COMPACT MANUAL
MicroSAM™ and Maxum™

process
GAS CHROMATOGRAPHY

SIEMENS

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Compact Manual
MicroSAM and Maxum

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Technical Support

Getting Help

At Siemens we take pride in the on going support we provide our customers. This User's manual should answer your technical questions; however, our technical support service provides a special "hot" line as an added source of information.

If you require assistance call:

In the United States: (800) 448-8224
Internationally: 001-918-662-7030

Before You Call

Before you call one of our technical support lines, please have the following information available to help our representative answer your questions:

1. Unit Serial Number and Date of Installation

2. Description of Problem

3. LEDs Status on CAN I/O Modules

Safety Practices and Precautions

Product Safety

This product has been designed and tested in accordance with IEC Publication 1010-1, Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements, and has been supplied in a safe condition. This manual contains information and warnings, which have to be followed by the user to ensure safe operation and to retain the product in a safe condition.

Terms in This Manual

WARNING statements identify conditions or practices that could result in personal injury or loss of life.

CAUTION statements identify conditions or practices that could result in damage to the equipment or other property.

Terms as Marked on Equipment

DANGER indicates a personal injury hazard immediately accessible as one reads the markings.

CAUTION indicates a personal injury hazard not immediately accessible as one reads the markings, or a hazard to property, including the equipment itself.

Symbols in This Manual

⚠ This symbol indicates where applicable cautionary or other information is to be found.

Symbols Marked on Equipment

⚡ DANGER - High voltage

⏚ Protective ground (earth) terminal

⚠ ATTENTION - Refer to Manual

Safety Practices and Precautions, Continued

Hazardous or Poisonous Gases

WARNING

⚠

If hazardous or poisonous gases are analyzed or used in the analyzer, all national and international requirements must be fulfilled to protect personnel and the environment against any hazard that could arise, in the event that a leak occurs. To avoid leaks, scheduled preventive maintenance and inspection for leaks should be performed by the customer.

Disregarding this warning could result in serious injury or death and damage to equipment.

Correct Operating Voltage

Before switching on the power, check that the operating voltage listed on the equipment agrees with the available line voltage. Ensure that the power supply switch is to the correct input voltage.

Danger Arising from Loss of Ground

Any interruption of the grounding conductor inside or outside the equipment or loose connection of the grounding conductor can result in a dangerous unit. Intentional interruption of the grounding conductor is not permitted.

Safe Equipment

If it is determined that the equipment cannot be operated safely, it should be taken out of operation and secured against unintentional usage.

Use the Proper Fuse

To avoid fire hazard, use only a fuse of the correct type, voltage rating and current rating as specified in the parts list for your product. Use of repaired fuses or short-circuiting of the fuse switch is not permitted.

Safety Guidelines

DO NOT open the equipment to perform any adjustment, measurements, maintenance, parts replacement or repairs until all power supplies have been disconnected.

Only a properly trained technician should work on any equipment with power still applied.

When opening covers or removing parts, exercise extreme care "live parts or connections can be exposed".

Chapter 1

Introduction

Description

This manual covers commonly required operations for Maxum GCs, Maxum NAUs and MicroSAMs. It is intended to be an "easy reference guide" which allows the user to quickly find assistance relating to specific tasks.

Who is the Intended Audience?

- The user with some familiarity with using process instruments
- The user with a basic idea of chromatography, methods and applications.
- Maxum and/or MicroSAM Training Class attendance is recommended for each technician maintaining GC and NAU equipment.

How Should This Manual be Used?

- The manual is organized around the concept of explaining how to accomplish common tasks in the Maxum GC, NAU or MicroSAM GC. Each section contains the information pertinent to that task.
- Terms that are unfamiliar can be looked up in the Glossary (Appendix A).
- The manual will provide the simplest procedure for performing one of the tasks. In other words, if we can do something from the MMI or the workstation, but one is much simpler or advantageous than the other, then the more advantageous method will be shown. If there are advantages to showing both procedures, then we will show both, and note which one is preferable. Keep in mind that the user can always emulate the MMI from a workstation. Where the choice is arbitrary, the MMI method is illustrated.

Conventions & Notations

Where a sequence of user inputs is required in a procedure, a shorthand notation is used.

- Right arrows separate User actions, >.
- Selections from lists on the display are shown in quotes " ".
- Soft keys selections are shown within square brackets [ ].
- All "hard" keys will be shown these brackets { }

MMI / MMI Emulation

Description

There are three operating levels for the MMI / MMI Emulation. They have different permission levels and passwords which limits access to only those parts of the system needed for different personnel.

