT	Archive_Min[23 - Average 23]	2	RD_ONLY	
7438	FLOAT	Archive_Min[24 - Average 24]	2	RD_ONLY	
7439	FLOAT	Archive_Min[25 - Average 25]	2	RD_ONLY	
7440	FLOAT	Archive_Min[26 - Average 26]	2	RD_ONLY	
7441	FLOAT	Archive_Min[27 - Average 27]	2	RD_ONLY	
7442	FLOAT	Archive_Min[28 - Average 28]	2	RD_ONLY	
7443	FLOAT	Archive_Min[29 - Average 29]	2	RD_ONLY	
7444	FLOAT	Archive_Min[30 - Average 30]	2	RD_ONLY	
7445	FLOAT	Archive_Min[31 - Average 31]	2	RD_ONLY	
7446	FLOAT	Archive_Min[32 - Average 32]	2	RD_ONLY	
7447	FLOAT	Archive_Min[33 - Average 33]	2	RD_ONLY	
7448	FLOAT	Archive_Min[34 - Average 34]	2	RD_ONLY	
7449	FLOAT	Archive_Min[35 - Average 35]	2	RD_ONLY	
7450	FLOAT	Archive_Min[36 - Average 36]	2	RD_ONLY	
7451	FLOAT	Archive_Avg[1 - Average 1]	3	RD_ONLY	
7452	FLOAT	Archive_Avg[2 - Average 2]	3	RD_ONLY	
7453	FLOAT	Archive_Avg[3 - Average 3]	3	RD_ONLY	
7454	FLOAT	Archive_Avg[4 - Average 4]	3	RD_ONLY	
7455	FLOAT	Archive_Avg[5 - Average 5]	3	RD_ONLY	
7456	FLOAT	Archive_Avg[6 - Average 6]	3	RD_ONLY	
7457	FLOAT	Archive_Avg[7 - Average 7]	3	RD_ONLY	
7458	FLOAT	Archive_Avg[8 - Average 8]	3	RD_ONLY	
7459	FLOAT	Archive_Avg[9 - Average 9]	3	RD_ONLY	
7460	FLOAT	Archive_Avg[10 - Average 10]	3	RD_ONLY	
7461	FLOAT	Archive_Avg[11 - Average 11]	3	RD_ONLY	
7462	FLOAT	Archive_Avg[12 - Average 12]	3	RD_ONLY	
7463	FLOAT	Archive_Avg[13 - Average 13]	3	RD_ONLY	
7464	FLOAT	Archive_Avg[14 - Average 14]	3	RD_ONLY	
7465	FLOAT	Archive_Avg[15 - Average 15]	3	RD_ONLY	
7466	FLOAT	Archive_Avg[16 - Average 16]	3	RD_ONLY	
7467	FLOAT	Archive_Avg[17 - Average 17]	3	RD_ONLY	
7468	FLOAT	Archive_Avg[18 - Average 18]	3	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7469	FLOAT	Archive_Avg[19 - Average 19]	3	RD_ONLY	
7470	FLOAT	Archive_Avg[20 - Average 20]	3	RD_ONLY	
7471	FLOAT	Archive_Avg[21 - Average 21]	3	RD_ONLY	
7472	FLOAT	Archive_Avg[22 - Average 22]	3	RD_ONLY	
7473	FLOAT	Archive_Avg[23 - Average 23]	3	RD_ONLY	
7474	FLOAT	Archive_Avg[24 - Average 24]	3	RD_ONLY	
7475	FLOAT	Archive_Avg[25 - Average 25]	3	RD_ONLY	
7476	FLOAT	Archive_Avg[26 - Average 26]	3	RD_ONLY	
7477	FLOAT	Archive_Avg[27 - Average 27]	3	RD_ONLY	
7478	FLOAT	Archive_Avg[28 - Average 28]	3	RD_ONLY	
7479	FLOAT	Archive_Avg[29 - Average 29]	3	RD_ONLY	
7480	FLOAT	Archive_Avg[30 - Average 30]	3	RD_ONLY	
7481	FLOAT	Archive_Avg[31 - Average 31]	3	RD_ONLY	
7482	FLOAT	Archive_Avg[32 - Average 32]	3	RD_ONLY	
7483	FLOAT	Archive_Avg[33 - Average 33]	3	RD_ONLY	
7484	FLOAT	Archive_Avg[34 - Average 34]	3	RD_ONLY	
7485	FLOAT	Archive_Avg[35 - Average 35]	3	RD_ONLY	
7486	FLOAT	Archive_Avg[36 - Average 36]	3	RD_ONLY	
7487	FLOAT	Archive_Max[1 - Average 1]	3	RD_ONLY	
7488	FLOAT	Archive_Max[2 - Average 2]	3	RD_ONLY	
7489	FLOAT	Archive_Max[3 - Average 3]	3	RD_ONLY	
7490	FLOAT	Archive_Max[4 - Average 4]	3	RD_ONLY	
7491	FLOAT	Archive_Max[5 - Average 5]	3	RD_ONLY	
7492	FLOAT	Archive_Max[6 - Average 6]	3	RD_ONLY	
7493	FLOAT	Archive_Max[7 - Average 7]	3	RD_ONLY	
7494	FLOAT	Archive_Max[8 - Average 8]	3	RD_ONLY	
7495	FLOAT	Archive_Max[9 - Average 9]	3	RD_ONLY	
7496	FLOAT	Archive_Max[10 - Average 10]	3	RD_ONLY	
7497	FLOAT	Archive_Max[11 - Average 11]	3	RD_ONLY	
7498	FLOAT	Archive_Max[12 - Average 12]	3	RD_ONLY	
7499	FLOAT	Archive_Max[13 - Average 13]	3	RD_ONLY	
7500	FLOAT	Archive_Max[14 - Average 14]	3	RD_ONLY	
7501	FLOAT	Archive_Max[15 - Average 15]	3	RD_ONLY	
7502	FLOAT	Archive_Max[16 - Average 16]	3	RD_ONLY	
7503	FLOAT	Archive_Max[17 - Average 17]	3	RD_ONLY	
7504	FLOAT	Archive_Max[18 - Average 18]	3	RD_ONLY	
7505	FLOAT	Archive_Max[19 - Average 19]	3	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7506	FLOAT	Archive_Max[20 - Average 20]	3	RD_ONLY	
7507	FLOAT	Archive_Max[21 - Average 21]	3	RD_ONLY	
7508	FLOAT	Archive_Max[22 - Average 22]	3	RD_ONLY	
7509	FLOAT	Archive_Max[23 - Average 23]	3	RD_ONLY	
7510	FLOAT	Archive_Max[24 - Average 24]	3	RD_ONLY	
7511	FLOAT	Archive_Max[25 - Average 25]	3	RD_ONLY	
7512	FLOAT	Archive_Max[26 - Average 26]	3	RD_ONLY	
7513	FLOAT	Archive_Max[27 - Average 27]	3	RD_ONLY	
7514	FLOAT	Archive_Max[28 - Average 28]	3	RD_ONLY	
7515	FLOAT	Archive_Max[29 - Average 29]	3	RD_ONLY	
7516	FLOAT	Archive_Max[30 - Average 30]	3	RD_ONLY	
7517	FLOAT	Archive_Max[31 - Average 31]	3	RD_ONLY	
7518	FLOAT	Archive_Max[32 - Average 32]	3	RD_ONLY	
7519	FLOAT	Archive_Max[33 - Average 33]	3	RD_ONLY	
7520	FLOAT	Archive_Max[34 - Average 34]	3	RD_ONLY	
7521	FLOAT	Archive_Max[35 - Average 35]	3	RD_ONLY	
7522	FLOAT	Archive_Max[36 - Average 36]	3	RD_ONLY	
7523	FLOAT	Archive_Min[1 - Average 1]	3	RD_ONLY	
7524	FLOAT	Archive_Min[2 - Average 2]	3	RD_ONLY	
7525	FLOAT	Archive_Min[3 - Average 3]	3	RD_ONLY	
7526	FLOAT	Archive_Min[4 - Average 4]	3	RD_ONLY	
7527	FLOAT	Archive_Min[5 - Average 5]	3	RD_ONLY	
7528	FLOAT	Archive_Min[6 - Average 6]	3	RD_ONLY	
7529	FLOAT	Archive_Min[7 - Average 7]	3	RD_ONLY	
7530	FLOAT	Archive_Min[8 - Average 8]	3	RD_ONLY	
7531	FLOAT	Archive_Min[9 - Average 9]	3	RD_ONLY	
7532	FLOAT	Archive_Min[10 - Average 10]	3	RD_ONLY	
7533	FLOAT	Archive_Min[11 - Average 11]	3	RD_ONLY	
7534	FLOAT	Archive_Min[12 - Average 12]	3	RD_ONLY	
7535	FLOAT	Archive_Min[13 - Average 13]	3	RD_ONLY	
7536	FLOAT	Archive_Min[14 - Average 14]	3	RD_ONLY	
7537	FLOAT	Archive_Min[15 - Average 15]	3	RD_ONLY	
7538	FLOAT	Archive_Min[16 - Average 16]	3	RD_ONLY	
7539	FLOAT	Archive_Min[17 - Average 17]	3	RD_ONLY	
7540	FLOAT	Archive_Min[18 - Average 18]	3	RD_ONLY	
7541	FLOAT	Archive_Min[19 - Average 19]	3	RD_ONLY	
7542	FLOAT	Archive_Min[20 - Average 20]	3	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7543	FLOAT	Archive_Min[21 - Average 21]	3	RD_ONLY	
7544	FLOAT	Archive_Min[22 - Average 22]	3	RD_ONLY	
7545	FLOAT	Archive_Min[23 - Average 23]	3	RD_ONLY	
7546	FLOAT	Archive_Min[24 - Average 24]	3	RD_ONLY	
7547	FLOAT	Archive_Min[25 - Average 25]	3	RD_ONLY	
7548	FLOAT	Archive_Min[26 - Average 26]	3	RD_ONLY	
7549	FLOAT	Archive_Min[27 - Average 27]	3	RD_ONLY	
7550	FLOAT	Archive_Min[28 - Average 28]	3	RD_ONLY	
7551	FLOAT	Archive_Min[29 - Average 29]	3	RD_ONLY	
7552	FLOAT	Archive_Min[30 - Average 30]	3	RD_ONLY	
7553	FLOAT	Archive_Min[31 - Average 31]	3	RD_ONLY	
7554	FLOAT	Archive_Min[32 - Average 32]	3	RD_ONLY	
7555	FLOAT	Archive_Min[33 - Average 33]	3	RD_ONLY	
7556	FLOAT	Archive_Min[34 - Average 34]	3	RD_ONLY	
7557	FLOAT	Archive_Min[35 - Average 35]	3	RD_ONLY	
7558	FLOAT	Archive_Min[36 - Average 36]	3	RD_ONLY	
7560	FLOAT	Current Value[1 - Analog Input 1]		RD_ONLY	
7561	FLOAT	Current Value[2 - Analog Input 2]		RD_ONLY	
7562	FLOAT	Current Value[3]		RD_ONLY	
7563	FLOAT	Current Value[4]		RD_ONLY	
7564	FLOAT	Current Value[1 - Analog Input 1]		RD_ONLY	
7565	FLOAT	Current Value[2 - Analog Input 2]		RD_ONLY	
7566	FLOAT	Current Value[3]		RD_ONLY	
7567	FLOAT	Current Value[4]		RD_ONLY	
7621	FLOAT	1 - Stream 1_Start Time		RD_ONLY	YYMMDD
7622	FLOAT	1 - Stream 1_Start Time		RD_ONLY	hhmmss
7623	FLOAT	1 - Stream 1_Mole %[1 - Component 1]		RD_ONLY	
7624	FLOAT	1 - Stream 1_Mole %[2 - Component 2]		RD_ONLY	
7625	FLOAT	1 - Stream 1_Mole %[3 - Component 3]		RD_ONLY	
7626	FLOAT	1 - Stream 1_Mole %[4 - Component 4]		RD_ONLY	
7627	FLOAT	1 - Stream 1_Mole %[5 - Component 5]		RD_ONLY	
7628	FLOAT	1 - Stream 1_Mole %[6 - Component 6]		RD_ONLY	
7629	FLOAT	1 - Stream 1_Mole %[7 - Component 7]		RD_ONLY	
7630	FLOAT	1 - Stream 1_Mole %[8 - Component 8]		RD_ONLY	
7631	FLOAT	1 - Stream 1_Mole %[9 - Component 9]		RD_ONLY	
7632	FLOAT	1 - Stream 1_Mole %[10 - Component 10]		RD_ONLY	
7633	FLOAT	1 - Stream 1_Mole %[11 - Component 11]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7634	FLOAT	1 - Stream 1_Mole %[12 - Component 12]		RD_ONLY	
7635	FLOAT	1 - Stream 1_Mole %[13 - Component 13]		RD_ONLY	
7636	FLOAT	1 - Stream 1_Mole %[14 - Component 14]		RD_ONLY	
7637	FLOAT	1 - Stream 1_Mole %[15 - Component 15]		RD_ONLY	
7638	FLOAT	1 - Stream 1_Mole %[16 - Component 16]		RD_ONLY	
7639	FLOAT	1 - Stream 1_Mole %[17 - Component 17]		RD_ONLY	
7640	FLOAT	1 - Stream 1_Mole %[18 - Component 18]		RD_ONLY	
7641	FLOAT	1 - Stream 1_Mole %[19 - Component 19]		RD_ONLY	
7642	FLOAT	1 - Stream 1_Mole %[20 - Component 20]		RD_ONLY	
7643	FLOAT	1 - Stream 1_HV Gross BTU Dry		RD_ONLY	
7644	FLOAT	1 - Stream 1_GPA Real Rel Den Gas		RD_ONLY	
7645	FLOAT	1 - Stream 1_GPA Z Factor		RD_ONLY	
7646	FLOAT	1 - Stream 1_Total Unnormalized Conc		RD_ONLY	
7647	FLOAT	Unused		RD_ONLY	
7648	FLOAT	Unused		RD_ONLY	
7649	FLOAT	Unused		RD_ONLY	
7650	FLOAT	Unused		RD_ONLY	
7651	FLOAT	2 - Stream 2_Start Time		RD_ONLY	YYMMDD
7652	FLOAT	2 - Stream 2_Start Time		RD_ONLY	hhmmss
7653	FLOAT	2 - Stream 2_Mole %[1 - Component 1]		RD_ONLY	
7654	FLOAT	2 - Stream 2_Mole %[2 - Component 2]		RD_ONLY	
7655	FLOAT	2 - Stream 2_Mole %[3 - Component 3]		RD_ONLY	
7656	FLOAT	2 - Stream 2_Mole %[4 - Component 4]		RD_ONLY	
7657	FLOAT	2 - Stream 2_Mole %[5 - Component 5]		RD_ONLY	
7658	FLOAT	2 - Stream 2_Mole %[6 - Component 6]		RD_ONLY	
7659	FLOAT	2 - Stream 2_Mole %[7 - Component 7]		RD_ONLY	
7660	FLOAT	2 - Stream 2_Mole %[8 - Component 8]		RD_ONLY	
7661	FLOAT	2 - Stream 2_Mole %[9 - Component 9]		RD_ONLY	
7662	FLOAT	2 - Stream 2_Mole %[10 - Component 10]		RD_ONLY	
7663	FLOAT	2 - Stream 2_Mole %[11 - Component 11]		RD_ONLY	
7664	FLOAT	2 - Stream 2_Mole %[12 - Component 12]		RD_ONLY	
7665	FLOAT	2 - Stream 2_Mole %[13 - Component 13]		RD_ONLY	
7666	FLOAT	2 - Stream 2_Mole %[14 - Component 14]		RD_ONLY	
7667	FLOAT	2 - Stream 2_Mole %[15 - Component 15]		RD_ONLY	
7668	FLOAT	2 - Stream 2_Mole %[16 - Component 16]		RD_ONLY	
7669	FLOAT	2 - Stream 2_Mole %[17 - Component 17]		RD_ONLY	
7670	FLOAT	2 - Stream 2_Mole %[18 - Component 18]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7671	FLOAT	2 - Stream 2_Mole %[19 - Component 19]		RD_ONLY	
7672	FLOAT	2 - Stream 2_Mole %[20 - Component 20]		RD_ONLY	
7673	FLOAT	2 - Stream 2_HV Gross BTU Dry		RD_ONLY	
7674	FLOAT	2 - Stream 2_GPA Real Rel Den Gas		RD_ONLY	
7675	FLOAT	2 - Stream 2_GPA Z Factor		RD_ONLY	
7676	FLOAT	2 - Stream 2_Total Unnormalized Conc		RD_ONLY	
7677	FLOAT	Unused		RD_ONLY	
7678	FLOAT	Unused		RD_ONLY	
7679	FLOAT	Unused		RD_ONLY	
7680	FLOAT	Unused		RD_ONLY	
7681	FLOAT	3 - Stream 3_Start Time		RD_ONLY	YYMMDD
7682	FLOAT	3 - Stream 3_Start Time		RD_ONLY	hhmmss
7683	FLOAT	3 - Stream 3_Mole %[1 - Component 1]		RD_ONLY	
7684	FLOAT	3 - Stream 3_Mole %[2 - Component 2]		RD_ONLY	
7685	FLOAT	3 - Stream 3_Mole %[3 - Component 3]		RD_ONLY	
7686	FLOAT	3 - Stream 3_Mole %[4 - Component 4]		RD_ONLY	
7687	FLOAT	3 - Stream 3_Mole %[5 - Component 5]		RD_ONLY	
7688	FLOAT	3 - Stream 3_Mole %[6 - Component 6]		RD_ONLY	
7689	FLOAT	3 - Stream 3_Mole %[7 - Component 7]		RD_ONLY	
7690	FLOAT	3 - Stream 3_Mole %[8 - Component 8]		RD_ONLY	
7691	FLOAT	3 - Stream 3_Mole %[9 - Component 9]		RD_ONLY	
7692	FLOAT	3 - Stream 3_Mole %[10 - Component 10]		RD_ONLY	
7693	FLOAT	3 - Stream 3_Mole %[11 - Component 11]		RD_ONLY	
7694	FLOAT	3 - Stream 3_Mole %[12 - Component 12]		RD_ONLY	
7695	FLOAT	3 - Stream 3_Mole %[13 - Component 13]		RD_ONLY	
7696	FLOAT	3 - Stream 3_Mole %[14 - Component 14]		RD_ONLY	
7697	FLOAT	3 - Stream 3_Mole %[15 - Component 15]		RD_ONLY	
7698	FLOAT	3 - Stream 3_Mole %[16 - Component 16]		RD_ONLY	
7699	FLOAT	3 - Stream 3_Mole %[17 - Component 17]		RD_ONLY	
7700	FLOAT	3 - Stream 3_Mole %[18 - Component 18]		RD_ONLY	
7701	FLOAT	3 - Stream 3_Mole %[19 - Component 19]		RD_ONLY	
7702	FLOAT	3 - Stream 3_Mole %[20 - Component 20]		RD_ONLY	
7703	FLOAT	3 - Stream 3_HV Gross BTU Dry		RD_ONLY	
7704	FLOAT	3 - Stream 3_GPA Real Rel Den Gas		RD_ONLY	
7705	FLOAT	3 - Stream 3_GPA Z Factor		RD_ONLY	
7706	FLOAT	3 - Stream 3_Total Unnormalized Conc		RD_ONLY	
7707	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7708	FLOAT	Unused		RD_ONLY	
7709	FLOAT	Unused		RD_ONLY	
7710	FLOAT	Unused		RD_ONLY	
7711	FLOAT	4 - Stream 4_Start Time		RD_ONLY	YYMMDD
7712	FLOAT	4 - Stream 4_Start Time		RD_ONLY	hhmmss
7713	FLOAT	4 - Stream 4_Mole %[1 - Component 1]		RD_ONLY	
7714	FLOAT	4 - Stream 4_Mole %[2 - Component 2]		RD_ONLY	
7715	FLOAT	4 - Stream 4_Mole %[3 - Component 3]		RD_ONLY	
7716	FLOAT	4 - Stream 4_Mole %[4 - Component 4]		RD_ONLY	
7717	FLOAT	4 - Stream 4_Mole %[5 - Component 5]		RD_ONLY	
7718	FLOAT	4 - Stream 4_Mole %[6 - Component 6]		RD_ONLY	
7719	FLOAT	4 - Stream 4_Mole %[7 - Component 7]		RD_ONLY	
7720	FLOAT	4 - Stream 4_Mole %[8 - Component 8]		RD_ONLY	
7721	FLOAT	4 - Stream 4_Mole %[9 - Component 9]		RD_ONLY	
7722	FLOAT	4 - Stream 4_Mole %[10 - Component 10]		RD_ONLY	
7723	FLOAT	4 - Stream 4_Mole %[11 - Component 11]		RD_ONLY	
7724	FLOAT	4 - Stream 4_Mole %[12 - Component 12]		RD_ONLY	
7725	FLOAT	4 - Stream 4_Mole %[13 - Component 13]		RD_ONLY	
7726	FLOAT	4 - Stream 4_Mole %[14 - Component 14]		RD_ONLY	
7727	FLOAT	4 - Stream 4_Mole %[15 - Component 15]		RD_ONLY	
7728	FLOAT	4 - Stream 4_Mole %[16 - Component 16]		RD_ONLY	
7729	FLOAT	4 - Stream 4_Mole %[17 - Component 17]		RD_ONLY	
7730	FLOAT	4 - Stream 4_Mole %[18 - Component 18]		RD_ONLY	
7731	FLOAT	4 - Stream 4_Mole %[19 - Component 19]		RD_ONLY	
7732	FLOAT	4 - Stream 4_Mole %[20 - Component 20]		RD_ONLY	
7733	FLOAT	4 - Stream 4_HV Gross BTU Dry		RD_ONLY	
7734	FLOAT	4 - Stream 4_GPA Real Rel Den Gas		RD_ONLY	
7735	FLOAT	4 - Stream 4_GPA Z Factor		RD_ONLY	
7736	FLOAT	4 - Stream 4_Total Unnormalized Conc		RD_ONLY	
7737	FLOAT	Unused		RD_ONLY	
7738	FLOAT	Unused		RD_ONLY	
7739	FLOAT	Unused		RD_ONLY	
7740	FLOAT	Unused		RD_ONLY	
7741	FLOAT	5 - Stream 5_Start Time		RD_ONLY	YYMMDD
7742	FLOAT	5 - Stream 5_Start Time		RD_ONLY	hhmmss
7743	FLOAT	5 - Stream 5_Mole %[1 - Component 1]		RD_ONLY	
7744	FLOAT	5 - Stream 5_Mole %[2 - Component 2]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7745	FLOAT	5 - Stream 5_Mole %[3 - Component 3]		RD_ONLY	
7746	FLOAT	5 - Stream 5_Mole %[4 - Component 4]		RD_ONLY	
7747	FLOAT	5 - Stream 5_Mole %[5 - Component 5]		RD_ONLY	
7748	FLOAT	5 - Stream 5_Mole %[6 - Component 6]		RD_ONLY	
7749	FLOAT	5 - Stream 5_Mole %[7 - Component 7]		RD_ONLY	
7750	FLOAT	5 - Stream 5_Mole %[8 - Component 8]		RD_ONLY	
7751	FLOAT	5 - Stream 5_Mole %[9 - Component 9]		RD_ONLY	
7752	FLOAT	5 - Stream 5_Mole %[10 - Component 10]		RD_ONLY	
7753	FLOAT	5 - Stream 5_Mole %[11 - Component 11]		RD_ONLY	
7754	FLOAT	5 - Stream 5_Mole %[12 - Component 12]		RD_ONLY	
7755	FLOAT	5 - Stream 5_Mole %[13 - Component 13]		RD_ONLY	
7756	FLOAT	5 - Stream 5_Mole %[14 - Component 14]		RD_ONLY	
7757	FLOAT	5 - Stream 5_Mole %[15 - Component 15]		RD_ONLY	
7758	FLOAT	5 - Stream 5_Mole %[16 - Component 16]		RD_ONLY	
7759	FLOAT	5 - Stream 5_Mole %[17 - Component 17]		RD_ONLY	
7760	FLOAT	5 - Stream 5_Mole %[18 - Component 18]		RD_ONLY	
7761	FLOAT	5 - Stream 5_Mole %[19 - Component 19]		RD_ONLY	
7762	FLOAT	5 - Stream 5_Mole %[20 - Component 20]		RD_ONLY	
7763	FLOAT	5 - Stream 5_HV Gross BTU Dry		RD_ONLY	
7764	FLOAT	5 - Stream 5_GPA Real Rel Den Gas		RD_ONLY	
7765	FLOAT	5 - Stream 5_GPA Z Factor		RD_ONLY	
7766	FLOAT	5 - Stream 5_Total Unnormalized Conc		RD_ONLY	
7767	FLOAT	Unused		RD_ONLY	
7768	FLOAT	Unused		RD_ONLY	
7769	FLOAT	Unused		RD_ONLY	
7770	FLOAT	Unused		RD_ONLY	
7771	FLOAT	6 - Stream 6_Start Time		RD_ONLY	YYMMDD
7772	FLOAT	6 - Stream 6_Start Time		RD_ONLY	hhmmss
7773	FLOAT	6 - Stream 6_Mole %[1 - Component 1]		RD_ONLY	
7774	FLOAT	6 - Stream 6_Mole %[2 - Component 2]		RD_ONLY	
7775	FLOAT	6 - Stream 6_Mole %[3 - Component 3]		RD_ONLY	
7776	FLOAT	6 - Stream 6_Mole %[4 - Component 4]		RD_ONLY	
7777	FLOAT	6 - Stream 6_Mole %[5 - Component 5]		RD_ONLY	
7778	FLOAT	6 - Stream 6_Mole %[6 - Component 6]		RD_ONLY	
7779	FLOAT	6 - Stream 6_Mole %[7 - Component 7]		RD_ONLY	
7780	FLOAT	6 - Stream 6_Mole %[8 - Component 8]		RD_ONLY	
7781	FLOAT	6 - Stream 6_Mole %[9 - Component 9]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7782	FLOAT	6 - Stream 6_Mole %[10 - Component 10]		RD_ONLY	
7783	FLOAT	6 - Stream 6_Mole %[11 - Component 11]		RD_ONLY	
7784	FLOAT	6 - Stream 6_Mole %[12 - Component 12]		RD_ONLY	
7785	FLOAT	6 - Stream 6_Mole %[13 - Component 13]		RD_ONLY	
7786	FLOAT	6 - Stream 6_Mole %[14 - Component 14]		RD_ONLY	
7787	FLOAT	6 - Stream 6_Mole %[15 - Component 15]		RD_ONLY	
7788	FLOAT	6 - Stream 6_Mole %[16 - Component 16]		RD_ONLY	
7789	FLOAT	6 - Stream 6_Mole %[17 - Component 17]		RD_ONLY	
7790	FLOAT	6 - Stream 6_Mole %[18 - Component 18]		RD_ONLY	
7791	FLOAT	6 - Stream 6_Mole %[19 - Component 19]		RD_ONLY	
7792	FLOAT	6 - Stream 6_Mole %[20 - Component 20]		RD_ONLY	
7793	FLOAT	6 - Stream 6_HV Gross BTU Dry		RD_ONLY	
7794	FLOAT	6 - Stream 6_GPA Real Rel Den Gas		RD_ONLY	
7795	FLOAT	6 - Stream 6_GPA Z Factor		RD_ONLY	
7796	FLOAT	6 - Stream 6_Total Unnormalized Conc		RD_ONLY	
7797	FLOAT	Unused		RD_ONLY	
7798	FLOAT	Unused		RD_ONLY	
7799	FLOAT	Unused		RD_ONLY	
7800	FLOAT	Unused		RD_ONLY	
7801	FLOAT	7 - Stream 7_Start Time		RD_ONLY	YYMMDD
7802	FLOAT	7 - Stream 7_Start Time		RD_ONLY	hhmmss
7803	FLOAT	7 - Stream 7_Mole %[1 - Component 1]		RD_ONLY	
7804	FLOAT	7 - Stream 7_Mole %[2 - Component 2]		RD_ONLY	
7805	FLOAT	7 - Stream 7_Mole %[3 - Component 3]		RD_ONLY	
7806	FLOAT	7 - Stream 7_Mole %[4 - Component 4]		RD_ONLY	
7807	FLOAT	7 - Stream 7_Mole %[5 - Component 5]		RD_ONLY	
7808	FLOAT	7 - Stream 7_Mole %[6 - Component 6]		RD_ONLY	
7809	FLOAT	7 - Stream 7_Mole %[7 - Component 7]		RD_ONLY	
7810	FLOAT	7 - Stream 7_Mole %[8 - Component 8]		RD_ONLY	
7811	FLOAT	7 - Stream 7_Mole %[9 - Component 9]		RD_ONLY	
7812	FLOAT	7 - Stream 7_Mole %[10 - Component 10]		RD_ONLY	
7813	FLOAT	7 - Stream 7_Mole %[11 - Component 11]		RD_ONLY	
7814	FLOAT	7 - Stream 7_Mole %[12 - Component 12]		RD_ONLY	
7815	FLOAT	7 - Stream 7_Mole %[13 - Component 13]		RD_ONLY	
7816	FLOAT	7 - Stream 7_Mole %[14 - Component 14]		RD_ONLY	
7817	FLOAT	7 - Stream 7_Mole %[15 - Component 15]		RD_ONLY	
7818	FLOAT	7 - Stream 7_Mole %[16 - Component 16]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7819	FLOAT	7 - Stream 7_Mole %[17 - Component 17]		RD_ONLY	
7820	FLOAT	7 - Stream 7_Mole %[18 - Component 18]		RD_ONLY	
7821	FLOAT	7 - Stream 7_Mole %[19 - Component 19]		RD_ONLY	
7822	FLOAT	7 - Stream 7_Mole %[20 - Component 20]		RD_ONLY	
7823	FLOAT	7 - Stream 7_HV Gross BTU Dry		RD_ONLY	
7824	FLOAT	7 - Stream 7_GPA Real Rel Den Gas		RD_ONLY	
7825	FLOAT	7 - Stream 7_GPA Z Factor		RD_ONLY	
7826	FLOAT	7 - Stream 7_Total Unnormalized Conc		RD_ONLY	
7827	FLOAT	Unused		RD_ONLY	
7828	FLOAT	Unused		RD_ONLY	
7829	FLOAT	Unused		RD_ONLY	
7830	FLOAT	Unused		RD_ONLY	
7831	FLOAT	8 - Stream 8_Start Time		RD_ONLY	YYMMDD
7832	FLOAT	8 - Stream 8_Start Time		RD_ONLY	hhmmss
7833	FLOAT	8 - Stream 8_Mole %[1 - Component 1]		RD_ONLY	
7834	FLOAT	8 - Stream 8_Mole %[2 - Component 2]		RD_ONLY	
7835	FLOAT	8 - Stream 8_Mole %[3 - Component 3]		RD_ONLY	
7836	FLOAT	8 - Stream 8_Mole %[4 - Component 4]		RD_ONLY	
7837	FLOAT	8 - Stream 8_Mole %[5 - Component 5]		RD_ONLY	
7838	FLOAT	8 - Stream 8_Mole %[6 - Component 6]		RD_ONLY	
7839	FLOAT	8 - Stream 8_Mole %[7 - Component 7]		RD_ONLY	
7840	FLOAT	8 - Stream 8_Mole %[8 - Component 8]		RD_ONLY	
7841	FLOAT	8 - Stream 8_Mole %[9 - Component 9]		RD_ONLY	
7842	FLOAT	8 - Stream 8_Mole %[10 - Component 10]		RD_ONLY	
7843	FLOAT	8 - Stream 8_Mole %[11 - Component 11]		RD_ONLY	
7844	FLOAT	8 - Stream 8_Mole %[12 - Component 12]		RD_ONLY	
7845	FLOAT	8 - Stream 8_Mole %[13 - Component 13]		RD_ONLY	
7846	FLOAT	8 - Stream 8_Mole %[14 - Component 14]		RD_ONLY	
7847	FLOAT	8 - Stream 8_Mole %[15 - Component 15]		RD_ONLY	
7848	FLOAT	8 - Stream 8_Mole %[16 - Component 16]		RD_ONLY	
7849	FLOAT	8 - Stream 8_Mole %[17 - Component 17]		RD_ONLY	
7850	FLOAT	8 - Stream 8_Mole %[18 - Component 18]		RD_ONLY	
7851	FLOAT	8 - Stream 8_Mole %[19 - Component 19]		RD_ONLY	
7852	FLOAT	8 - Stream 8_Mole %[20 - Component 20]		RD_ONLY	
7853	FLOAT	8 - Stream 8_HV Gross BTU Dry		RD_ONLY	
7854	FLOAT	8 - Stream 8_GPA Real Rel Den Gas		RD_ONLY	
7855	FLOAT	8 - Stream 8_GPA Z Factor		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7856	FLOAT	8 - Stream 8_Total Unnormalized Conc		RD_ONLY	
7857	FLOAT	Unused		RD_ONLY	
7858	FLOAT	Unused		RD_ONLY	
7859	FLOAT	Unused		RD_ONLY	
7860	FLOAT	Unused		RD_ONLY	
7861	FLOAT	9 - Stream 9_Start Time		RD_ONLY	YYMMDD
7862	FLOAT	9 - Stream 9_Start Time		RD_ONLY	hhmmss
7863	FLOAT	9 - Stream 9_Mole %[1 - Component 1]		RD_ONLY	
7864	FLOAT	9 - Stream 9_Mole %[2 - Component 2]		RD_ONLY	
7865	FLOAT	9 - Stream 9_Mole %[3 - Component 3]		RD_ONLY	
7866	FLOAT	9 - Stream 9_Mole %[4 - Component 4]		RD_ONLY	
7867	FLOAT	9 - Stream 9_Mole %[5 - Component 5]		RD_ONLY	
7868	FLOAT	9 - Stream 9_Mole %[6 - Component 6]		RD_ONLY	
7869	FLOAT	9 - Stream 9_Mole %[7 - Component 7]		RD_ONLY	
7870	FLOAT	9 - Stream 9_Mole %[8 - Component 8]		RD_ONLY	
7871	FLOAT	9 - Stream 9_Mole %[9 - Component 9]		RD_ONLY	
7872	FLOAT	9 - Stream 9_Mole %[10 - Component 10]		RD_ONLY	
7873	FLOAT	9 - Stream 9_Mole %[11 - Component 11]		RD_ONLY	
7874	FLOAT	9 - Stream 9_Mole %[12 - Component 12]		RD_ONLY	
7875	FLOAT	9 - Stream 9_Mole %[13 - Component 13]		RD_ONLY	
7876	FLOAT	9 - Stream 9_Mole %[14 - Component 14]		RD_ONLY	
7877	FLOAT	9 - Stream 9_Mole %[15 - Component 15]		RD_ONLY	
7878	FLOAT	9 - Stream 9_Mole %[16 - Component 16]		RD_ONLY	
7879	FLOAT	9 - Stream 9_Mole %[17 - Component 17]		RD_ONLY	
7880	FLOAT	9 - Stream 9_Mole %[18 - Component 18]		RD_ONLY	
7881	FLOAT	9 - Stream 9_Mole %[19 - Component 19]		RD_ONLY	
7882	FLOAT	9 - Stream 9_Mole %[20 - Component 20]		RD_ONLY	
7883	FLOAT	9 - Stream 9_HV Gross BTU Dry		RD_ONLY	
7884	FLOAT	9 - Stream 9_GPA Real Rel Den Gas		RD_ONLY	
7885	FLOAT	9 - Stream 9_GPA Z Factor		RD_ONLY	
7886	FLOAT	9 - Stream 9_Total Unnormalized Conc		RD_ONLY	
7887	FLOAT	Unused		RD_ONLY	
7888	FLOAT	Unused		RD_ONLY	
7889	FLOAT	Unused		RD_ONLY	
7890	FLOAT	Unused		RD_ONLY	
7891	FLOAT	10 - Stream 10_Start Time		RD_ONLY	YYMMDD
7892	FLOAT	10 - Stream 10_Start Time		RD_ONLY	hhmmss

Register #	Data Type	Variable	Record #	Access	Format
7893	FLOAT	10 - Stream 10_Mole %[1 - Component 1]		RD_ONLY	
7894	FLOAT	10 - Stream 10_Mole %[2 - Component 2]		RD_ONLY	
7895	FLOAT	10 - Stream 10_Mole %[3 - Component 3]		RD_ONLY	
7896	FLOAT	10 - Stream 10_Mole %[4 - Component 4]		RD_ONLY	
7897	FLOAT	10 - Stream 10_Mole %[5 - Component 5]		RD_ONLY	
7898	FLOAT	10 - Stream 10_Mole %[6 - Component 6]		RD_ONLY	
7899	FLOAT	10 - Stream 10_Mole %[7 - Component 7]		RD_ONLY	
7900	FLOAT	10 - Stream 10_Mole %[8 - Component 8]		RD_ONLY	
7901	FLOAT	10 - Stream 10_Mole %[9 - Component 9]		RD_ONLY	
7902	FLOAT	10 - Stream 10_Mole %[10 - Component 10]		RD_ONLY	
7903	FLOAT	10 - Stream 10_Mole %[11 - Component 11]		RD_ONLY	
7904	FLOAT	10 - Stream 10_Mole %[12 - Component 12]		RD_ONLY	
7905	FLOAT	10 - Stream 10_Mole %[13 - Component 13]		RD_ONLY	
7906	FLOAT	10 - Stream 10_Mole %[14 - Component 14]		RD_ONLY	
7907	FLOAT	10 - Stream 10_Mole %[15 - Component 15]		RD_ONLY	
7908	FLOAT	10 - Stream 10_Mole %[16 - Component 16]		RD_ONLY	
7909	FLOAT	10 - Stream 10_Mole %[17 - Component 17]		RD_ONLY	
7910	FLOAT	10 - Stream 10_Mole %[18 - Component 18]		RD_ONLY	
7911	FLOAT	10 - Stream 10_Mole %[19 - Component 19]		RD_ONLY	
7912	FLOAT	10 - Stream 10_Mole %[20 - Component 20]		RD_ONLY	
7913	FLOAT	10 - Stream 10_HV Gross BTU Dry		RD_ONLY	
7914	FLOAT	10 - Stream 10_GPA Real Rel Den Gas		RD_ONLY	
7915	FLOAT	10 - Stream 10_GPA Z Factor		RD_ONLY	
7916	FLOAT	10 - Stream 10_Total Unnormalized Conc		RD_ONLY	
7917	FLOAT	Unused		RD_ONLY	
7918	FLOAT	Unused		RD_ONLY	
7919	FLOAT	Unused		RD_ONLY	
7920	FLOAT	Unused		RD_ONLY	
7921	FLOAT	11 - Stream 11_Start Time		RD_ONLY	YYMMDD
7922	FLOAT	11 - Stream 11_Start Time		RD_ONLY	hhmmss
7923	FLOAT	11 - Stream 11_Mole %[1 - Component 1]		RD_ONLY	
7924	FLOAT	11 - Stream 11_Mole %[2 - Component 2]		RD_ONLY	
7925	FLOAT	11 - Stream 11_Mole %[3 - Component 3]		RD_ONLY	
7926	FLOAT	11 - Stream 11_Mole %[4 - Component 4]		RD_ONLY	
7927	FLOAT	11 - Stream 11_Mole %[5 - Component 5]		RD_ONLY	
7928	FLOAT	11 - Stream 11_Mole %[6 - Component 6]		RD_ONLY	
7929	FLOAT	11 - Stream 11_Mole %[7 - Component 7]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7930	FLOAT	11 - Stream 11_Mole %[8 - Component 8]		RD_ONLY	
7931	FLOAT	11 - Stream 11_Mole %[9 - Component 9]		RD_ONLY	
7932	FLOAT	11 - Stream 11_Mole %[10 - Component 10]		RD_ONLY	
7933	FLOAT	11 - Stream 11_Mole %[11 - Component 11]		RD_ONLY	
7934	FLOAT	11 - Stream 11_Mole %[12 - Component 12]		RD_ONLY	
7935	FLOAT	11 - Stream 11_Mole %[13 - Component 13]		RD_ONLY	
7936	FLOAT	11 - Stream 11_Mole %[14 - Component 14]		RD_ONLY	
7937	FLOAT	11 - Stream 11_Mole %[15 - Component 15]		RD_ONLY	
7938	FLOAT	11 - Stream 11_Mole %[16 - Component 16]		RD_ONLY	
7939	FLOAT	11 - Stream 11_Mole %[17 - Component 17]		RD_ONLY	
7940	FLOAT	11 - Stream 11_Mole %[18 - Component 18]		RD_ONLY	
7941	FLOAT	11 - Stream 11_Mole %[19 - Component 19]		RD_ONLY	
7942	FLOAT	11 - Stream 11_Mole %[20 - Component 20]		RD_ONLY	
7943	FLOAT	11 - Stream 11_HV Gross BTU Dry		RD_ONLY	
7944	FLOAT	11 - Stream 11_GPA Real Rel Den Gas		RD_ONLY	
7945	FLOAT	11 - Stream 11_GPA Z Factor		RD_ONLY	
7946	FLOAT	11 - Stream 11_Total Unnormalized Conc		RD_ONLY	
7947	FLOAT	Unused		RD_ONLY	
7948	FLOAT	Unused		RD_ONLY	
7949	FLOAT	Unused		RD_ONLY	
7950	FLOAT	Unused		RD_ONLY	
7951	FLOAT	12 - Stream 12_Start Time		RD_ONLY	YYMMDD
7952	FLOAT	12 - Stream 12_Start Time		RD_ONLY	hhmmss
7953	FLOAT	12 - Stream 12_Mole %[1 - Component 1]		RD_ONLY	
7954	FLOAT	12 - Stream 12_Mole %[2 - Component 2]		RD_ONLY	
7955	FLOAT	12 - Stream 12_Mole %[3 - Component 3]		RD_ONLY	
7956	FLOAT	12 - Stream 12_Mole %[4 - Component 4]		RD_ONLY	
7957	FLOAT	12 - Stream 12_Mole %[5 - Component 5]		RD_ONLY	
7958	FLOAT	12 - Stream 12_Mole %[6 - Component 6]		RD_ONLY	
7959	FLOAT	12 - Stream 12_Mole %[7 - Component 7]		RD_ONLY	
7960	FLOAT	12 - Stream 12_Mole %[8 - Component 8]		RD_ONLY	
7961	FLOAT	12 - Stream 12_Mole %[9 - Component 9]		RD_ONLY	
7962	FLOAT	12 - Stream 12_Mole %[10 - Component 10]		RD_ONLY	
7963	FLOAT	12 - Stream 12_Mole %[11 - Component 11]		RD_ONLY	
7964	FLOAT	12 - Stream 12_Mole %[12 - Component 12]		RD_ONLY	
7965	FLOAT	12 - Stream 12_Mole %[13 - Component 13]		RD_ONLY	
7966	FLOAT	12 - Stream 12_Mole %[14 - Component 14]		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
7967	FLOAT	12 - Stream 12_Mole %[15 - Component 15]		RD_ONLY	
7968	FLOAT	12 - Stream 12_Mole %[16 - Component 16]		RD_ONLY	
7969	FLOAT	12 - Stream 12_Mole %[17 - Component 17]		RD_ONLY	
7970	FLOAT	12 - Stream 12_Mole %[18 - Component 18]		RD_ONLY	
7971	FLOAT	12 - Stream 12_Mole %[19 - Component 19]		RD_ONLY	
7972	FLOAT	12 - Stream 12_Mole %[20 - Component 20]		RD_ONLY	
7973	FLOAT	12 - Stream 12_HV Gross BTU Dry		RD_ONLY	
7974	FLOAT	12 - Stream 12_GPA Real Rel Den Gas		RD_ONLY	
7975	FLOAT	12 - Stream 12_GPA Z Factor		RD_ONLY	
7976	FLOAT	12 - Stream 12_Total Unnormalized Conc		RD_ONLY	
7977	FLOAT	Unused		RD_ONLY	
7978	FLOAT	Unused		RD_ONLY	
7979	FLOAT	Unused		RD_ONLY	
7980	FLOAT	Unused		RD_ONLY	
7981	FLOAT	Unused		RD_ONLY	
7982	FLOAT	Unused		RD_ONLY	
7983	FLOAT	Unused		RD_ONLY	
7984	FLOAT	Unused		RD_ONLY	
7985	FLOAT	Unused		RD_ONLY	
7986	FLOAT	Unused		RD_ONLY	
7987	FLOAT	Unused		RD_ONLY	
7988	FLOAT	Unused		RD_ONLY	
7989	FLOAT	Unused		RD_ONLY	
7990	FLOAT	Unused		RD_ONLY	
7991	FLOAT	Unused		RD_ONLY	
7992	FLOAT	Unused		RD_ONLY	
7993	FLOAT	Unused		RD_ONLY	
7994	FLOAT	Unused		RD_ONLY	
7995	FLOAT	Unused		RD_ONLY	
7996	FLOAT	GC Control_Auto Sequence		RD_WR	
7997	FLOAT	GC Control_Halt		RD_WR	
7998	FLOAT	GC Control_Calibration		RD_WR	
7999	FLOAT	GC Control_Single Stream		RD_WR	
8000	FLOAT	Current Stream		RD_ONLY	
8001	FLOAT	GC Calibrating		RD_ONLY	
8002	FLOAT	GC Running		RD_ONLY	
8003	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8004	FLOAT	Run Time		RD_ONLY	
8005	FLOAT	Current Analysis Mode		RD_ONLY	
8006	FLOAT	GC Control_Validation		RD_WR	
8007	FLOAT	Unused		RD_ONLY	
8008	FLOAT	Unused		RD_ONLY	
8009	FLOAT	Unused		RD_ONLY	
8010	FLOAT	Unused		RD_ONLY	
8011	FLOAT	Unused		RD_ONLY	
8012	FLOAT	Unused		RD_ONLY	
8013	FLOAT	Unused		RD_ONLY	
8014	FLOAT	Unused		RD_ONLY	
8015	FLOAT	Unused		RD_ONLY	
8016	FLOAT	Unused		RD_ONLY	
8017	FLOAT	Unused		RD_ONLY	
8018	FLOAT	Unused		RD_ONLY	
8019	FLOAT	Unused		RD_ONLY	
8020	FLOAT	Unused		RD_ONLY	
8021	FLOAT	Unused		RD_ONLY	
8022	FLOAT	Unused		RD_ONLY	
8023	FLOAT	Unused		RD_ONLY	
8024	FLOAT	Unused		RD_ONLY	
8025	FLOAT	Unused		RD_ONLY	
8026	FLOAT	Unused		RD_ONLY	
8027	FLOAT	Unused		RD_ONLY	
8028	FLOAT	Unused		RD_ONLY	
8029	FLOAT	Unused		RD_ONLY	
8030	FLOAT	Unused		RD_ONLY	
8031	FLOAT	Unused		RD_ONLY	
8032	FLOAT	Unused		RD_ONLY	
8033	FLOAT	Unused		RD_ONLY	
8034	FLOAT	Unused		RD_ONLY	
8035	FLOAT	Unused		RD_ONLY	
8036	FLOAT	Unused		RD_ONLY	
8037	FLOAT	Unused		RD_ONLY	
8038	FLOAT	Unused		RD_ONLY	
8039	FLOAT	Unused		RD_ONLY	
8040	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8041	FLOAT	Unused		RD_ONLY	
8042	FLOAT	Unused		RD_ONLY	
8043	FLOAT	Unused		RD_ONLY	
8044	FLOAT	Unused		RD_ONLY	
8045	FLOAT	Unused		RD_ONLY	
8046	FLOAT	Unused		RD_ONLY	
8047	FLOAT	Unused		RD_ONLY	
8048	FLOAT	Unused		RD_ONLY	
8049	FLOAT	Unused		RD_ONLY	
8050	FLOAT	Unused		RD_ONLY	
8051	FLOAT	Unused		RD_ONLY	
8052	FLOAT	Unused		RD_ONLY	
8053	FLOAT	Unused		RD_ONLY	
8054	FLOAT	Unused		RD_ONLY	
8055	FLOAT	Unused		RD_ONLY	
8056	FLOAT	Unused		RD_ONLY	
8057	FLOAT	Unused		RD_ONLY	
8058	FLOAT	Unused		RD_ONLY	
8059	FLOAT	Unused		RD_ONLY	
8060	FLOAT	Unused		RD_ONLY	
8061	FLOAT	Unused		RD_ONLY	
8062	FLOAT	Unused		RD_ONLY	
8063	FLOAT	Unused		RD_ONLY	
8064	FLOAT	Unused		RD_ONLY	
8065	FLOAT	Unused		RD_ONLY	
8066	FLOAT	Unused		RD_ONLY	
8067	FLOAT	Unused		RD_ONLY	
8068	FLOAT	Unused		RD_ONLY	
8069	FLOAT	Unused		RD_ONLY	
8070	FLOAT	Unused		RD_ONLY	
8071	FLOAT	Unused		RD_ONLY	
8072	FLOAT	Unused		RD_ONLY	
8073	FLOAT	Unused		RD_ONLY	
8074	FLOAT	Unused		RD_ONLY	
8075	FLOAT	Unused		RD_ONLY	
8076	FLOAT	Unused		RD_ONLY	
8077	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8078	FLOAT	Unused		RD_ONLY	
8079	FLOAT	Unused		RD_ONLY	
8080	FLOAT	Unused		RD_ONLY	
8081	FLOAT	Unused		RD_ONLY	
8082	FLOAT	Unused		RD_ONLY	
8083	FLOAT	Unused		RD_ONLY	
8084	FLOAT	Unused		RD_ONLY	
8085	FLOAT	Unused		RD_ONLY	
8086	FLOAT	Unused		RD_ONLY	
8087	FLOAT	Unused		RD_ONLY	
8088	FLOAT	Unused		RD_ONLY	
8089	FLOAT	Unused		RD_ONLY	
8090	FLOAT	Unused		RD_ONLY	
8091	FLOAT	Unused		RD_ONLY	
8092	FLOAT	Unused		RD_ONLY	
8093	FLOAT	Unused		RD_ONLY	
8094	FLOAT	Unused		RD_ONLY	
8095	FLOAT	Unused		RD_ONLY	
8096	FLOAT	Unused		RD_ONLY	
8097	FLOAT	Unused		RD_ONLY	
8098	FLOAT	Unused		RD_ONLY	
8099	FLOAT	Unused		RD_ONLY	
8100	FLOAT	Unused		RD_ONLY	
8101	FLOAT	Unused		RD_ONLY	
8102	FLOAT	Unused		RD_ONLY	
8103	FLOAT	Unused		RD_ONLY	
8104	FLOAT	Unused		RD_ONLY	
8105	FLOAT	Unused		RD_ONLY	
8106	FLOAT	Unused		RD_ONLY	
8107	FLOAT	Unused		RD_ONLY	
8108	FLOAT	Unused		RD_ONLY	
8109	FLOAT	Unused		RD_ONLY	
8110	FLOAT	Unused		RD_ONLY	
8111	FLOAT	Unused		RD_ONLY	
8112	FLOAT	Unused		RD_ONLY	
8113	FLOAT	Unused		RD_ONLY	
8114	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8115	FLOAT	Unused		RD_ONLY	
8116	FLOAT	Unused		RD_ONLY	
8117	FLOAT	Unused		RD_ONLY	
8118	FLOAT	Unused		RD_ONLY	
8119	FLOAT	Unused		RD_ONLY	
8120	FLOAT	Unused		RD_ONLY	
8121	FLOAT	Unused		RD_ONLY	
8122	FLOAT	Unused		RD_ONLY	
8123	FLOAT	Unused		RD_ONLY	
8124	FLOAT	Unused		RD_ONLY	
8125	FLOAT	Unused		RD_ONLY	
8126	FLOAT	Unused		RD_ONLY	
8127	FLOAT	Unused		RD_ONLY	
8128	FLOAT	Unused		RD_ONLY	
8129	FLOAT	Unused		RD_ONLY	
8130	FLOAT	Unused		RD_ONLY	
8131	FLOAT	Unused		RD_ONLY	
8132	FLOAT	Unused		RD_ONLY	
8133	FLOAT	Unused		RD_ONLY	
8134	FLOAT	Unused		RD_ONLY	
8135	FLOAT	Unused		RD_ONLY	
8136	FLOAT	Unused		RD_ONLY	
8137	FLOAT	Unused		RD_ONLY	
8138	FLOAT	Unused		RD_ONLY	
8139	FLOAT	Unused		RD_ONLY	
8140	FLOAT	Unused		RD_ONLY	
8141	FLOAT	Unused		RD_ONLY	
8142	FLOAT	Unused		RD_ONLY	
8143	FLOAT	Unused		RD_ONLY	
8144	FLOAT	Unused		RD_ONLY	
8145	FLOAT	Unused		RD_ONLY	
8146	FLOAT	Unused		RD_ONLY	
8147	FLOAT	Unused		RD_ONLY	
8148	FLOAT	Unused		RD_ONLY	
8149	FLOAT	Unused		RD_ONLY	
8150	FLOAT	Unused		RD_ONLY	
8151	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8152	FLOAT	Unused		RD_ONLY	
8153	FLOAT	Unused		RD_ONLY	
8154	FLOAT	Unused		RD_ONLY	
8155	FLOAT	Unused		RD_ONLY	
8156	FLOAT	Unused		RD_ONLY	
8157	FLOAT	Unused		RD_ONLY	
8158	FLOAT	Unused		RD_ONLY	
8159	FLOAT	Unused		RD_ONLY	
8160	FLOAT	Unused		RD_ONLY	
8161	FLOAT	Unused		RD_ONLY	
8162	FLOAT	Unused		RD_ONLY	
8163	FLOAT	Unused		RD_ONLY	
8164	FLOAT	Unused		RD_ONLY	
8165	FLOAT	Unused		RD_ONLY	
8166	FLOAT	Unused		RD_ONLY	
8167	FLOAT	Unused		RD_ONLY	
8168	FLOAT	Unused		RD_ONLY	
8169	FLOAT	Unused		RD_ONLY	
8170	FLOAT	Unused		RD_ONLY	
8171	FLOAT	Unused		RD_ONLY	
8172	FLOAT	Unused		RD_ONLY	
8173	FLOAT	Unused		RD_ONLY	
8174	FLOAT	Unused		RD_ONLY	
8175	FLOAT	Unused		RD_ONLY	
8176	FLOAT	Unused		RD_ONLY	
8177	FLOAT	Unused		RD_ONLY	
8178	FLOAT	Unused		RD_ONLY	
8179	FLOAT	Unused		RD_ONLY	
8180	FLOAT	Unused		RD_ONLY	
8181	FLOAT	Unused		RD_ONLY	
8182	FLOAT	Unused		RD_ONLY	
8183	FLOAT	Unused		RD_ONLY	
8184	FLOAT	Unused		RD_ONLY	
8185	FLOAT	Unused		RD_ONLY	
8186	FLOAT	Unused		RD_ONLY	
8187	FLOAT	Unused		RD_ONLY	
8188	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8189	FLOAT	Unused		RD_ONLY	
8190	FLOAT	Unused		RD_ONLY	
8191	FLOAT	Unused		RD_ONLY	
8192	FLOAT	Unused		RD_ONLY	
8193	FLOAT	Unused		RD_ONLY	
8194	FLOAT	Unused		RD_ONLY	
8195	FLOAT	Unused		RD_ONLY	
8196	FLOAT	Unused		RD_ONLY	
8197	FLOAT	Unused		RD_ONLY	
8198	FLOAT	Unused		RD_ONLY	
8199	FLOAT	Unused		RD_ONLY	
8200	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
8201	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
8202	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
8203	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
8204	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
8205	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
8206	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
8207	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
8208	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	
8209	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
8210	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
8211	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	
8212	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
8213	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
8214	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
8215	FLOAT	Archive_Avg[16 - Average 16]	1	RD_ONLY	
8216	FLOAT	Archive_Avg[17 - Average 17]	1	RD_ONLY	
8217	FLOAT	Archive_Avg[18 - Average 18]	1	RD_ONLY	
8218	FLOAT	Archive_Avg[19 - Average 19]	1	RD_ONLY	
8219	FLOAT	Archive_Avg[20 - Average 20]	1	RD_ONLY	
8220	FLOAT	Archive_Avg[21 - Average 21]	1	RD_ONLY	
8221	FLOAT	Archive_Avg[22 - Average 22]	1	RD_ONLY	
8222	FLOAT	Archive_Avg[23 - Average 23]	1	RD_ONLY	
8223	FLOAT	Archive_Avg[24 - Average 24]	1	RD_ONLY	
8224	FLOAT	Archive_Avg[25 - Average 25]	1	RD_ONLY	
8225	FLOAT	Archive_Avg[26 - Average 26]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8226	FLOAT	Archive_Avg[27 - Average 27]	1	RD_ONLY	
8227	FLOAT	Archive_Avg[28 - Average 28]	1	RD_ONLY	
8228	FLOAT	Archive_Avg[29 - Average 29]	1	RD_ONLY	
8229	FLOAT	Archive_Avg[30 - Average 30]	1	RD_ONLY	
8230	FLOAT	Archive_Avg[31 - Average 31]	1	RD_ONLY	
8231	FLOAT	Archive_Avg[32 - Average 32]	1	RD_ONLY	
8232	FLOAT	Archive_Avg[33 - Average 33]	1	RD_ONLY	
8233	FLOAT	Archive_Avg[34 - Average 34]	1	RD_ONLY	
8234	FLOAT	Archive_Avg[35 - Average 35]	1	RD_ONLY	
8235	FLOAT	Archive_Avg[36 - Average 36]	1	RD_ONLY	
8236	FLOAT	Archive_Avg[37 - Average 37]	1	RD_ONLY	
8237	FLOAT	Archive_Avg[38 - Average 38]	1	RD_ONLY	
8238	FLOAT	Archive_Avg[39 - Average 39]	1	RD_ONLY	
8239	FLOAT	Archive_Avg[40 - Average 40]	1	RD_ONLY	
8240	FLOAT	Archive_Avg[41 - Average 41]	1	RD_ONLY	
8241	FLOAT	Archive_Avg[42 - Average 42]	1	RD_ONLY	
8242	FLOAT	Archive_Avg[43 - Average 43]	1	RD_ONLY	
8243	FLOAT	Archive_Avg[44 - Average 44]	1	RD_ONLY	
8244	FLOAT	Archive_Avg[45 - Average 45]	1	RD_ONLY	
8245	FLOAT	Archive_Avg[46 - Average 46]	1	RD_ONLY	
8246	FLOAT	Archive_Avg[47 - Average 47]	1	RD_ONLY	
8247	FLOAT	Archive_Avg[48 - Average 48]	1	RD_ONLY	
8248	FLOAT	Archive_Avg[49 - Average 49]	1	RD_ONLY	
8249	FLOAT	Archive_Avg[50 - Average 50]	1	RD_ONLY	
8250	FLOAT	Archive_Avg[51 - Average 51]	1	RD_ONLY	
8251	FLOAT	Archive_Avg[52 - Average 52]	1	RD_ONLY	
8252	FLOAT	Archive_Avg[53 - Average 53]	1	RD_ONLY	
8253	FLOAT	Archive_Avg[54 - Average 54]	1	RD_ONLY	
8254	FLOAT	Archive_Avg[55 - Average 55]	1	RD_ONLY	
8255	FLOAT	Archive_Avg[56 - Average 56]	1	RD_ONLY	
8256	FLOAT	Archive_Avg[57 - Average 57]	1	RD_ONLY	
8257	FLOAT	Archive_Avg[58 - Average 58]	1	RD_ONLY	
8258	FLOAT	Archive_Avg[59 - Average 59]	1	RD_ONLY	
8259	FLOAT	Archive_Avg[60 - Average 60]	1	RD_ONLY	
8260	FLOAT	Archive_Avg[61 - Average 61]	1	RD_ONLY	
8261	FLOAT	Archive_Avg[62 - Average 62]	1	RD_ONLY	
8262	FLOAT	Archive_Avg[63 - Average 63]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8263	FLOAT	Archive_Avg[64 - Average 64]	1	RD_ONLY	
8264	FLOAT	Archive_Avg[65 - Average 65]	1	RD_ONLY	
8265	FLOAT	Archive_Avg[66 - Average 66]	1	RD_ONLY	
8266	FLOAT	Archive_Avg[67 - Average 67]	1	RD_ONLY	
8267	FLOAT	Archive_Avg[68 - Average 68]	1	RD_ONLY	
8268	FLOAT	Archive_Avg[69 - Average 69]	1	RD_ONLY	
8269	FLOAT	Archive_Avg[70 - Average 70]	1	RD_ONLY	
8270	FLOAT	Archive_Avg[71 - Average 71]	1	RD_ONLY	
8271	FLOAT	Archive_Avg[72 - Average 72]	1	RD_ONLY	
8272	FLOAT	Archive_Avg[73 - Average 73]	1	RD_ONLY	
8273	FLOAT	Archive_Avg[74 - Average 74]	1	RD_ONLY	
8274	FLOAT	Archive_Avg[75 - Average 75]	1	RD_ONLY	
8275	FLOAT	Archive_Avg[76 - Average 76]	1	RD_ONLY	
8276	FLOAT	Archive_Avg[77 - Average 77]	1	RD_ONLY	
8277	FLOAT	Archive_Avg[78 - Average 78]	1	RD_ONLY	
8278	FLOAT	Archive_Avg[79 - Average 79]	1	RD_ONLY	
8279	FLOAT	Archive_Avg[80 - Average 80]	1	RD_ONLY	
8280	FLOAT	Archive_Avg[81 - Average 81]	1	RD_ONLY	
8281	FLOAT	Archive_Avg[82 - Average 82]	1	RD_ONLY	
8282	FLOAT	Archive_Avg[83 - Average 83]	1	RD_ONLY	
8283	FLOAT	Archive_Avg[84 - Average 84]	1	RD_ONLY	
8284	FLOAT	Archive_Avg[85 - Average 85]	1	RD_ONLY	
8285	FLOAT	Archive_Avg[86 - Average 86]	1	RD_ONLY	
8286	FLOAT	Archive_Avg[87 - Average 87]	1	RD_ONLY	
8287	FLOAT	Archive_Avg[88 - Average 88]	1	RD_ONLY	
8288	FLOAT	Archive_Avg[89 - Average 89]	1	RD_ONLY	
8289	FLOAT	Archive_Avg[90 - Average 90]	1	RD_ONLY	
8290	FLOAT	Archive_Avg[91 - Average 91]	1	RD_ONLY	
8291	FLOAT	Archive_Avg[92 - Average 92]	1	RD_ONLY	
8292	FLOAT	Archive_Avg[93 - Average 93]	1	RD_ONLY	
8293	FLOAT	Archive_Avg[94 - Average 94]	1	RD_ONLY	
8294	FLOAT	Archive_Avg[95 - Average 95]	1	RD_ONLY	
8295	FLOAT	Archive_Avg[96 - Average 96]	1	RD_ONLY	
8296	FLOAT	Archive_Avg[97 - Average 97]	1	RD_ONLY	
8297	FLOAT	Archive_Avg[98 - Average 98]	1	RD_ONLY	
8298	FLOAT	Archive_Avg[99 - Average 99]	1	RD_ONLY	
8299	FLOAT	Archive_Avg[100 - Average 100]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8300	FLOAT	Archive_Avg[101 - Average 101]	1	RD_ONLY	
8301	FLOAT	Archive_Avg[102 - Average 102]	1	RD_ONLY	
8302	FLOAT	Archive_Avg[103 - Average 103]	1	RD_ONLY	
8303	FLOAT	Archive_Avg[104 - Average 104]	1	RD_ONLY	
8304	FLOAT	Archive_Avg[105 - Average 105]	1	RD_ONLY	
8305	FLOAT	Archive_Avg[106 - Average 106]	1	RD_ONLY	
8306	FLOAT	Archive_Avg[107 - Average 107]	1	RD_ONLY	
8307	FLOAT	Archive_Avg[108 - Average 108]	1	RD_ONLY	
8308	FLOAT	Archive_Avg[109 - Average 109]	1	RD_ONLY	
8309	FLOAT	Archive_Avg[110 - Average 110]	1	RD_ONLY	
8310	FLOAT	Archive_Avg[111 - Average 111]	1	RD_ONLY	
8311	FLOAT	Archive_Avg[112 - Average 112]	1	RD_ONLY	
8312	FLOAT	Archive_Avg[113 - Average 113]	1	RD_ONLY	
8313	FLOAT	Archive_Avg[114 - Average 114]	1	RD_ONLY	
8314	FLOAT	Archive_Avg[115 - Average 115]	1	RD_ONLY	
8315	FLOAT	Archive_Avg[116 - Average 116]	1	RD_ONLY	
8316	FLOAT	Archive_Avg[117 - Average 117]	1	RD_ONLY	
8317	FLOAT	Archive_Avg[118 - Average 118]	1	RD_ONLY	
8318	FLOAT	Archive_Avg[119 - Average 119]	1	RD_ONLY	
8319	FLOAT	Archive_Avg[120 - Average 120]	1	RD_ONLY	
8320	FLOAT	Archive_Avg[121 - Average 121]	1	RD_ONLY	
8321	FLOAT	Archive_Avg[122 - Average 122]	1	RD_ONLY	
8322	FLOAT	Archive_Avg[123 - Average 123]	1	RD_ONLY	
8323	FLOAT	Archive_Avg[124 - Average 124]	1	RD_ONLY	
8324	FLOAT	Archive_Avg[125 - Average 125]	1	RD_ONLY	
8325	FLOAT	Archive_Avg[126 - Average 126]	1	RD_ONLY	
8326	FLOAT	Archive_Avg[127 - Average 127]	1	RD_ONLY	
8327	FLOAT	Archive_Avg[128 - Average 128]	1	RD_ONLY	
8328	FLOAT	Archive_Avg[129 - Average 129]	1	RD_ONLY	
8329	FLOAT	Archive_Avg[130 - Average 130]	1	RD_ONLY	
8330	FLOAT	Archive_Avg[131 - Average 131]	1	RD_ONLY	
8331	FLOAT	Archive_Avg[132 - Average 132]	1	RD_ONLY	
8332	FLOAT	Archive_Avg[133 - Average 133]	1	RD_ONLY	
8333	FLOAT	Archive_Avg[134 - Average 134]	1	RD_ONLY	
8334	FLOAT	Archive_Avg[135 - Average 135]	1	RD_ONLY	
8335	FLOAT	Archive_Avg[136 - Average 136]	1	RD_ONLY	
8336	FLOAT	Archive_Avg[137 - Average 137]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8337	FLOAT	Archive_Avg[138 - Average 138]	1	RD_ONLY	
8338	FLOAT	Archive_Avg[139 - Average 139]	1	RD_ONLY	
8339	FLOAT	Archive_Avg[140 - Average 140]	1	RD_ONLY	
8340	FLOAT	Archive_Avg[141 - Average 141]	1	RD_ONLY	
8341	FLOAT	Archive_Avg[142 - Average 142]	1	RD_ONLY	
8342	FLOAT	Archive_Avg[143 - Average 143]	1	RD_ONLY	
8343	FLOAT	Archive_Avg[144 - Average 144]	1	RD_ONLY	
8344	FLOAT	Archive_Avg[145 - Average 145]	1	RD_ONLY	
8345	FLOAT	Archive_Avg[146 - Average 146]	1	RD_ONLY	
8346	FLOAT	Archive_Avg[147 - Average 147]	1	RD_ONLY	
8347	FLOAT	Archive_Avg[148 - Average 148]	1	RD_ONLY	
8348	FLOAT	Archive_Avg[149 - Average 149]	1	RD_ONLY	
8349	FLOAT	Archive_Avg[150 - Average 150]	1	RD_ONLY	
8350	FLOAT	Archive_Avg[151 - Average 151]	1	RD_ONLY	
8351	FLOAT	Archive_Avg[152 - Average 152]	1	RD_ONLY	
8352	FLOAT	Archive_Avg[153 - Average 153]	1	RD_ONLY	
8353	FLOAT	Archive_Avg[154 - Average 154]	1	RD_ONLY	
8354	FLOAT	Archive_Avg[155 - Average 155]	1	RD_ONLY	
8355	FLOAT	Archive_Avg[156 - Average 156]	1	RD_ONLY	
8356	FLOAT	Archive_Avg[157 - Average 157]	1	RD_ONLY	
8357	FLOAT	Archive_Avg[158 - Average 158]	1	RD_ONLY	
8358	FLOAT	Archive_Avg[159 - Average 159]	1	RD_ONLY	
8359	FLOAT	Archive_Avg[160 - Average 160]	1	RD_ONLY	
8360	FLOAT	Archive_Avg[161 - Average 161]	1	RD_ONLY	
8361	FLOAT	Archive_Avg[162 - Average 162]	1	RD_ONLY	
8362	FLOAT	Archive_Avg[163 - Average 163]	1	RD_ONLY	
8363	FLOAT	Archive_Avg[164 - Average 164]	1	RD_ONLY	
8364	FLOAT	Archive_Avg[165 - Average 165]	1	RD_ONLY	
8365	FLOAT	Archive_Avg[166 - Average 166]	1	RD_ONLY	
8366	FLOAT	Archive_Avg[167 - Average 167]	1	RD_ONLY	
8367	FLOAT	Archive_Avg[168 - Average 168]	1	RD_ONLY	
8368	FLOAT	Archive_Avg[169 - Average 169]	1	RD_ONLY	
8369	FLOAT	Archive_Avg[170 - Average 170]	1	RD_ONLY	
8370	FLOAT	Archive_Avg[171 - Average 171]	1	RD_ONLY	
8371	FLOAT	Archive_Avg[172 - Average 172]	1	RD_ONLY	
8372	FLOAT	Archive_Avg[173 - Average 173]	1	RD_ONLY	
8373	FLOAT	Archive_Avg[174 - Average 174]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8374	FLOAT	Archive_Avg[175 - Average 175]	1	RD_ONLY	
8375	FLOAT	Archive_Avg[176 - Average 176]	1	RD_ONLY	
8376	FLOAT	Archive_Avg[177 - Average 177]	1	RD_ONLY	
8377	FLOAT	Archive_Avg[178 - Average 178]	1	RD_ONLY	
8378	FLOAT	Archive_Avg[179 - Average 179]	1	RD_ONLY	
8379	FLOAT	Archive_Avg[180 - Average 180]	1	RD_ONLY	
8380	FLOAT	Archive_Avg[181 - Average 181]	1	RD_ONLY	
8381	FLOAT	Archive_Avg[182 - Average 182]	1	RD_ONLY	
8382	FLOAT	Archive_Avg[183 - Average 183]	1	RD_ONLY	
8383	FLOAT	Archive_Avg[184 - Average 184]	1	RD_ONLY	
8384	FLOAT	Archive_Avg[185 - Average 185]	1	RD_ONLY	
8385	FLOAT	Archive_Avg[186 - Average 186]	1	RD_ONLY	
8386	FLOAT	Archive_Avg[187 - Average 187]	1	RD_ONLY	
8387	FLOAT	Archive_Avg[188 - Average 188]	1	RD_ONLY	
8388	FLOAT	Archive_Avg[189 - Average 189]	1	RD_ONLY	
8389	FLOAT	Archive_Avg[190 - Average 190]	1	RD_ONLY	
8390	FLOAT	Archive_Avg[191 - Average 191]	1	RD_ONLY	
8391	FLOAT	Archive_Avg[192 - Average 192]	1	RD_ONLY	
8392	FLOAT	Archive_Avg[193 - Average 193]	1	RD_ONLY	
8393	FLOAT	Archive_Avg[194 - Average 194]	1	RD_ONLY	
8394	FLOAT	Archive_Avg[195 - Average 195]	1	RD_ONLY	
8395	FLOAT	Archive_Avg[196 - Average 196]	1	RD_ONLY	
8396	FLOAT	Archive_Avg[197 - Average 197]	1	RD_ONLY	
8397	FLOAT	Archive_Avg[198 - Average 198]	1	RD_ONLY	
8398	FLOAT	Archive_Avg[199 - Average 199]	1	RD_ONLY	
8399	FLOAT	Archive_Avg[200 - Average 200]	1	RD_ONLY	
8400	FLOAT	Archive_Avg[201 - Average 201]	1	RD_ONLY	
8401	FLOAT	Archive_Avg[202 - Average 202]	1	RD_ONLY	
8402	FLOAT	Archive_Avg[203 - Average 203]	1	RD_ONLY	
8403	FLOAT	Archive_Avg[204 - Average 204]	1	RD_ONLY	
8404	FLOAT	Archive_Avg[205 - Average 205]	1	RD_ONLY	
8405	FLOAT	Archive_Avg[206 - Average 206]	1	RD_ONLY	
8406	FLOAT	Archive_Avg[207 - Average 207]	1	RD_ONLY	
8407	FLOAT	Archive_Avg[208 - Average 208]	1	RD_ONLY	
8408	FLOAT	Archive_Avg[209 - Average 209]	1	RD_ONLY	
8409	FLOAT	Archive_Avg[210 - Average 210]	1	RD_ONLY	
8410	FLOAT	Archive_Avg[211 - Average 211]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8411	FLOAT	Archive_Avg[212 - Average 212]	1	RD_ONLY	
8412	FLOAT	Archive_Avg[213 - Average 213]	1	RD_ONLY	
8413	FLOAT	Archive_Avg[214 - Average 214]	1	RD_ONLY	
8414	FLOAT	Archive_Avg[215 - Average 215]	1	RD_ONLY	
8415	FLOAT	Archive_Avg[216 - Average 216]	1	RD_ONLY	
8416	FLOAT	Archive_Avg[217 - Average 217]	1	RD_ONLY	
8417	FLOAT	Archive_Avg[218 - Average 218]	1	RD_ONLY	
8418	FLOAT	Archive_Avg[219 - Average 219]	1	RD_ONLY	
8419	FLOAT	Archive_Avg[220 - Average 220]	1	RD_ONLY	
8420	FLOAT	Archive_Avg[221 - Average 221]	1	RD_ONLY	
8421	FLOAT	Archive_Avg[222 - Average 222]	1	RD_ONLY	
8422	FLOAT	Archive_Avg[223 - Average 223]	1	RD_ONLY	
8423	FLOAT	Archive_Avg[224 - Average 224]	1	RD_ONLY	
8424	FLOAT	Archive_Avg[225 - Average 225]	1	RD_ONLY	
8425	FLOAT	Archive_Avg[226 - Average 226]	1	RD_ONLY	
8426	FLOAT	Archive_Avg[227 - Average 227]	1	RD_ONLY	
8427	FLOAT	Archive_Avg[228 - Average 228]	1	RD_ONLY	
8428	FLOAT	Archive_Avg[229 - Average 229]	1	RD_ONLY	
8429	FLOAT	Archive_Avg[230 - Average 230]	1	RD_ONLY	
8430	FLOAT	Archive_Avg[231 - Average 231]	1	RD_ONLY	
8431	FLOAT	Archive_Avg[232 - Average 232]	1	RD_ONLY	
8432	FLOAT	Archive_Avg[233 - Average 233]	1	RD_ONLY	
8433	FLOAT	Archive_Avg[234 - Average 234]	1	RD_ONLY	
8434	FLOAT	Archive_Avg[235 - Average 235]	1	RD_ONLY	
8435	FLOAT	Archive_Avg[236 - Average 236]	1	RD_ONLY	
8436	FLOAT	Archive_Avg[237 - Average 237]	1	RD_ONLY	
8437	FLOAT	Archive_Avg[238 - Average 238]	1	RD_ONLY	
8438	FLOAT	Archive_Avg[239 - Average 239]	1	RD_ONLY	
8439	FLOAT	Archive_Avg[240 - Average 240]	1	RD_ONLY	
8440	FLOAT	Archive_Avg[241 - Average 241]	1	RD_ONLY	
8441	FLOAT	Archive_Avg[242 - Average 242]	1	RD_ONLY	
8442	FLOAT	Archive_Avg[243 - Average 243]	1	RD_ONLY	
8443	FLOAT	Archive_Avg[244 - Average 244]	1	RD_ONLY	
8444	FLOAT	Archive_Avg[245 - Average 245]	1	RD_ONLY	
8445	FLOAT	Archive_Avg[246 - Average 246]	1	RD_ONLY	
8446	FLOAT	Archive_Avg[247 - Average 247]	1	RD_ONLY	
8447	FLOAT	Archive_Avg[248 - Average 248]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8448	FLOAT	Archive_Avg[249 - Average 249]	1	RD_ONLY	
8449	FLOAT	Archive_Avg[250 - Average 250]	1	RD_ONLY	
8450	FLOAT	Unused		RD_ONLY	
8451	FLOAT	Unused		RD_ONLY	
8452	FLOAT	Unused		RD_ONLY	
8453	FLOAT	Unused		RD_ONLY	
8454	FLOAT	Archive_Max[1 - Average 1]	1	RD_ONLY	
8455	FLOAT	Archive_Max[2 - Average 2]	1	RD_ONLY	
8456	FLOAT	Archive_Max[3 - Average 3]	1	RD_ONLY	
8457	FLOAT	Archive_Max[4 - Average 4]	1	RD_ONLY	
8458	FLOAT	Archive_Max[5 - Average 5]	1	RD_ONLY	
8459	FLOAT	Archive_Max[6 - Average 6]	1	RD_ONLY	
8460	FLOAT	Archive_Max[7 - Average 7]	1	RD_ONLY	
8461	FLOAT	Archive_Max[8 - Average 8]	1	RD_ONLY	
8462	FLOAT	Archive_Max[9 - Average 9]	1	RD_ONLY	
8463	FLOAT	Archive_Max[10 - Average 10]	1	RD_ONLY	
8464	FLOAT	Archive_Max[11 - Average 11]	1	RD_ONLY	
8465	FLOAT	Archive_Max[12 - Average 12]	1	RD_ONLY	
8466	FLOAT	Archive_Max[13 - Average 13]	1	RD_ONLY	
8467	FLOAT	Archive_Max[14 - Average 14]	1	RD_ONLY	
8468	FLOAT	Archive_Max[15 - Average 15]	1	RD_ONLY	
8469	FLOAT	Archive_Max[16 - Average 16]	1	RD_ONLY	
8470	FLOAT	Archive_Max[17 - Average 17]	1	RD_ONLY	
8471	FLOAT	Archive_Max[18 - Average 18]	1	RD_ONLY	
8472	FLOAT	Archive_Max[19 - Average 19]	1	RD_ONLY	
8473	FLOAT	Archive_Max[20 - Average 20]	1	RD_ONLY	
8474	FLOAT	Archive_Max[21 - Average 21]	1	RD_ONLY	
8475	FLOAT	Archive_Max[22 - Average 22]	1	RD_ONLY	
8476	FLOAT	Archive_Max[23 - Average 23]	1	RD_ONLY	
8477	FLOAT	Archive_Max[24 - Average 24]	1	RD_ONLY	
8478	FLOAT	Archive_Max[25 - Average 25]	1	RD_ONLY	
8479	FLOAT	Archive_Max[26 - Average 26]	1	RD_ONLY	
8480	FLOAT	Archive_Max[27 - Average 27]	1	RD_ONLY	
8481	FLOAT	Archive_Max[28 - Average 28]	1	RD_ONLY	
8482	FLOAT	Archive_Max[29 - Average 29]	1	RD_ONLY	
8483	FLOAT	Archive_Max[30 - Average 30]	1	RD_ONLY	
8484	FLOAT	Archive_Max[31 - Average 31]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8485	FLOAT	Archive_Max[32 - Average 32]	1	RD_ONLY	
8486	FLOAT	Archive_Max[33 - Average 33]	1	RD_ONLY	
8487	FLOAT	Archive_Max[34 - Average 34]	1	RD_ONLY	
8488	FLOAT	Archive_Max[35 - Average 35]	1	RD_ONLY	
8489	FLOAT	Archive_Max[36 - Average 36]	1	RD_ONLY	
8490	FLOAT	Archive_Max[37 - Average 37]	1	RD_ONLY	
8491	FLOAT	Archive_Max[38 - Average 38]	1	RD_ONLY	
8492	FLOAT	Archive_Max[39 - Average 39]	1	RD_ONLY	
8493	FLOAT	Archive_Max[40 - Average 40]	1	RD_ONLY	
8494	FLOAT	Archive_Max[41 - Average 41]	1	RD_ONLY	
8495	FLOAT	Archive_Max[42 - Average 42]	1	RD_ONLY	
8496	FLOAT	Archive_Max[43 - Average 43]	1	RD_ONLY	
8497	FLOAT	Archive_Max[44 - Average 44]	1	RD_ONLY	
8498	FLOAT	Archive_Max[45 - Average 45]	1	RD_ONLY	
8499	FLOAT	Archive_Max[46 - Average 46]	1	RD_ONLY	
8500	FLOAT	Archive_Max[47 - Average 47]	1	RD_ONLY	
8501	FLOAT	Archive_Max[48 - Average 48]	1	RD_ONLY	
8502	FLOAT	Archive_Max[49 - Average 49]	1	RD_ONLY	
8503	FLOAT	Archive_Max[50 - Average 50]	1	RD_ONLY	
8504	FLOAT	Archive_Max[51 - Average 51]	1	RD_ONLY	
8505	FLOAT	Archive_Max[52 - Average 52]	1	RD_ONLY	
8506	FLOAT	Archive_Max[53 - Average 53]	1	RD_ONLY	
8507	FLOAT	Archive_Max[54 - Average 54]	1	RD_ONLY	
8508	FLOAT	Archive_Max[55 - Average 55]	1	RD_ONLY	
8509	FLOAT	Archive_Max[56 - Average 56]	1	RD_ONLY	
8510	FLOAT	Archive_Max[57 - Average 57]	1	RD_ONLY	
8511	FLOAT	Archive_Max[58 - Average 58]	1	RD_ONLY	
8512	FLOAT	Archive_Max[59 - Average 59]	1	RD_ONLY	
8513	FLOAT	Archive_Max[60 - Average 60]	1	RD_ONLY	
8514	FLOAT	Archive_Max[61 - Average 61]	1	RD_ONLY	
8515	FLOAT	Archive_Max[62 - Average 62]	1	RD_ONLY	
8516	FLOAT	Archive_Max[63 - Average 63]	1	RD_ONLY	
8517	FLOAT	Archive_Max[64 - Average 64]	1	RD_ONLY	
8518	FLOAT	Archive_Max[65 - Average 65]	1	RD_ONLY	
8519	FLOAT	Archive_Max[66 - Average 66]	1	RD_ONLY	
8520	FLOAT	Archive_Max[67 - Average 67]	1	RD_ONLY	
8521	FLOAT	Archive_Max[68 - Average 68]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8522	FLOAT	Archive_Max[69 - Average 69]	1	RD_ONLY	
8523	FLOAT	Archive_Max[70 - Average 70]	1	RD_ONLY	
8524	FLOAT	Archive_Max[71 - Average 71]	1	RD_ONLY	
8525	FLOAT	Archive_Max[72 - Average 72]	1	RD_ONLY	
8526	FLOAT	Archive_Max[73 - Average 73]	1	RD_ONLY	
8527	FLOAT	Archive_Max[74 - Average 74]	1	RD_ONLY	
8528	FLOAT	Archive_Max[75 - Average 75]	1	RD_ONLY	
8529	FLOAT	Archive_Max[76 - Average 76]	1	RD_ONLY	
8530	FLOAT	Archive_Max[77 - Average 77]	1	RD_ONLY	
8531	FLOAT	Archive_Max[78 - Average 78]	1	RD_ONLY	
8532	FLOAT	Archive_Max[79 - Average 79]	1	RD_ONLY	
8533	FLOAT	Archive_Max[80 - Average 80]	1	RD_ONLY	
8534	FLOAT	Archive_Max[81 - Average 81]	1	RD_ONLY	
8535	FLOAT	Archive_Max[82 - Average 82]	1	RD_ONLY	
8536	FLOAT	Archive_Max[83 - Average 83]	1	RD_ONLY	
8537	FLOAT	Archive_Max[84 - Average 84]	1	RD_ONLY	
8538	FLOAT	Archive_Max[85 - Average 85]	1	RD_ONLY	
8539	FLOAT	Archive_Max[86 - Average 86]	1	RD_ONLY	
8540	FLOAT	Archive_Max[87 - Average 87]	1	RD_ONLY	
8541	FLOAT	Archive_Max[88 - Average 88]	1	RD_ONLY	
8542	FLOAT	Archive_Max[89 - Average 89]	1	RD_ONLY	
8543	FLOAT	Archive_Max[90 - Average 90]	1	RD_ONLY	
8544	FLOAT	Archive_Max[91 - Average 91]	1	RD_ONLY	
8545	FLOAT	Archive_Max[92 - Average 92]	1	RD_ONLY	
8546	FLOAT	Archive_Max[93 - Average 93]	1	RD_ONLY	
8547	FLOAT	Archive_Max[94 - Average 94]	1	RD_ONLY	
8548	FLOAT	Archive_Max[95 - Average 95]	1	RD_ONLY	
8549	FLOAT	Archive_Max[96 - Average 96]	1	RD_ONLY	
8550	FLOAT	Archive_Max[97 - Average 97]	1	RD_ONLY	
8551	FLOAT	Archive_Max[98 - Average 98]	1	RD_ONLY	
8552	FLOAT	Archive_Max[99 - Average 99]	1	RD_ONLY	
8553	FLOAT	Archive_Max[100 - Average 100]	1	RD_ONLY	
8554	FLOAT	Archive_Max[101 - Average 101]	1	RD_ONLY	
8555	FLOAT	Archive_Max[102 - Average 102]	1	RD_ONLY	
8556	FLOAT	Archive_Max[103 - Average 103]	1	RD_ONLY	
8557	FLOAT	Archive_Max[104 - Average 104]	1	RD_ONLY	
8558	FLOAT	Archive_Max[105 - Average 105]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8559	FLOAT	Archive_Max[106 - Average 106]	1	RD_ONLY	
8560	FLOAT	Archive_Max[107 - Average 107]	1	RD_ONLY	
8561	FLOAT	Archive_Max[108 - Average 108]	1	RD_ONLY	
8562	FLOAT	Archive_Max[109 - Average 109]	1	RD_ONLY	
8563	FLOAT	Archive_Max[110 - Average 110]	1	RD_ONLY	
8564	FLOAT	Archive_Max[111 - Average 111]	1	RD_ONLY	
8565	FLOAT	Archive_Max[112 - Average 112]	1	RD_ONLY	
8566	FLOAT	Archive_Max[113 - Average 113]	1	RD_ONLY	
8567	FLOAT	Archive_Max[114 - Average 114]	1	RD_ONLY	
8568	FLOAT	Archive_Max[115 - Average 115]	1	RD_ONLY	
8569	FLOAT	Archive_Max[116 - Average 116]	1	RD_ONLY	
8570	FLOAT	Archive_Max[117 - Average 117]	1	RD_ONLY	
8571	FLOAT	Archive_Max[118 - Average 118]	1	RD_ONLY	
8572	FLOAT	Archive_Max[119 - Average 119]	1	RD_ONLY	
8573	FLOAT	Archive_Max[120 - Average 120]	1	RD_ONLY	
8574	FLOAT	Archive_Max[121 - Average 121]	1	RD_ONLY	
8575	FLOAT	Archive_Max[122 - Average 122]	1	RD_ONLY	
8576	FLOAT	Archive_Max[123 - Average 123]	1	RD_ONLY	
8577	FLOAT	Archive_Max[124 - Average 124]	1	RD_ONLY	
8578	FLOAT	Archive_Max[125 - Average 125]	1	RD_ONLY	
8579	FLOAT	Archive_Max[126 - Average 126]	1	RD_ONLY	
8580	FLOAT	Archive_Max[127 - Average 127]	1	RD_ONLY	
8581	FLOAT	Archive_Max[128 - Average 128]	1	RD_ONLY	
8582	FLOAT	Archive_Max[129 - Average 129]	1	RD_ONLY	
8583	FLOAT	Archive_Max[130 - Average 130]	1	RD_ONLY	
8584	FLOAT	Archive_Max[131 - Average 131]	1	RD_ONLY	
8585	FLOAT	Archive_Max[132 - Average 132]	1	RD_ONLY	
8586	FLOAT	Archive_Max[133 - Average 133]	1	RD_ONLY	
8587	FLOAT	Archive_Max[134 - Average 134]	1	RD_ONLY	
8588	FLOAT	Archive_Max[135 - Average 135]	1	RD_ONLY	
8589	FLOAT	Archive_Max[136 - Average 136]	1	RD_ONLY	
8590	FLOAT	Archive_Max[137 - Average 137]	1	RD_ONLY	
8591	FLOAT	Archive_Max[138 - Average 138]	1	RD_ONLY	
8592	FLOAT	Archive_Max[139 - Average 139]	1	RD_ONLY	
8593	FLOAT	Archive_Max[140 - Average 140]	1	RD_ONLY	
8594	FLOAT	Archive_Max[141 - Average 141]	1	RD_ONLY	
8595	FLOAT	Archive_Max[142 - Average 142]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8596	FLOAT	Archive_Max[143 - Average 143]	1	RD_ONLY	
8597	FLOAT	Archive_Max[144 - Average 144]	1	RD_ONLY	
8598	FLOAT	Archive_Max[145 - Average 145]	1	RD_ONLY	
8599	FLOAT	Archive_Max[146 - Average 146]	1	RD_ONLY	
8600	FLOAT	Archive_Max[147 - Average 147]	1	RD_ONLY	
8601	FLOAT	Archive_Max[148 - Average 148]	1	RD_ONLY	
8602	FLOAT	Archive_Max[149 - Average 149]	1	RD_ONLY	
8603	FLOAT	Archive_Max[150 - Average 150]	1	RD_ONLY	
8604	FLOAT	Archive_Max[151 - Average 151]	1	RD_ONLY	
8605	FLOAT	Archive_Max[152 - Average 152]	1	RD_ONLY	
8606	FLOAT	Archive_Max[153 - Average 153]	1	RD_ONLY	
8607	FLOAT	Archive_Max[154 - Average 154]	1	RD_ONLY	
8608	FLOAT	Archive_Max[155 - Average 155]	1	RD_ONLY	
8609	FLOAT	Archive_Max[156 - Average 156]	1	RD_ONLY	
8610	FLOAT	Archive_Max[157 - Average 157]	1	RD_ONLY	
8611	FLOAT	Archive_Max[158 - Average 158]	1	RD_ONLY	
8612	FLOAT	Archive_Max[159 - Average 159]	1	RD_ONLY	
8613	FLOAT	Archive_Max[160 - Average 160]	1	RD_ONLY	
8614	FLOAT	Archive_Max[161 - Average 161]	1	RD_ONLY	
8615	FLOAT	Archive_Max[162 - Average 162]	1	RD_ONLY	
8616	FLOAT	Archive_Max[163 - Average 163]	1	RD_ONLY	
8617	FLOAT	Archive_Max[164 - Average 164]	1	RD_ONLY	
8618	FLOAT	Archive_Max[165 - Average 165]	1	RD_ONLY	
8619	FLOAT	Archive_Max[166 - Average 166]	1	RD_ONLY	
8620	FLOAT	Archive_Max[167 - Average 167]	1	RD_ONLY	
8621	FLOAT	Archive_Max[168 - Average 168]	1	RD_ONLY	
8622	FLOAT	Archive_Max[169 - Average 169]	1	RD_ONLY	
8623	FLOAT	Archive_Max[170 - Average 170]	1	RD_ONLY	
8624	FLOAT	Archive_Max[171 - Average 171]	1	RD_ONLY	
8625	FLOAT	Archive_Max[172 - Average 172]	1	RD_ONLY	
8626	FLOAT	Archive_Max[173 - Average 173]	1	RD_ONLY	
8627	FLOAT	Archive_Max[174 - Average 174]	1	RD_ONLY	
8628	FLOAT	Archive_Max[175 - Average 175]	1	RD_ONLY	
8629	FLOAT	Archive_Max[176 - Average 176]	1	RD_ONLY	
8630	FLOAT	Archive_Max[177 - Average 177]	1	RD_ONLY	
8631	FLOAT	Archive_Max[178 - Average 178]	1	RD_ONLY	
8632	FLOAT	Archive_Max[179 - Average 179]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8633	FLOAT	Archive_Max[180 - Average 180]	1	RD_ONLY	
8634	FLOAT	Archive_Max[181 - Average 181]	1	RD_ONLY	
8635	FLOAT	Archive_Max[182 - Average 182]	1	RD_ONLY	
8636	FLOAT	Archive_Max[183 - Average 183]	1	RD_ONLY	
8637	FLOAT	Archive_Max[184 - Average 184]	1	RD_ONLY	
8638	FLOAT	Archive_Max[185 - Average 185]	1	RD_ONLY	
8639	FLOAT	Archive_Max[186 - Average 186]	1	RD_ONLY	
8640	FLOAT	Archive_Max[187 - Average 187]	1	RD_ONLY	
8641	FLOAT	Archive_Max[188 - Average 188]	1	RD_ONLY	
8642	FLOAT	Archive_Max[189 - Average 189]	1	RD_ONLY	
8643	FLOAT	Archive_Max[190 - Average 190]	1	RD_ONLY	
8644	FLOAT	Archive_Max[191 - Average 191]	1	RD_ONLY	
8645	FLOAT	Archive_Max[192 - Average 192]	1	RD_ONLY	
8646	FLOAT	Archive_Max[193 - Average 193]	1	RD_ONLY	
8647	FLOAT	Archive_Max[194 - Average 194]	1	RD_ONLY	
8648	FLOAT	Archive_Max[195 - Average 195]	1	RD_ONLY	
8649	FLOAT	Archive_Max[196 - Average 196]	1	RD_ONLY	
8650	FLOAT	Archive_Max[197 - Average 197]	1	RD_ONLY	
8651	FLOAT	Archive_Max[198 - Average 198]	1	RD_ONLY	
8652	FLOAT	Archive_Max[199 - Average 199]	1	RD_ONLY	
8653	FLOAT	Archive_Max[200 - Average 200]	1	RD_ONLY	
8654	FLOAT	Archive_Max[201 - Average 201]	1	RD_ONLY	
8655	FLOAT	Archive_Max[202 - Average 202]	1	RD_ONLY	
8656	FLOAT	Archive_Max[203 - Average 203]	1	RD_ONLY	
8657	FLOAT	Archive_Max[204 - Average 204]	1	RD_ONLY	
8658	FLOAT	Archive_Max[205 - Average 205]	1	RD_ONLY	
8659	FLOAT	Archive_Max[206 - Average 206]	1	RD_ONLY	
8660	FLOAT	Archive_Max[207 - Average 207]	1	RD_ONLY	
8661	FLOAT	Archive_Max[208 - Average 208]	1	RD_ONLY	
8662	FLOAT	Archive_Max[209 - Average 209]	1	RD_ONLY	
8663	FLOAT	Archive_Max[210 - Average 210]	1	RD_ONLY	
8664	FLOAT	Archive_Max[211 - Average 211]	1	RD_ONLY	
8665	FLOAT	Archive_Max[212 - Average 212]	1	RD_ONLY	
8666	FLOAT	Archive_Max[213 - Average 213]	1	RD_ONLY	
8667	FLOAT	Archive_Max[214 - Average 214]	1	RD_ONLY	
8668	FLOAT	Archive_Max[215 - Average 215]	1	RD_ONLY	
8669	FLOAT	Archive_Max[216 - Average 216]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8670	FLOAT	Archive_Max[217 - Average 217]	1	RD_ONLY	
8671	FLOAT	Archive_Max[218 - Average 218]	1	RD_ONLY	
8672	FLOAT	Archive_Max[219 - Average 219]	1	RD_ONLY	
8673	FLOAT	Archive_Max[220 - Average 220]	1	RD_ONLY	
8674	FLOAT	Archive_Max[221 - Average 221]	1	RD_ONLY	
8675	FLOAT	Archive_Max[222 - Average 222]	1	RD_ONLY	
8676	FLOAT	Archive_Max[223 - Average 223]	1	RD_ONLY	
8677	FLOAT	Archive_Max[224 - Average 224]	1	RD_ONLY	
8678	FLOAT	Archive_Max[225 - Average 225]	1	RD_ONLY	
8679	FLOAT	Archive_Max[226 - Average 226]	1	RD_ONLY	
8680	FLOAT	Archive_Max[227 - Average 227]	1	RD_ONLY	
8681	FLOAT	Archive_Max[228 - Average 228]	1	RD_ONLY	
8682	FLOAT	Archive_Max[229 - Average 229]	1	RD_ONLY	
8683	FLOAT	Archive_Max[230 - Average 230]	1	RD_ONLY	
8684	FLOAT	Archive_Max[231 - Average 231]	1	RD_ONLY	
8685	FLOAT	Archive_Max[232 - Average 232]	1	RD_ONLY	
8686	FLOAT	Archive_Max[233 - Average 233]	1	RD_ONLY	
8687	FLOAT	Archive_Max[234 - Average 234]	1	RD_ONLY	
8688	FLOAT	Archive_Max[235 - Average 235]	1	RD_ONLY	
8689	FLOAT	Archive_Max[236 - Average 236]	1	RD_ONLY	
8690	FLOAT	Archive_Max[237 - Average 237]	1	RD_ONLY	
8691	FLOAT	Archive_Max[238 - Average 238]	1	RD_ONLY	
8692	FLOAT	Archive_Max[239 - Average 239]	1	RD_ONLY	
8693	FLOAT	Archive_Max[240 - Average 240]	1	RD_ONLY	
8694	FLOAT	Archive_Max[241 - Average 241]	1	RD_ONLY	
8695	FLOAT	Archive_Max[242 - Average 242]	1	RD_ONLY	
8696	FLOAT	Archive_Max[243 - Average 243]	1	RD_ONLY	
8697	FLOAT	Archive_Max[244 - Average 244]	1	RD_ONLY	
8698	FLOAT	Archive_Max[245 - Average 245]	1	RD_ONLY	
8699	FLOAT	Archive_Max[246 - Average 246]	1	RD_ONLY	
8700	FLOAT	Archive_Max[247 - Average 247]	1	RD_ONLY	
8701	FLOAT	Archive_Max[248 - Average 248]	1	RD_ONLY	
8702	FLOAT	Archive_Max[249 - Average 249]	1	RD_ONLY	
8703	FLOAT	Archive_Max[250 - Average 250]	1	RD_ONLY	
8704	FLOAT	Unused		RD_ONLY	
8705	FLOAT	Unused		RD_ONLY	
8706	FLOAT	Unused		RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8707	FLOAT	Unused		RD_ONLY	
8708	FLOAT	Archive_Min[1 - Average 1]	1	RD_ONLY	
8709	FLOAT	Archive_Min[2 - Average 2]	1	RD_ONLY	
8710	FLOAT	Archive_Min[3 - Average 3]	1	RD_ONLY	
8711	FLOAT	Archive_Min[4 - Average 4]	1	RD_ONLY	
8712	FLOAT	Archive_Min[5 - Average 5]	1	RD_ONLY	
8713	FLOAT	Archive_Min[6 - Average 6]	1	RD_ONLY	
8714	FLOAT	Archive_Min[7 - Average 7]	1	RD_ONLY	
8715	FLOAT	Archive_Min[8 - Average 8]	1	RD_ONLY	
8716	FLOAT	Archive_Min[9 - Average 9]	1	RD_ONLY	
8717	FLOAT	Archive_Min[10 - Average 10]	1	RD_ONLY	
8718	FLOAT	Archive_Min[11 - Average 11]	1	RD_ONLY	
8719	FLOAT	Archive_Min[12 - Average 12]	1	RD_ONLY	
8720	FLOAT	Archive_Min[13 - Average 13]	1	RD_ONLY	
8721	FLOAT	Archive_Min[14 - Average 14]	1	RD_ONLY	
8722	FLOAT	Archive_Min[15 - Average 15]	1	RD_ONLY	
8723	FLOAT	Archive_Min[16 - Average 16]	1	RD_ONLY	
8724	FLOAT	Archive_Min[17 - Average 17]	1	RD_ONLY	
8725	FLOAT	Archive_Min[18 - Average 18]	1	RD_ONLY	
8726	FLOAT	Archive_Min[19 - Average 19]	1	RD_ONLY	
8727	FLOAT	Archive_Min[20 - Average 20]	1	RD_ONLY	
8728	FLOAT	Archive_Min[21 - Average 21]	1	RD_ONLY	
8729	FLOAT	Archive_Min[22 - Average 22]	1	RD_ONLY	
8730	FLOAT	Archive_Min[23 - Average 23]	1	RD_ONLY	
8731	FLOAT	Archive_Min[24 - Average 24]	1	RD_ONLY	
8732	FLOAT	Archive_Min[25 - Average 25]	1	RD_ONLY	
8733	FLOAT	Archive_Min[26 - Average 26]	1	RD_ONLY	
8734	FLOAT	Archive_Min[27 - Average 27]	1	RD_ONLY	
8735	FLOAT	Archive_Min[28 - Average 28]	1	RD_ONLY	
8736	FLOAT	Archive_Min[29 - Average 29]	1	RD_ONLY	
8737	FLOAT	Archive_Min[30 - Average 30]	1	RD_ONLY	
8738	FLOAT	Archive_Min[31 - Average 31]	1	RD_ONLY	
8739	FLOAT	Archive_Min[32 - Average 32]	1	RD_ONLY	
8740	FLOAT	Archive_Min[33 - Average 33]	1	RD_ONLY	
8741	FLOAT	Archive_Min[34 - Average 34]	1	RD_ONLY	
8742	FLOAT	Archive_Min[35 - Average 35]	1	RD_ONLY	
8743	FLOAT	Archive_Min[36 - Average 36]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8744	FLOAT	Archive_Min[37 - Average 37]	1	RD_ONLY	
8745	FLOAT	Archive_Min[38 - Average 38]	1	RD_ONLY	
8746	FLOAT	Archive_Min[39 - Average 39]	1	RD_ONLY	
8747	FLOAT	Archive_Min[40 - Average 40]	1	RD_ONLY	
8748	FLOAT	Archive_Min[41 - Average 41]	1	RD_ONLY	
8749	FLOAT	Archive_Min[42 - Average 42]	1	RD_ONLY	
8750	FLOAT	Archive_Min[43 - Average 43]	1	RD_ONLY	
8751	FLOAT	Archive_Min[44 - Average 44]	1	RD_ONLY	
8752	FLOAT	Archive_Min[45 - Average 45]	1	RD_ONLY	
8753	FLOAT	Archive_Min[46 - Average 46]	1	RD_ONLY	
8754	FLOAT	Archive_Min[47 - Average 47]	1	RD_ONLY	
8755	FLOAT	Archive_Min[48 - Average 48]	1	RD_ONLY	
8756	FLOAT	Archive_Min[49 - Average 49]	1	RD_ONLY	
8757	FLOAT	Archive_Min[50 - Average 50]	1	RD_ONLY	
8758	FLOAT	Archive_Min[51 - Average 51]	1	RD_ONLY	
8759	FLOAT	Archive_Min[52 - Average 52]	1	RD_ONLY	
8760	FLOAT	Archive_Min[53 - Average 53]	1	RD_ONLY	
8761	FLOAT	Archive_Min[54 - Average 54]	1	RD_ONLY	
8762	FLOAT	Archive_Min[55 - Average 55]	1	RD_ONLY	
8763	FLOAT	Archive_Min[56 - Average 56]	1	RD_ONLY	
8764	FLOAT	Archive_Min[57 - Average 57]	1	RD_ONLY	
8765	FLOAT	Archive_Min[58 - Average 58]	1	RD_ONLY	
8766	FLOAT	Archive_Min[59 - Average 59]	1	RD_ONLY	
8767	FLOAT	Archive_Min[60 - Average 60]	1	RD_ONLY	
8768	FLOAT	Archive_Min[61 - Average 61]	1	RD_ONLY	
8769	FLOAT	Archive_Min[62 - Average 62]	1	RD_ONLY	
8770	FLOAT	Archive_Min[63 - Average 63]	1	RD_ONLY	
8771	FLOAT	Archive_Min[64 - Average 64]	1	RD_ONLY	
8772	FLOAT	Archive_Min[65 - Average 65]	1	RD_ONLY	
8773	FLOAT	Archive_Min[66 - Average 66]	1	RD_ONLY	
8774	FLOAT	Archive_Min[67 - Average 67]	1	RD_ONLY	
8775	FLOAT	Archive_Min[68 - Average 68]	1	RD_ONLY	
8776	FLOAT	Archive_Min[69 - Average 69]	1	RD_ONLY	
8777	FLOAT	Archive_Min[70 - Average 70]	1	RD_ONLY	
8778	FLOAT	Archive_Min[71 - Average 71]	1	RD_ONLY	
8779	FLOAT	Archive_Min[72 - Average 72]	1	RD_ONLY	
8780	FLOAT	Archive_Min[73 - Average 73]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8781	FLOAT	Archive_Min[74 - Average 74]	1	RD_ONLY	
8782	FLOAT	Archive_Min[75 - Average 75]	1	RD_ONLY	
8783	FLOAT	Archive_Min[76 - Average 76]	1	RD_ONLY	
8784	FLOAT	Archive_Min[77 - Average 77]	1	RD_ONLY	
8785	FLOAT	Archive_Min[78 - Average 78]	1	RD_ONLY	
8786	FLOAT	Archive_Min[79 - Average 79]	1	RD_ONLY	
8787	FLOAT	Archive_Min[80 - Average 80]	1	RD_ONLY	
8788	FLOAT	Archive_Min[81 - Average 81]	1	RD_ONLY	
8789	FLOAT	Archive_Min[82 - Average 82]	1	RD_ONLY	
8790	FLOAT	Archive_Min[83 - Average 83]	1	RD_ONLY	
8791	FLOAT	Archive_Min[84 - Average 84]	1	RD_ONLY	
8792	FLOAT	Archive_Min[85 - Average 85]	1	RD_ONLY	
8793	FLOAT	Archive_Min[86 - Average 86]	1	RD_ONLY	
8794	FLOAT	Archive_Min[87 - Average 87]	1	RD_ONLY	
8795	FLOAT	Archive_Min[88 - Average 88]	1	RD_ONLY	
8796	FLOAT	Archive_Min[89 - Average 89]	1	RD_ONLY	
8797	FLOAT	Archive_Min[90 - Average 90]	1	RD_ONLY	
8798	FLOAT	Archive_Min[91 - Average 91]	1	RD_ONLY	
8799	FLOAT	Archive_Min[92 - Average 92]	1	RD_ONLY	
8800	FLOAT	Archive_Min[93 - Average 93]	1	RD_ONLY	
8801	FLOAT	Archive_Min[94 - Average 94]	1	RD_ONLY	
8802	FLOAT	Archive_Min[95 - Average 95]	1	RD_ONLY	
8803	FLOAT	Archive_Min[96 - Average 96]	1	RD_ONLY	
8804	FLOAT	Archive_Min[97 - Average 97]	1	RD_ONLY	
8805	FLOAT	Archive_Min[98 - Average 98]	1	RD_ONLY	
8806	FLOAT	Archive_Min[99 - Average 99]	1	RD_ONLY	
8807	FLOAT	Archive_Min[100 - Average 100]	1	RD_ONLY	
8808	FLOAT	Archive_Min[101 - Average 101]	1	RD_ONLY	
8809	FLOAT	Archive_Min[102 - Average 102]	1	RD_ONLY	
8810	FLOAT	Archive_Min[103 - Average 103]	1	RD_ONLY	
8811	FLOAT	Archive_Min[104 - Average 104]	1	RD_ONLY	
8812	FLOAT	Archive_Min[105 - Average 105]	1	RD_ONLY	
8813	FLOAT	Archive_Min[106 - Average 106]	1	RD_ONLY	
8814	FLOAT	Archive_Min[107 - Average 107]	1	RD_ONLY	
8815	FLOAT	Archive_Min[108 - Average 108]	1	RD_ONLY	
8816	FLOAT	Archive_Min[109 - Average 109]	1	RD_ONLY	
8817	FLOAT	Archive_Min[110 - Average 110]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8818	FLOAT	Archive_Min[111 - Average 111]	1	RD_ONLY	
8819	FLOAT	Archive_Min[112 - Average 112]	1	RD_ONLY	
8820	FLOAT	Archive_Min[113 - Average 113]	1	RD_ONLY	
8821	FLOAT	Archive_Min[114 - Average 114]	1	RD_ONLY	
8822	FLOAT	Archive_Min[115 - Average 115]	1	RD_ONLY	
8823	FLOAT	Archive_Min[116 - Average 116]	1	RD_ONLY	
8824	FLOAT	Archive_Min[117 - Average 117]	1	RD_ONLY	
8825	FLOAT	Archive_Min[118 - Average 118]	1	RD_ONLY	
8826	FLOAT	Archive_Min[119 - Average 119]	1	RD_ONLY	
8827	FLOAT	Archive_Min[120 - Average 120]	1	RD_ONLY	
8828	FLOAT	Archive_Min[121 - Average 121]	1	RD_ONLY	
8829	FLOAT	Archive_Min[122 - Average 122]	1	RD_ONLY	
8830	FLOAT	Archive_Min[123 - Average 123]	1	RD_ONLY	
8831	FLOAT	Archive_Min[124 - Average 124]	1	RD_ONLY	
8832	FLOAT	Archive_Min[125 - Average 125]	1	RD_ONLY	
8833	FLOAT	Archive_Min[126 - Average 126]	1	RD_ONLY	
8834	FLOAT	Archive_Min[127 - Average 127]	1	RD_ONLY	
8835	FLOAT	Archive_Min[128 - Average 128]	1	RD_ONLY	
8836	FLOAT	Archive_Min[129 - Average 129]	1	RD_ONLY	
8837	FLOAT	Archive_Min[130 - Average 130]	1	RD_ONLY	
8838	FLOAT	Archive_Min[131 - Average 131]	1	RD_ONLY	
8839	FLOAT	Archive_Min[132 - Average 132]	1	RD_ONLY	
8840	FLOAT	Archive_Min[133 - Average 133]	1	RD_ONLY	
8841	FLOAT	Archive_Min[134 - Average 134]	1	RD_ONLY	
8842	FLOAT	Archive_Min[135 - Average 135]	1	RD_ONLY	
8843	FLOAT	Archive_Min[136 - Average 136]	1	RD_ONLY	
8844	FLOAT	Archive_Min[137 - Average 137]	1	RD_ONLY	
8845	FLOAT	Archive_Min[138 - Average 138]	1	RD_ONLY	
8846	FLOAT	Archive_Min[139 - Average 139]	1	RD_ONLY	
8847	FLOAT	Archive_Min[140 - Average 140]	1	RD_ONLY	
8848	FLOAT	Archive_Min[141 - Average 141]	1	RD_ONLY	
8849	FLOAT	Archive_Min[142 - Average 142]	1	RD_ONLY	
8850	FLOAT	Archive_Min[143 - Average 143]	1	RD_ONLY	
8851	FLOAT	Archive_Min[144 - Average 144]	1	RD_ONLY	
8852	FLOAT	Archive_Min[145 - Average 145]	1	RD_ONLY	
8853	FLOAT	Archive_Min[146 - Average 146]	1	RD_ONLY	
8854	FLOAT	Archive_Min[147 - Average 147]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8855	FLOAT	Archive_Min[148 - Average 148]	1	RD_ONLY	
8856	FLOAT	Archive_Min[149 - Average 149]	1	RD_ONLY	
8857	FLOAT	Archive_Min[150 - Average 150]	1	RD_ONLY	
8858	FLOAT	Archive_Min[151 - Average 151]	1	RD_ONLY	
8859	FLOAT	Archive_Min[152 - Average 152]	1	RD_ONLY	
8860	FLOAT	Archive_Min[153 - Average 153]	1	RD_ONLY	
8861	FLOAT	Archive_Min[154 - Average 154]	1	RD_ONLY	
8862	FLOAT	Archive_Min[155 - Average 155]	1	RD_ONLY	
8863	FLOAT	Archive_Min[156 - Average 156]	1	RD_ONLY	
8864	FLOAT	Archive_Min[157 - Average 157]	1	RD_ONLY	
8865	FLOAT	Archive_Min[158 - Average 158]	1	RD_ONLY	
8866	FLOAT	Archive_Min[159 - Average 159]	1	RD_ONLY	
8867	FLOAT	Archive_Min[160 - Average 160]	1	RD_ONLY	
8868	FLOAT	Archive_Min[161 - Average 161]	1	RD_ONLY	
8869	FLOAT	Archive_Min[162 - Average 162]	1	RD_ONLY	
8870	FLOAT	Archive_Min[163 - Average 163]	1	RD_ONLY	
8871	FLOAT	Archive_Min[164 - Average 164]	1	RD_ONLY	
8872	FLOAT	Archive_Min[165 - Average 165]	1	RD_ONLY	
8873	FLOAT	Archive_Min[166 - Average 166]	1	RD_ONLY	
8874	FLOAT	Archive_Min[167 - Average 167]	1	RD_ONLY	
8875	FLOAT	Archive_Min[168 - Average 168]	1	RD_ONLY	
8876	FLOAT	Archive_Min[169 - Average 169]	1	RD_ONLY	
8877	FLOAT	Archive_Min[170 - Average 170]	1	RD_ONLY	
8878	FLOAT	Archive_Min[171 - Average 171]	1	RD_ONLY	
8879	FLOAT	Archive_Min[172 - Average 172]	1	RD_ONLY	
8880	FLOAT	Archive_Min[173 - Average 173]	1	RD_ONLY	
8881	FLOAT	Archive_Min[174 - Average 174]	1	RD_ONLY	
8882	FLOAT	Archive_Min[175 - Average 175]	1	RD_ONLY	
8883	FLOAT	Archive_Min[176 - Average 176]	1	RD_ONLY	
8884	FLOAT	Archive_Min[177 - Average 177]	1	RD_ONLY	
8885	FLOAT	Archive_Min[178 - Average 178]	1	RD_ONLY	
8886	FLOAT	Archive_Min[179 - Average 179]	1	RD_ONLY	
8887	FLOAT	Archive_Min[180 - Average 180]	1	RD_ONLY	
8888	FLOAT	Archive_Min[181 - Average 181]	1	RD_ONLY	
8889	FLOAT	Archive_Min[182 - Average 182]	1	RD_ONLY	
8890	FLOAT	Archive_Min[183 - Average 183]	1	RD_ONLY	
8891	FLOAT	Archive_Min[184 - Average 184]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8892	FLOAT	Archive_Min[185 - Average 185]	1	RD_ONLY	
8893	FLOAT	Archive_Min[186 - Average 186]	1	RD_ONLY	
8894	FLOAT	Archive_Min[187 - Average 187]	1	RD_ONLY	
8895	FLOAT	Archive_Min[188 - Average 188]	1	RD_ONLY	
8896	FLOAT	Archive_Min[189 - Average 189]	1	RD_ONLY	
8897	FLOAT	Archive_Min[190 - Average 190]	1	RD_ONLY	
8898	FLOAT	Archive_Min[191 - Average 191]	1	RD_ONLY	
8899	FLOAT	Archive_Min[192 - Average 192]	1	RD_ONLY	
8900	FLOAT	Archive_Min[193 - Average 193]	1	RD_ONLY	
8901	FLOAT	Archive_Min[194 - Average 194]	1	RD_ONLY	
8902	FLOAT	Archive_Min[195 - Average 195]	1	RD_ONLY	
8903	FLOAT	Archive_Min[196 - Average 196]	1	RD_ONLY	
8904	FLOAT	Archive_Min[197 - Average 197]	1	RD_ONLY	
8905	FLOAT	Archive_Min[198 - Average 198]	1	RD_ONLY	
8906	FLOAT	Archive_Min[199 - Average 199]	1	RD_ONLY	
8907	FLOAT	Archive_Min[200 - Average 200]	1	RD_ONLY	
8908	FLOAT	Archive_Min[201 - Average 201]	1	RD_ONLY	
8909	FLOAT	Archive_Min[202 - Average 202]	1	RD_ONLY	
8910	FLOAT	Archive_Min[203 - Average 203]	1	RD_ONLY	
8911	FLOAT	Archive_Min[204 - Average 204]	1	RD_ONLY	
8912	FLOAT	Archive_Min[205 - Average 205]	1	RD_ONLY	
8913	FLOAT	Archive_Min[206 - Average 206]	1	RD_ONLY	
8914	FLOAT	Archive_Min[207 - Average 207]	1	RD_ONLY	
8915	FLOAT	Archive_Min[208 - Average 208]	1	RD_ONLY	
8916	FLOAT	Archive_Min[209 - Average 209]	1	RD_ONLY	
8917	FLOAT	Archive_Min[210 - Average 210]	1	RD_ONLY	
8918	FLOAT	Archive_Min[211 - Average 211]	1	RD_ONLY	
8919	FLOAT	Archive_Min[212 - Average 212]	1	RD_ONLY	
8920	FLOAT	Archive_Min[213 - Average 213]	1	RD_ONLY	
8921	FLOAT	Archive_Min[214 - Average 214]	1	RD_ONLY	
8922	FLOAT	Archive_Min[215 - Average 215]	1	RD_ONLY	
8923	FLOAT	Archive_Min[216 - Average 216]	1	RD_ONLY	
8924	FLOAT	Archive_Min[217 - Average 217]	1	RD_ONLY	
8925	FLOAT	Archive_Min[218 - Average 218]	1	RD_ONLY	
8926	FLOAT	Archive_Min[219 - Average 219]	1	RD_ONLY	
8927	FLOAT	Archive_Min[220 - Average 220]	1	RD_ONLY	
8928	FLOAT	Archive_Min[221 - Average 221]	1	RD_ONLY	