{Home}>[SELECT MENU]>"Monitor Menu"

The Monitor Level is used for routine operation of Analyzers. This includes:

1. Selection of which analyzer to view, Putting Analyzers into Run or Hold
2. Viewing and acknowledging or clearing Alarms
3. Viewing Streams
4. Viewing Detectors and Realtime Chromatograms
5. Viewing Results and stored Chromatograms
6. Initiating an Auto Validation Sequence
7. Initiating an Auto Calibration Sequence

{Home}> [SELECT MENU]>"Maintenance Menu"

The Maintenance Level is used for routine maintenance of analyzers. The following selections are available:

1. Selection of which Analyzer to control, Putting Analyzers into Run or Hold
2. Viewing and acknowledging or clearing Alarms
3. Viewing and selecting Applications
4. Viewing and selecting Stream Sequences
5. Viewing Detectors and Realtime Chromatograms
6. Viewing Results and stored Chromatograms
7. Selecting Methods, performing Calibration and Validation including changing of blends and calibration factors
8. Viewing and changing I/O, Temperatures and Pressures
9. Saving program to Flash

{Home}>[SELECT MENU]>"Configure Menu"

The Configuration Level is used to make non-routine changes to an Analyzer. The following selections are available:

1. System Setup and information about software and communications
2. Viewing and acknowledging or clearing Alarms
3. Selection of Printers
4. Selection of Host Computers
5. Enabling BASIC events
6. Viewing and changing Parameters
7. Viewing and changing System I/O
8. Viewing and changing Users and Passwords
9. Saving program to Flash

EZChrom General Description

EZChrom is the chromatogram storage, display and integration software that runs on a Workstation. An embedded version of EZChrom resides in the Analyzer software and performs integration, and calculations of chromatographic Results. EZChrom can be used on a Workstation to create or modify Methods, re-integrate Chromatograms, Calibrate a Method, display and print Chromatograms, log Chromatograms, view Real time Chromatograms, and Create and modify Sequences. The cycle clock of an Analyzer can be viewed and the Analyzer can be put into Run or Hold from the Application Control module.

To use EZChrom on a Workstation, a software "Instrument" must be created in EZChrom. A separate software Instrument must be created for each Application in a physical Analyzer one wishes to access. The Instrument must also be "Configured". Once created, the Instrument will stay available until deleted.

NOTE   Each Application requires a separate "Instrument"!

To create an Instrument from EZChrom

> "File">"New">"Instrument"
> "File">"Configure">"Instrument"
> Enter a name for the Instrument [Set Database]
> [Configure]
> [Set Database]
> Select the desired Application [OK]
> [Auto Configuration]
> [OK] [OK]

Double Click on the desired Instrument to open EZChrom for that Analyzer Application.

System Manager

Description

System Manager gives a high level overview of the analytical system. This interface allows the user to monitor the status of all units in the analytical system on one screen and access those units to perform configuration or maintenance functions. All Maxum, NAU, Advance Optichrom, Process Quantra and MicroSAM units automatically populate the icon list at the bottom of the main window as they broadcast on the network. The icons show the current state of each analyzer. A "grayed-out" icon is one that has not communicated with System Manager. A green icon shows the unit is in a normal state, a yellow icon denotes a warning alarm and a red icon a fault alarm.

System Manager allows the user to select an analyzer and view its database in tabular form to make configuration changes beyond those allowed by MMI/MMI Emulation. In addition to configuration changes, the user can back-up/restore analyzer databases to/from files on the PC or upgrade software. From this interface the user can also access Datalogger, EZChrom, MMI emulation or the MaxBasic Editor (if installed).

Once a device icon has been selected, the "Windows Explorer" type of interface allows the user to select the type of table to be accessed. Application tables contain records that are unique to each application and are accessed by highlighting an application folder, selecting "Tables" and then selecting a table of interest in the directory tree. System tables contain records that have information common to all applications and are selected by highlighting "System" and then selecting a table of interest in the directory tree. All table displays are static (snapshot) with the following exceptions: active updates are maintained for the Alarm Log, Results (results folder under each application), and the System View (analyzer icon list).

Once a table is displayed, help information in the lower portion of the window describes each field in the table displayed. Additional help information is available for each table from the main menu by selecting: **[Help] > "Maxum Reference" > "Maxum Database Reference" > "Tables" > then select the type table of interest**.