Register #	Data Type	Variable	Record #	Access	Format
8929	FLOAT	Archive_Min[222 - Average 222]	1	RD_ONLY	
8930	FLOAT	Archive_Min[223 - Average 223]	1	RD_ONLY	
8931	FLOAT	Archive_Min[224 - Average 224]	1	RD_ONLY	
8932	FLOAT	Archive_Min[225 - Average 225]	1	RD_ONLY	
8933	FLOAT	Archive_Min[226 - Average 226]	1	RD_ONLY	
8934	FLOAT	Archive_Min[227 - Average 227]	1	RD_ONLY	
8935	FLOAT	Archive_Min[228 - Average 228]	1	RD_ONLY	
8936	FLOAT	Archive_Min[229 - Average 229]	1	RD_ONLY	
8937	FLOAT	Archive_Min[230 - Average 230]	1	RD_ONLY	
8938	FLOAT	Archive_Min[231 - Average 231]	1	RD_ONLY	
8939	FLOAT	Archive_Min[232 - Average 232]	1	RD_ONLY	
8940	FLOAT	Archive_Min[233 - Average 233]	1	RD_ONLY	
8941	FLOAT	Archive_Min[234 - Average 234]	1	RD_ONLY	
8942	FLOAT	Archive_Min[235 - Average 235]	1	RD_ONLY	
8943	FLOAT	Archive_Min[236 - Average 236]	1	RD_ONLY	
8944	FLOAT	Archive_Min[237 - Average 237]	1	RD_ONLY	
8945	FLOAT	Archive_Min[238 - Average 238]	1	RD_ONLY	
8946	FLOAT	Archive_Min[239 - Average 239]	1	RD_ONLY	
8947	FLOAT	Archive_Min[240 - Average 240]	1	RD_ONLY	
8948	FLOAT	Archive_Min[241 - Average 241]	1	RD_ONLY	
8949	FLOAT	Archive_Min[242 - Average 242]	1	RD_ONLY	
8950	FLOAT	Archive_Min[243 - Average 243]	1	RD_ONLY	
8951	FLOAT	Archive_Min[244 - Average 244]	1	RD_ONLY	
8952	FLOAT	Archive_Min[245 - Average 245]	1	RD_ONLY	
8953	FLOAT	Archive_Min[246 - Average 246]	1	RD_ONLY	
8954	FLOAT	Archive_Min[247 - Average 247]	1	RD_ONLY	
8955	FLOAT	Archive_Min[248 - Average 248]	1	RD_ONLY	
8956	FLOAT	Archive_Min[249 - Average 249]	1	RD_ONLY	
8957	FLOAT	Archive_Min[250 - Average 250]	1	RD_ONLY	
8958	FLOAT	Unused		RD_ONLY	
8959	FLOAT	Unused		RD_ONLY	
8960	FLOAT	Unused		RD_ONLY	
8961	FLOAT	Unused		RD_ONLY	
8962	FLOAT	Unused		RD_ONLY	
8963	FLOAT	Clear All Alarms		RD_WR	
8964	FLOAT	Acknowledge All Alarms		RD_WR	
9006	INT	Current Time(time_t)		RD_WR	MM

Register #	Data Type	Variable	Record #	Access	Format
9007	INT	Current Time(time_t)		RD_WR	DD
9008	INT	Current Time(time_t)		RD_WR	YYYY
9009	INT	Current Time(time_t)		RD_WR	hh
9010	INT	Current Time(time_t)		RD_WR	mm
9011	INT	Current Time(time_t)		RD_WR	ss
9012	INT	Unused		RD_ONLY	
9013	INT	Modbus Id[1 - Port 0]		RD_ONLY	
9014	INT	Site Id		RD_WR	
9022	INT	Analysis Time		RD_ONLY	
9023	INT	Unused		RD_ONLY	
9024	INT	Cycle Time		RD_ONLY	
9025	INT	Unused		RD_ONLY	
9026	INT	Run Time		RD_ONLY	
9027	INT	Unused		RD_ONLY	
9028	INT	Current Stream		RD_ONLY	
9029	INT	Unused		RD_ONLY	
9030	INT	GC Control_Analyser Control (Write Reg 9030)		RD_WR	
9031	INT	Unused		RD_ONLY	
9032	INT	GC Calibrating		RD_ONLY	
9033	INT	Unused		RD_ONLY	
9034	INT	Active Alarm Flag		RD_ONLY	
9035	INT	UnAck Alarm Flag		RD_ONLY	
9036	INT	Hourly Average Reset time		RD_ONLY	YY
9037	INT	Hourly Average Reset time		RD_ONLY	MM
9038	INT	Hourly Average Reset time		RD_ONLY	DD
9039	INT	Hourly Average Reset time		RD_ONLY	hh
9040	INT	Hourly Average Reset time		RD_ONLY	mm
9041	INT	Daily Average Reset time		RD_ONLY	YY
9042	INT	Daily Average Reset time		RD_ONLY	MM
9043	INT	Daily Average Reset time		RD_ONLY	DD
9044	INT	Daily Average Reset time		RD_ONLY	hh
9045	INT	Daily Average Reset time		RD_ONLY	mm
9046	INT	Weekly Average Reset time		RD_ONLY	YY
9047	INT	Weekly Average Reset time		RD_ONLY	MM
9048	INT	Weekly Average Reset time		RD_ONLY	DD
9049	INT	Weekly Average Reset time		RD_ONLY	hh
9050	INT	Weekly Average Reset time		RD_ONLY	mm

Register #	Data Type	Variable	Record #	Access	Format
9051	INT	Monthly Average Reset time		RD_ONLY	YY
9052	INT	Monthly Average Reset time		RD_ONLY	MM
9053	INT	Monthly Average Reset time		RD_ONLY	DD
9054	INT	Monthly Average Reset time		RD_ONLY	hh
9055	INT	Monthly Average Reset time		RD_ONLY	mm
9056	INT	Variable Average Reset time		RD_ONLY	YY
9057	INT	Variable Average Reset time		RD_ONLY	MM
9058	INT	Variable Average Reset time		RD_ONLY	DD
9059	INT	Variable Average Reset time		RD_ONLY	hh
9060	INT	Variable Average Reset time		RD_ONLY	mm

3001..3016/3017..3032 (Component Code): Component Codes for components whose mole % results are available in Registers 7001..7016.