Chapter 2

Installation

Minimum PC Requirements

Software

a) Windows NT 4.0 (Service Pack 4 or greater), Windows 2000 Professional, Windows XP Professional or later.

b) Internet Explorer 5.01 (Service Pack 2 or greater)

c) TCP/IP installed

d) User logged in with Administrator Privileges

Hardware

166 MHz Pentium processor, 64 Mbytes RAM;

Workstation Software

Description

The workstation tools are available on multiple CDs. The primary CD is **Maxum System Tools**. The other CDs are installed based on their need as described below. Each of the CDs is copy protected. The "Software Key" label used in the installation process is affixed to the outside of each CD case. This case or a copy of the "Software Key" label should be kept in a secure location in the event of a need to uninstall and reinstall on another PC. For the default installation (recommended) follow the procedure shown below for the Maxum System Tools CD. The other CDs will not have the exact same installation selections, but the choices will be similar.

NOTE

During the load process read the information in each pop-up window to familiarize yourself with product information, verification of PC specifications and the software license that you are acknowledging.

Maxum System Tools CD

The base workstation software is available on the "Maxum System Tools" CD. This software provides tools for routine maintenance on most analyzers and includes Maxum System Manager, Maxum Utilities and Maxum EZChrom.

MaxBasic CD

The MaxBasic Editor on this CD is required for the user to modify Max-Basic programs in the GC or NAU.

Maxum OPC Server CD

This product is required in order to interface Maxum devices to DCS systems or other devices via OPC.

Simulated Distillation CD

This software is required if the user has a Simulated Distillation application running on one or more GC's. These additions to EZChrom allow the user to import and/or export Simulated Distillation methods.

Procedure

1. Insert the CD into the PC and make sure that the **"Software Key"** from the CD case is available.
2. Select **[Information]** to learn more about the applications about to be installed
3. Select **[Maxum EZChrom] > [ok] > [Next] > [Next] > [Yes] >** Enter the **"Software Key" > [Next] >** Verify the Registration information and select **[Yes] > [Next] > [Next] >** When the install is complete press **[Finish]**
4. Select **[Maxum System Manager] > [ok] > [Next] > [Next] > [yes]>** Enter the **"Software Key" > [Next] >** Verify the Registration information and select **[Yes] > [Next] > [Next] >** When the install is complete press **[Finish]**
5. Remove CD and store with case in a secure location.

Results

The applications from the CD should now be installed on the PC.

Configure the Network Address for a GC

Description

Each GC or NAU has a unique Ethernet network address. This allows exchange of data and display information with other devices on the network. The GC subnet mask must exactly match the subnet mask of the other devices on the same segment of the network. The IP address for the GC must be unique. If an IP address has not been assigned for the GC, one must be obtained from the local network administrator.

MMI Procedure

1. **"Configuration Menu"** > **"System Setup"** > **[IP Set Info] > "1 Lan 1 IP adr" >** Enter the new IP address and accept entry.

2. **"2 Lan 1 IP mask"** > Enter the new IP mask.

3. Reset the GC in order for the changes to take effect.

Results

The GC will now broadcast its new IP address on power up and will be accessible through other devices.

NOTE

The "Logical Analyzer ID" must also be unique in the network. If the GC is placed in a network with Advance Optichrom devices a unique "ADH loop" and "ADH unit" number must also be assigned. **"Configuration Menu" > "System Setup" > [Comm Info] > "Logical Analyzer ID" >** Enter the new Analyzer ID and accept entry. > (Enter ADH loop and unit if needed.)

Chapter 3

GC Operation

Alarms

Description

The Maxum system monitors many different functions and generates alarms to warn the user of abnormal operation. These include electronic self diagnostics, chromatographic conditions, and in some cases sample conditions such as low flow or pressure. These alarms are broken into two categories Fault Alarms and Warning Alarms. In general Warning Alarms tell the user that a problem has been detected and maintenance will be needed but analyzer data is probably usable. Fault Alarms generally indicate that current data is suspect. Alarms can be viewed, acknowledged and cleared. Acknowledging an alarm shuts off the warning display until the next occurrence of the alarm.

NOTE

Clearing an alarm erases all information about that alarm from the system memory.