3033 (Run Time in 1/30th Sec): Current GC Run Time. If Run Time = 200 seconds, then this register reads 6000.

3034 (Last Analy_Stream Number): Stream that was analyzed last.

3035 (Last Analy_CDT Stream Mask):

- Bit 0: Holds 1 if Stream 1 uses CDT1, 0 otherwise
- Bit 1: Holds 1 if Stream 2 uses CDT1, 0 otherwise
- Bit 2: Holds 1 if Stream 3 uses CDT1, 0 otherwise
- ...
- Bit 15: Holds 1 if Stream 16 uses CDT1, 0 otherwise

3036..3040 (Current GC Time): Holds the current GC Time. Can be written to update GC date/time.

3041..3045 (Last Analy_Start Time): Sample inject time for the stream that was analyzed last.

3046..3047 (Alarm Bitmaps): Boolean alarm conditions. 1 – Alarm Active, 0 – Alarm Inactive.

3046 Bit 14 (Analyzer Failure): This bit is set to 1 if any of the Carrier Pressure/Low Pressure Limit Switch alarms are active.

3048 (Stream 1 Active Low Limit Alarms):

- Bit 0: Holds 1 if, User Limit Alarm 1 is associated with Stream 1 and if a Low Limit condition is currently active. This bit holds 0 if either User Limit Alarm 1 is not associated with Stream 1 or no Low Limit alarm condition exists.
- Bit 1: Holds 1 if, User Limit Alarm 2 is associated with Stream 1 and if a Low Limit condition is currently active. This bit holds 0 if either User Limit Alarm 2 is not associated with Stream 1 or no Low Limit alarm condition exists.

- ...
- Bit 15: Holds 1 if, User Limit Alarm 16 is associated with Stream 1 and if a Low Limit condition is currently active. This bit holds 0 if either User Limit Alarm 16 is not associated with Stream 1 or no Low Limit alarm condition exists.

3049 (Stream 1 Active High Limit Alarms):

- Bit 0: Holds 1 if, User Limit Alarm 1 is associated with Stream 1 and if a High Limit condition is currently active. This bit holds 0 if either User Limit Alarm 1 is not associated with Stream 1 or no High Limit alarm condition exists.
- Bit 1: Holds 1 if, User Limit Alarm 2 is associated with Stream 1 and if a High Limit condition is currently active. This bit holds 0 if either User Limit Alarm 2 is not associated with Stream 1 or no High Limit alarm condition exists.
- ...
- Bit 15: Holds 1 if, User Limit Alarm 16 is associated with Stream 1 and if a High Limit condition is currently active. This bit holds 0 if either User Limit Alarm 16 is not associated with Stream 1 or no High Limit alarm condition exists.

3050 .. 3057 (Stream 2..5 Active High/Low Limit Alarms): These registers hold limit alarm status for Streams 2 through 5. The implementation of these registers is similar to the Stream 1 Active Low/High Alarms (Registers 3048/3049).

3058 (New Data Flag): This flag is set to 1 when new data is available in the Last Analysis Results registers. This is a read-write register, so a Modbus Master can clear the flag once the new results are read.

3059 (Anly/Calib Flag): This flag is set to 1 to indicate the last analysis results were from an Analysis run. This flag is set to 0 to indicate the last analysis results were from a Calibration run. A Modbus Master can use Registers 3058 and 3059 to determine when new analysis results are available on the GC.

5001 (Last Analy_Cycle Time (1/30th sec)): Cycle time for last analysis in 1/30th seconds. For example, if cycle time is 300 seconds, this register reads 9000.

5002 (Last Cal_Cycle Time (1/30th sec)): Cycle time for last calibration run in 1/30th seconds. For example, if cycle time is 300 seconds, this register reads 9000.

7001..7016 (Last Analy Mole %): These registers hold the mole % Results for the last analysis run. The order of components in these registers can be determined by reading Register 3001..3016 which contain the component codes.

7017..7032 (Last Analy Weight %): These registers hold the weight % results for the last analysis run. The order of components in these registers can be determined by reading Register 3001..3016 which contain the component codes.

7033..7039, 7054: Last analysis stream results

7040..7044: User calculation results 1..5

7055..7069: Current running average for Averages 1 through 15

7070..7084: Most recent archive average for Averages 1 through 15

7085..7086: Current analog input values for Analog Input 1 and 2

7087..7094: Last Calibration Stream Results

7095..7110/7111..7126: Response factors used for last analysis run

7127..7162: Current running average for Averages 1 through 36

7163..7198: Maximum sample value during current averaging period for Averages 1 through 36

7199..7234: Minimum sample value during current averaging period for Averages 1 through 36

7235..7270: Most recent archived average for Averages 1 through 36

7271..7306: Maximum sample value in the most recent archived average for Averages 1 through 36.

7307..7342: Minimum sample value in the most recent archived average for Averages 1 through 36.

7343..7378: Second most recent archived average for Averages 1 through 36

7379..7414: Maximum sample value in the second most recent archived average for Averages 1 through 36.

7415..7450: Minimum sample value in the second most recent archived average for Averages 1 through 36.

7451..7486: Third most recent archived average for Averages 1 through 36

7487..7522: Maximum sample value in the third most recent archived average for Averages 1 through 36.

7523..7558: Minimum sample value in the third most recent archived average for Averages 1 through 36.

7560..7563/7564..7567: Analog Input Current Value for AI 1 through 4.

7621..7646: Stream 1 results

7651..7676: Stream 2 results

7681..7706: Stream 3 results

7711..7736: Stream 4 results

7741..7766: Stream 5 results

7771..7796: Stream 6 results

7801..7826: Stream 7 results

7831..7856: Stream 8 results

7861..7886: Stream 9 results

7891..7916: Stream 10 results

7921..7946: Stream 11 results

7951..7976: Stream 12 results

7996..8006: *Section D.6*

8200..8449: Most recent archived average for Averages 1 through 250.

8454..8703: Maximum sample value in the most recent archived average for Averages 1 through 250.

8708..8957: Minimum sample value in the most recent archived average for Averages 1 through 250.

8963 (Clear All Alarms): Write 1 to this register to clear all active alarms.

8964 (Acknowledge All Alarms): Write 1 to this register to acknowledge all alarms.

9006..9011: GC System Date/Time Read/Write Registers.

9013 (Modbus Id[Port 0]): Modbus ID for Serial Port 0.

9014 (Site ID): GC Site ID read/write register.

9022 (Analysis Time): Analysis time

9024 (Cycle Time): Cycle time

9026 (Run Time): Run rime

9028 (Current Stream): Stream number

9030 (Analyzer Control): *Section D.7*

9032 (GC Calibrating): Tells you if the GC is calibrating. A value of 1 means GC is calibrating, 0 otherwise.

9034 (Active Alarm Flag): Tells you if the GC has any active alarms. A value of 1 indicates that there are active alarms, 0 otherwise.

9035 (UnAck Alarm Flag): Tells you if the GC has any unacknowledged alarms. A value of 1 indicates that there are unacknowledged alarms, 0 otherwise.

9036..9040 (Hourly Average Reset Time): Date/time when hourly average results were archived.

9041..9045 (Daily Average Reset Time): Date/time when daily average results were archived.

9046..9047 (Weekly Average Reset Time): Date/time when weekly average results were archived.

9051..9055 (Monthly Average Reset Time): Date/time when monthly average results were archived.

9056..9060 (Variable Average Reset Time): Date/time when variable average results were archived.

D.3 User Modbus mapping template

Register #	Data type	Variable	Access	Format
1	BOOLEAN	Unused	RD_ONLY	
2	BOOLEAN	Unused	RD_ONLY	
3	BOOLEAN	Unused	RD_ONLY	
4	BOOLEAN	Unused	RD_ONLY	
5	BOOLEAN	Unused	RD_ONLY	
6	BOOLEAN	Unused	RD_ONLY	
7	BOOLEAN	Unused	RD_ONLY	
8	BOOLEAN	Unused	RD_ONLY	
9	BOOLEAN	Unused	RD_ONLY	
10	BOOLEAN	System Alarm_Alarm On - Current Analysis_Heater 1 Out Of Range	RD_ONLY	
11	BOOLEAN	System Alarm_Alarm On - Current Analysis_Heater 2 Out Of Range	RD_ONLY	
12	BOOLEAN	System Alarm_Alarm On - Current Analysis_Heater 3 Out Of Range	RD_ONLY	
13	BOOLEAN	System Alarm_Alarm On - Current Analysis_Heater 4 Out Of Range	RD_ONLY	
14	BOOLEAN	Unused	RD_ONLY	
15	BOOLEAN	Unused	RD_ONLY	
16	BOOLEAN	System Alarm_Alarm On - Current Analysis_Flame Out	RD_ONLY	
17	BOOLEAN	System Alarm_Alarm On - Current Analysis_Warm Start Failed	RD_ONLY	
18	BOOLEAN	Unused	RD_ONLY	
19	BOOLEAN	Calibration Failed	RD_ONLY	
20	BOOLEAN	System Alarm_Alarm On - Current Analysis_Low Carrier Pressure 1	RD_ONLY	
21	BOOLEAN	System Alarm_Alarm On - Current Analysis_Low Carrier Pressure 2	RD_ONLY	
22	BOOLEAN	System Alarm_Alarm On - Current Analysis_No Sample Flow 1	RD_ONLY	
23	BOOLEAN	System Alarm_Alarm On - Current Analysis_No Sample Flow 2	RD_ONLY	
24	BOOLEAN	System Alarm_Alarm On - Current Analysis_Maintenance Mode	RD_ONLY	
25	BOOLEAN	Calibration Failed	RD_ONLY	
26	BOOLEAN	Unused	RD_ONLY	
27	BOOLEAN	Unused	RD_ONLY	

Register #	Data type	Variable	Access	Format
28	BOOLEAN	Unused	RD_ONLY	
29	BOOLEAN	Unused	RD_ONLY	
30	BOOLEAN	Unused	RD_ONLY	
31	BOOLEAN	System Alarm_Alarm On - Current Analysis_Detector 1 Scaling Factor Failure	RD_ONLY	
32	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 1 High Signal	RD_ONLY	
33	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 2 High Signal	RD_ONLY	
34	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 3 High Signal	RD_ONLY	
35	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 4 High Signal	RD_ONLY	
36	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 5 High Signal	RD_ONLY	
37	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 6 High Signal	RD_ONLY	
38	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 7 High Signal	RD_ONLY	
39	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 8 High Signal	RD_ONLY	
40	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 9 High Signal	RD_ONLY	
41	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 10 High Signal	RD_ONLY	
42	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 11 High Signal	RD_ONLY	
43	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 12 High Signal	RD_ONLY	
44	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 13 High Signal	RD_ONLY	
45	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 14 High Signal	RD_ONLY	
46	BOOLEAN	Unused	RD_ONLY	
47	BOOLEAN	Unused	RD_ONLY	
48	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 1 Low Signal	RD_ONLY	
49	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 2 Low Signal	RD_ONLY	
50	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 3 Low Signal	RD_ONLY	

Register #	Data type	Variable	Access	Format
51	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 4 Low Signal	RD_ONLY	
52	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 5 Low Signal	RD_ONLY	
53	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 6 Low Signal	RD_ONLY	
54	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 7 Low Signal	RD_ONLY	
55	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 8 Low Signal	RD_ONLY	
56	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 9 Low Signal	RD_ONLY	
57	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 10 Low Signal	RD_ONLY	
58	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 11 Low Signal	RD_ONLY	
59	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 12 Low Signal	RD_ONLY	
60	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 13 Low Signal	RD_ONLY	
61	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Output 14 Low Signal	RD_ONLY	
62	BOOLEAN	Unused	RD_ONLY	
63	BOOLEAN	Unused	RD_ONLY	
64	BOOLEAN	Analyzer Failure	RD_ONLY	
65	BOOLEAN	System Alarm_Alarm On - Current Analysis_Power Failure	RD_ONLY	
66	BOOLEAN	Unused	RD_ONLY	
67	BOOLEAN	System Alarm_Alarm On - Current Analysis_Low Battery Volt-age	RD_ONLY	
68	BOOLEAN	System Alarm_Alarm On - Current Analysis_GC Idle	RD_ONLY	
69	BOOLEAN	Unused	RD_ONLY	
70	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 1 High Signal	RD_ONLY	
71	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 2 High Signal	RD_ONLY	
72	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 3 High Signal	RD_ONLY	
73	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 4 High Signal	RD_ONLY	
74	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 1 Low Signal	RD_ONLY	

Register #	Data type	Variable	Access	Format
75	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 2 Low Signal	RD_ONLY	
76	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 3 Low Signal	RD_ONLY	
77	BOOLEAN	System Alarm_Alarm On - Current Analysis_Analog Input 4 Low Signal	RD_ONLY	
78	BOOLEAN	Unused	RD_ONLY	
79	BOOLEAN	Unused	RD_ONLY	
80	BOOLEAN	Unused	RD_ONLY	
81	BOOLEAN	Unused	RD_ONLY	
82	BOOLEAN	Unused	RD_ONLY	
83	BOOLEAN	Unused	RD_ONLY	
84	BOOLEAN	Unused	RD_ONLY	
85	BOOLEAN	Alarm On[1 - Alarm 1]	RD_ONLY	
86	BOOLEAN	Alarm On[2 - Alarm 2]	RD_ONLY	
87	BOOLEAN	Alarm On[3 - Alarm 3]	RD_ONLY	
88	BOOLEAN	Alarm On[4 - Alarm 4]	RD_ONLY	
89	BOOLEAN	Alarm On[5 - Alarm 5]	RD_ONLY	
90	BOOLEAN	Alarm On[6 - Alarm 6]	RD_ONLY	
91	BOOLEAN	Alarm On[7 - Alarm 7]	RD_ONLY	
92	BOOLEAN	Alarm On[8 - Alarm 8]	RD_ONLY	
93	BOOLEAN	Alarm On[9 - Alarm 9]	RD_ONLY	
94	BOOLEAN	Alarm On[10 - Alarm 10]	RD_ONLY	
95	BOOLEAN	Alarm On[11 - Alarm 11]	RD_ONLY	
96	BOOLEAN	Alarm On[12 - Alarm 12]	RD_ONLY	
97	BOOLEAN	Alarm On[13 - Alarm 13]	RD_ONLY	
98	BOOLEAN	Alarm On[14 - Alarm 14]	RD_ONLY	
99	BOOLEAN	Alarm On[15 - Alarm 15]	RD_ONLY	
100	BOOLEAN	Alarm On[16 - Alarm 16]	RD_ONLY	
101	BOOLEAN	Alarm On[17 - Alarm 17]	RD_ONLY	
102	BOOLEAN	Alarm On[18 - Alarm 18]	RD_ONLY	
103	BOOLEAN	Alarm On[19 - Alarm 19]	RD_ONLY	
104	BOOLEAN	Alarm On[20 - Alarm 20]	RD_ONLY	
105	BOOLEAN	1 - Stream 1_Stream Toggle	RD_ONLY	
106	BOOLEAN	2 - Stream 2_Stream Toggle	RD_ONLY	
107	BOOLEAN	3 - Stream 3_Stream Toggle	RD_ONLY	
108	BOOLEAN	4 - Stream 4_Stream Toggle	RD_ONLY	

Register #	Data type	Variable	Access	Format
109	BOOLEAN	5 - Stream 5_Stream Toggle	RD_ONLY	
110	BOOLEAN	6 - Stream 6_Stream Toggle	RD_ONLY	
111	BOOLEAN	7 - Stream 7_Stream Toggle	RD_ONLY	
112	BOOLEAN	8 - Stream 8_Stream Toggle	RD_ONLY	
113	BOOLEAN	Current Value[1 - Discrete Output 1]	RD_ONLY	
114	BOOLEAN	Current Value[2 - Discrete Output 2]	RD_ONLY	
115	BOOLEAN	Current Value[3 - Discrete Output 3]	RD_ONLY	
116	BOOLEAN	Current Value[4 - Discrete Output 4]	RD_ONLY	
117	BOOLEAN	Current Value[5 - Discrete Output 5]	RD_ONLY	
118	BOOLEAN	Switch[1 - Discrete Output 1]	RD_WR	
119	BOOLEAN	Switch[2 - Discrete Output 2]	RD_WR	
120	BOOLEAN	Switch[3 - Discrete Output 3]	RD_WR	
121	BOOLEAN	Switch[4 - Discrete Output 4]	RD_WR	
122	BOOLEAN	Switch[5 - Discrete Output 5]	RD_WR	
123	INT	Switch[1 - Discrete Output 1]	RD_WR	
124	INT	Switch[2 - Discrete Output 2]	RD_WR	
125	INT	Switch[3 - Discrete Output 3]	RD_WR	
126	INT	Switch[4 - Discrete Output 4]	RD_WR	
127	INT	Switch[5 - Discrete Output 5]	RD_WR	
9006	INT	Current Time(time_t)	RD_WR	MM
9007	INT	Current Time(time_t)	RD_WR	DD
9008	INT	Current Time(time_t)	RD_WR	YYYY
9009	INT	Current Time(time_t)	RD_WR	hh
9010	INT	Current Time(time_t)	RD_WR	mm
9011	INT	Current Time(time_t)	RD_WR	ss
9012	INT	Unused	RD_ONLY	
9013	INT	Modbus Id[1 - Port 0]	RD_ONLY	
9014	INT	Site Id	RD_WR	
9022	INT	Analysis Time	RD_ONLY	
9023	INT	Unused	RD_ONLY	
9024	INT	Cycle Time	RD_ONLY	
9025	INT	Unused	RD_ONLY	
9026	INT	Run Time	RD_ONLY	
9027	INT	Unused	RD_ONLY	
9028	INT	Current Stream	RD_ONLY	
9029	INT	Unused	RD_ONLY	
9030	INT	GC Control_Analyzer Control (Write Reg 9030)	RD_WR	

Register #	Data type	Variable	Access	Format
9031	INT	Unused	RD_ONLY	
9032	INT	GC Calibrating	RD_ONLY	
9033	INT	Unused	RD_ONLY	
9034	INT	Active Alarm Flag	RD_ONLY	
9035	INT	UnAck Alarm Flag	RD_ONLY	
9036	INT	Hourly Average Reset time	RD_ONLY	YY
9037	INT	Hourly Average Reset time	RD_ONLY	MM
9038	INT	Hourly Average Reset time	RD_ONLY	DD
9039	INT	Hourly Average Reset time	RD_ONLY	hh
9040	INT	Hourly Average Reset time	RD_ONLY	mm
9041	INT	Daily Average Reset time	RD_ONLY	YY
9042	INT	Daily Average Reset time	RD_ONLY	MM
9043	INT	Daily Average Reset time	RD_ONLY	DD
9044	INT	Daily Average Reset time	RD_ONLY	hh
9045	INT	Daily Average Reset time	RD_ONLY	mm
9046	INT	Weekly Average Reset time	RD_ONLY	YY
9047	INT	Weekly Average Reset time	RD_ONLY	MM
9048	INT	Weekly Average Reset time	RD_ONLY	DD
9049	INT	Weekly Average Reset time	RD_ONLY	hh
9050	INT	Weekly Average Reset time	RD_ONLY	mm
9051	INT	Monthly Average Reset time	RD_ONLY	YY
9052	INT	Monthly Average Reset time	RD_ONLY	MM
9053	INT	Monthly Average Reset time	RD_ONLY	DD
9054	INT	Monthly Average Reset time	RD_ONLY	hh
9055	INT	Monthly Average Reset time	RD_ONLY	mm
9056	INT	Variable Average Reset time	RD_ONLY	YY
9057	INT	Variable Average Reset time	RD_ONLY	MM
9058	INT	Variable Average Reset time	RD_ONLY	DD
9059	INT	Variable Average Reset time	RD_ONLY	hh
9060	INT	Variable Average Reset time	RD_ONLY	mm

10...13 (Heater 1...4 out of range): 1 if heater is out of range, 0 otherwise

16 (FID flame out): 1 if FID flame has gone out, 0 otherwise

17 (Warmstart failed): 1 if GC warmstart was unable to stabilize temperature/pressure in analytical oven within pre-defined warmstart duration, 0 otherwise

19 (Calibration failed): 1 if last calibration sequence failed, 0 otherwise

20...21 (Low carrier pressure 1...2): 1 if the carrier pressure is low, 0 otherwise

22...23 (No sample flow 1...2): 1 if there is no sample flow in the sample conditioning system, 0 otherwise

24 (Maintenance mode): 1 if a technician has put the GC into *Maintenance* mode to perform repairs, 0 otherwise

25 (Calibration failed): 1 if last calibration sequence failed, 0 otherwise

31 (Preamp scaling factor): 1 if there is an electronics failure on the preamp board, 0 otherwise

32...45 (Analog output high signal 1...14): 1 if the variable associated with analog output has a value that is greater than the zero scale value assigned to the analog output, 0 otherwise

48...61 (Analog output low signal 1...14): 1 if the variable associated with analog output has a value that is lesser than the zero scale value assigned to the analog output, 0 otherwise

64 (Analyzer failure): 1 indicates that the carrier pressure is either too low or the GC cannot control the carrier pressure to the desired setpoint, 0 otherwise

65 (Power failure): 1 indicates that the GC lost power and is currently executing the warmstart sequence, 0 otherwise

67 (Low battery voltage): 1 indicates that the battery used to back up configuration and real-time clock on the main CPU board is low, 0 otherwise

68 (GC idle): 1 indicates that the GC is not performing an analysis, 0 otherwise

Note

If the GC is halted by the operator using MON2020, then the *Idle* alarm is not raised. It is raised only if the GC goes into the *Idle* state due to alarm condition that has the Halt on Alarm flag enabled.

Note

If the GC is halted by the operator using MON2020 and if he disconnects from the GC without restarting normal operation, then the GC *Idle* alarm is raised.

70...77 (Analog input low signal 1...8): 1 indicates that the analog input is sensing a current that is lower than 4 mA, 0 otherwise

85...104 (User limit alarm 1...20): 1 indicates that the user limit alarm is active, 0 otherwise

105...112 (Stream toggle 1...5): Each time new results are available for a particular stream, this flag is toggled.

113...117 (Discrete output 1...5 current value): Current state of the discrete output, 1 indicates that it is *On*; 0 indicates it is *Off*.

118...122 (Switch discrete output 1...5): Read/write register for changing the state of the discrete output. Write 1 to this register to set output state to *On*, 0 to set output state to *Off*.

123...127 (Switch discrete output 1...5): Read/write register for changing the state of the discrete output. Write 1 to this register to set output state to *On*, 0 to set output state to *Off*, and 2 to set the register to *Auto* mode.

9006...9011: GC system date/time read-write registers

9013 (Modbus ID [Port 0]): Modbus ID for serial port 0

9014 (Site ID): GC site ID read/write register

9022 (Analysis time): Analysis time

9024 (Cycle time): Cycle time

9026 (Run time): Run time

9028 (Current stream): Stream number

9030 (Analyzer control): *Section D.3*

9032 (GC calibrating): Tells you if the GC is calibrating. A value of 1 means GC is calibrating, 0 otherwise.

9034 (Active alarm flag): Tells you if the GC has any active alarms. A value of 1 indicates that there are active alarms, 0 otherwise.

9035 (UnAck alarm flag): Tells you if the GC has any unacknowledged alarms. A value of 1 indicates that there are unacknowledged alarms, 0 otherwise.

9036...9040 (Hourly average reset time): Date/time when hourly average results was archived

9041...9045 (Daily average reset time): Date/time when daily average results was archived

9046...9047 (Weekly average reset time): Date/time when weekly average result was archived

9051...9055 (Monthly average reset time): Date/time when monthly average results was archived

9056...9060 (Variable average reset time): Date/time when variable average results was archived

D.4 SIM_2251 C9 + Hydrocarbon Dewpoint map

This map file is an extension of the SIM2251 map file with the following additional registers.

Register #	Data type	Variable	Access
3101	INT	1 - Stream 1_Dew Status 1	RD_ONLY
3102	INT	1 - Stream 1_Dew Status 2	RD_ONLY
3103	INT	1 - Stream 1_Dew Status 3	RD_ONLY
3104	INT	1 - Stream 1_Dew Status 4	RD_ONLY
3105	INT	1 - Stream 1_Cri Status	RD_ONLY
3106	INT	2 - Calibration_Dew Status 1	RD_ONLY
3107	INT	2 - Calibration_Dew Status 2	RD_ONLY
3108	INT	2 - Calibration_Dew Status 3	RD_ONLY
3109	INT	2 - Calibration_Dew Status 4	RD_ONLY
3110	INT	2 - Calibration_Cri Status	RD_ONLY
3111	INT	3 - Stream 3_Dew Status 1	RD_ONLY
3112	INT	3 - Stream 3_Dew Status 2	RD_ONLY
3113	INT	3 - Stream 3_Dew Status 3	RD_ONLY
3114	INT	3 - Stream 3_Dew Status 4	RD_ONLY
3115	INT	3 - Stream 3_Cri Status	RD_ONLY
3116	INT	4 - Stream 4_Dew Status 1	RD_ONLY
3117	INT	4 - Stream 4_Dew Status 2	RD_ONLY
3118	INT	4 - Stream 4_Dew Status 3	RD_ONLY
3119	INT	4 - Stream 4_Dew Status 4	RD_ONLY
3120	INT	4 - Stream 4_Cri Status	RD_ONLY
3121	INT	5 - Stream 5_Dew Status 1	RD_ONLY
3122	INT	5 - Stream 5_Dew Status 2	RD_ONLY
3123	INT	5 - Stream 5_Dew Status 3	RD_ONLY
3124	INT	5 - Stream 5_Dew Status 4	RD_ONLY
3125	INT	5 - Stream 5_Cri Status	RD_ONLY
3126	INT	6 - Stream 6_Dew Status 1	RD_ONLY
3127	INT	6 - Stream 6_Dew Status 2	RD_ONLY
3128	INT	6 - Stream 6_Dew Status 3	RD_ONLY
3129	INT	6 - Stream 6_Dew Status 4	RD_ONLY
3130	INT	6 - Stream 6_Cri Status	RD_ONLY
3131	INT	7 - Stream 7_Dew Status 1	RD_ONLY
3132	INT	7 - Stream 7_Dew Status 2	RD_ONLY

Register #	Data type	Variable	Access
3133	INT	7 - Stream 7_Dew Status 3	RD_ONLY
3134	INT	7 - Stream 7_Dew Status 4	RD_ONLY
3135	INT	7 - Stream 7_Cri Status	RD_ONLY
3136	INT	8 - Stream 8_Dew Status 1	RD_ONLY
3137	INT	8 - Stream 8_Dew Status 2	RD_ONLY
3138	INT	8 - Stream 8_Dew Status 3	RD_ONLY
3139	INT	8 - Stream 8_Dew Status 4	RD_ONLY
3140	INT	8 - Stream 8_Cri Status	RD_ONLY
8100	FLOAT	Dewpoint Configuration 1_Pressure 1	RD_WR
8101	FLOAT	Dewpoint Configuration 1_Pressure 2	RD_WR
8102	FLOAT	Dewpoint Configuration 1_Pressure 3	RD_WR
8103	FLOAT	Dewpoint Configuration 1_Pressure 4	RD_WR
8104	FLOAT	Dewpoint Configuration 2_Pressure 1	RD_WR
8105	FLOAT	Dewpoint Configuration 2_Pressure 2	RD_WR
8106	FLOAT	Dewpoint Configuration 3_Pressure 1	RD_WR
8107	FLOAT	Dewpoint Configuration 3_Pressure 2	RD_WR
8108	FLOAT	Dewpoint Configuration 4_Pressure 1	RD_WR
8109	FLOAT	Dewpoint Configuration 4_Pressure 2	RD_WR
8110	FLOAT	1 - Stream 1_Dewpoint Temp 1	RD_ONLY
8111	FLOAT	1 - Stream 1_Dewpoint Temp 2	RD_ONLY
8112	FLOAT	1 - Stream 1_Dewpoint Temp 3	RD_ONLY
8113	FLOAT	1 - Stream 1_Dewpoint Temp 4	RD_ONLY
8114	FLOAT	1 - Stream 1_Dewpoint Pres 1	RD_ONLY
8115	FLOAT	1 - Stream 1_Dewpoint Pres 2	RD_ONLY
8116	FLOAT	1 - Stream 1_Dewpoint Pres 3	RD_ONLY
8117	FLOAT	1 - Stream 1_Dewpoint Pres 4	RD_ONLY
8118	FLOAT	1 - Stream 1_CricondenTherm Temp	RD_ONLY
8119	FLOAT	1 - Stream 1_CricondenTherm Pres	RD_ONLY
8120	FLOAT	2 - Calibration_Dewpoint Temp 1	RD_ONLY
8121	FLOAT	2 - Calibration_Dewpoint Temp 2	RD_ONLY
8122	FLOAT	2 - Calibration_Dewpoint Temp 3	RD_ONLY
8123	FLOAT	2 - Calibration_Dewpoint Temp 4	RD_ONLY
8124	FLOAT	2 - Calibration_Dewpoint Pres 1	RD_ONLY
8125	FLOAT	2 - Calibration_Dewpoint Pres 2	RD_ONLY
8126	FLOAT	2 - Calibration_Dewpoint Pres 3	RD_ONLY
8127	FLOAT	2 - Calibration_Dewpoint Pres 4	RD_ONLY
8128	FLOAT	2 - Calibration_CricondenTherm Temp	RD_ONLY

Register #	Data type	Variable	Access
8129	FLOAT	2 - Calibration_CricondenTherm Pres	RD_ONLY
8130	FLOAT	3 - Stream 3_Dewpoint Temp 1	RD_ONLY
8131	FLOAT	3 - Stream 3_Dewpoint Temp 2	RD_ONLY
8132	FLOAT	3 - Stream 3_Dewpoint Temp 3	RD_ONLY
8133	FLOAT	3 - Stream 3_Dewpoint Temp 4	RD_ONLY
8134	FLOAT	3 - Stream 3_Dewpoint Pres 1	RD_ONLY
8135	FLOAT	3 - Stream 3_Dewpoint Pres 2	RD_ONLY
8136	FLOAT	3 - Stream 3_Dewpoint Pres 3	RD_ONLY
8137	FLOAT	3 - Stream 3_Dewpoint Pres 4	RD_ONLY
8138	FLOAT	3 - Stream 3_CricondenTherm Temp	RD_ONLY
8139	FLOAT	3 - Stream 3_CricondenTherm Pres	RD_ONLY
8140	FLOAT	4 - Stream 4_Dewpoint Temp 1	RD_ONLY
8141	FLOAT	4 - Stream 4_Dewpoint Temp 2	RD_ONLY
8142	FLOAT	4 - Stream 4_Dewpoint Temp 3	RD_ONLY
8143	FLOAT	4 - Stream 4_Dewpoint Temp 4	RD_ONLY
8144	FLOAT	4 - Stream 4_Dewpoint Pres 1	RD_ONLY
8145	FLOAT	4 - Stream 4_Dewpoint Pres 2	RD_ONLY
8146	FLOAT	4 - Stream 4_Dewpoint Pres 3	RD_ONLY
8147	FLOAT	4 - Stream 4_Dewpoint Pres 4	RD_ONLY
8148	FLOAT	4 - Stream 4_CricondenTherm Temp	RD_ONLY
8149	FLOAT	4 - Stream 4_CricondenTherm Pres	RD_ONLY
8150	FLOAT	5 - Stream 5_Dewpoint Temp 1	RD_ONLY
8151	FLOAT	5 - Stream 5_Dewpoint Temp 2	RD_ONLY
8152	FLOAT	5 - Stream 5_Dewpoint Temp 3	RD_ONLY
8153	FLOAT	5 - Stream 5_Dewpoint Temp 4	RD_ONLY
8154	FLOAT	5 - Stream 5_Dewpoint Pres 1	RD_ONLY
8155	FLOAT	5 - Stream 5_Dewpoint Pres 2	RD_ONLY
8156	FLOAT	5 - Stream 5_Dewpoint Pres 3	RD_ONLY
8157	FLOAT	5 - Stream 5_Dewpoint Pres 4	RD_ONLY
8158	FLOAT	5 - Stream 5_CricondenTherm Temp	RD_ONLY
8159	FLOAT	5 - Stream 5_CricondenTherm Pres	RD_ONLY
8160	FLOAT	6 - Stream 6_Dewpoint Temp 1	RD_ONLY
8161	FLOAT	6 - Stream 6_Dewpoint Temp 2	RD_ONLY
8162	FLOAT	6 - Stream 6_Dewpoint Temp 3	RD_ONLY
8163	FLOAT	6 - Stream 6_Dewpoint Temp 4	RD_ONLY
8164	FLOAT	6 - Stream 6_Dewpoint Pres 1	RD_ONLY
8165	FLOAT	6 - Stream 6_Dewpoint Pres 2	RD_ONLY

Register #	Data type	Variable	Access
8166	FLOAT	6 - Stream 6_Dewpoint Pres 3	RD_ONLY
8167	FLOAT	6 - Stream 6_Dewpoint Pres 4	RD_ONLY
8168	FLOAT	6 - Stream 6_CricondenTherm Temp	RD_ONLY
8169	FLOAT	6 - Stream 6_CricondenTherm Pres	RD_ONLY
8170	FLOAT	7 - Stream 7_Dewpoint Temp 1	RD_ONLY
8171	FLOAT	7 - Stream 7_Dewpoint Temp 2	RD_ONLY
8172	FLOAT	7 - Stream 7_Dewpoint Temp 3	RD_ONLY
8173	FLOAT	7 - Stream 7_Dewpoint Temp 4	RD_ONLY
8174	FLOAT	7 - Stream 7_Dewpoint Pres 1	RD_ONLY
8175	FLOAT	7 - Stream 7_Dewpoint Pres 2	RD_ONLY
8176	FLOAT	7 - Stream 7_Dewpoint Pres 3	RD_ONLY
8177	FLOAT	7 - Stream 7_Dewpoint Pres 4	RD_ONLY
8178	FLOAT	7 - Stream 7_CricondenTherm Temp	RD_ONLY
8179	FLOAT	7 - Stream 7_CricondenTherm Pres	RD_ONLY
8180	FLOAT	8 - Stream 8_Dewpoint Temp 1	RD_ONLY
8181	FLOAT	8 - Stream 8_Dewpoint Temp 2	RD_ONLY
8182	FLOAT	8 - Stream 8_Dewpoint Temp 3	RD_ONLY
8183	FLOAT	8 - Stream 8_Dewpoint Temp 4	RD_ONLY
8184	FLOAT	8 - Stream 8_Dewpoint Pres 1	RD_ONLY
8185	FLOAT	8 - Stream 8_Dewpoint Pres 2	RD_ONLY
8186	FLOAT	8 - Stream 8_Dewpoint Pres 3	RD_ONLY
8187	FLOAT	8 - Stream 8_Dewpoint Pres 4	RD_ONLY
8188	FLOAT	8 - Stream 8_CricondenTherm Temp	RD_ONLY
8189	FLOAT	8 - Stream 8_CricondenTherm Pres	RD_ONLY

3101...3140 (Dewpoint status): Dewpoint calculation status for Streams 1 to 8 (read only). Here are the possible values for these registers and their descriptions.

8100...8109 (Dewpoint pressure setpoints): Pressure setpoints at which dewpoint calculation results are performed (read-write). The setpoint can be changed through a Modbus Master.

8110...8189 (Dewpoint results): Dewpoint temperature and pressure, cricondentherm temperature and pressure.

Value	Description	Remarks
0	OK	Calculation is valid
1	Error 1	No valid solution to gas equation found
2	Error 2	Mole% values are all zero – if analysis is OK check Numeric data
3	Error 3	Calculated fugacities too large – probably unrealistic composition
4	Error 4	Single phase – no liquid phase at this pressure
5	Error 5	Pressure value (from operator or Modbus) is negative
6	Error 6	(Cricondentherm only) – no maximum found – next analysis normally OK
7	Error 7	Single phase – no gas phase at this pressure

D.5 SIM_2251 UK (with ISO results)

Register #	Data type	Variable	Record #	Access	Format
1001	BOOLEAN	Current Value[1 - Discrete Output 1]		RD_ONLY	
1002	BOOLEAN	Current Value[2 - Discrete Output 2]		RD_ONLY	
1003	BOOLEAN	Current Value[3 - Discrete Output 3]		RD_ONLY	
1004	BOOLEAN	Current Value[4 - Discrete Output 4]		RD_ONLY	
1005	BOOLEAN	Current Value[5 - Discrete Output 5]		RD_ONLY	
1006	BOOLEAN	Current Value[1 - Discrete Input 1]		RD_ONLY	
1007	BOOLEAN	Current Value[2 - Discrete Input 2]		RD_ONLY	
1008	BOOLEAN	Current Value[3 - Discrete Input 3]		RD_ONLY	
1009	BOOLEAN	Current Value[4 - Discrete Input 4]		RD_ONLY	
1010	BOOLEAN	Current Value[5 - Discrete Input 5]		RD_ONLY	
3001	INT	Last Analy_Component Code(UK)[1 - Component 1]		RD_ONLY	
3002	INT	Last Analy_Component Code(UK)[2 - Component 2]		RD_ONLY	
3003	INT	Last Analy_Component Code(UK)[3 - Component 3]		RD_ONLY	
3004	INT	Last Analy_Component Code(UK)[4 - Component 4]		RD_ONLY	
3005	INT	Last Analy_Component Code(UK)[5 - Component 5]		RD_ONLY	
3006	INT	Last Analy_Component Code(UK)[6 - Component 6]		RD_ONLY	
3007	INT	Last Analy_Component Code(UK)[7 - Component 7]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3008	INT	Last Analy_Component Code(UK)[8 - Component 8]		RD_ONLY	
3009	INT	Last Analy_Component Code(UK)[9 - Component 9]		RD_ONLY	
3010	INT	Last Analy_Component Code(UK)[10 - Component 10]		RD_ONLY	
3011	INT	Last Analy_Component Code(UK)[11 - Component 11]		RD_ONLY	
3012	INT	Last Analy_Component Code(UK)[12 - Component 12]		RD_ONLY	
3013	INT	Last Analy_Component Code(UK)[13 - Component 13]		RD_ONLY	
3014	INT	Last Analy_Component Code(UK)[14 - Component 14]		RD_ONLY	
3015	INT	Last Analy_Component Code(UK)[15 - Component 15]		RD_ONLY	
3016	INT	Last Analy_Component Code(UK)[16 - Component 16]		RD_ONLY	
3017	INT	Last Analy_Component Code(UK)[1 - Component 1]		RD_ONLY	
3018	INT	Last Analy_Component Code(UK)[2 - Component 2]		RD_ONLY	
3019	INT	Last Analy_Component Code(UK)[3 - Component 3]		RD_ONLY	
3020	INT	Last Analy_Component Code(UK)[4 - Component 4]		RD_ONLY	
3021	INT	Last Analy_Component Code(UK)[5 - Component 5]		RD_ONLY	
3022	INT	Last Analy_Component Code(UK)[6 - Component 6]		RD_ONLY	
3023	INT	Last Analy_Component Code(UK)[7 - Component 7]		RD_ONLY	
3024	INT	Last Analy_Component Code(UK)[8 - Component 8]		RD_ONLY	
3025	INT	Last Analy_Component Code(UK)[9 - Component 9]		RD_ONLY	
3026	INT	Last Analy_Component Code(UK)[10 - Component 10]		RD_ONLY	
3027	INT	Last Analy_Component Code(UK)[11 - Component 11]		RD_ONLY	
3028	INT	Last Analy_Component Code(UK)[12 - Component 12]		RD_ONLY	
3029	INT	Last Analy_Component Code(UK)[13 - Component 13]		RD_ONLY	
3030	INT	Last Analy_Component Code(UK)[14 - Component 14]		RD_ONLY	
3031	INT	Last Analy_Component Code(UK)[15 - Component 15]		RD_ONLY	
3032	INT	Last Analy_Component Code(UK)[16 - Component 16]		RD_ONLY	
3033	INT	Run Time(1/30th Sec)		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3034	INT	Last Analy_Stream Number		RD_ONLY	
3035	INT	Last Analy_CDT Stream Mask		RD_ONLY	
3036	INT	Current Time(time_t)		RD_WR	MM
3037	INT	Current Time(time_t)		RD_WR	DD
3038	INT	Current Time(time_t)		RD_WR	YY
3039	INT	Current Time(time_t)		RD_WR	hh
3040	INT	Current Time(time_t)		RD_WR	mm
3041	INT	Last Analy_Start Time		RD_ONLY	MM
3042	INT	Last Analy_Start Time		RD_ONLY	DD
3043	INT	Last Analy_Start Time		RD_ONLY	YY
3044	INT	Last Analy_Start Time		RD_ONLY	hh
3045	INT	Last Analy_Start Time		RD_ONLY	mm
3046	Bit-map(INT)	0:Unused, 1:Unused, 2:System Alarm_Alarm On - Last Analysis_Analog Input 1 Low Signal, 3:System Alarm_Alarm On - Last Analysis_Analog Input 1 High Signal, 4:System Alarm_Alarm On - Last Analysis_Analog Input 2 Low Signal, 5:System Alarm_Alarm On - Last Analysis_Analog Input 2 High Signal, 6:Unused, 7:Unused, 8:System Alarm_Alarm On - Last Analysis_Analog Output 1 Low Signal, 9:System Alarm_Alarm On - Last Analysis_Analog Output 1 High Signal, 10:System Alarm_Alarm On - Last Analysis_Analog Output 2 Low Signal, 11:System Alarm_Alarm On - Last Analysis_Analog Output 2 High Signal, 12:System Alarm_Alarm On - Last Analysis_Analog Output 3 Low Signal, 13:System Alarm_Alarm On - Last Analysis_Analog Output 3 High Signal, 14:Analyzer Failure, 15:Unused		RD_ONLY	
3047	Bit-map(INT)	0:System Alarm_Alarm On - Current Analysis_Power Failure, 1:Calibration Failed, 2:Preamp Failure, 3:Unused, 4:Unused, 5:Unused, 6:Unused, 7:Unused, 8:Unused, 9:Unused, 10:Unused, 11:Unused, 12:Unused, 13:Unused, 14:Unused, 15:Unused		RD_ONLY	
3048	INT	1 - Stream 1_Active Low Limit Alarms		RD_ONLY	
3049	INT	1 - Stream 1_Active High Limit Alarms		RD_ONLY	
3050	INT	2 - Stream 2_Active Low Limit Alarms		RD_ONLY	
3051	INT	2 - Stream 2_Active High Limit Alarms		RD_ONLY	
3052	INT	3 - Stream 3_Active Low Limit Alarms		RD_ONLY	
3053	INT	3 - Stream 3_Active High Limit Alarms		RD_ONLY	
3054	INT	4 - Stream 4_Active Low Limit Alarms		RD_ONLY	
3055	INT	4 - Stream 4_Active High Limit Alarms		RD_ONLY	
3056	INT	5 - Stream 5_Active Low Limit Alarms		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3057	INT	5 - Stream 5_Active High Limit Alarms		RD_ONLY	
3058	INT	New Data Flag		RD_WR	
3059	INT	Analy/Calib Flag		RD_ONLY	
3060	INT	Daily Avg Updated		RD_WR	
3061	INT	Last Stream		RD_ONLY	
3062	INT	2 - Stream 2_New Data Available		RD_WR	
3063	INT	3 - Stream 3_New Data Available		RD_WR	
3064	INT	4 - Stream 4_New Data Available		RD_WR	
3065	INT	5 - Stream 5_New Data Available		RD_WR	
3066	INT	Component Data 1_Reference Code[1]		RD_ONLY	
3067	INT	Component Data 1_Reference Code[2]		RD_ONLY	
3068	INT	Component Data 1_Reference Code[3]		RD_ONLY	
3069	INT	Component Data 1_Reference Code[4]		RD_ONLY	
3070	INT	Component Data 1_Reference Code[5]		RD_ONLY	
3071	INT	Component Data 1_Reference Code[6]		RD_ONLY	
3072	INT	Component Data 1_Reference Code[7]		RD_ONLY	
3073	INT	Component Data 1_Reference Code[8]		RD_ONLY	
3074	INT	Component Data 1_Reference Code[9]		RD_ONLY	
3075	INT	Component Data 1_Reference Code[10]		RD_ONLY	
3076	INT	Component Data 1_Reference Code[11]		RD_ONLY	
3077	INT	Component Data 1_Reference Code[12]		RD_ONLY	
3078	INT	Component Data 1_Reference Code[13]		RD_ONLY	
3079	INT	Component Data 1_Reference Code[14]		RD_ONLY	
3080	INT	Component Data 1_Reference Code[15]		RD_ONLY	
3081	INT	Component Data 1_Reference Code[16]		RD_ONLY	
3082	INT	Component Data 2_Reference Code[1]		RD_ONLY	
3083	INT	Component Data 2_Reference Code[2]		RD_ONLY	
3084	INT	Component Data 2_Reference Code[3]		RD_ONLY	
3085	INT	Component Data 2_Reference Code[4]		RD_ONLY	
3086	INT	Component Data 2_Reference Code[5]		RD_ONLY	
3087	INT	Component Data 2_Reference Code[6]		RD_ONLY	
3088	INT	Component Data 2_Reference Code[7]		RD_ONLY	
3089	INT	Component Data 2_Reference Code[8]		RD_ONLY	
3090	INT	Component Data 2_Reference Code[9]		RD_ONLY	
3091	INT	Component Data 2_Reference Code[10]		RD_ONLY	
3092	INT	Component Data 2_Reference Code[11]		RD_ONLY	
3093	INT	Component Data 2_Reference Code[12]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3094	INT	Component Data 2_Reference Code[13]		RD_ONLY	
3095	INT	Component Data 2_Reference Code[14]		RD_ONLY	
3096	INT	Component Data 2_Reference Code[15]		RD_ONLY	
3097	INT	Component Data 2_Reference Code[16]		RD_ONLY	
3098	INT	Calculations Configuration_Primary CV Units		RD_ONLY	
3099	INT	Last Run Data Valid 1		RD_WR	
3100	INT	Last Run Data Valid 2		RD_WR	
3101	INT	Last Run Data Valid 3		RD_WR	
3102	INT	Last Run Data Valid 4		RD_WR	
3103	INT	Last FCalib_New RF Update Flag[1 - Component 1]		RD_ONLY	
3104	INT	Last FCalib_New RF Update Flag[2 - Component 2]		RD_ONLY	
3105	INT	Last FCalib_New RF Update Flag[3 - Component 3]		RD_ONLY	
3106	INT	Last FCalib_New RF Update Flag[4 - Component 4]		RD_ONLY	
3107	INT	Last FCalib_New RF Update Flag[5 - Component 5]		RD_ONLY	
3108	INT	Last FCalib_New RF Update Flag[6 - Component 6]		RD_ONLY	
3109	INT	Last FCalib_New RF Update Flag[7 - Component 7]		RD_ONLY	
3110	INT	Last FCalib_New RF Update Flag[8 - Component 8]		RD_ONLY	
3111	INT	Last FCalib_New RF Update Flag[9 - Component 9]		RD_ONLY	
3112	INT	Last FCalib_New RF Update Flag[10 - Component 10]		RD_ONLY	
3113	INT	Last FCalib_New RF Update Flag[11 - Component 11]		RD_ONLY	
3114	INT	Last FCalib_New RF Update Flag[12 - Component 12]		RD_ONLY	
3115	INT	Last FCalib_New RF Update Flag[13 - Component 13]		RD_ONLY	
3116	INT	Last FCalib_New RF Update Flag[14 - Component 14]		RD_ONLY	
3117	INT	Last FCalib_New RF Update Flag[15 - Component 15]		RD_ONLY	
3118	INT	Last FCalib_New RF Update Flag[16 - Component 16]		RD_ONLY	
3119	INT	Last FCalib_New RF Update Flag[17 - Component 17]		RD_ONLY	
3120	INT	Last FCalib_New RF Update Flag[18 - Component 18]		RD_ONLY	
3121	INT	Last FCalib_New RF Update Flag[19 - Component 19]		RD_ONLY	
3122	INT	Last FCalib_New RF Update Flag[20 - Component 20]		RD_ONLY	
3123	INT	Last FCalib_New RF Update Flag[1 - Component 1]		RD_ONLY	
3124	INT	Last FCalib_New RF Update Flag[2 - Component 2]		RD_ONLY	
3125	INT	Last FCalib_New RF Update Flag[3 - Component 3]		RD_ONLY	
3126	INT	Last FCalib_New RF Update Flag[4 - Component 4]		RD_ONLY	
3127	INT	Last FCalib_New RF Update Flag[5 - Component 5]		RD_ONLY	
3128	INT	Last FCalib_New RF Update Flag[6 - Component 6]		RD_ONLY	
3129	INT	Last FCalib_New RF Update Flag[7 - Component 7]		RD_ONLY	
3130	INT	Last FCalib_New RF Update Flag[8 - Component 8]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3131	INT	Last FCalib_New RF Update Flag[9 - Component 9]		RD_ONLY	
3132	INT	Last FCalib_New RF Update Flag[10 - Component 10]		RD_ONLY	
3133	INT	Last FCalib_New RF Update Flag[11 - Component 11]		RD_ONLY	
3134	INT	Last FCalib_New RF Update Flag[12 - Component 12]		RD_ONLY	
3135	INT	Last FCalib_New RF Update Flag[13 - Component 13]		RD_ONLY	
3136	INT	Last FCalib_New RF Update Flag[14 - Component 14]		RD_ONLY	
3137	INT	Last FCalib_New RF Update Flag[15 - Component 15]		RD_ONLY	
3138	INT	Last FCalib_New RF Update Flag[16 - Component 16]		RD_ONLY	
3139	INT	Last FCalib_New RF Update Flag[17 - Component 17]		RD_ONLY	
3140	INT	Last FCalib_New RF Update Flag[18 - Component 18]		RD_ONLY	
3141	INT	Last FCalib_New RF Update Flag[19 - Component 19]		RD_ONLY	
3142	INT	Last FCalib_New RF Update Flag[20 - Component 20]		RD_ONLY	
3143	INT	Last FCalib_New RF Update Flag[1 - Component 1]		RD_ONLY	
3144	INT	Last FCalib_New RF Update Flag[2 - Component 2]		RD_ONLY	
3145	INT	Last FCalib_New RF Update Flag[3 - Component 3]		RD_ONLY	
3146	INT	Last FCalib_New RF Update Flag[4 - Component 4]		RD_ONLY	
3147	INT	Last FCalib_New RF Update Flag[5 - Component 5]		RD_ONLY	
3148	INT	Last FCalib_New RF Update Flag[6 - Component 6]		RD_ONLY	
3149	INT	Last FCalib_New RF Update Flag[7 - Component 7]		RD_ONLY	
3150	INT	Last FCalib_New RF Update Flag[8 - Component 8]		RD_ONLY	
3151	INT	Last FCalib_New RF Update Flag[9 - Component 9]		RD_ONLY	
3152	INT	Last FCalib_New RF Update Flag[10 - Component 10]		RD_ONLY	
3153	INT	Last FCalib_New RF Update Flag[11 - Component 11]		RD_ONLY	
3154	INT	Last FCalib_New RF Update Flag[12 - Component 12]		RD_ONLY	
3155	INT	Last FCalib_New RF Update Flag[13 - Component 13]		RD_ONLY	
3156	INT	Last FCalib_New RF Update Flag[14 - Component 14]		RD_ONLY	
3157	INT	Last FCalib_New RF Update Flag[15 - Component 15]		RD_ONLY	
3158	INT	Last FCalib_New RF Update Flag[16 - Component 16]		RD_ONLY	
3159	INT	Last FCalib_New RF Update Flag[17 - Component 17]		RD_ONLY	
3160	INT	Last FCalib_New RF Update Flag[18 - Component 18]		RD_ONLY	
3161	INT	Last FCalib_New RF Update Flag[19 - Component 19]		RD_ONLY	
3162	INT	Last FCalib_New RF Update Flag[20 - Component 20]		RD_ONLY	
3163	INT	Last FCalib_New RF Update Flag[1 - Component 1]		RD_ONLY	
3164	INT	Last FCalib_New RF Update Flag[2 - Component 2]		RD_ONLY	
3165	INT	Last FCalib_New RF Update Flag[3 - Component 3]		RD_ONLY	
3166	INT	Last FCalib_New RF Update Flag[4 - Component 4]		RD_ONLY	
3167	INT	Last FCalib_New RF Update Flag[5 - Component 5]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
3168	INT	Last FCalib_New RF Update Flag[6 - Component 6]		RD_ONLY	
3169	INT	Last FCalib_New RF Update Flag[7 - Component 7]		RD_ONLY	
3170	INT	Last FCalib_New RF Update Flag[8 - Component 8]		RD_ONLY	
3171	INT	Last FCalib_New RF Update Flag[9 - Component 9]		RD_ONLY	
3172	INT	Last FCalib_New RF Update Flag[10 - Component 10]		RD_ONLY	
3173	INT	Last FCalib_New RF Update Flag[11 - Component 11]		RD_ONLY	
3174	INT	Last FCalib_New RF Update Flag[12 - Component 12]		RD_ONLY	
3175	INT	Last FCalib_New RF Update Flag[13 - Component 13]		RD_ONLY	
3176	INT	Last FCalib_New RF Update Flag[14 - Component 14]		RD_ONLY	
3177	INT	Last FCalib_New RF Update Flag[15 - Component 15]		RD_ONLY	
3178	INT	Last FCalib_New RF Update Flag[16 - Component 16]		RD_ONLY	
3179	INT	Last FCalib_New RF Update Flag[17 - Component 17]		RD_ONLY	
3180	INT	Last FCalib_New RF Update Flag[18 - Component 18]		RD_ONLY	
3181	INT	Last FCalib_New RF Update Flag[19 - Component 19]		RD_ONLY	
3182	INT	Last FCalib_New RF Update Flag[20 - Component 20]		RD_ONLY	
5001	LONG	Last Analy_Cycle Time (1/30th sec)		RD_ONLY	
5002	LONG	Last Calib_Calib Time(1/30th sec)		RD_ONLY	
7001	FLOAT	Last Analy_Mole %[1 - Component 1]		RD_ONLY	
7002	FLOAT	Last Analy_Mole %[2 - Component 2]		RD_ONLY	
7003	FLOAT	Last Analy_Mole %[3 - Component 3]		RD_ONLY	
7004	FLOAT	Last Analy_Mole %[4 - Component 4]		RD_ONLY	
7005	FLOAT	Last Analy_Mole %[5 - Component 5]		RD_ONLY	
7006	FLOAT	Last Analy_Mole %[6 - Component 6]		RD_ONLY	
7007	FLOAT	Last Analy_Mole %[7 - Component 7]		RD_ONLY	
7008	FLOAT	Last Analy_Mole %[8 - Component 8]		RD_ONLY	
7009	FLOAT	Last Analy_Mole %[9 - Component 9]		RD_ONLY	
7010	FLOAT	Last Analy_Mole %[10 - Component 10]		RD_ONLY	
7011	FLOAT	Last Analy_Mole %[11 - Component 11]		RD_ONLY	
7012	FLOAT	Last Analy_Mole %[12 - Component 12]		RD_ONLY	
7013	FLOAT	Last Analy_Mole %[13 - Component 13]		RD_ONLY	
7014	FLOAT	Last Analy_Mole %[14 - Component 14]		RD_ONLY	
7015	FLOAT	Last Analy_Mole %[15 - Component 15]		RD_ONLY	
7016	FLOAT	Last Analy_Mole %[16 - Component 16]		RD_ONLY	
7017	FLOAT	Last Analy_Weight %[1 - Component 1]		RD_ONLY	
7018	FLOAT	Last Analy_Weight %[2 - Component 2]		RD_ONLY	
7019	FLOAT	Last Analy_Weight %[3 - Component 3]		RD_ONLY	
7020	FLOAT	Last Analy_Weight %[4 - Component 4]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7021	FLOAT	Last Analy_Weight %[5 - Component 5]		RD_ONLY	
7022	FLOAT	Last Analy_Weight %[6 - Component 6]		RD_ONLY	
7023	FLOAT	Last Analy_Weight %[7 - Component 7]		RD_ONLY	
7024	FLOAT	Last Analy_Weight %[8 - Component 8]		RD_ONLY	
7025	FLOAT	Last Analy_Weight %[9 - Component 9]		RD_ONLY	
7026	FLOAT	Last Analy_Weight %[10 - Component 10]		RD_ONLY	
7027	FLOAT	Last Analy_Weight %[11 - Component 11]		RD_ONLY	
7028	FLOAT	Last Analy_Weight %[12 - Component 12]		RD_ONLY	
7029	FLOAT	Last Analy_Weight %[13 - Component 13]		RD_ONLY	
7030	FLOAT	Last Analy_Weight %[14 - Component 14]		RD_ONLY	
7031	FLOAT	Last Analy_Weight %[15 - Component 15]		RD_ONLY	
7032	FLOAT	Last Analy_Weight %[16 - Component 16]		RD_ONLY	
7033	FLOAT	Last Analy_ISO CV Sup Dry - Pri		RD_ONLY	
7034	FLOAT	Last Analy_ISO CV Sup Sat - Pri		RD_ONLY	
7035	FLOAT	Last Analy_ISO Real Rel Den Gas - Pri		RD_ONLY	
7036	FLOAT	Last Analy_ISO Z Factor - Pri		RD_ONLY	
7037	FLOAT	Last Analy_ISO Wobbe Index Sup - Pri		RD_ONLY	
7038	FLOAT	Last Analy_Total Unnormalized Conc		RD_ONLY	
7039	FLOAT	Last Analy_ISO Avg Molar Mass		RD_ONLY	
7040	FLOAT	Calc Result[1 - User Cal 1]		RD_ONLY	
7041	FLOAT	Calc Result[2 - User Cal 2]		RD_ONLY	
7042	FLOAT	Calc Result[3 - User Cal 3]		RD_ONLY	
7043	FLOAT	Calc Result[4 - User Cal 4]		RD_ONLY	
7044	FLOAT	Calc Result[5 - User Cal 5]		RD_ONLY	
7045	FLOAT	Unused		RD_ONLY	
7046	FLOAT	Last Analy_ISO CV Sup Dry - Sec		RD_ONLY	
7047	FLOAT	Last Analy_ISO CV Sup Sat - Sec		RD_ONLY	
7048	FLOAT	Last Analy_ISO CV Inf Dry - Sec		RD_ONLY	
7049	FLOAT	Last Analy_ISO CV Inf Sat - Sec		RD_ONLY	
7050	FLOAT	Last Analy_ISO Z Factor - Sec		RD_ONLY	
7051	FLOAT	Last Analy_ISO Real Rel Den Gas - Sec		RD_ONLY	
7052	FLOAT	Last Analy_ISO Gas Den kg/m3 - Sec		RD_ONLY	
7053	FLOAT	Last Analy_ISO Wobbe Index Sup - Sec		RD_ONLY	
7054	FLOAT	Last Analy_ISO Wobbe Index Inf - Sec		RD_ONLY	
7055	FLOAT	Avg[1 - Average 1]		RD_ONLY	
7056	FLOAT	Avg[2 - Average 2]		RD_ONLY	
7057	FLOAT	Avg[3 - Average 3]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7058	FLOAT	Avg[4 - Average 4]		RD_ONLY	
7059	FLOAT	Avg[5 - Average 5]		RD_ONLY	
7060	FLOAT	Avg[6 - Average 6]		RD_ONLY	
7061	FLOAT	Avg[7 - Average 7]		RD_ONLY	
7062	FLOAT	Avg[8 - Average 8]		RD_ONLY	
7063	FLOAT	Avg[9 - Average 9]		RD_ONLY	
7064	FLOAT	Avg[10 - Average 10]		RD_ONLY	
7065	FLOAT	Avg[11 - Average 11]		RD_ONLY	
7066	FLOAT	Avg[12 - Average 12]		RD_ONLY	
7067	FLOAT	Avg[13 - Average 13]		RD_ONLY	
7068	FLOAT	Avg[14 - Average 14]		RD_ONLY	
7069	FLOAT	Avg[15 - Average 15]		RD_ONLY	
7070	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
7071	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
7072	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
7073	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
7074	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
7075	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
7076	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
7077	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
7078	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	
7079	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
7080	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
7081	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	
7082	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
7083	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
7084	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
7085	FLOAT	Current Value[1 - Analog Input 1]		RD_ONLY	
7086	FLOAT	Current Value[2 - Analog Input 2]		RD_ONLY	
7087	FLOAT	Last Analy_ISO CV Inf Dry - Pri		RD_ONLY	
7088	FLOAT	Last Analy_ISO CV Inf Sat - Pri		RD_ONLY	
7089	FLOAT	Last Analy_ISO Wobbe Index Inf - Pri		RD_ONLY	
7090	FLOAT	Last Analy_ISO Gas Den kg/m3 - Pri		RD_ONLY	
7091	FLOAT	Last FCalib_Total Calibration Runs		RD_ONLY	
7092	FLOAT	Last FCalib_Total Average Runs		RD_ONLY	
7093	FLOAT	Auto Calibration Start Time		RD_ONLY	hhmm
7094	FLOAT	GC Control_Stream Sequence Select		RD_WR	

Register #	Data type	Variable	Record #	Access	Format
7095	FLOAT	Last Analy_Response Factor[1 - Component 1]		RD_ONLY	
7096	FLOAT	Last Analy_Response Factor[2 - Component 2]		RD_ONLY	
7097	FLOAT	Last Analy_Response Factor[3 - Component 3]		RD_ONLY	
7098	FLOAT	Last Analy_Response Factor[4 - Component 4]		RD_ONLY	
7099	FLOAT	Last Analy_Response Factor[5 - Component 5]		RD_ONLY	
7100	FLOAT	Last Analy_Response Factor[6 - Component 6]		RD_ONLY	
7101	FLOAT	Last Analy_Response Factor[7 - Component 7]		RD_ONLY	
7102	FLOAT	Last Analy_Response Factor[8 - Component 8]		RD_ONLY	
7103	FLOAT	Last Analy_Response Factor[9 - Component 9]		RD_ONLY	
7104	FLOAT	Last Analy_Response Factor[10 - Component 10]		RD_ONLY	
7105	FLOAT	Last Analy_Response Factor[11 - Component 11]		RD_ONLY	
7106	FLOAT	Last Analy_Response Factor[12 - Component 12]		RD_ONLY	
7107	FLOAT	Last Analy_Response Factor[13 - Component 13]		RD_ONLY	
7108	FLOAT	Last Analy_Response Factor[14 - Component 14]		RD_ONLY	
7109	FLOAT	Last Analy_Response Factor[15 - Component 15]		RD_ONLY	
7110	FLOAT	Last Analy_Response Factor[16 - Component 16]		RD_ONLY	
7111	FLOAT	Last FCalib_ISO CV Sup Dry - Pri		RD_ONLY	
7112	FLOAT	Last FCalib_ISO CV Sup Sat - Pri		RD_ONLY	
7113	FLOAT	Last FCalib_ISO CV Inf Dry - Pri		RD_ONLY	
7114	FLOAT	Last FCalib_ISO CV Inf Sat - Pri		RD_ONLY	
7115	FLOAT	Last FCalib_ISO Z Factor - Pri		RD_ONLY	
7116	FLOAT	Last FCalib_ISO Real Rel Den Gas - Pri		RD_ONLY	
7117	FLOAT	Last FCalib_ISO Gas Den kg/m3 - Pri		RD_ONLY	
7118	FLOAT	Last FCalib_ISO Wobbe Index Sup - Pri		RD_ONLY	
7119	FLOAT	Last FCalib_ISO Wobbe Index Inf - Pri		RD_ONLY	
7120	FLOAT	Last FCalib_ISO Avg Molar Mass		RD_ONLY	
7121	FLOAT	Last FCalib_Total Unnormalized Conc		RD_ONLY	
7122	FLOAT	Last Calib_Stream Number		RD_ONLY	
7123	FLOAT	Last Analy_GS(M)R Incomp Combustion Factor		RD_ONLY	
7124	FLOAT	Last Analy_GS(M)R Soot Index		RD_ONLY	
7125	FLOAT	Last Analy_Ratio of Latent Heat Cap		RD_ONLY	
7126	FLOAT	Avg[1 - Average 1]		RD_ONLY	
7127	FLOAT	Avg[2 - Average 2]		RD_ONLY	
7128	FLOAT	Avg[3 - Average 3]		RD_ONLY	
7129	FLOAT	Avg[4 - Average 4]		RD_ONLY	
7130	FLOAT	Avg[5 - Average 5]		RD_ONLY	
7131	FLOAT	Avg[6 - Average 6]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7132	FLOAT	Avg[7 - Average 7]		RD_ONLY	
7133	FLOAT	Avg[8 - Average 8]		RD_ONLY	
7134	FLOAT	Avg[9 - Average 9]		RD_ONLY	
7135	FLOAT	Avg[10 - Average 10]		RD_ONLY	
7136	FLOAT	Avg[11 - Average 11]		RD_ONLY	
7137	FLOAT	Avg[12 - Average 12]		RD_ONLY	
7138	FLOAT	Avg[13 - Average 13]		RD_ONLY	
7139	FLOAT	Avg[14 - Average 14]		RD_ONLY	
7140	FLOAT	Avg[15 - Average 15]		RD_ONLY	
7141	FLOAT	Avg[16 - Average 16]		RD_ONLY	
7142	FLOAT	Avg[17 - Average 17]		RD_ONLY	
7143	FLOAT	Avg[18 - Average 18]		RD_ONLY	
7144	FLOAT	Avg[19 - Average 19]		RD_ONLY	
7145	FLOAT	Avg[20 - Average 20]		RD_ONLY	
7146	FLOAT	Avg[21 - Average 21]		RD_ONLY	
7147	FLOAT	Avg[22 - Average 22]		RD_ONLY	
7148	FLOAT	Avg[23 - Average 23]		RD_ONLY	
7149	FLOAT	Avg[24 - Average 24]		RD_ONLY	
7150	FLOAT	Avg[25 - Average 25]		RD_ONLY	
7151	FLOAT	Avg[26 - Average 26]		RD_ONLY	
7152	FLOAT	Avg[27 - Average 27]		RD_ONLY	
7153	FLOAT	Avg[28 - Average 28]		RD_ONLY	
7154	FLOAT	Avg[29 - Average 29]		RD_ONLY	
7155	FLOAT	Avg[30 - Average 30]		RD_ONLY	
7156	FLOAT	Avg[31 - Average 31]		RD_ONLY	
7157	FLOAT	Avg[32 - Average 32]		RD_ONLY	
7158	FLOAT	Avg[33 - Average 33]		RD_ONLY	
7159	FLOAT	Avg[34 - Average 34]		RD_ONLY	
7160	FLOAT	Avg[35 - Average 35]		RD_ONLY	
7161	FLOAT	Avg[36 - Average 36]		RD_ONLY	
7162	FLOAT	Max[1 - Average 1]		RD_ONLY	
7163	FLOAT	Max[2 - Average 2]		RD_ONLY	
7164	FLOAT	Max[3 - Average 3]		RD_ONLY	
7165	FLOAT	Max[4 - Average 4]		RD_ONLY	
7166	FLOAT	Max[5 - Average 5]		RD_ONLY	
7167	FLOAT	Max[6 - Average 6]		RD_ONLY	
7168	FLOAT	Max[7 - Average 7]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7169	FLOAT	Max[8 - Average 8]		RD_ONLY	
7170	FLOAT	Max[9 - Average 9]		RD_ONLY	
7171	FLOAT	Max[10 - Average 10]		RD_ONLY	
7172	FLOAT	Max[11 - Average 11]		RD_ONLY	
7173	FLOAT	Max[12 - Average 12]		RD_ONLY	
7174	FLOAT	Max[13 - Average 13]		RD_ONLY	
7175	FLOAT	Max[14 - Average 14]		RD_ONLY	
7176	FLOAT	Max[15 - Average 15]		RD_ONLY	
7177	FLOAT	Max[16 - Average 16]		RD_ONLY	
7178	FLOAT	Max[17 - Average 17]		RD_ONLY	
7179	FLOAT	Max[18 - Average 18]		RD_ONLY	
7180	FLOAT	Max[19 - Average 19]		RD_ONLY	
7181	FLOAT	Max[20 - Average 20]		RD_ONLY	
7182	FLOAT	Max[21 - Average 21]		RD_ONLY	
7183	FLOAT	Max[22 - Average 22]		RD_ONLY	
7184	FLOAT	Max[23 - Average 23]		RD_ONLY	
7185	FLOAT	Max[24 - Average 24]		RD_ONLY	
7186	FLOAT	Max[25 - Average 25]		RD_ONLY	
7187	FLOAT	Max[26 - Average 26]		RD_ONLY	
7188	FLOAT	Max[27 - Average 27]		RD_ONLY	
7189	FLOAT	Max[28 - Average 28]		RD_ONLY	
7190	FLOAT	Max[29 - Average 29]		RD_ONLY	
7191	FLOAT	Max[30 - Average 30]		RD_ONLY	
7192	FLOAT	Max[31 - Average 31]		RD_ONLY	
7193	FLOAT	Max[32 - Average 32]		RD_ONLY	
7194	FLOAT	Max[33 - Average 33]		RD_ONLY	
7195	FLOAT	Max[34 - Average 34]		RD_ONLY	
7196	FLOAT	Max[35 - Average 35]		RD_ONLY	
7197	FLOAT	Max[36 - Average 36]		RD_ONLY	
7198	FLOAT	Min[1 - Average 1]		RD_ONLY	
7199	FLOAT	Min[2 - Average 2]		RD_ONLY	
7200	FLOAT	Min[3 - Average 3]		RD_ONLY	
7201	FLOAT	Min[4 - Average 4]		RD_ONLY	
7202	FLOAT	Min[5 - Average 5]		RD_ONLY	
7203	FLOAT	Min[6 - Average 6]		RD_ONLY	
7204	FLOAT	Min[7 - Average 7]		RD_ONLY	
7205	FLOAT	Min[8 - Average 8]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7206	FLOAT	Min[9 - Average 9]		RD_ONLY	
7207	FLOAT	Min[10 - Average 10]		RD_ONLY	
7208	FLOAT	Min[11 - Average 11]		RD_ONLY	
7209	FLOAT	Min[12 - Average 12]		RD_ONLY	
7210	FLOAT	Min[13 - Average 13]		RD_ONLY	
7211	FLOAT	Min[14 - Average 14]		RD_ONLY	
7212	FLOAT	Min[15 - Average 15]		RD_ONLY	
7213	FLOAT	Min[16 - Average 16]		RD_ONLY	
7214	FLOAT	Min[17 - Average 17]		RD_ONLY	
7215	FLOAT	Min[18 - Average 18]		RD_ONLY	
7216	FLOAT	Min[19 - Average 19]		RD_ONLY	
7217	FLOAT	Min[20 - Average 20]		RD_ONLY	
7218	FLOAT	Min[21 - Average 21]		RD_ONLY	
7219	FLOAT	Min[22 - Average 22]		RD_ONLY	
7220	FLOAT	Min[23 - Average 23]		RD_ONLY	
7221	FLOAT	Min[24 - Average 24]		RD_ONLY	
7222	FLOAT	Min[25 - Average 25]		RD_ONLY	
7223	FLOAT	Min[26 - Average 26]		RD_ONLY	
7224	FLOAT	Min[27 - Average 27]		RD_ONLY	
7225	FLOAT	Min[28 - Average 28]		RD_ONLY	
7226	FLOAT	Min[29 - Average 29]		RD_ONLY	
7227	FLOAT	Min[30 - Average 30]		RD_ONLY	
7228	FLOAT	Min[31 - Average 31]		RD_ONLY	
7229	FLOAT	Min[32 - Average 32]		RD_ONLY	
7230	FLOAT	Min[33 - Average 33]		RD_ONLY	
7231	FLOAT	Min[34 - Average 34]		RD_ONLY	
7232	FLOAT	Min[35 - Average 35]		RD_ONLY	
7233	FLOAT	Min[36 - Average 36]		RD_ONLY	
7234	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
7235	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
7236	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
7237	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
7238	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
7239	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
7240	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
7241	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
7242	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7243	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
7244	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
7245	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	
7246	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
7247	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
7248	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
7249	FLOAT	Archive_Avg[16 - Average 16]	1	RD_ONLY	
7250	FLOAT	Archive_Avg[17 - Average 17]	1	RD_ONLY	
7251	FLOAT	Archive_Avg[18 - Average 18]	1	RD_ONLY	
7252	FLOAT	Archive_Avg[19 - Average 19]	1	RD_ONLY	
7253	FLOAT	Archive_Avg[20 - Average 20]	1	RD_ONLY	
7254	FLOAT	Archive_Avg[21 - Average 21]	1	RD_ONLY	
7255	FLOAT	Archive_Avg[22 - Average 22]	1	RD_ONLY	
7256	FLOAT	Archive_Avg[23 - Average 23]	1	RD_ONLY	
7257	FLOAT	Archive_Avg[24 - Average 24]	1	RD_ONLY	
7258	FLOAT	Archive_Avg[25 - Average 25]	1	RD_ONLY	
7259	FLOAT	Archive_Avg[26 - Average 26]	1	RD_ONLY	
7260	FLOAT	Archive_Avg[27 - Average 27]	1	RD_ONLY	
7261	FLOAT	Archive_Avg[28 - Average 28]	1	RD_ONLY	
7262	FLOAT	Archive_Avg[29 - Average 29]	1	RD_ONLY	
7263	FLOAT	Archive_Avg[30 - Average 30]	1	RD_ONLY	
7264	FLOAT	Archive_Avg[31 - Average 31]	1	RD_ONLY	
7265	FLOAT	Archive_Avg[32 - Average 32]	1	RD_ONLY	
7266	FLOAT	Archive_Avg[33 - Average 33]	1	RD_ONLY	
7267	FLOAT	Archive_Avg[34 - Average 34]	1	RD_ONLY	
7268	FLOAT	Archive_Avg[35 - Average 35]	1	RD_ONLY	
7269	FLOAT	Archive_Avg[36 - Average 36]	1	RD_ONLY	
7270	FLOAT	Archive_Max[1 - Average 1]	1	RD_ONLY	
7271	FLOAT	Archive_Max[2 - Average 2]	1	RD_ONLY	
7272	FLOAT	Archive_Max[3 - Average 3]	1	RD_ONLY	
7273	FLOAT	Archive_Max[4 - Average 4]	1	RD_ONLY	
7274	FLOAT	Archive_Max[5 - Average 5]	1	RD_ONLY	
7275	FLOAT	Archive_Max[6 - Average 6]	1	RD_ONLY	
7276	FLOAT	Archive_Max[7 - Average 7]	1	RD_ONLY	
7277	FLOAT	Archive_Max[8 - Average 8]	1	RD_ONLY	
7278	FLOAT	Archive_Max[9 - Average 9]	1	RD_ONLY	
7279	FLOAT	Archive_Max[10 - Average 10]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7280	FLOAT	Archive_Max[11 - Average 11]	1	RD_ONLY	
7281	FLOAT	Archive_Max[12 - Average 12]	1	RD_ONLY	
7282	FLOAT	Archive_Max[13 - Average 13]	1	RD_ONLY	
7283	FLOAT	Archive_Max[14 - Average 14]	1	RD_ONLY	
7284	FLOAT	Archive_Max[15 - Average 15]	1	RD_ONLY	
7285	FLOAT	Archive_Max[16 - Average 16]	1	RD_ONLY	
7286	FLOAT	Archive_Max[17 - Average 17]	1	RD_ONLY	
7287	FLOAT	Archive_Max[18 - Average 18]	1	RD_ONLY	
7288	FLOAT	Archive_Max[19 - Average 19]	1	RD_ONLY	
7289	FLOAT	Archive_Max[20 - Average 20]	1	RD_ONLY	
7290	FLOAT	Archive_Max[21 - Average 21]	1	RD_ONLY	
7291	FLOAT	Archive_Max[22 - Average 22]	1	RD_ONLY	
7292	FLOAT	Archive_Max[23 - Average 23]	1	RD_ONLY	
7293	FLOAT	Archive_Max[24 - Average 24]	1	RD_ONLY	
7294	FLOAT	Archive_Max[25 - Average 25]	1	RD_ONLY	
7295	FLOAT	Archive_Max[26 - Average 26]	1	RD_ONLY	
7296	FLOAT	Archive_Max[27 - Average 27]	1	RD_ONLY	
7297	FLOAT	Archive_Max[28 - Average 28]	1	RD_ONLY	
7298	FLOAT	Archive_Max[29 - Average 29]	1	RD_ONLY	
7299	FLOAT	Archive_Max[30 - Average 30]	1	RD_ONLY	
7300	FLOAT	Archive_Max[31 - Average 31]	1	RD_ONLY	
7301	FLOAT	Archive_Max[32 - Average 32]	1	RD_ONLY	
7302	FLOAT	Archive_Max[33 - Average 33]	1	RD_ONLY	
7303	FLOAT	Archive_Max[34 - Average 34]	1	RD_ONLY	
7304	FLOAT	Archive_Max[35 - Average 35]	1	RD_ONLY	
7305	FLOAT	Archive_Max[36 - Average 36]	1	RD_ONLY	
7306	FLOAT	Archive_Min[1 - Average 1]	1	RD_ONLY	
7307	FLOAT	Archive_Min[2 - Average 2]	1	RD_ONLY	
7308	FLOAT	Archive_Min[3 - Average 3]	1	RD_ONLY	
7309	FLOAT	Archive_Min[4 - Average 4]	1	RD_ONLY	
7310	FLOAT	Archive_Min[5 - Average 5]	1	RD_ONLY	
7311	FLOAT	Archive_Min[6 - Average 6]	1	RD_ONLY	
7312	FLOAT	Archive_Min[7 - Average 7]	1	RD_ONLY	
7313	FLOAT	Archive_Min[8 - Average 8]	1	RD_ONLY	
7314	FLOAT	Archive_Min[9 - Average 9]	1	RD_ONLY	
7315	FLOAT	Archive_Min[10 - Average 10]	1	RD_ONLY	
7316	FLOAT	Archive_Min[11 - Average 11]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7317	FLOAT	Archive_Min[12 - Average 12]	1	RD_ONLY	
7318	FLOAT	Archive_Min[13 - Average 13]	1	RD_ONLY	
7319	FLOAT	Archive_Min[14 - Average 14]	1	RD_ONLY	
7320	FLOAT	Archive_Min[15 - Average 15]	1	RD_ONLY	
7321	FLOAT	Archive_Min[16 - Average 16]	1	RD_ONLY	
7322	FLOAT	Archive_Min[17 - Average 17]	1	RD_ONLY	
7323	FLOAT	Archive_Min[18 - Average 18]	1	RD_ONLY	
7324	FLOAT	Archive_Min[19 - Average 19]	1	RD_ONLY	
7325	FLOAT	Archive_Min[20 - Average 20]	1	RD_ONLY	
7326	FLOAT	Archive_Min[21 - Average 21]	1	RD_ONLY	
7327	FLOAT	Archive_Min[22 - Average 22]	1	RD_ONLY	
7328	FLOAT	Archive_Min[23 - Average 23]	1	RD_ONLY	
7329	FLOAT	Archive_Min[24 - Average 24]	1	RD_ONLY	
7330	FLOAT	Archive_Min[25 - Average 25]	1	RD_ONLY	
7331	FLOAT	Archive_Min[26 - Average 26]	1	RD_ONLY	
7332	FLOAT	Archive_Min[27 - Average 27]	1	RD_ONLY	
7333	FLOAT	Archive_Min[28 - Average 28]	1	RD_ONLY	
7334	FLOAT	Archive_Min[29 - Average 29]	1	RD_ONLY	
7335	FLOAT	Archive_Min[30 - Average 30]	1	RD_ONLY	
7336	FLOAT	Archive_Min[31 - Average 31]	1	RD_ONLY	
7337	FLOAT	Archive_Min[32 - Average 32]	1	RD_ONLY	
7338	FLOAT	Archive_Min[33 - Average 33]	1	RD_ONLY	
7339	FLOAT	Archive_Min[34 - Average 34]	1	RD_ONLY	
7340	FLOAT	Archive_Min[35 - Average 35]	1	RD_ONLY	
7341	FLOAT	Archive_Min[36 - Average 36]	1	RD_ONLY	
7342	FLOAT	Archive_Avg[1 - Average 1]	2	RD_ONLY	
7343	FLOAT	Archive_Avg[2 - Average 2]	2	RD_ONLY	
7344	FLOAT	Archive_Avg[3 - Average 3]	2	RD_ONLY	
7345	FLOAT	Archive_Avg[4 - Average 4]	2	RD_ONLY	
7346	FLOAT	Archive_Avg[5 - Average 5]	2	RD_ONLY	
7347	FLOAT	Archive_Avg[6 - Average 6]	2	RD_ONLY	
7348	FLOAT	Archive_Avg[7 - Average 7]	2	RD_ONLY	
7349	FLOAT	Archive_Avg[8 - Average 8]	2	RD_ONLY	
7350	FLOAT	Archive_Avg[9 - Average 9]	2	RD_ONLY	
7351	FLOAT	Archive_Avg[10 - Average 10]	2	RD_ONLY	
7352	FLOAT	Archive_Avg[11 - Average 11]	2	RD_ONLY	
7353	FLOAT	Archive_Avg[12 - Average 12]	2	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7354	FLOAT	Archive_Avg[13 - Average 13]	2	RD_ONLY	
7355	FLOAT	Archive_Avg[14 - Average 14]	2	RD_ONLY	
7356	FLOAT	Archive_Avg[15 - Average 15]	2	RD_ONLY	
7357	FLOAT	Archive_Avg[16 - Average 16]	2	RD_ONLY	
7358	FLOAT	Archive_Avg[17 - Average 17]	2	RD_ONLY	
7359	FLOAT	Archive_Avg[18 - Average 18]	2	RD_ONLY	
7360	FLOAT	Archive_Avg[19 - Average 19]	2	RD_ONLY	
7361	FLOAT	Archive_Avg[20 - Average 20]	2	RD_ONLY	
7362	FLOAT	Archive_Avg[21 - Average 21]	2	RD_ONLY	
7363	FLOAT	Archive_Avg[22 - Average 22]	2	RD_ONLY	
7364	FLOAT	Archive_Avg[23 - Average 23]	2	RD_ONLY	
7365	FLOAT	Archive_Avg[24 - Average 24]	2	RD_ONLY	
7366	FLOAT	Archive_Avg[25 - Average 25]	2	RD_ONLY	
7367	FLOAT	Archive_Avg[26 - Average 26]	2	RD_ONLY	
7368	FLOAT	Archive_Avg[27 - Average 27]	2	RD_ONLY	
7369	FLOAT	Archive_Avg[28 - Average 28]	2	RD_ONLY	
7370	FLOAT	Archive_Avg[29 - Average 29]	2	RD_ONLY	
7371	FLOAT	Archive_Avg[30 - Average 30]	2	RD_ONLY	
7372	FLOAT	Archive_Avg[31 - Average 31]	2	RD_ONLY	
7373	FLOAT	Archive_Avg[32 - Average 32]	2	RD_ONLY	
7374	FLOAT	Archive_Avg[33 - Average 33]	2	RD_ONLY	
7375	FLOAT	Archive_Avg[34 - Average 34]	2	RD_ONLY	
7376	FLOAT	Archive_Avg[35 - Average 35]	2	RD_ONLY	
7377	FLOAT	Archive_Avg[36 - Average 36]	2	RD_ONLY	
7378	FLOAT	Archive_Max[1 - Average 1]	2	RD_ONLY	
7379	FLOAT	Archive_Max[2 - Average 2]	2	RD_ONLY	
7380	FLOAT	Archive_Max[3 - Average 3]	2	RD_ONLY	
7381	FLOAT	Archive_Max[4 - Average 4]	2	RD_ONLY	
7382	FLOAT	Archive_Max[5 - Average 5]	2	RD_ONLY	
7383	FLOAT	Archive_Max[6 - Average 6]	2	RD_ONLY	
7384	FLOAT	Archive_Max[7 - Average 7]	2	RD_ONLY	
7385	FLOAT	Archive_Max[8 - Average 8]	2	RD_ONLY	
7386	FLOAT	Archive_Max[9 - Average 9]	2	RD_ONLY	
7387	FLOAT	Archive_Max[10 - Average 10]	2	RD_ONLY	
7388	FLOAT	Archive_Max[11 - Average 11]	2	RD_ONLY	
7389	FLOAT	Archive_Max[12 - Average 12]	2	RD_ONLY	
7390	FLOAT	Archive_Max[13 - Average 13]	2	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7391	FLOAT	Archive_Max[14 - Average 14]	2	RD_ONLY	
7392	FLOAT	Archive_Max[15 - Average 15]	2	RD_ONLY	
7393	FLOAT	Archive_Max[16 - Average 16]	2	RD_ONLY	
7394	FLOAT	Archive_Max[17 - Average 17]	2	RD_ONLY	
7395	FLOAT	Archive_Max[18 - Average 18]	2	RD_ONLY	
7396	FLOAT	Archive_Max[19 - Average 19]	2	RD_ONLY	
7397	FLOAT	Archive_Max[20 - Average 20]	2	RD_ONLY	
7398	FLOAT	Archive_Max[21 - Average 21]	2	RD_ONLY	
7399	FLOAT	Archive_Max[22 - Average 22]	2	RD_ONLY	
7400	FLOAT	Archive_Max[23 - Average 23]	2	RD_ONLY	
7401	FLOAT	Archive_Max[24 - Average 24]	2	RD_ONLY	
7402	FLOAT	Archive_Max[25 - Average 25]	2	RD_ONLY	
7403	FLOAT	Archive_Max[26 - Average 26]	2	RD_ONLY	
7404	FLOAT	Archive_Max[27 - Average 27]	2	RD_ONLY	
7405	FLOAT	Archive_Max[28 - Average 28]	2	RD_ONLY	
7406	FLOAT	Archive_Max[29 - Average 29]	2	RD_ONLY	
7407	FLOAT	Archive_Max[30 - Average 30]	2	RD_ONLY	
7408	FLOAT	Archive_Max[31 - Average 31]	2	RD_ONLY	
7409	FLOAT	Archive_Max[32 - Average 32]	2	RD_ONLY	
7410	FLOAT	Archive_Max[33 - Average 33]	2	RD_ONLY	
7411	FLOAT	Archive_Max[34 - Average 34]	2	RD_ONLY	
7412	FLOAT	Archive_Max[35 - Average 35]	2	RD_ONLY	
7413	FLOAT	Archive_Max[36 - Average 36]	2	RD_ONLY	
7414	FLOAT	Archive_Min[1 - Average 1]	2	RD_ONLY	
7415	FLOAT	Archive_Min[2 - Average 2]	2	RD_ONLY	
7416	FLOAT	Archive_Min[3 - Average 3]	2	RD_ONLY	
7417	FLOAT	Archive_Min[4 - Average 4]	2	RD_ONLY	
7418	FLOAT	Archive_Min[5 - Average 5]	2	RD_ONLY	
7419	FLOAT	Archive_Min[6 - Average 6]	2	RD_ONLY	
7420	FLOAT	Archive_Min[7 - Average 7]	2	RD_ONLY	
7421	FLOAT	Archive_Min[8 - Average 8]	2	RD_ONLY	
7422	FLOAT	Archive_Min[9 - Average 9]	2	RD_ONLY	
7423	FLOAT	Archive_Min[10 - Average 10]	2	RD_ONLY	
7424	FLOAT	Archive_Min[11 - Average 11]	2	RD_ONLY	
7425	FLOAT	Archive_Min[12 - Average 12]	2	RD_ONLY	
7426	FLOAT	Archive_Min[13 - Average 13]	2	RD_ONLY	
7427	FLOAT	Archive_Min[14 - Average 14]	2	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7428	FLOAT	Archive_Min[15 - Average 15]	2	RD_ONLY	
7429	FLOAT	Archive_Min[16 - Average 16]	2	RD_ONLY	
7430	FLOAT	Archive_Min[17 - Average 17]	2	RD_ONLY	
7431	FLOAT	Archive_Min[18 - Average 18]	2	RD_ONLY	
7432	FLOAT	Archive_Min[19 - Average 19]	2	RD_ONLY	
7433	FLOAT	Archive_Min[20 - Average 20]	2	RD_ONLY	
7434	FLOAT	Archive_Min[21 - Average 21]	2	RD_ONLY	
7435	FLOAT	Archive_Min[22 - Average 22]	2	RD_ONLY	
7436	FLOAT	Archive_Min[23 - Average 23]	2	RD_ONLY	
7437	FLOAT	Archive_Min[24 - Average 24]	2	RD_ONLY	
7438	FLOAT	Archive_Min[25 - Average 25]	2	RD_ONLY	
7439	FLOAT	Archive_Min[26 - Average 26]	2	RD_ONLY	
7440	FLOAT	Archive_Min[27 - Average 27]	2	RD_ONLY	
7441	FLOAT	Archive_Min[28 - Average 28]	2	RD_ONLY	
7442	FLOAT	Archive_Min[29 - Average 29]	2	RD_ONLY	
7443	FLOAT	Archive_Min[30 - Average 30]	2	RD_ONLY	
7444	FLOAT	Archive_Min[31 - Average 31]	2	RD_ONLY	
7445	FLOAT	Archive_Min[32 - Average 32]	2	RD_ONLY	
7446	FLOAT	Archive_Min[33 - Average 33]	2	RD_ONLY	
7447	FLOAT	Archive_Min[34 - Average 34]	2	RD_ONLY	
7448	FLOAT	Archive_Min[35 - Average 35]	2	RD_ONLY	
7449	FLOAT	Archive_Min[36 - Average 36]	2	RD_ONLY	
7450	FLOAT	Archive_Avg[1 - Average 1]	3	RD_ONLY	
7451	FLOAT	Archive_Avg[2 - Average 2]	3	RD_ONLY	
7452	FLOAT	Archive_Avg[3 - Average 3]	3	RD_ONLY	
7453	FLOAT	Archive_Avg[4 - Average 4]	3	RD_ONLY	
7454	FLOAT	Archive_Avg[5 - Average 5]	3	RD_ONLY	
7455	FLOAT	Archive_Avg[6 - Average 6]	3	RD_ONLY	
7456	FLOAT	Archive_Avg[7 - Average 7]	3	RD_ONLY	
7457	FLOAT	Archive_Avg[8 - Average 8]	3	RD_ONLY	
7458	FLOAT	Archive_Avg[9 - Average 9]	3	RD_ONLY	
7459	FLOAT	Archive_Avg[10 - Average 10]	3	RD_ONLY	
7460	FLOAT	Archive_Avg[11 - Average 11]	3	RD_ONLY	
7461	FLOAT	Archive_Avg[12 - Average 12]	3	RD_ONLY	
7462	FLOAT	Archive_Avg[13 - Average 13]	3	RD_ONLY	
7463	FLOAT	Archive_Avg[14 - Average 14]	3	RD_ONLY	
7464	FLOAT	Archive_Avg[15 - Average 15]	3	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7465	FLOAT	Archive_Avg[16 - Average 16]	3	RD_ONLY	
7466	FLOAT	Archive_Avg[17 - Average 17]	3	RD_ONLY	
7467	FLOAT	Archive_Avg[18 - Average 18]	3	RD_ONLY	
7468	FLOAT	Archive_Avg[19 - Average 19]	3	RD_ONLY	
7469	FLOAT	Archive_Avg[20 - Average 20]	3	RD_ONLY	
7470	FLOAT	Archive_Avg[21 - Average 21]	3	RD_ONLY	
7471	FLOAT	Archive_Avg[22 - Average 22]	3	RD_ONLY	
7472	FLOAT	Archive_Avg[23 - Average 23]	3	RD_ONLY	
7473	FLOAT	Archive_Avg[24 - Average 24]	3	RD_ONLY	
7474	FLOAT	Archive_Avg[25 - Average 25]	3	RD_ONLY	
7475	FLOAT	Archive_Avg[26 - Average 26]	3	RD_ONLY	
7476	FLOAT	Archive_Avg[27 - Average 27]	3	RD_ONLY	
7477	FLOAT	Archive_Avg[28 - Average 28]	3	RD_ONLY	
7478	FLOAT	Archive_Avg[29 - Average 29]	3	RD_ONLY	
7479	FLOAT	Archive_Avg[30 - Average 30]	3	RD_ONLY	
7480	FLOAT	Archive_Avg[31 - Average 31]	3	RD_ONLY	
7481	FLOAT	Archive_Avg[32 - Average 32]	3	RD_ONLY	
7482	FLOAT	Archive_Avg[33 - Average 33]	3	RD_ONLY	
7483	FLOAT	Archive_Avg[34 - Average 34]	3	RD_ONLY	
7484	FLOAT	Archive_Avg[35 - Average 35]	3	RD_ONLY	
7485	FLOAT	Archive_Avg[36 - Average 36]	3	RD_ONLY	
7486	FLOAT	Archive_Max[1 - Average 1]	3	RD_ONLY	
7487	FLOAT	Archive_Max[2 - Average 2]	3	RD_ONLY	
7488	FLOAT	Archive_Max[3 - Average 3]	3	RD_ONLY	
7489	FLOAT	Archive_Max[4 - Average 4]	3	RD_ONLY	
7490	FLOAT	Archive_Max[5 - Average 5]	3	RD_ONLY	
7491	FLOAT	Archive_Max[6 - Average 6]	3	RD_ONLY	
7492	FLOAT	Archive_Max[7 - Average 7]	3	RD_ONLY	
7493	FLOAT	Archive_Max[8 - Average 8]	3	RD_ONLY	
7494	FLOAT	Archive_Max[9 - Average 9]	3	RD_ONLY	
7495	FLOAT	Archive_Max[10 - Average 10]	3	RD_ONLY	
7496	FLOAT	Archive_Max[11 - Average 11]	3	RD_ONLY	
7497	FLOAT	Archive_Max[12 - Average 12]	3	RD_ONLY	
7498	FLOAT	Archive_Max[13 - Average 13]	3	RD_ONLY	
7499	FLOAT	Archive_Max[14 - Average 14]	3	RD_ONLY	
7500	FLOAT	Archive_Max[15 - Average 15]	3	RD_ONLY	
7501	FLOAT	Archive_Max[16 - Average 16]	3	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7502	FLOAT	Archive_Max[17 - Average 17]	3	RD_ONLY	
7503	FLOAT	Archive_Max[18 - Average 18]	3	RD_ONLY	
7504	FLOAT	Archive_Max[19 - Average 19]	3	RD_ONLY	
7505	FLOAT	Archive_Max[20 - Average 20]	3	RD_ONLY	
7506	FLOAT	Archive_Max[21 - Average 21]	3	RD_ONLY	
7507	FLOAT	Archive_Max[22 - Average 22]	3	RD_ONLY	
7508	FLOAT	Archive_Max[23 - Average 23]	3	RD_ONLY	
7509	FLOAT	Archive_Max[24 - Average 24]	3	RD_ONLY	
7510	FLOAT	Archive_Max[25 - Average 25]	3	RD_ONLY	
7511	FLOAT	Archive_Max[26 - Average 26]	3	RD_ONLY	
7512	FLOAT	Archive_Max[27 - Average 27]	3	RD_ONLY	
7513	FLOAT	Archive_Max[28 - Average 28]	3	RD_ONLY	
7514	FLOAT	Archive_Max[29 - Average 29]	3	RD_ONLY	
7515	FLOAT	Archive_Max[30 - Average 30]	3	RD_ONLY	
7516	FLOAT	Archive_Max[31 - Average 31]	3	RD_ONLY	
7517	FLOAT	Archive_Max[32 - Average 32]	3	RD_ONLY	
7518	FLOAT	Archive_Max[33 - Average 33]	3	RD_ONLY	
7519	FLOAT	Archive_Max[34 - Average 34]	3	RD_ONLY	
7520	FLOAT	Archive_Max[35 - Average 35]	3	RD_ONLY	
7521	FLOAT	Archive_Max[36 - Average 36]	3	RD_ONLY	
7522	FLOAT	Archive_Min[1 - Average 1]	3	RD_ONLY	
7523	FLOAT	Archive_Min[2 - Average 2]	3	RD_ONLY	
7524	FLOAT	Archive_Min[3 - Average 3]	3	RD_ONLY	
7525	FLOAT	Archive_Min[4 - Average 4]	3	RD_ONLY	
7526	FLOAT	Archive_Min[5 - Average 5]	3	RD_ONLY	
7527	FLOAT	Archive_Min[6 - Average 6]	3	RD_ONLY	
7528	FLOAT	Archive_Min[7 - Average 7]	3	RD_ONLY	
7529	FLOAT	Archive_Min[8 - Average 8]	3	RD_ONLY	
7530	FLOAT	Archive_Min[9 - Average 9]	3	RD_ONLY	
7531	FLOAT	Archive_Min[10 - Average 10]	3	RD_ONLY	
7532	FLOAT	Archive_Min[11 - Average 11]	3	RD_ONLY	
7533	FLOAT	Archive_Min[12 - Average 12]	3	RD_ONLY	
7534	FLOAT	Archive_Min[13 - Average 13]	3	RD_ONLY	
7535	FLOAT	Archive_Min[14 - Average 14]	3	RD_ONLY	
7536	FLOAT	Archive_Min[15 - Average 15]	3	RD_ONLY	
7537	FLOAT	Archive_Min[16 - Average 16]	3	RD_ONLY	
7538	FLOAT	Archive_Min[17 - Average 17]	3	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7539	FLOAT	Archive_Min[18 - Average 18]	3	RD_ONLY	
7540	FLOAT	Archive_Min[19 - Average 19]	3	RD_ONLY	
7541	FLOAT	Archive_Min[20 - Average 20]	3	RD_ONLY	
7542	FLOAT	Archive_Min[21 - Average 21]	3	RD_ONLY	
7543	FLOAT	Archive_Min[22 - Average 22]	3	RD_ONLY	
7544	FLOAT	Archive_Min[23 - Average 23]	3	RD_ONLY	
7545	FLOAT	Archive_Min[24 - Average 24]	3	RD_ONLY	
7546	FLOAT	Archive_Min[25 - Average 25]	3	RD_ONLY	
7547	FLOAT	Archive_Min[26 - Average 26]	3	RD_ONLY	
7548	FLOAT	Archive_Min[27 - Average 27]	3	RD_ONLY	
7549	FLOAT	Archive_Min[28 - Average 28]	3	RD_ONLY	
7550	FLOAT	Archive_Min[29 - Average 29]	3	RD_ONLY	
7551	FLOAT	Archive_Min[30 - Average 30]	3	RD_ONLY	
7552	FLOAT	Archive_Min[31 - Average 31]	3	RD_ONLY	
7553	FLOAT	Archive_Min[32 - Average 32]	3	RD_ONLY	
7554	FLOAT	Archive_Min[33 - Average 33]	3	RD_ONLY	
7555	FLOAT	Archive_Min[34 - Average 34]	3	RD_ONLY	
7556	FLOAT	Archive_Min[35 - Average 35]	3	RD_ONLY	
7557	FLOAT	Archive_Min[36 - Average 36]	3	RD_ONLY	
7558	FLOAT	Component Data 1_Multi-level Calib 'a'[1]		RD_ONLY	
7559	FLOAT	Component Data 1_Multi-level Calib 'a'[2]		RD_ONLY	
7560	FLOAT	Component Data 1_Multi-level Calib 'a'[3]		RD_ONLY	
7561	FLOAT	Component Data 1_Multi-level Calib 'a'[4]		RD_ONLY	
7562	FLOAT	Component Data 1_Multi-level Calib 'a'[5]		RD_ONLY	
7563	FLOAT	Component Data 1_Multi-level Calib 'a'[6]		RD_ONLY	
7564	FLOAT	Component Data 1_Multi-level Calib 'a'[7]		RD_ONLY	
7565	FLOAT	Component Data 1_Multi-level Calib 'a'[8]		RD_ONLY	
7566	FLOAT	Component Data 1_Multi-level Calib 'a'[9]		RD_ONLY	
7567	FLOAT	Component Data 1_Multi-level Calib 'a'[10]		RD_ONLY	
7568	FLOAT	Component Data 1_Multi-level Calib 'a'[11]		RD_ONLY	
7569	FLOAT	Component Data 1_Multi-level Calib 'a'[12]		RD_ONLY	
7570	FLOAT	Component Data 1_Multi-level Calib 'a'[13]		RD_ONLY	
7571	FLOAT	Component Data 1_Multi-level Calib 'a'[14]		RD_ONLY	
7572	FLOAT	Component Data 1_Multi-level Calib 'a'[15]		RD_ONLY	
7573	FLOAT	Component Data 1_Multi-level Calib 'a'[16]		RD_ONLY	
7574	FLOAT	Component Data 1_Multi-level Calib 'b'[1]		RD_ONLY	
7575	FLOAT	Component Data 1_Multi-level Calib 'b'[2]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7576	FLOAT	Component Data 1_Multi-level Calib 'b'[3]		RD_ONLY	
7577	FLOAT	Component Data 1_Multi-level Calib 'b'[4]		RD_ONLY	
7578	FLOAT	Component Data 1_Multi-level Calib 'b'[5]		RD_ONLY	
7579	FLOAT	Component Data 1_Multi-level Calib 'b'[6]		RD_ONLY	
7580	FLOAT	Component Data 1_Multi-level Calib 'b'[7]		RD_ONLY	
7581	FLOAT	Component Data 1_Multi-level Calib 'b'[8]		RD_ONLY	
7582	FLOAT	Component Data 1_Multi-level Calib 'b'[9]		RD_ONLY	
7583	FLOAT	Component Data 1_Multi-level Calib 'b'[10]		RD_ONLY	
7584	FLOAT	Component Data 1_Multi-level Calib 'b'[11]		RD_ONLY	
7585	FLOAT	Component Data 1_Multi-level Calib 'b'[12]		RD_ONLY	
7586	FLOAT	Component Data 1_Multi-level Calib 'b'[13]		RD_ONLY	
7587	FLOAT	Component Data 1_Multi-level Calib 'b'[14]		RD_ONLY	
7588	FLOAT	Component Data 1_Multi-level Calib 'b'[15]		RD_ONLY	
7589	FLOAT	Component Data 1_Multi-level Calib 'b'[16]		RD_ONLY	
7590	FLOAT	Component Data 1_Multi-level Calib 'c'[1]		RD_ONLY	
7591	FLOAT	Component Data 1_Multi-level Calib 'c'[2]		RD_ONLY	
7592	FLOAT	Component Data 1_Multi-level Calib 'c'[3]		RD_ONLY	
7593	FLOAT	Component Data 1_Multi-level Calib 'c'[4]		RD_ONLY	
7594	FLOAT	Component Data 1_Multi-level Calib 'c'[5]		RD_ONLY	
7595	FLOAT	Component Data 1_Multi-level Calib 'c'[6]		RD_ONLY	
7596	FLOAT	Component Data 1_Multi-level Calib 'c'[7]		RD_ONLY	
7597	FLOAT	Component Data 1_Multi-level Calib 'c'[8]		RD_ONLY	
7598	FLOAT	Component Data 1_Multi-level Calib 'c'[9]		RD_ONLY	
7599	FLOAT	Component Data 1_Multi-level Calib 'c'[10]		RD_ONLY	
7600	FLOAT	Component Data 1_Multi-level Calib 'c'[11]		RD_ONLY	
7601	FLOAT	Component Data 1_Multi-level Calib 'c'[12]		RD_ONLY	
7602	FLOAT	Component Data 1_Multi-level Calib 'c'[13]		RD_ONLY	
7603	FLOAT	Component Data 1_Multi-level Calib 'c'[14]		RD_ONLY	
7604	FLOAT	Component Data 1_Multi-level Calib 'c'[15]		RD_ONLY	
7605	FLOAT	Component Data 1_Multi-level Calib 'c'[16]		RD_ONLY	
7606	FLOAT	Component Data 1_Multi-level Calib 'd'[1]		RD_ONLY	
7607	FLOAT	Component Data 1_Multi-level Calib 'd'[2]		RD_ONLY	
7608	FLOAT	Component Data 1_Multi-level Calib 'd'[3]		RD_ONLY	
7609	FLOAT	Component Data 1_Multi-level Calib 'd'[4]		RD_ONLY	
7610	FLOAT	Component Data 1_Multi-level Calib 'd'[5]		RD_ONLY	
7611	FLOAT	Component Data 1_Multi-level Calib 'd'[6]		RD_ONLY	
7612	FLOAT	Component Data 1_Multi-level Calib 'd'[7]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7613	FLOAT	Component Data 1_Multi-level Calib 'd'[8]		RD_ONLY	
7614	FLOAT	Component Data 1_Multi-level Calib 'd'[9]		RD_ONLY	
7615	FLOAT	Component Data 1_Multi-level Calib 'd'[10]		RD_ONLY	
7616	FLOAT	Component Data 1_Multi-level Calib 'd'[11]		RD_ONLY	
7617	FLOAT	Component Data 1_Multi-level Calib 'd'[12]		RD_ONLY	
7618	FLOAT	Component Data 1_Multi-level Calib 'd'[13]		RD_ONLY	
7619	FLOAT	Component Data 1_Multi-level Calib 'd'[14]		RD_ONLY	
7620	FLOAT	Component Data 1_Multi-level Calib 'd'[15]		RD_ONLY	
7621	FLOAT	Component Data 1_Multi-level Calib 'd'[16]		RD_ONLY	
7622	FLOAT	Component Data 1_Rel Resp Factor[1]		RD_ONLY	
7623	FLOAT	Component Data 1_Rel Resp Factor[2]		RD_ONLY	
7624	FLOAT	Component Data 1_Rel Resp Factor[3]		RD_ONLY	
7625	FLOAT	Component Data 1_Rel Resp Factor[4]		RD_ONLY	
7626	FLOAT	Component Data 1_Rel Resp Factor[5]		RD_ONLY	
7627	FLOAT	Component Data 1_Rel Resp Factor[6]		RD_ONLY	
7628	FLOAT	Component Data 1_Rel Resp Factor[7]		RD_ONLY	
7629	FLOAT	Component Data 1_Rel Resp Factor[8]		RD_ONLY	
7630	FLOAT	Component Data 1_Rel Resp Factor[9]		RD_ONLY	
7631	FLOAT	Component Data 1_Rel Resp Factor[10]		RD_ONLY	
7632	FLOAT	Component Data 1_Rel Resp Factor[11]		RD_ONLY	
7633	FLOAT	Component Data 1_Rel Resp Factor[12]		RD_ONLY	
7634	FLOAT	Component Data 1_Rel Resp Factor[13]		RD_ONLY	
7635	FLOAT	Component Data 1_Rel Resp Factor[14]		RD_ONLY	
7636	FLOAT	Component Data 1_Rel Resp Factor[15]		RD_ONLY	
7637	FLOAT	Component Data 1_Rel Resp Factor[16]		RD_ONLY	
7638	FLOAT	Component Data 2_Multi-level Calib 'a'[1]		RD_ONLY	
7639	FLOAT	Component Data 2_Multi-level Calib 'a'[2]		RD_ONLY	
7640	FLOAT	Component Data 2_Multi-level Calib 'a'[3]		RD_ONLY	
7641	FLOAT	Component Data 2_Multi-level Calib 'a'[4]		RD_ONLY	
7642	FLOAT	Component Data 2_Multi-level Calib 'a'[5]		RD_ONLY	
7643	FLOAT	Component Data 2_Multi-level Calib 'a'[6]		RD_ONLY	
7644	FLOAT	Component Data 2_Multi-level Calib 'a'[7]		RD_ONLY	
7645	FLOAT	Component Data 2_Multi-level Calib 'a'[8]		RD_ONLY	
7646	FLOAT	Component Data 2_Multi-level Calib 'a'[9]		RD_ONLY	
7647	FLOAT	Component Data 2_Multi-level Calib 'a'[10]		RD_ONLY	
7648	FLOAT	Component Data 2_Multi-level Calib 'a'[11]		RD_ONLY	
7649	FLOAT	Component Data 2_Multi-level Calib 'a'[12]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7650	FLOAT	Component Data 2_Multi-level Calib 'a'[13]		RD_ONLY	
7651	FLOAT	Component Data 2_Multi-level Calib 'a'[14]		RD_ONLY	
7652	FLOAT	Component Data 2_Multi-level Calib 'a'[15]		RD_ONLY	
7653	FLOAT	Component Data 2_Multi-level Calib 'a'[16]		RD_ONLY	
7654	FLOAT	Component Data 2_Multi-level Calib 'b'[1]		RD_ONLY	
7655	FLOAT	Component Data 2_Multi-level Calib 'b'[2]		RD_ONLY	
7656	FLOAT	Component Data 2_Multi-level Calib 'b'[3]		RD_ONLY	
7657	FLOAT	Component Data 2_Multi-level Calib 'b'[4]		RD_ONLY	
7658	FLOAT	Component Data 2_Multi-level Calib 'b'[5]		RD_ONLY	
7659	FLOAT	Component Data 2_Multi-level Calib 'b'[6]		RD_ONLY	
7660	FLOAT	Component Data 2_Multi-level Calib 'b'[7]		RD_ONLY	
7661	FLOAT	Component Data 2_Multi-level Calib 'b'[8]		RD_ONLY	
7662	FLOAT	Component Data 2_Multi-level Calib 'b'[9]		RD_ONLY	
7663	FLOAT	Component Data 2_Multi-level Calib 'b'[10]		RD_ONLY	
7664	FLOAT	Component Data 2_Multi-level Calib 'b'[11]		RD_ONLY	
7665	FLOAT	Component Data 2_Multi-level Calib 'b'[12]		RD_ONLY	
7666	FLOAT	Component Data 2_Multi-level Calib 'b'[13]		RD_ONLY	
7667	FLOAT	Component Data 2_Multi-level Calib 'b'[14]		RD_ONLY	
7668	FLOAT	Component Data 2_Multi-level Calib 'b'[15]		RD_ONLY	
7669	FLOAT	Component Data 2_Multi-level Calib 'b'[16]		RD_ONLY	
7670	FLOAT	Component Data 2_Multi-level Calib 'c'[1]		RD_ONLY	
7671	FLOAT	Component Data 2_Multi-level Calib 'c'[2]		RD_ONLY	
7672	FLOAT	Component Data 2_Multi-level Calib 'c'[3]		RD_ONLY	
7673	FLOAT	Component Data 2_Multi-level Calib 'c'[4]		RD_ONLY	
7674	FLOAT	Component Data 2_Multi-level Calib 'c'[5]		RD_ONLY	
7675	FLOAT	Component Data 2_Multi-level Calib 'c'[6]		RD_ONLY	
7676	FLOAT	Component Data 2_Multi-level Calib 'c'[7]		RD_ONLY	
7677	FLOAT	Component Data 2_Multi-level Calib 'c'[8]		RD_ONLY	
7678	FLOAT	Component Data 2_Multi-level Calib 'c'[9]		RD_ONLY	
7679	FLOAT	Component Data 2_Multi-level Calib 'c'[10]		RD_ONLY	
7680	FLOAT	Component Data 2_Multi-level Calib 'c'[11]		RD_ONLY	
7681	FLOAT	Component Data 2_Multi-level Calib 'c'[12]		RD_ONLY	
7682	FLOAT	Component Data 2_Multi-level Calib 'c'[13]		RD_ONLY	
7683	FLOAT	Component Data 2_Multi-level Calib 'c'[14]		RD_ONLY	
7684	FLOAT	Component Data 2_Multi-level Calib 'c'[15]		RD_ONLY	
7685	FLOAT	Component Data 2_Multi-level Calib 'c'[16]		RD_ONLY	
7686	FLOAT	Component Data 2_Multi-level Calib 'd'[1]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7687	FLOAT	Component Data 2_Multi-level Calib 'd'[2]		RD_ONLY	
7688	FLOAT	Component Data 2_Multi-level Calib 'd'[3]		RD_ONLY	
7689	FLOAT	Component Data 2_Multi-level Calib 'd'[4]		RD_ONLY	
7690	FLOAT	Component Data 2_Multi-level Calib 'd'[5]		RD_ONLY	
7691	FLOAT	Component Data 2_Multi-level Calib 'd'[6]		RD_ONLY	
7692	FLOAT	Component Data 2_Multi-level Calib 'd'[7]		RD_ONLY	
7693	FLOAT	Component Data 2_Multi-level Calib 'd'[8]		RD_ONLY	
7694	FLOAT	Component Data 2_Multi-level Calib 'd'[9]		RD_ONLY	
7695	FLOAT	Component Data 2_Multi-level Calib 'd'[10]		RD_ONLY	
7696	FLOAT	Component Data 2_Multi-level Calib 'd'[11]		RD_ONLY	
7697	FLOAT	Component Data 2_Multi-level Calib 'd'[12]		RD_ONLY	
7698	FLOAT	Component Data 2_Multi-level Calib 'd'[13]		RD_ONLY	
7699	FLOAT	Component Data 2_Multi-level Calib 'd'[14]		RD_ONLY	
7700	FLOAT	Component Data 2_Multi-level Calib 'd'[15]		RD_ONLY	
7701	FLOAT	Component Data 2_Multi-level Calib 'd'[16]		RD_ONLY	
7702	FLOAT	Component Data 2_Rel Resp Factor[1]		RD_ONLY	
7703	FLOAT	Component Data 2_Rel Resp Factor[2]		RD_ONLY	
7704	FLOAT	Component Data 2_Rel Resp Factor[3]		RD_ONLY	
7705	FLOAT	Component Data 2_Rel Resp Factor[4]		RD_ONLY	
7706	FLOAT	Component Data 2_Rel Resp Factor[5]		RD_ONLY	
7707	FLOAT	Component Data 2_Rel Resp Factor[6]		RD_ONLY	
7708	FLOAT	Component Data 2_Rel Resp Factor[7]		RD_ONLY	
7709	FLOAT	Component Data 2_Rel Resp Factor[8]		RD_ONLY	
7710	FLOAT	Component Data 2_Rel Resp Factor[9]		RD_ONLY	
7711	FLOAT	Component Data 2_Rel Resp Factor[10]		RD_ONLY	
7712	FLOAT	Component Data 2_Rel Resp Factor[11]		RD_ONLY	
7713	FLOAT	Component Data 2_Rel Resp Factor[12]		RD_ONLY	
7714	FLOAT	Component Data 2_Rel Resp Factor[13]		RD_ONLY	
7715	FLOAT	Component Data 2_Rel Resp Factor[14]		RD_ONLY	
7716	FLOAT	Component Data 2_Rel Resp Factor[15]		RD_ONLY	
7717	FLOAT	Component Data 2_Rel Resp Factor[16]		RD_ONLY	
7718	FLOAT	Avg[1 - Average 1]		RD_ONLY	
7719	FLOAT	Avg[2 - Average 2]		RD_ONLY	
7720	FLOAT	Avg[3 - Average 3]		RD_ONLY	
7721	FLOAT	Avg[4 - Average 4]		RD_ONLY	
7722	FLOAT	Avg[5 - Average 5]		RD_ONLY	
7723	FLOAT	Avg[6 - Average 6]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7724	FLOAT	Avg[7 - Average 7]		RD_ONLY	
7725	FLOAT	Avg[8 - Average 8]		RD_ONLY	
7726	FLOAT	Avg[9 - Average 9]		RD_ONLY	
7727	FLOAT	Avg[10 - Average 10]		RD_ONLY	
7728	FLOAT	Avg[11 - Average 11]		RD_ONLY	
7729	FLOAT	Avg[12 - Average 12]		RD_ONLY	
7730	FLOAT	Avg[13 - Average 13]		RD_ONLY	
7731	FLOAT	Avg[14 - Average 14]		RD_ONLY	
7732	FLOAT	Avg[15 - Average 15]		RD_ONLY	
7733	FLOAT	Avg[16 - Average 16]		RD_ONLY	
7734	FLOAT	Avg[17 - Average 17]		RD_ONLY	
7735	FLOAT	Avg[18 - Average 18]		RD_ONLY	
7736	FLOAT	Avg[19 - Average 19]		RD_ONLY	
7737	FLOAT	Avg[20 - Average 20]		RD_ONLY	
7738	FLOAT	Avg[21 - Average 21]		RD_ONLY	
7739	FLOAT	Avg[22 - Average 22]		RD_ONLY	
7740	FLOAT	Avg[23 - Average 23]		RD_ONLY	
7741	FLOAT	Avg[24 - Average 24]		RD_ONLY	
7742	FLOAT	Avg[25 - Average 25]		RD_ONLY	
7743	FLOAT	Avg[26 - Average 26]		RD_ONLY	
7744	FLOAT	Avg[27 - Average 27]		RD_ONLY	
7745	FLOAT	Avg[28 - Average 28]		RD_ONLY	
7746	FLOAT	Avg[29 - Average 29]		RD_ONLY	
7747	FLOAT	Avg[30 - Average 30]		RD_ONLY	
7748	FLOAT	Avg[31 - Average 31]		RD_ONLY	
7749	FLOAT	Avg[32 - Average 32]		RD_ONLY	
7750	FLOAT	Avg[33 - Average 33]		RD_ONLY	
7751	FLOAT	Avg[34 - Average 34]		RD_ONLY	
7752	FLOAT	Avg[35 - Average 35]		RD_ONLY	
7753	FLOAT	Avg[36 - Average 36]		RD_ONLY	
7754	FLOAT	Avg[37 - Average 37]		RD_ONLY	
7755	FLOAT	Avg[38 - Average 38]		RD_ONLY	
7756	FLOAT	Avg[39 - Average 39]		RD_ONLY	
7757	FLOAT	Avg[40 - Average 40]		RD_ONLY	
7758	FLOAT	Avg[41 - Average 41]		RD_ONLY	
7759	FLOAT	Avg[42 - Average 42]		RD_ONLY	
7760	FLOAT	Avg[43 - Average 43]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7761	FLOAT	Avg[44 - Average 44]		RD_ONLY	
7762	FLOAT	Avg[45 - Average 45]		RD_ONLY	
7763	FLOAT	Avg[46 - Average 46]		RD_ONLY	
7764	FLOAT	Avg[47 - Average 47]		RD_ONLY	
7765	FLOAT	Avg[48 - Average 48]		RD_ONLY	
7766	FLOAT	Avg[49 - Average 49]		RD_ONLY	
7767	FLOAT	Avg[50 - Average 50]		RD_ONLY	
7768	FLOAT	Avg[51 - Average 51]		RD_ONLY	
7769	FLOAT	Avg[52 - Average 52]		RD_ONLY	
7770	FLOAT	Avg[53 - Average 53]		RD_ONLY	
7771	FLOAT	Avg[54 - Average 54]		RD_ONLY	
7772	FLOAT	Avg[55 - Average 55]		RD_ONLY	
7773	FLOAT	Avg[56 - Average 56]		RD_ONLY	
7774	FLOAT	Avg[57 - Average 57]		RD_ONLY	
7775	FLOAT	Avg[58 - Average 58]		RD_ONLY	
7776	FLOAT	Avg[59 - Average 59]		RD_ONLY	
7777	FLOAT	Avg[60 - Average 60]		RD_ONLY	
7778	FLOAT	Avg[61 - Average 61]		RD_ONLY	
7779	FLOAT	Avg[62 - Average 62]		RD_ONLY	
7780	FLOAT	Avg[63 - Average 63]		RD_ONLY	
7781	FLOAT	Avg[64 - Average 64]		RD_ONLY	
7782	FLOAT	Avg[65 - Average 65]		RD_ONLY	
7783	FLOAT	Avg[66 - Average 66]		RD_ONLY	
7784	FLOAT	Avg[67 - Average 67]		RD_ONLY	
7785	FLOAT	Avg[68 - Average 68]		RD_ONLY	
7786	FLOAT	Avg[69 - Average 69]		RD_ONLY	
7787	FLOAT	Avg[70 - Average 70]		RD_ONLY	
7788	FLOAT	Avg[71 - Average 71]		RD_ONLY	
7789	FLOAT	Avg[72 - Average 72]		RD_ONLY	
7790	FLOAT	Avg[73 - Average 73]		RD_ONLY	
7791	FLOAT	Avg[74 - Average 74]		RD_ONLY	
7792	FLOAT	Avg[75 - Average 75]		RD_ONLY	
7793	FLOAT	Avg[76 - Average 76]		RD_ONLY	
7794	FLOAT	Avg[77 - Average 77]		RD_ONLY	
7795	FLOAT	Avg[78 - Average 78]		RD_ONLY	
7796	FLOAT	Avg[79 - Average 79]		RD_ONLY	
7797	FLOAT	Avg[80 - Average 80]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7798	FLOAT	Avg[81 - Average 81]		RD_ONLY	
7799	FLOAT	Avg[82 - Average 82]		RD_ONLY	
7800	FLOAT	Avg[83 - Average 83]		RD_ONLY	
7801	FLOAT	Avg[84 - Average 84]		RD_ONLY	
7802	FLOAT	Avg[85 - Average 85]		RD_ONLY	
7803	FLOAT	Avg[86 - Average 86]		RD_ONLY	
7804	FLOAT	Avg[87 - Average 87]		RD_ONLY	
7805	FLOAT	Avg[88 - Average 88]		RD_ONLY	
7806	FLOAT	Avg[89 - Average 89]		RD_ONLY	
7807	FLOAT	Avg[90 - Average 90]		RD_ONLY	
7808	FLOAT	Avg[91 - Average 91]		RD_ONLY	
7809	FLOAT	Avg[92 - Average 92]		RD_ONLY	
7810	FLOAT	Avg[93 - Average 93]		RD_ONLY	
7811	FLOAT	Avg[94 - Average 94]		RD_ONLY	
7812	FLOAT	Avg[95 - Average 95]		RD_ONLY	
7813	FLOAT	Avg[96 - Average 96]		RD_ONLY	
7814	FLOAT	Avg[97 - Average 97]		RD_ONLY	
7815	FLOAT	Avg[98 - Average 98]		RD_ONLY	
7816	FLOAT	Avg[99 - Average 99]		RD_ONLY	
7817	FLOAT	Avg[100 - Average 100]		RD_ONLY	
7818	FLOAT	Avg[101 - Average 101]		RD_ONLY	
7819	FLOAT	Avg[102 - Average 102]		RD_ONLY	
7820	FLOAT	Avg[103 - Average 103]		RD_ONLY	
7821	FLOAT	Avg[104 - Average 104]		RD_ONLY	
7822	FLOAT	Avg[105 - Average 105]		RD_ONLY	
7823	FLOAT	Avg[106 - Average 106]		RD_ONLY	
7824	FLOAT	Avg[107 - Average 107]		RD_ONLY	
7825	FLOAT	Avg[108 - Average 108]		RD_ONLY	
7826	FLOAT	Avg[109 - Average 109]		RD_ONLY	
7827	FLOAT	Avg[110 - Average 110]		RD_ONLY	
7828	FLOAT	Avg[111 - Average 111]		RD_ONLY	
7829	FLOAT	Avg[112 - Average 112]		RD_ONLY	
7830	FLOAT	Avg[113 - Average 113]		RD_ONLY	
7831	FLOAT	Avg[114 - Average 114]		RD_ONLY	
7832	FLOAT	Avg[115 - Average 115]		RD_ONLY	
7833	FLOAT	Avg[116 - Average 116]		RD_ONLY	
7834	FLOAT	Avg[117 - Average 117]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7835	FLOAT	Avg[118 - Average 118]		RD_ONLY	
7836	FLOAT	Avg[119 - Average 119]		RD_ONLY	
7837	FLOAT	Avg[120 - Average 120]		RD_ONLY	
7838	FLOAT	Avg[121 - Average 121]		RD_ONLY	
7839	FLOAT	Avg[122 - Average 122]		RD_ONLY	
7840	FLOAT	Avg[123 - Average 123]		RD_ONLY	
7841	FLOAT	Avg[124 - Average 124]		RD_ONLY	
7842	FLOAT	Avg[125 - Average 125]		RD_ONLY	
7843	FLOAT	Avg[126 - Average 126]		RD_ONLY	
7844	FLOAT	Avg[127 - Average 127]		RD_ONLY	
7845	FLOAT	Avg[128 - Average 128]		RD_ONLY	
7846	FLOAT	Archive_Avg[1 - Average 1]	1	RD_ONLY	
7847	FLOAT	Archive_Avg[2 - Average 2]	1	RD_ONLY	
7848	FLOAT	Archive_Avg[3 - Average 3]	1	RD_ONLY	
7849	FLOAT	Archive_Avg[4 - Average 4]	1	RD_ONLY	
7850	FLOAT	Archive_Avg[5 - Average 5]	1	RD_ONLY	
7851	FLOAT	Archive_Avg[6 - Average 6]	1	RD_ONLY	
7852	FLOAT	Archive_Avg[7 - Average 7]	1	RD_ONLY	
7853	FLOAT	Archive_Avg[8 - Average 8]	1	RD_ONLY	
7854	FLOAT	Archive_Avg[9 - Average 9]	1	RD_ONLY	
7855	FLOAT	Archive_Avg[10 - Average 10]	1	RD_ONLY	
7856	FLOAT	Archive_Avg[11 - Average 11]	1	RD_ONLY	
7857	FLOAT	Archive_Avg[12 - Average 12]	1	RD_ONLY	
7858	FLOAT	Archive_Avg[13 - Average 13]	1	RD_ONLY	
7859	FLOAT	Archive_Avg[14 - Average 14]	1	RD_ONLY	
7860	FLOAT	Archive_Avg[15 - Average 15]	1	RD_ONLY	
7861	FLOAT	Archive_Avg[16 - Average 16]	1	RD_ONLY	
7862	FLOAT	Archive_Avg[17 - Average 17]	1	RD_ONLY	
7863	FLOAT	Archive_Avg[18 - Average 18]	1	RD_ONLY	
7864	FLOAT	Archive_Avg[19 - Average 19]	1	RD_ONLY	
7865	FLOAT	Archive_Avg[20 - Average 20]	1	RD_ONLY	
7866	FLOAT	Archive_Avg[21 - Average 21]	1	RD_ONLY	
7867	FLOAT	Archive_Avg[22 - Average 22]	1	RD_ONLY	
7868	FLOAT	Archive_Avg[23 - Average 23]	1	RD_ONLY	
7869	FLOAT	Archive_Avg[24 - Average 24]	1	RD_ONLY	
7870	FLOAT	Archive_Avg[25 - Average 25]	1	RD_ONLY	
7871	FLOAT	Archive_Avg[26 - Average 26]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7872	FLOAT	Archive_Avg[27 - Average 27]	1	RD_ONLY	
7873	FLOAT	Archive_Avg[28 - Average 28]	1	RD_ONLY	
7874	FLOAT	Archive_Avg[29 - Average 29]	1	RD_ONLY	
7875	FLOAT	Archive_Avg[30 - Average 30]	1	RD_ONLY	
7876	FLOAT	Archive_Avg[31 - Average 31]	1	RD_ONLY	
7877	FLOAT	Archive_Avg[32 - Average 32]	1	RD_ONLY	
7878	FLOAT	Archive_Avg[33 - Average 33]	1	RD_ONLY	
7879	FLOAT	Archive_Avg[34 - Average 34]	1	RD_ONLY	
7880	FLOAT	Archive_Avg[35 - Average 35]	1	RD_ONLY	
7881	FLOAT	Archive_Avg[36 - Average 36]	1	RD_ONLY	
7882	FLOAT	Archive_Avg[37 - Average 37]	1	RD_ONLY	
7883	FLOAT	Archive_Avg[38 - Average 38]	1	RD_ONLY	
7884	FLOAT	Archive_Avg[39 - Average 39]	1	RD_ONLY	
7885	FLOAT	Archive_Avg[40 - Average 40]	1	RD_ONLY	
7886	FLOAT	Archive_Avg[41 - Average 41]	1	RD_ONLY	
7887	FLOAT	Archive_Avg[42 - Average 42]	1	RD_ONLY	
7888	FLOAT	Archive_Avg[43 - Average 43]	1	RD_ONLY	
7889	FLOAT	Archive_Avg[44 - Average 44]	1	RD_ONLY	
7890	FLOAT	Archive_Avg[45 - Average 45]	1	RD_ONLY	
7891	FLOAT	Archive_Avg[46 - Average 46]	1	RD_ONLY	
7892	FLOAT	Archive_Avg[47 - Average 47]	1	RD_ONLY	
7893	FLOAT	Archive_Avg[48 - Average 48]	1	RD_ONLY	
7894	FLOAT	Archive_Avg[49 - Average 49]	1	RD_ONLY	
7895	FLOAT	Archive_Avg[50 - Average 50]	1	RD_ONLY	
7896	FLOAT	Archive_Avg[51 - Average 51]	1	RD_ONLY	
7897	FLOAT	Archive_Avg[52 - Average 52]	1	RD_ONLY	
7898	FLOAT	Archive_Avg[53 - Average 53]	1	RD_ONLY	
7899	FLOAT	Archive_Avg[54 - Average 54]	1	RD_ONLY	
7900	FLOAT	Archive_Avg[55 - Average 55]	1	RD_ONLY	
7901	FLOAT	Archive_Avg[56 - Average 56]	1	RD_ONLY	
7902	FLOAT	Archive_Avg[57 - Average 57]	1	RD_ONLY	
7903	FLOAT	Archive_Avg[58 - Average 58]	1	RD_ONLY	
7904	FLOAT	Archive_Avg[59 - Average 59]	1	RD_ONLY	
7905	FLOAT	Archive_Avg[60 - Average 60]	1	RD_ONLY	
7906	FLOAT	Archive_Avg[61 - Average 61]	1	RD_ONLY	
7907	FLOAT	Archive_Avg[62 - Average 62]	1	RD_ONLY	
7908	FLOAT	Archive_Avg[63 - Average 63]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7909	FLOAT	Archive_Avg[64 - Average 64]	1	RD_ONLY	
7910	FLOAT	Archive_Avg[65 - Average 65]	1	RD_ONLY	
7911	FLOAT	Archive_Avg[66 - Average 66]	1	RD_ONLY	
7912	FLOAT	Archive_Avg[67 - Average 67]	1	RD_ONLY	
7913	FLOAT	Archive_Avg[68 - Average 68]	1	RD_ONLY	
7914	FLOAT	Archive_Avg[69 - Average 69]	1	RD_ONLY	
7915	FLOAT	Archive_Avg[70 - Average 70]	1	RD_ONLY	
7916	FLOAT	Archive_Avg[71 - Average 71]	1	RD_ONLY	
7917	FLOAT	Archive_Avg[72 - Average 72]	1	RD_ONLY	
7918	FLOAT	Archive_Avg[73 - Average 73]	1	RD_ONLY	
7919	FLOAT	Archive_Avg[74 - Average 74]	1	RD_ONLY	
7920	FLOAT	Archive_Avg[75 - Average 75]	1	RD_ONLY	
7921	FLOAT	Archive_Avg[76 - Average 76]	1	RD_ONLY	
7922	FLOAT	Archive_Avg[77 - Average 77]	1	RD_ONLY	
7923	FLOAT	Archive_Avg[78 - Average 78]	1	RD_ONLY	
7924	FLOAT	Archive_Avg[79 - Average 79]	1	RD_ONLY	
7925	FLOAT	Archive_Avg[80 - Average 80]	1	RD_ONLY	
7926	FLOAT	Archive_Avg[81 - Average 81]	1	RD_ONLY	
7927	FLOAT	Archive_Avg[82 - Average 82]	1	RD_ONLY	
7928	FLOAT	Archive_Avg[83 - Average 83]	1	RD_ONLY	
7929	FLOAT	Archive_Avg[84 - Average 84]	1	RD_ONLY	
7930	FLOAT	Archive_Avg[85 - Average 85]	1	RD_ONLY	
7931	FLOAT	Archive_Avg[86 - Average 86]	1	RD_ONLY	
7932	FLOAT	Archive_Avg[87 - Average 87]	1	RD_ONLY	
7933	FLOAT	Archive_Avg[88 - Average 88]	1	RD_ONLY	
7934	FLOAT	Archive_Avg[89 - Average 89]	1	RD_ONLY	
7935	FLOAT	Archive_Avg[90 - Average 90]	1	RD_ONLY	
7936	FLOAT	Archive_Avg[91 - Average 91]	1	RD_ONLY	
7937	FLOAT	Archive_Avg[92 - Average 92]	1	RD_ONLY	
7938	FLOAT	Archive_Avg[93 - Average 93]	1	RD_ONLY	
7939	FLOAT	Archive_Avg[94 - Average 94]	1	RD_ONLY	
7940	FLOAT	Archive_Avg[95 - Average 95]	1	RD_ONLY	
7941	FLOAT	Archive_Avg[96 - Average 96]	1	RD_ONLY	
7942	FLOAT	Archive_Avg[97 - Average 97]	1	RD_ONLY	
7943	FLOAT	Archive_Avg[98 - Average 98]	1	RD_ONLY	
7944	FLOAT	Archive_Avg[99 - Average 99]	1	RD_ONLY	
7945	FLOAT	Archive_Avg[100 - Average 100]	1	RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7946	FLOAT	Archive_Avg[101 - Average 101]	1	RD_ONLY	
7947	FLOAT	Archive_Avg[102 - Average 102]	1	RD_ONLY	
7948	FLOAT	Archive_Avg[103 - Average 103]	1	RD_ONLY	
7949	FLOAT	Archive_Avg[104 - Average 104]	1	RD_ONLY	
7950	FLOAT	Archive_Avg[105 - Average 105]	1	RD_ONLY	
7951	FLOAT	Archive_Avg[106 - Average 106]	1	RD_ONLY	
7952	FLOAT	Archive_Avg[107 - Average 107]	1	RD_ONLY	
7953	FLOAT	Archive_Avg[108 - Average 108]	1	RD_ONLY	
7954	FLOAT	Archive_Avg[109 - Average 109]	1	RD_ONLY	
7955	FLOAT	Archive_Avg[110 - Average 110]	1	RD_ONLY	
7956	FLOAT	Archive_Avg[111 - Average 111]	1	RD_ONLY	
7957	FLOAT	Archive_Avg[112 - Average 112]	1	RD_ONLY	
7958	FLOAT	Archive_Avg[113 - Average 113]	1	RD_ONLY	
7959	FLOAT	Archive_Avg[114 - Average 114]	1	RD_ONLY	
7960	FLOAT	Archive_Avg[115 - Average 115]	1	RD_ONLY	
7961	FLOAT	Archive_Avg[116 - Average 116]	1	RD_ONLY	
7962	FLOAT	Archive_Avg[117 - Average 117]	1	RD_ONLY	
7963	FLOAT	Archive_Avg[118 - Average 118]	1	RD_ONLY	
7964	FLOAT	Archive_Avg[119 - Average 119]	1	RD_ONLY	
7965	FLOAT	Archive_Avg[120 - Average 120]	1	RD_ONLY	
7966	FLOAT	Archive_Avg[121 - Average 121]	1	RD_ONLY	
7967	FLOAT	Archive_Avg[122 - Average 122]	1	RD_ONLY	
7968	FLOAT	Archive_Avg[123 - Average 123]	1	RD_ONLY	
7969	FLOAT	Archive_Avg[124 - Average 124]	1	RD_ONLY	
7970	FLOAT	Archive_Avg[125 - Average 125]	1	RD_ONLY	
7971	FLOAT	Archive_Avg[126 - Average 126]	1	RD_ONLY	
7972	FLOAT	Archive_Avg[127 - Average 127]	1	RD_ONLY	
7973	FLOAT	Archive_Avg[128 - Average 128]	1	RD_ONLY	
7974	FLOAT	Last FCalib_New Resp Factor[1 - Component 1]		RD_ONLY	
7975	FLOAT	Last FCalib_New Resp Factor[2 - Component 2]		RD_ONLY	
7976	FLOAT	Last FCalib_New Resp Factor[3 - Component 3]		RD_ONLY	
7977	FLOAT	Last FCalib_New Resp Factor[4 - Component 4]		RD_ONLY	
7978	FLOAT	Last FCalib_New Resp Factor[5 - Component 5]		RD_ONLY	
7979	FLOAT	Last FCalib_New Resp Factor[6 - Component 6]		RD_ONLY	
7980	FLOAT	Last FCalib_New Resp Factor[7 - Component 7]		RD_ONLY	
7981	FLOAT	Last FCalib_New Resp Factor[8 - Component 8]		RD_ONLY	
7982	FLOAT	Last FCalib_New Resp Factor[9 - Component 9]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
7983	FLOAT	Last FCalib_New Resp Factor[10 - Component 10]		RD_ONLY	
7984	FLOAT	Last FCalib_New Resp Factor[11 - Component 11]		RD_ONLY	
7985	FLOAT	Last FCalib_New Resp Factor[12 - Component 12]		RD_ONLY	
7986	FLOAT	Last FCalib_New Resp Factor[13 - Component 13]		RD_ONLY	
7987	FLOAT	Last FCalib_New Resp Factor[14 - Component 14]		RD_ONLY	
7988	FLOAT	Last FCalib_New Resp Factor[15 - Component 15]		RD_ONLY	
7989	FLOAT	Last FCalib_New Resp Factor[16 - Component 16]		RD_ONLY	
7990	FLOAT	Last FCalib_New Resp Factor[17 - Component 17]		RD_ONLY	
7991	FLOAT	Last FCalib_New Resp Factor[18 - Component 18]		RD_ONLY	
7992	FLOAT	Last FCalib_New Resp Factor[19 - Component 19]		RD_ONLY	
7993	FLOAT	Last FCalib_New Resp Factor[20 - Component 20]		RD_ONLY	
7994	FLOAT	Last FCalib_New Resp Factor[1 - Component 1]		RD_ONLY	
7995	FLOAT	Last FCalib_New Resp Factor[2 - Component 2]		RD_ONLY	
7996	FLOAT	Last FCalib_New Resp Factor[3 - Component 3]		RD_ONLY	
7997	FLOAT	Last FCalib_New Resp Factor[4 - Component 4]		RD_ONLY	
7998	FLOAT	Last FCalib_New Resp Factor[5 - Component 5]		RD_ONLY	
7999	FLOAT	Last FCalib_New Resp Factor[6 - Component 6]		RD_ONLY	
8000	FLOAT	Last FCalib_New Resp Factor[7 - Component 7]		RD_ONLY	
8001	FLOAT	Last FCalib_New Resp Factor[8 - Component 8]		RD_ONLY	
8002	FLOAT	Last FCalib_New Resp Factor[9 - Component 9]		RD_ONLY	
8003	FLOAT	Last FCalib_New Resp Factor[10 - Component 10]		RD_ONLY	
8004	FLOAT	Last FCalib_New Resp Factor[11 - Component 11]		RD_ONLY	
8005	FLOAT	Last FCalib_New Resp Factor[12 - Component 12]		RD_ONLY	
8006	FLOAT	Last FCalib_New Resp Factor[13 - Component 13]		RD_ONLY	
8007	FLOAT	Last FCalib_New Resp Factor[14 - Component 14]		RD_ONLY	
8008	FLOAT	Last FCalib_New Resp Factor[15 - Component 15]		RD_ONLY	
8009	FLOAT	Last FCalib_New Resp Factor[16 - Component 16]		RD_ONLY	
8010	FLOAT	Last FCalib_New Resp Factor[17 - Component 17]		RD_ONLY	
8011	FLOAT	Last FCalib_New Resp Factor[18 - Component 18]		RD_ONLY	
8012	FLOAT	Last FCalib_New Resp Factor[19 - Component 19]		RD_ONLY	
8013	FLOAT	Last FCalib_New Resp Factor[20 - Component 20]		RD_ONLY	
8014	FLOAT	Last FCalib_New Resp Factor[1 - Component 1]		RD_ONLY	
8015	FLOAT	Last FCalib_New Resp Factor[2 - Component 2]		RD_ONLY	
8016	FLOAT	Last FCalib_New Resp Factor[3 - Component 3]		RD_ONLY	
8017	FLOAT	Last FCalib_New Resp Factor[4 - Component 4]		RD_ONLY	
8018	FLOAT	Last FCalib_New Resp Factor[5 - Component 5]		RD_ONLY	
8019	FLOAT	Last FCalib_New Resp Factor[6 - Component 6]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8020	FLOAT	Last FCalib_New Resp Factor[7 - Component 7]		RD_ONLY	
8021	FLOAT	Last FCalib_New Resp Factor[8 - Component 8]		RD_ONLY	
8022	FLOAT	Last FCalib_New Resp Factor[9 - Component 9]		RD_ONLY	
8023	FLOAT	Last FCalib_New Resp Factor[10 - Component 10]		RD_ONLY	
8024	FLOAT	Last FCalib_New Resp Factor[11 - Component 11]		RD_ONLY	
8025	FLOAT	Last FCalib_New Resp Factor[12 - Component 12]		RD_ONLY	
8026	FLOAT	Last FCalib_New Resp Factor[13 - Component 13]		RD_ONLY	
8027	FLOAT	Last FCalib_New Resp Factor[14 - Component 14]		RD_ONLY	
8028	FLOAT	Last FCalib_New Resp Factor[15 - Component 15]		RD_ONLY	
8029	FLOAT	Last FCalib_New Resp Factor[16 - Component 16]		RD_ONLY	
8030	FLOAT	Last FCalib_New Resp Factor[17 - Component 17]		RD_ONLY	
8031	FLOAT	Last FCalib_New Resp Factor[18 - Component 18]		RD_ONLY	
8032	FLOAT	Last FCalib_New Resp Factor[19 - Component 19]		RD_ONLY	
8033	FLOAT	Last FCalib_New Resp Factor[20 - Component 20]		RD_ONLY	
8034	FLOAT	Last FCalib_New Resp Factor[1 - Component 1]		RD_ONLY	
8035	FLOAT	Last FCalib_New Resp Factor[2 - Component 2]		RD_ONLY	
8036	FLOAT	Last FCalib_New Resp Factor[3 - Component 3]		RD_ONLY	
8037	FLOAT	Last FCalib_New Resp Factor[4 - Component 4]		RD_ONLY	
8038	FLOAT	Last FCalib_New Resp Factor[5 - Component 5]		RD_ONLY	
8039	FLOAT	Last FCalib_New Resp Factor[6 - Component 6]		RD_ONLY	
8040	FLOAT	Last FCalib_New Resp Factor[7 - Component 7]		RD_ONLY	
8041	FLOAT	Last FCalib_New Resp Factor[8 - Component 8]		RD_ONLY	
8042	FLOAT	Last FCalib_New Resp Factor[9 - Component 9]		RD_ONLY	
8043	FLOAT	Last FCalib_New Resp Factor[10 - Component 10]		RD_ONLY	
8044	FLOAT	Last FCalib_New Resp Factor[11 - Component 11]		RD_ONLY	
8045	FLOAT	Last FCalib_New Resp Factor[12 - Component 12]		RD_ONLY	
8046	FLOAT	Last FCalib_New Resp Factor[13 - Component 13]		RD_ONLY	
8047	FLOAT	Last FCalib_New Resp Factor[14 - Component 14]		RD_ONLY	
8048	FLOAT	Last FCalib_New Resp Factor[15 - Component 15]		RD_ONLY	
8049	FLOAT	Last FCalib_New Resp Factor[16 - Component 16]		RD_ONLY	
8050	FLOAT	Last FCalib_New Resp Factor[17 - Component 17]		RD_ONLY	
8051	FLOAT	Last FCalib_New Resp Factor[18 - Component 18]		RD_ONLY	
8052	FLOAT	Last FCalib_New Resp Factor[19 - Component 19]		RD_ONLY	
8053	FLOAT	Last FCalib_New Resp Factor[20 - Component 20]		RD_ONLY	
8054	FLOAT	Last FCalib_New Ret Time[1 - Component 1]		RD_ONLY	
8055	FLOAT	Last FCalib_New Ret Time[2 - Component 2]		RD_ONLY	
8056	FLOAT	Last FCalib_New Ret Time[3 - Component 3]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8057	FLOAT	Last FCalib_New Ret Time[4 - Component 4]		RD_ONLY	
8058	FLOAT	Last FCalib_New Ret Time[5 - Component 5]		RD_ONLY	
8059	FLOAT	Last FCalib_New Ret Time[6 - Component 6]		RD_ONLY	
8060	FLOAT	Last FCalib_New Ret Time[7 - Component 7]		RD_ONLY	
8061	FLOAT	Last FCalib_New Ret Time[8 - Component 8]		RD_ONLY	
8062	FLOAT	Last FCalib_New Ret Time[9 - Component 9]		RD_ONLY	
8063	FLOAT	Last FCalib_New Ret Time[10 - Component 10]		RD_ONLY	
8064	FLOAT	Last FCalib_New Ret Time[11 - Component 11]		RD_ONLY	
8065	FLOAT	Last FCalib_New Ret Time[12 - Component 12]		RD_ONLY	
8066	FLOAT	Last FCalib_New Ret Time[13 - Component 13]		RD_ONLY	
8067	FLOAT	Last FCalib_New Ret Time[14 - Component 14]		RD_ONLY	
8068	FLOAT	Last FCalib_New Ret Time[15 - Component 15]		RD_ONLY	
8069	FLOAT	Last FCalib_New Ret Time[16 - Component 16]		RD_ONLY	
8070	FLOAT	Last FCalib_New Ret Time[17 - Component 17]		RD_ONLY	
8071	FLOAT	Last FCalib_New Ret Time[18 - Component 18]		RD_ONLY	
8072	FLOAT	Last FCalib_New Ret Time[19 - Component 19]		RD_ONLY	
8073	FLOAT	Last FCalib_New Ret Time[20 - Component 20]		RD_ONLY	
8074	FLOAT	Last FCalib_New Ret Time[1 - Component 1]		RD_ONLY	
8075	FLOAT	Last FCalib_New Ret Time[2 - Component 2]		RD_ONLY	
8076	FLOAT	Last FCalib_New Ret Time[3 - Component 3]		RD_ONLY	
8077	FLOAT	Last FCalib_New Ret Time[4 - Component 4]		RD_ONLY	
8078	FLOAT	Last FCalib_New Ret Time[5 - Component 5]		RD_ONLY	
8079	FLOAT	Last FCalib_New Ret Time[6 - Component 6]		RD_ONLY	
8080	FLOAT	Last FCalib_New Ret Time[7 - Component 7]		RD_ONLY	
8081	FLOAT	Last FCalib_New Ret Time[8 - Component 8]		RD_ONLY	
8082	FLOAT	Last FCalib_New Ret Time[9 - Component 9]		RD_ONLY	
8083	FLOAT	Last FCalib_New Ret Time[10 - Component 10]		RD_ONLY	
8084	FLOAT	Last FCalib_New Ret Time[11 - Component 11]		RD_ONLY	
8085	FLOAT	Last FCalib_New Ret Time[12 - Component 12]		RD_ONLY	
8086	FLOAT	Last FCalib_New Ret Time[13 - Component 13]		RD_ONLY	
8087	FLOAT	Last FCalib_New Ret Time[14 - Component 14]		RD_ONLY	
8088	FLOAT	Last FCalib_New Ret Time[15 - Component 15]		RD_ONLY	
8089	FLOAT	Last FCalib_New Ret Time[16 - Component 16]		RD_ONLY	
8090	FLOAT	Last FCalib_New Ret Time[17 - Component 17]		RD_ONLY	
8091	FLOAT	Last FCalib_New Ret Time[18 - Component 18]		RD_ONLY	
8092	FLOAT	Last FCalib_New Ret Time[19 - Component 19]		RD_ONLY	
8093	FLOAT	Last FCalib_New Ret Time[20 - Component 20]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8094	FLOAT	Last FCalib_New Ret Time[1 - Component 1]		RD_ONLY	
8095	FLOAT	Last FCalib_New Ret Time[2 - Component 2]		RD_ONLY	
8096	FLOAT	Last FCalib_New Ret Time[3 - Component 3]		RD_ONLY	
8097	FLOAT	Last FCalib_New Ret Time[4 - Component 4]		RD_ONLY	
8098	FLOAT	Last FCalib_New Ret Time[5 - Component 5]		RD_ONLY	
8099	FLOAT	Last FCalib_New Ret Time[6 - Component 6]		RD_ONLY	
8100	FLOAT	Last FCalib_New Ret Time[7 - Component 7]		RD_ONLY	
8101	FLOAT	Last FCalib_New Ret Time[8 - Component 8]		RD_ONLY	
8102	FLOAT	Last FCalib_New Ret Time[9 - Component 9]		RD_ONLY	
8103	FLOAT	Last FCalib_New Ret Time[10 - Component 10]		RD_ONLY	
8104	FLOAT	Last FCalib_New Ret Time[11 - Component 11]		RD_ONLY	
8105	FLOAT	Last FCalib_New Ret Time[12 - Component 12]		RD_ONLY	
8106	FLOAT	Last FCalib_New Ret Time[13 - Component 13]		RD_ONLY	
8107	FLOAT	Last FCalib_New Ret Time[14 - Component 14]		RD_ONLY	
8108	FLOAT	Last FCalib_New Ret Time[15 - Component 15]		RD_ONLY	
8109	FLOAT	Last FCalib_New Ret Time[16 - Component 16]		RD_ONLY	
8110	FLOAT	Last FCalib_New Ret Time[17 - Component 17]		RD_ONLY	
8111	FLOAT	Last FCalib_New Ret Time[18 - Component 18]		RD_ONLY	
8112	FLOAT	Last FCalib_New Ret Time[19 - Component 19]		RD_ONLY	
8113	FLOAT	Last FCalib_New Ret Time[20 - Component 20]		RD_ONLY	
8114	FLOAT	Last FCalib_New Ret Time[1 - Component 1]		RD_ONLY	
8115	FLOAT	Last FCalib_New Ret Time[2 - Component 2]		RD_ONLY	
8116	FLOAT	Last FCalib_New Ret Time[3 - Component 3]		RD_ONLY	
8117	FLOAT	Last FCalib_New Ret Time[4 - Component 4]		RD_ONLY	
8118	FLOAT	Last FCalib_New Ret Time[5 - Component 5]		RD_ONLY	
8119	FLOAT	Last FCalib_New Ret Time[6 - Component 6]		RD_ONLY	
8120	FLOAT	Last FCalib_New Ret Time[7 - Component 7]		RD_ONLY	
8121	FLOAT	Last FCalib_New Ret Time[8 - Component 8]		RD_ONLY	
8122	FLOAT	Last FCalib_New Ret Time[9 - Component 9]		RD_ONLY	
8123	FLOAT	Last FCalib_New Ret Time[10 - Component 10]		RD_ONLY	
8124	FLOAT	Last FCalib_New Ret Time[11 - Component 11]		RD_ONLY	
8125	FLOAT	Last FCalib_New Ret Time[12 - Component 12]		RD_ONLY	
8126	FLOAT	Last FCalib_New Ret Time[13 - Component 13]		RD_ONLY	
8127	FLOAT	Last FCalib_New Ret Time[14 - Component 14]		RD_ONLY	
8128	FLOAT	Last FCalib_New Ret Time[15 - Component 15]		RD_ONLY	
8129	FLOAT	Last FCalib_New Ret Time[16 - Component 16]		RD_ONLY	
8130	FLOAT	Last FCalib_New Ret Time[17 - Component 17]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8131	FLOAT	Last FCalib_New Ret Time[18 - Component 18]		RD_ONLY	
8132	FLOAT	Last FCalib_New Ret Time[19 - Component 19]		RD_ONLY	
8133	FLOAT	Last FCalib_New Ret Time[20 - Component 20]		RD_ONLY	
8134	FLOAT	Last FCalib_Old Resp Factor[1 - Component 1]		RD_ONLY	
8135	FLOAT	Last FCalib_Old Resp Factor[2 - Component 2]		RD_ONLY	
8136	FLOAT	Last FCalib_Old Resp Factor[3 - Component 3]		RD_ONLY	
8137	FLOAT	Last FCalib_Old Resp Factor[4 - Component 4]		RD_ONLY	
8138	FLOAT	Last FCalib_Old Resp Factor[5 - Component 5]		RD_ONLY	
8139	FLOAT	Last FCalib_Old Resp Factor[6 - Component 6]		RD_ONLY	
8140	FLOAT	Last FCalib_Old Resp Factor[7 - Component 7]		RD_ONLY	
8141	FLOAT	Last FCalib_Old Resp Factor[8 - Component 8]		RD_ONLY	
8142	FLOAT	Last FCalib_Old Resp Factor[9 - Component 9]		RD_ONLY	
8143	FLOAT	Last FCalib_Old Resp Factor[10 - Component 10]		RD_ONLY	
8144	FLOAT	Last FCalib_Old Resp Factor[11 - Component 11]		RD_ONLY	
8145	FLOAT	Last FCalib_Old Resp Factor[12 - Component 12]		RD_ONLY	
8146	FLOAT	Last FCalib_Old Resp Factor[13 - Component 13]		RD_ONLY	
8147	FLOAT	Last FCalib_Old Resp Factor[14 - Component 14]		RD_ONLY	
8148	FLOAT	Last FCalib_Old Resp Factor[15 - Component 15]		RD_ONLY	
8149	FLOAT	Last FCalib_Old Resp Factor[16 - Component 16]		RD_ONLY	
8150	FLOAT	Last FCalib_Old Resp Factor[17 - Component 17]		RD_ONLY	
8151	FLOAT	Last FCalib_Old Resp Factor[18 - Component 18]		RD_ONLY	
8152	FLOAT	Last FCalib_Old Resp Factor[19 - Component 19]		RD_ONLY	
8153	FLOAT	Last FCalib_Old Resp Factor[20 - Component 20]		RD_ONLY	
8154	FLOAT	Last FCalib_Old Resp Factor[1 - Component 1]		RD_ONLY	
8155	FLOAT	Last FCalib_Old Resp Factor[2 - Component 2]		RD_ONLY	
8156	FLOAT	Last FCalib_Old Resp Factor[3 - Component 3]		RD_ONLY	
8157	FLOAT	Last FCalib_Old Resp Factor[4 - Component 4]		RD_ONLY	
8158	FLOAT	Last FCalib_Old Resp Factor[5 - Component 5]		RD_ONLY	
8159	FLOAT	Last FCalib_Old Resp Factor[6 - Component 6]		RD_ONLY	
8160	FLOAT	Last FCalib_Old Resp Factor[7 - Component 7]		RD_ONLY	
8161	FLOAT	Last FCalib_Old Resp Factor[8 - Component 8]		RD_ONLY	
8162	FLOAT	Last FCalib_Old Resp Factor[9 - Component 9]		RD_ONLY	
8163	FLOAT	Last FCalib_Old Resp Factor[10 - Component 10]		RD_ONLY	
8164	FLOAT	Last FCalib_Old Resp Factor[11 - Component 11]		RD_ONLY	
8165	FLOAT	Last FCalib_Old Resp Factor[12 - Component 12]		RD_ONLY	
8166	FLOAT	Last FCalib_Old Resp Factor[13 - Component 13]		RD_ONLY	
8167	FLOAT	Last FCalib_Old Resp Factor[14 - Component 14]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8168	FLOAT	Last FCalib_Old Resp Factor[15 - Component 15]		RD_ONLY	
8169	FLOAT	Last FCalib_Old Resp Factor[16 - Component 16]		RD_ONLY	
8170	FLOAT	Last FCalib_Old Resp Factor[17 - Component 17]		RD_ONLY	
8171	FLOAT	Last FCalib_Old Resp Factor[18 - Component 18]		RD_ONLY	
8172	FLOAT	Last FCalib_Old Resp Factor[19 - Component 19]		RD_ONLY	
8173	FLOAT	Last FCalib_Old Resp Factor[20 - Component 20]		RD_ONLY	
8174	FLOAT	Last FCalib_Old Resp Factor[1 - Component 1]		RD_ONLY	
8175	FLOAT	Last FCalib_Old Resp Factor[2 - Component 2]		RD_ONLY	
8176	FLOAT	Last FCalib_Old Resp Factor[3 - Component 3]		RD_ONLY	
8177	FLOAT	Last FCalib_Old Resp Factor[4 - Component 4]		RD_ONLY	
8178	FLOAT	Last FCalib_Old Resp Factor[5 - Component 5]		RD_ONLY	
8179	FLOAT	Last FCalib_Old Resp Factor[6 - Component 6]		RD_ONLY	
8180	FLOAT	Last FCalib_Old Resp Factor[7 - Component 7]		RD_ONLY	
8181	FLOAT	Last FCalib_Old Resp Factor[8 - Component 8]		RD_ONLY	
8182	FLOAT	Last FCalib_Old Resp Factor[9 - Component 9]		RD_ONLY	
8183	FLOAT	Last FCalib_Old Resp Factor[10 - Component 10]		RD_ONLY	
8184	FLOAT	Last FCalib_Old Resp Factor[11 - Component 11]		RD_ONLY	
8185	FLOAT	Last FCalib_Old Resp Factor[12 - Component 12]		RD_ONLY	
8186	FLOAT	Last FCalib_Old Resp Factor[13 - Component 13]		RD_ONLY	
8187	FLOAT	Last FCalib_Old Resp Factor[14 - Component 14]		RD_ONLY	
8188	FLOAT	Last FCalib_Old Resp Factor[15 - Component 15]		RD_ONLY	
8189	FLOAT	Last FCalib_Old Resp Factor[16 - Component 16]		RD_ONLY	
8190	FLOAT	Last FCalib_Old Resp Factor[17 - Component 17]		RD_ONLY	
8191	FLOAT	Last FCalib_Old Resp Factor[18 - Component 18]		RD_ONLY	
8192	FLOAT	Last FCalib_Old Resp Factor[19 - Component 19]		RD_ONLY	
8193	FLOAT	Last FCalib_Old Resp Factor[20 - Component 20]		RD_ONLY	
8194	FLOAT	Last FCalib_Old Resp Factor[1 - Component 1]		RD_ONLY	
8195	FLOAT	Last FCalib_Old Resp Factor[2 - Component 2]		RD_ONLY	
8196	FLOAT	Last FCalib_Old Resp Factor[3 - Component 3]		RD_ONLY	
8197	FLOAT	Last FCalib_Old Resp Factor[4 - Component 4]		RD_ONLY	
8198	FLOAT	Last FCalib_Old Resp Factor[5 - Component 5]		RD_ONLY	
8199	FLOAT	Last FCalib_Old Resp Factor[6 - Component 6]		RD_ONLY	
8200	FLOAT	Last FCalib_Old Resp Factor[7 - Component 7]		RD_ONLY	
8201	FLOAT	Last FCalib_Old Resp Factor[8 - Component 8]		RD_ONLY	
8202	FLOAT	Last FCalib_Old Resp Factor[9 - Component 9]		RD_ONLY	
8203	FLOAT	Last FCalib_Old Resp Factor[10 - Component 10]		RD_ONLY	
8204	FLOAT	Last FCalib_Old Resp Factor[11 - Component 11]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8205	FLOAT	Last FCalib_Old Resp Factor[12 - Component 12]		RD_ONLY	
8206	FLOAT	Last FCalib_Old Resp Factor[13 - Component 13]		RD_ONLY	
8207	FLOAT	Last FCalib_Old Resp Factor[14 - Component 14]		RD_ONLY	
8208	FLOAT	Last FCalib_Old Resp Factor[15 - Component 15]		RD_ONLY	
8209	FLOAT	Last FCalib_Old Resp Factor[16 - Component 16]		RD_ONLY	
8210	FLOAT	Last FCalib_Old Resp Factor[17 - Component 17]		RD_ONLY	
8211	FLOAT	Last FCalib_Old Resp Factor[18 - Component 18]		RD_ONLY	
8212	FLOAT	Last FCalib_Old Resp Factor[19 - Component 19]		RD_ONLY	
8213	FLOAT	Last FCalib_Old Resp Factor[20 - Component 20]		RD_ONLY	
8214	FLOAT	Last FCalib_Old Ret Time[1 - Component 1]		RD_ONLY	
8215	FLOAT	Last FCalib_Old Ret Time[2 - Component 2]		RD_ONLY	
8216	FLOAT	Last FCalib_Old Ret Time[3 - Component 3]		RD_ONLY	
8217	FLOAT	Last FCalib_Old Ret Time[4 - Component 4]		RD_ONLY	
8218	FLOAT	Last FCalib_Old Ret Time[5 - Component 5]		RD_ONLY	
8219	FLOAT	Last FCalib_Old Ret Time[6 - Component 6]		RD_ONLY	
8220	FLOAT	Last FCalib_Old Ret Time[7 - Component 7]		RD_ONLY	
8221	FLOAT	Last FCalib_Old Ret Time[8 - Component 8]		RD_ONLY	
8222	FLOAT	Last FCalib_Old Ret Time[9 - Component 9]		RD_ONLY	
8223	FLOAT	Last FCalib_Old Ret Time[10 - Component 10]		RD_ONLY	
8224	FLOAT	Last FCalib_Old Ret Time[11 - Component 11]		RD_ONLY	
8225	FLOAT	Last FCalib_Old Ret Time[12 - Component 12]		RD_ONLY	
8226	FLOAT	Last FCalib_Old Ret Time[13 - Component 13]		RD_ONLY	
8227	FLOAT	Last FCalib_Old Ret Time[14 - Component 14]		RD_ONLY	
8228	FLOAT	Last FCalib_Old Ret Time[15 - Component 15]		RD_ONLY	
8229	FLOAT	Last FCalib_Old Ret Time[16 - Component 16]		RD_ONLY	
8230	FLOAT	Last FCalib_Old Ret Time[17 - Component 17]		RD_ONLY	
8231	FLOAT	Last FCalib_Old Ret Time[18 - Component 18]		RD_ONLY	
8232	FLOAT	Last FCalib_Old Ret Time[19 - Component 19]		RD_ONLY	
8233	FLOAT	Last FCalib_Old Ret Time[20 - Component 20]		RD_ONLY	
8234	FLOAT	Last FCalib_Old Ret Time[1 - Component 1]		RD_ONLY	
8235	FLOAT	Last FCalib_Old Ret Time[2 - Component 2]		RD_ONLY	
8236	FLOAT	Last FCalib_Old Ret Time[3 - Component 3]		RD_ONLY	
8237	FLOAT	Last FCalib_Old Ret Time[4 - Component 4]		RD_ONLY	
8238	FLOAT	Last FCalib_Old Ret Time[5 - Component 5]		RD_ONLY	
8239	FLOAT	Last FCalib_Old Ret Time[6 - Component 6]		RD_ONLY	
8240	FLOAT	Last FCalib_Old Ret Time[7 - Component 7]		RD_ONLY	
8241	FLOAT	Last FCalib_Old Ret Time[8 - Component 8]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8242	FLOAT	Last FCalib_Old Ret Time[9 - Component 9]		RD_ONLY	
8243	FLOAT	Last FCalib_Old Ret Time[10 - Component 10]		RD_ONLY	
8244	FLOAT	Last FCalib_Old Ret Time[11 - Component 11]		RD_ONLY	
8245	FLOAT	Last FCalib_Old Ret Time[12 - Component 12]		RD_ONLY	
8246	FLOAT	Last FCalib_Old Ret Time[13 - Component 13]		RD_ONLY	
8247	FLOAT	Last FCalib_Old Ret Time[14 - Component 14]		RD_ONLY	
8248	FLOAT	Last FCalib_Old Ret Time[15 - Component 15]		RD_ONLY	
8249	FLOAT	Last FCalib_Old Ret Time[16 - Component 16]		RD_ONLY	
8250	FLOAT	Last FCalib_Old Ret Time[17 - Component 17]		RD_ONLY	
8251	FLOAT	Last FCalib_Old Ret Time[18 - Component 18]		RD_ONLY	
8252	FLOAT	Last FCalib_Old Ret Time[19 - Component 19]		RD_ONLY	
8253	FLOAT	Last FCalib_Old Ret Time[20 - Component 20]		RD_ONLY	
8254	FLOAT	Last FCalib_Old Ret Time[1 - Component 1]		RD_ONLY	
8255	FLOAT	Last FCalib_Old Ret Time[2 - Component 2]		RD_ONLY	
8256	FLOAT	Last FCalib_Old Ret Time[3 - Component 3]		RD_ONLY	
8257	FLOAT	Last FCalib_Old Ret Time[4 - Component 4]		RD_ONLY	
8258	FLOAT	Last FCalib_Old Ret Time[5 - Component 5]		RD_ONLY	
8259	FLOAT	Last FCalib_Old Ret Time[6 - Component 6]		RD_ONLY	
8260	FLOAT	Last FCalib_Old Ret Time[7 - Component 7]		RD_ONLY	
8261	FLOAT	Last FCalib_Old Ret Time[8 - Component 8]		RD_ONLY	
8262	FLOAT	Last FCalib_Old Ret Time[9 - Component 9]		RD_ONLY	
8263	FLOAT	Last FCalib_Old Ret Time[10 - Component 10]		RD_ONLY	
8264	FLOAT	Last FCalib_Old Ret Time[11 - Component 11]		RD_ONLY	
8265	FLOAT	Last FCalib_Old Ret Time[12 - Component 12]		RD_ONLY	
8266	FLOAT	Last FCalib_Old Ret Time[13 - Component 13]		RD_ONLY	
8267	FLOAT	Last FCalib_Old Ret Time[14 - Component 14]		RD_ONLY	
8268	FLOAT	Last FCalib_Old Ret Time[15 - Component 15]		RD_ONLY	
8269	FLOAT	Last FCalib_Old Ret Time[16 - Component 16]		RD_ONLY	
8270	FLOAT	Last FCalib_Old Ret Time[17 - Component 17]		RD_ONLY	
8271	FLOAT	Last FCalib_Old Ret Time[18 - Component 18]		RD_ONLY	
8272	FLOAT	Last FCalib_Old Ret Time[19 - Component 19]		RD_ONLY	
8273	FLOAT	Last FCalib_Old Ret Time[20 - Component 20]		RD_ONLY	
8274	FLOAT	Last FCalib_Old Ret Time[1 - Component 1]		RD_ONLY	
8275	FLOAT	Last FCalib_Old Ret Time[2 - Component 2]		RD_ONLY	
8276	FLOAT	Last FCalib_Old Ret Time[3 - Component 3]		RD_ONLY	
8277	FLOAT	Last FCalib_Old Ret Time[4 - Component 4]		RD_ONLY	
8278	FLOAT	Last FCalib_Old Ret Time[5 - Component 5]		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
8279	FLOAT	Last FCalib_Old Ret Time[6 - Component 6]		RD_ONLY	
8280	FLOAT	Last FCalib_Old Ret Time[7 - Component 7]		RD_ONLY	
8281	FLOAT	Last FCalib_Old Ret Time[8 - Component 8]		RD_ONLY	
8282	FLOAT	Last FCalib_Old Ret Time[9 - Component 9]		RD_ONLY	
8283	FLOAT	Last FCalib_Old Ret Time[10 - Component 10]		RD_ONLY	
8284	FLOAT	Last FCalib_Old Ret Time[11 - Component 11]		RD_ONLY	
8285	FLOAT	Last FCalib_Old Ret Time[12 - Component 12]		RD_ONLY	
8286	FLOAT	Last FCalib_Old Ret Time[13 - Component 13]		RD_ONLY	
8287	FLOAT	Last FCalib_Old Ret Time[14 - Component 14]		RD_ONLY	
8288	FLOAT	Last FCalib_Old Ret Time[15 - Component 15]		RD_ONLY	
8289	FLOAT	Last FCalib_Old Ret Time[16 - Component 16]		RD_ONLY	
8290	FLOAT	Last FCalib_Old Ret Time[17 - Component 17]		RD_ONLY	
8291	FLOAT	Last FCalib_Old Ret Time[18 - Component 18]		RD_ONLY	
8292	FLOAT	Last FCalib_Old Ret Time[19 - Component 19]		RD_ONLY	
8293	FLOAT	Last FCalib_Old Ret Time[20 - Component 20]		RD_ONLY	
8963	FLOAT	Clear All Alarms		RD_WR	
8964	FLOAT	Acknowledge All Alarms		RD_WR	
9006	INT	Current Time(time_t)		RD_WR	MM
9007	INT	Current Time(time_t)		RD_WR	DD
9008	INT	Current Time(time_t)		RD_WR	YYYY
9009	INT	Current Time(time_t)		RD_WR	hh
9010	INT	Current Time(time_t)		RD_WR	mm
9011	INT	Current Time(time_t)		RD_WR	ss
9012	INT	Unused		RD_ONLY	
9013	INT	Modbus Id[1 - Port 0]		RD_ONLY	
9014	INT	Site Id		RD_WR	
9022	INT	Analysis Time		RD_ONLY	
9023	INT	Unused		RD_ONLY	
9024	INT	Cycle Time		RD_ONLY	
9025	INT	Unused		RD_ONLY	
9026	INT	Run Time		RD_ONLY	
9027	INT	Unused		RD_ONLY	
9028	INT	Current Stream		RD_ONLY	
9029	INT	Unused		RD_ONLY	
9030	INT	GC Control_Analyser Control (Write Reg 9030)		RD_WR	
9031	INT	Unused		RD_ONLY	
9032	INT	GC Calibrating		RD_ONLY	

Register #	Data type	Variable	Record #	Access	Format
9033	INT	Unused		RD_ONLY	
9034	INT	Active Alarm Flag		RD_ONLY	
9035	INT	UnAck Alarm Flag		RD_ONLY	
9036	INT	Hourly Average Reset time		RD_ONLY	YY
9037	INT	Hourly Average Reset time		RD_ONLY	MM
9038	INT	Hourly Average Reset time		RD_ONLY	DD
9039	INT	Hourly Average Reset time		RD_ONLY	hh
9040	INT	Hourly Average Reset time		RD_ONLY	mm
9041	INT	Daily Average Reset time		RD_ONLY	YY
9042	INT	Daily Average Reset time		RD_ONLY	MM
9043	INT	Daily Average Reset time		RD_ONLY	DD
9044	INT	Daily Average Reset time		RD_ONLY	hh
9045	INT	Daily Average Reset time		RD_ONLY	mm
9046	INT	Weekly Average Reset time		RD_ONLY	YY
9047	INT	Weekly Average Reset time		RD_ONLY	MM
9048	INT	Weekly Average Reset time		RD_ONLY	DD
9049	INT	Weekly Average Reset time		RD_ONLY	hh
9050	INT	Weekly Average Reset time		RD_ONLY	mm
9051	INT	Monthly Average Reset time		RD_ONLY	YY
9052	INT	Monthly Average Reset time		RD_ONLY	MM
9053	INT	Monthly Average Reset time		RD_ONLY	DD
9054	INT	Monthly Average Reset time		RD_ONLY	hh
9055	INT	Monthly Average Reset time		RD_ONLY	mm
9056	INT	Variable Average Reset time		RD_ONLY	YY
9057	INT	Variable Average Reset time		RD_ONLY	MM
9058	INT	Variable Average Reset time		RD_ONLY	DD
9059	INT	Variable Average Reset time		RD_ONLY	hh
9060	INT	Variable Average Reset time		RD_ONLY	mm

3099...3102 (Valid data flags): This flag is set to 1 when new valid data is put into the Modbus registers and set to 0 if an alarm is active. The 4 copies of this flag operate in the same way; they are intended for use by up to 4 independent Modbus master devices attached to the 4 serial ports. This is a read-write register, so the Modbus Master can clear the flag once the new results are read.

3103...3182 (Calibration update flags): Set to 1 when response factors are updated during a calibration.

5001 (Last Analy_Cycle Time (1/30th sec)): Cycle time for last analysis in 1/30th seconds. For example, if cycle time is 300 seconds, this register reads 9000.

5002 (Last Cal_Cycle Time (1/30th sec)): Cycle time for last calibration in 1/30th seconds. For example, if cycle time is 300 seconds, this register reads 9000.

7001...70016 (Last Analy Mole %): These registers hold the mole % results for the last analysis run. The order of components in these registers can be determined by reading Register 3001...3016 which contains the component codes.

7017...7032 (Last Analy Weight %): These registers hold the weight % results for the last analysis run. The order of components in these registers can be determined by reading Register 3001...3016 which contains the component codes.

7033...7039 : Last analysis stream results.

7040...7044: User calculation results 1...5.

7046...7054: Last analysis stream results.

7070...7084: Most recent archive averages for Averages 1...15.

7085...7086: Current analog input values for Analog Input 1 and 2.

7087...7090: Last analysis stream results.

7091: Number of total calibration runs.

7092: Number of averaged calibration runs.

7093: Auto calibration start time.

7094: (Stream Sequence Select): Read-write register. When read, returns currently selected stream sequence. To change stream sequence, write sequence number.

Value	Stream sequence
1	Default stream sequence
2	Aux stream sequence 1
3	Aux stream sequence 2

7095...7110 (Last Analysis Response Factors): Response factor for Components 1...16 used on last run.

7111...7121: Results from last calibration.

7122: Calibration stream number.

7123...7125: Last analysis GS(M)R results.

7126...7161: Current running averages for Averages 1...36.

7162...7197: Maximum sample value during current averaging period for Averages 1...36.

7198...7233: Minimum sample value during current averaging period for averages 1...36.

7234...7269: Most recent archived averages for Averages 1 through 36.

7270...7305: Maximum sample value in the second most recent archived average for Averages 1...36.

7306...7341: Minimum sample value in the second most recent archived average for Averages 1...36.

7342...7377: Second most recent archived averages for Averages 1...36.

7378...7413: Maximum sample value in the second most recent archived average for Averages 1...36.

7414...7449: Minimum sample value in the second most recent archived average for averages 1...36.

7450...7485: Third most recent archived averages for Averages 1...36.

7586...7621: Maximum sample value in the third most recent archived averages for Averages 1...36.

7521...7557: Minimum sample value in the third most recent archived averages for Averages 1...36.

7558...7573: Multi-level calibration coefficient *a* components 1...16.

7572...7589: Multi-level calibration coefficient *b* components 1...16.

7590...7605: Multi-level calibration coefficient *c* components 1...16.

7606...7621: Multi-level calibration coefficient *d* components 1...16.

7622...7637: Indirect calibration - relative response factors for components 1...16.

7638...7717: Repeat of 7558...7637 above for component table 2.

7718...7845: Current running averages for Averages 1...128.

7486..7973: Most recent archived averages for Averages 1...128.

7974...8053: Current response factors.

8054...8133: Current retention times.

8214...8293: Retention times from previous calibration.

8963 (Clear All Alarms): Write 1 to this register to clear all active alarms.

8964 (Acknowledge All Alarms): Write 1 to this register to acknowledge all alarms.

9006...9011: GC system date/time read-write registers.

9013 (Modbus ID [Port 0]): Modbus ID for Serial Port 0.

9014 (Site ID): GC site ID read-write register.

9022 (Analysis Time): Analysis time.

9024 (Cycle Time): Cycle time.

9026 (Run Time): Run time.

9028 (Current Stream): Stream number.

9030 (Analyzer Control): Section B.6.

9032 (GC Calibrating): Tells you if the GC is calibrating. A value of 1 means the GC is calibrating, 0 otherwise.

9034 (Active Alarm Flag): Tells you if the GC has any active alarms. A value of 1 indicates that there are active alarms, 0 otherwise.

9035 (UnAck Alarm Flag): Tells you if the GC has any unaknowledged alarms. A value of 1 indicates that there are unacknowledged alarms, 0 otherwise.

9036...9040 (Hourly Average Reset Time): Date/time when hourly average results were archived.

9041...9045 (Daily Average Reset Time): Date/time when daily average results were archived.

9046...9047 (Weekly Average Reset Time): Date/time when weekly average results were archived.

9051...9055 (Monthly Average Reset Time): Date/time when monthly averaged results were archived.

9056...9060 (Variable Average Reset Time): Date/time when variable average results were archived.

D.6 Remote control registers

Modbus register	Description
GC Control_Auto Sequence	Start chromatograph auto sequencing. Normally 0.0; write non-zero value to initiate sequencing. 1.0 - start with purge 2.0 - start without purge
GC Control_Halt	Halt chromatograph sequencing - Normally 0.0; write 1.0 to perform halt.
GC Control_Single Stream	Start single stream run - Normally 0.0. *Continuous Single Stream* mode: Write the stream number (in floating point) to start with a purge and the negative of the stream number to start without a purge. *Single Analysis Non-continuous Single Stream* mode: Write (128.0 + the stream number) (in floating point) to start with a purge, and the negative of (128.0 + the stream number) to start without a purge.

<table>
<tr><th>Modbus register</th><th>Description</th></tr>
<tr><td>GC Control_Calibration</td><td>Start calibration sequence - Normally 0.0. For Normal Calibration: Write the stream number of the calibration stream in floating point to start calibration sequence with a purge, or write the negative of the stream number to start calibration sequence without a purge.
For Forced Calibration: Write (128.0 + stream number) of the cal stream in floating point to start calibration sequence with a purge or writes the negative of (128 + stream number) of the cal stream to start a calibration sequence without a purge.</td></tr>
<tr><td>GC Control_Validation</td><td>Start validation sequence - Normally 0.0. For Validation: Write the stream number of the Validation stream in floating point to start validation sequence with a purge, or write the negative of the stream number to start validation sequence without a purge.</td></tr>
<tr><td>GC Control -> Validation Acknowledge</td><td>GC copies Start Validation command to this register; PLC can reset after confirming that command was successfully issued.</td></tr>
<tr><td>GC Control_Stream Sequence Select</td><td>Read-write register. When read, returns currently selected stream sequence. To change stream sequence, write sequence number.
<table>
<tr><th>Value</th><th>Stream sequence</th></tr>
<tr><td>1</td><td>Default stream sequence</td></tr>
<tr><td>2</td><td>Aux stream sequence 1</td></tr>
<tr><td>3</td><td>Aux stream sequence 2</td></tr>
</table></td></tr>
<tr><td>Stream Sequence - Default Stream Sequence</td><td>Reads the sequence of streams. For example, if current Sequence is 1, 2, then this register reads a value of 12. To change the sequence of streams: For example, to change the Sequence to 2,3, write 23 to this register.</td></tr>
<tr><td>GC Status > GC Running</td><td>GC is running.
0 - GC is idle
1 - GC is running (Auto Analysis, Single Stream, Calibration, Validation)</td></tr>
<tr><td>GC Status > Current Analysis Mode</td><td>Indicates mode of operation:
0 - GC Idle
1 - Auto Sequence
2 - Single Stream
3 - Manual Calibration
4 - Manual Validation</td></tr>
</table>

D.7 Read-write remote control register (9030)

9030 is a read-write register that can be used for controlling GC operation and for reading current operating mode.

The mode values read from register 9030 are:

0	Idle
1	In automatic sequencing mode
2	Running in single stream mode
3	Calibrating
4	Warm starting, running confidence tests
5	Validating (added in Firmware Version 2.1.0 and higher)

The commands that can be written to register 9030 are:

0	Halt at the end of the current analysis
1	Start automatic sequencing mode
2	Start a normal calibration, on first calibration stream
3	Run single analysis on stream 1, then halt
4	Run continually on stream 1
5	Run a single analysis on stream 2, then halt
6	Run continually on stream 2
7	Run a single analysis on stream 3, then halt
8	Run continuously on stream 3
9	Run a single analysis on stream 4, then halt
10	Run continually on stream 4
11	Run a single analysis on stream 5, then halt
12	Run continually on stream 5
13	Run a single analysis on stream 6, then halt
14	Run continually on stream 6
15	Run a single analysis on stream 7, then halt
16	Run continuously on stream 7
17	Run a single analysis on stream 8, then halt
18	Run continuously on stream 8
19	Run validation on first validation stream (added in Firmware Version 2.1.0 and higher)
...	
41	Run normal calibration on stream 1 (added in Firmware Version 2.1.0 and higher)
42	Run normal calibration on stream 2 (added in Firmware Version 2.1.0 and higher)
...	

60	Run normal calibration on stream 20 (added in Firmware Version 2.1.0 and higher)
...	
81	Run validation on stream 1 (added in Firmware Version 2.1.0 and higher)
82	Run validation on stream 2 (added in Firmware Version 2.1.0 and higher)
...	
100	Run validation on stream 20 (added in Firmware Version 2.1.0 and higher)

Commands 1-19, 41-60, and 81-100 above are with 60 seconds purge. Adding 20 to any command means *no purge* if relevant. These writes are done using Modbus functions 6 or 16. Except for commands 0 and 2, the GC must be idle. If a command fails because the GC was not idle or because the code is invalid or the stream is not used, a Modbus exception *illegal data value* will be returned. All these commands are allowed without requiring a password or the security switch to be unlocked. These commands are available to both User Modbus ports and SIM_2251 Modbus ports.

D.8 Writable Modbus registers

The following list documents all the Modbus registers in the GC that can be written when the GC is under legal metrology control with the security switch locked. Please note that not all the registers in this table are available in the SIM_2251 mapping.

Modbus register	Remarks
GC Status -> Current Month	Set GC clock. All 5 registers can be written in a single request, or individual registers can be written. The new date/time is validated before the GC system clock is changed.
GC Status -> Current Day	
GC Status -> Current Year	
GC Status -> Current Hour	
GC Status -> Current Minute	
GC Status -> New Data Flag	Flags for synchronizing Master and Slave. The Slave (GC) updates its result registers and then sets the flag to 1. The Master (PLC/Flow Computer) reads the data and resets the flag to 0.
GC Status -> Hourly Avg Updated	
GC Status -> Weekly Avg Updated	
GC Status -> Daily Avg Updated	
GC Status -> Monthly Avg Updated	
GC Status -> Last Run Data Valid 1	
GC Status -> Last Run Data Valid 2	
GC Status -> Last Run Data Valid 3	
GC Status -> Last Run Data Valid 4	
GC Status -> Last Run Data Valid 5	

Modbus register	Remarks
GC Status -> Last Run Data Valid 6	
GC Status -> Last Run Data Valid 7	
GC Status -> Last Run Data Valid 8	
GC Status -> Last Run Data Valid 9	
GC Status -> Last Run Data Valid 10	
Stream 1 -> New Data Available	
Stream 2 -> New Data Available	
Stream 3 -> New Data Available	
Stream 4 -> New Data Available	
Stream 5 -> New Data Available	
Stream 6 -> New Data Available	
Stream 7 -> New Data Available	
Stream 8 -> New Data Available	
Stream 9 -> New Data Available	
Stream 10 -> New Data Available	
Stream 11 -> New Data Available	
Stream 12 -> New Data Available	
Stream 13 -> New Data Available	
Stream 14 -> New Data Available	
Stream 15 -> New Data Available	
Stream 16 -> New Data Available	
Stream 17 -> New Data Available	
Stream 18 -> New Data Available	
Stream 19 -> New Data Available	
Stream 20 -> New Data Available	
Discrete Output 1 -> Switch	Master can write the following values to this register - 0 - Sets the discrete output to *Off*. 1 - Sets the discrete output to *On*. 2 - Sets the discrete output to *Automatic* (DO controller by GC's timed events).
Discrete Output 2 -> Switch	
Discrete Output 3 -> Switch	
Discrete Output 4 -> Switch	
Discrete Output 5 -> Switch	
Dewpoint Configuration 1 -> Pressure 1	Pressure at which hydrocarbon dewpoint results are computed. Used only for dual-detector C9+ hydrocarbon dewpoint GCs. These registers are not used in C6+ custody transfer applications.
Dewpoint Configuration 1 -> Pressure 2	

Modbus register	Remarks
Dewpoint Configuration 1 -> Pressure 3	
Dewpoint Configuration 1 -> Pressure 4	
Dewpoint Configuration 2 -> Pressure 1	
Dewpoint Configuration 2 -> Pressure 2	
Dewpoint Configuration 2 -> Pressure 3	
Dewpoint Configuration 2 -> Pressure 4	
Dewpoint Configuration 3 -> Pressure 1	
Dewpoint Configuration 3 -> Pressure 2	
Dewpoint Configuration 3 -> Pressure 3	
Dewpoint Configuration 3 -> Pressure 4	
Dewpoint Configuration 4 -> Pressure 1	
Dewpoint Configuration 4 -> Pressure 2	
Dewpoint Configuration 4 -> Pressure 3	
Dewpoint Configuration 4 -> Pressure 4	
GC Control_Auto Sequence	Start chromatograph auto sequencing. Normally 0.0; write non-zero value to initiate sequencing. 1.0 - Start with purge. 2.0 - Start without purge.
GC Control_Halt	Halt chromatograph sequencing - Normally 0.0; write *1.0* to perform halt.
GC Control_Single Stream	Start single stream run. Normally 0.0. *Continuous Single Stream* mode: Write the stream number (in floating point) to start with a purge, and the negative of the stream number to start without a purge. *Single Analysis Non-continuous Single Stream* mode: Write (128.0 + the stream number) (in floating point) to start with a purge and the negative of (128.0 + the stream number) to start without a purge.

<table>
<tr><th>Modbus register</th><th>Remarks</th></tr>
<tr><td>GC Control_Calibration</td><td>Start calibration sequence.
Normally 0.0.
For normal calibration:
Write the stream number of the calibration stream in floating point to start calibration sequence with a purge or write the negative of the stream number to start calibration sequence without a purge.</td></tr>
<tr><td>GC Control_Validation</td><td>Start validation sequence.
Normally 0.0.
For validation:
Write the stream number of the validation stream in floating point to start validation sequence with a purge or write the negative of the stream number to start validation sequence without a purge.</td></tr>
<tr><td>GC Control_Stream Sequence Select</td><td>Read-write register. When read, returns currently selected stream sequence. To change stream sequence, write the sequence number.
Value stream sequence
<table>
<tr><th>Value</th><th>Stream sequence</th></tr>
<tr><td>1</td><td>Default stream sequence</td></tr>
<tr><td>2</td><td>Aux stream sequence 1</td></tr>
<tr><td>3</td><td>Aux stream sequence 2</td></tr>
</table>
</td></tr>
<tr><td>GC Control_Analyser Control (Write Reg 9030)</td><td>GC remote control register. Please refer to Section D.7.
for details.</td></tr>
<tr><td>Acknowledge All Alarms</td><td>Normally 0.0. Write 1 to acknowledge all alarms.</td></tr>
<tr><td>Component Data 1_Calib Conc[Component 1..15]</td><td>Update calibration concentration from PLC before starting calibration.</td></tr>
<tr><td>Component Data 1_Resp Fact %
[Component 1..15]</td><td>Update response factors from PLC.</td></tr>
<tr><td>Stream Sequence - Default Stream Sequence</td><td>Reads the sequence of streams. For example, if the current Sequence is 1, 2, then this register reads a value of 12.
To change the sequence of streams:
For example, to change the Sequence to 2,3, write 23 to this register.</td></tr>
<tr><td>GC Control_Auto Valve Timing</td><td>Start auto valve timing. Normally 0.0. Write
• Calibration stream number: to start AVT from current settings.
• Calibration stream number + 20 - to start AVT from default settings.</td></tr>
</table>

Appendix E
Recommended spare parts

The following list of recommended spare parts will allow you to maintain a single Rosemount 1500XA for approximately two years.

For a more detailed list of recommended spare parts, please see the documentation package that was provided with the Rosemount 1500XA.

Description	Part Number	Quantity
Preamplifier board	7A00401	1
Base I/O board	7A00403	1
Solenoid/Heater board	9A00402	1
CPU Board	7A00055G02	1
Assembly, Carrier Dryer	2-3-0500-180	1
Pressure switch, carrier, for Rosemount 1500XA	2-4-5000-209	1
Solenoid, 4-Way, MAC	2-4-0710-224	4
Power supply	7C00086-001	1
Assembly, RTD GC Oven	2-3-1700-092	1
LOI	7A00148G01	1
Heater Assembly	2-3-1510-118 (115 Vac) 2-3-1510-107 (230 Vac)	1
Solid State Relay (SSR)	2-5-2710-055	1
Time Delay Relay (TDR)	2-5-2710-040 (115 VAC) 2-5-2710-054 (230 VAC)	1
Backplane Board	9A00051G01	1
Kit, diaphragm, 10-port XA valve	2-4-0710-171	Application Dependent
Kit, diaphragm, 6-port XA valve	2-4-0710-248	Application Dependent
PFTE Thermistor Seals (Set of 10)	2-3-0500-391	1
Porter Regulator	2-4-5002-223	1
Assembly, Methanator Rosemount 700XA/1500XA(1)	2-3-0710-265	1

(1) For GCs with methantor units

Electrical and mechanical assemblies (Analyzer)

For units with FID

Description	Part Number	Quantity
FID Support PCBA(1)	9A00049G01	1
PCA, FID Electrometer(1)	2-3-0710-014	1

(1) For GCs with FID units

Appendix F
Shipping and long-term storage recommendations

For applications equipped with special columns, e.g., mole sieve, read and follow the additional instructions shipped with the analyzer and/or column set first. If you need another copy, please contact customer service.

The following recommendations should be followed:

- For shipping purposes the gas chromatograph should be secured to a wooden pallet, maintained in a vertical position and enclosed in a wood framework.
- Auxiliary equipment such as sample probes may be stored in the packaging in which it was shipped. If this packaging material is no longer available, secure the equipment to prevent excessive shaking and protect the accessories in a water proof enclosure.
- The gas chromatograph should be stored in a sheltered environment that is temperature controlled between -30 °C (-22° F) and 60° C (140 ° F) to keep the gas chromatograph's protective coatings from deteriorating from exposure to rain or caustic or corrosive environments. Humidity in the sheltered environment should be non-condensing. Be especially cautious of humidity if the conduit has been potted. Temporary caps and dessicant may be necessary.
- The configuration of the analyzer may be retained through battery back-up on the CPU for at least two years. If lost for some reason, a custom program for downloading the appropriate GC application is included on the USB shipped with the system documentation.
- If the gas chromatograph has been in operation, the system should be purged with carrier gas before powering the gas chromatograph down, especially when heavy hydrocarbons or components that tend to polymerize are present. Allowing the gas chromatograph to perform a few analysis cycles without sample gas is an acceptable method of purging the system.

Note

To expedite the purge process, you may use 30 psig of a dry inert gas, such as nitrogen or helium.

Monitor the results and halt the analyzer after component values fall to **0** or after peaks are significantly reduced in size. Save a copy of the diagnostic data under **Tools → Save Diagnostic Data**; once the file has been saved to a local PC, USB, or hard drive, you may remove power.

- After removing power from the GC, remove the purge gas and immediately cap all inlets and vents, including the carrier drier. These vents and inlets should be capped with the fittings that were in place when the GC shipped from the factory or with Swagelok® caps (not provided). This will protect the columns and filters and should result in a trouble-free start up when the unit is returned to service.
- The sample conditioning system vents and inlets should also be capped with the fittings that were in place when the system shipped from the factory. Additionally, all vents should be closed.
- Any remaining openings—such as conduit entries—should also have appropriate plugs installed to prevent foreign material such as dust or water from entering the system.

Appendix G
Engineering drawings

G.1 List of engineering drawings

9R00001A - Outline and Dimensional 1500XA GC Cyclop Z-Purge

9R00002B - Rosemount 1500XA 115 Vac Internal Power Supply Wiring

9R00003B - Rosemount 1500XA 220 Vac Internal Power Supply Wiring

9R00004B - Rosemount 1500XA Field Wiring (sheets 1 & 2) Module

CE-22260D - Assembly, 6 Port XA Valve, Rosemount Model 700XA

CE-22300C - Assembly, 10 Port XA Valve, Rosemount Model 700XA

Note
Although the two drawings above refer to the 700XA, they also apply to the 1500XA because the two GCs use the same types of valves.

G.2 List of CSA North America engineering drawings

7R01500 – 1500XA Outline and Dimensional GC Cyclop Z-Purge

7R01501 – 1500XA Internal Wiring 115VAC POWER

7R01503 – 1500XA Flow Configuration

7R01505 – 1500XA Front Label

Appendix H Glossary

Auto Zero	The TCD is auto zeroed at the start of a new analysis. Automatic zeroing of the TCD preamplifier can also be configured to take place at any time during the analysis if the component is not eluting or the baseline is steady. The FID will auto zero at each new analysis run and can be configured to auto zero anytime during the analysis if the component is not eluting or the baseline is steady.
Baseline	Signal output when there is only carrier gas going across the detectors. In a chromatogram you should only see Baseline when running an analysis without injecting a sample.
Carrier gas	The gas used to push the sample through the system during an analysis.
Chromatogram	A permanent record of the detector output. A chromatogram is obtained from a PC interfaced with the detector output through the controller assembly. A typical chromatogram displays all component peaks, and gain changes. It may be viewed in color as it is processed on a PC display. Tick marks recorded on the chromatogram by the controller assembly indicate where timed events take place.
Component	Any one of several different gases that may appear in a sample mixture. For example, natural gas usually contains the following components: nitrogen, carbon dioxide, methane, ethane, propane, isobutane, normal butane, isopentane, normal pentane, and hexanes plus.
CTS	Clear to send.
DCD	Data carrier detect.
DSR	Data set ready.
DTR	Data terminal ready.
FID	Flame ionization detector. The optional FID may be used in place of a TCD for the detection of trace compounds. The FID requires a polarization voltage and its output is connected to the input to a high impedance amplifier, an electrometer. The sample of gas to be measured is injected into the burner with a mixture of hydrogen and air to maintain the flame.
GC	Gas Chromatograph. The Rosemount 1500XA Gas Chromatograph is a user-configurable analyzer for various process gas applications.

LSIV Liquid sample injection valve. The optional LSIV is used to convert a liquid sample to a gas sample by vaporizing the liquid in a heated chamber, so the resulting gas sample can be analyzed.

Methanator The optional methanator, also known as a catalytic converter, transforms undetectable (by the FID) components, carbon dioxide and/or carbon monoxide, into methane by adding hydrogen and heat to the sample.

Note

Carbon dioxide and/or carbon monoxide components are detectable by the TCD.

Response factor Correction factor for each component as determined by the following calibration:

$$RF = \frac{Raw\ \ area}{Calibration\ \ concentration}$$

Retention time Time, in seconds, that elapses between the start of analysis and the sensing of the maximum concentration of each component by the detector.

RI Ring indicator.

RLSD Received line signal detect. A digital simulation of a carrier detect.

RTS Request to send.

RxD, RD, or S_{in} Receive data, or signal in.

TCD Thermal conductivity detector. A detector that uses the thermal conductivity of the different gas components to produce an unbalanced signal across the bridge of the preamplifier. The higher the temperature, the lower the resistance on the detectors.

TxD, TD, or S_{out} Transmit data, or signal out.

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