EZChrom Procedure

"Control">"Application" This will open a small window that floats on top of the EZChrom window. If an alarm is present the analyzer status above the Hold/Run button (run/hold) will change from blue to red. If a fault alarm is present an exclamation mark (!) will precede the analyzer status. If a warning alarm is present a question mark (?) will precede the analyzer status. Holding the cursor over the analyzer status opens an information box which gives more information about the alarm. Right click on the analyzer status to open a box which allows one to "Clear current alarm" or "Clear all alarms".

MMI Procedure

Alarms can be viewed and cleared from all three Menus. Details of the alarm are only available from the Maintenance or Configure Menus.

"Monitor Menu">"View and Clear Alarms" Use the up and down arrows to select the desired alarm. Use [ACKN] to acknowledge the alarm use [CLEAR] to clear that specific alarm or [CLEAR ALL] to clear all the alarms.

or

"Maintenance Menu">"Alarms" Use the up and down arrows to select the desired alarm. Use [ACKN] to acknowledge the alarm use [CLEAR] to clear that specific alarm or [CLEAR ALL] to clear all the alarms. Use [DETAILS] to get more information about the alarm

System Manager Procedure

"System">Open Connection> click on analyzer of interest [Connect]. The alarms will be listed. Right click on an alarm to get a menu. Select "Acknowledge Alarm", "Clear Alarm" or "Clear All Alarms".

Backup & Restore

Backup/Restore a Stream Sequence

Description

Backup/Restore of stream sequences is done through EZChrom's Import/Export utilities. These utilities allow stream sequences to be saved to a file (.aes) on a workstation from a unit and to be saved onto a unit from a file on the workstation. The Import/Export can be done on a working unit or from a backup copy (.amd) of the unit.

EZChrom Procedure

Open the EZChrom instrument. "File" > "Online Sequence" > "Import" (or "Export")

Result

The stream sequence from the unit will be formatted and opened in EZChrom. If a permanent file copy is needed (.aes), **"File" > "Online Sequence" > "Save As".** This will open a browse window and allow you to name the file and save it in an appropriate folder for future use. A file that is saved can later be opened in EZChrom and saved (exported) to a unit.

Backup/Restore EZChrom Methods

Description

Backup/Restore of EZChrom methods is done through EZChrom's Import/Export utilities. These utilities allow methods to be saved to a file on a workstation from a unit and to be saved onto a unit from a file on the workstation. The Import/Export can be done on a working unit or from a backup copy (.amd) of the unit.

EZChrom Procedure

Open the EZChrom instrument. "File" > "Method" > "Import" (or "Export")

Result

The imported method from the unit will be formatted and opened in EZChrom. If a permanent file copy is needed (.met), **"File" > "Method" > "Save As"** This will open a browse window and allow you to name the file and save it in an appropriate folder for future use. A file that is saved can later be opened in EZChrom and saved (exported) to a unit.

Backup/Restore, Continued

Backup/Restore GC Configuration

Description

A database configuration can be saved (backup) to a file on a workstation and a file on the workstation can be placed on an analyzer (restore). The workstation file can be opened on the workstation for the purpose of viewing the configuration and making extract files.

System Manager Procedure

"System" > "Unit Backup / Restore"

Follow instructions on windows to backup/restore the unit.

Result

During backup a file with extension .amd will be made at the selected location. During restore, the selected file will be sent to the unit and a reset will occur to activate the file.

CAUTION

⚠

Files restored to a unit must match in the primary version. i.e., a file for a 4.0 unit must not be restored to a 3.0 unit. If a change in version is required, the **Maxum Utilities "Tools" > "Upgrade Unit"** should be used.

Load/Unload a Database Text File

Description

A database text file can be made as a version independent configuration of a unit, except for EZChrom methods and Modbus address maps. The text file can be edited or used as is to perform version upgrades or transfer the configuration to a new unit.

NOTE

Database text file load/unload is automatically done as a part of the Maxum Utilities Upgrade Unit. Normally it is unnecessary to run this independently.

System Manager Procedure for Database Unload

Tools > Maxum Utilities "Loader > "Database Unload" Select a unit and a file. [Continue]

Result

A file (.txt) will be created at the designated location. The file can be viewed and edited in a text editor, like NotePad.

CAUTION

⚠

Editing the text file can be tricky. Slight changes in the format usually cause a failed or incomplete load of the file onto a unit. The file should not be renamed or moved, since it is paired with a second file (.bin) that contains MaxBasic programs.

Backup/Restore, Continued

Load/Unload a Database Text file, Continued

System Manager Procedure for Database Load	Tools > Maxum Utilities "Loader > "Database Load". Select a unit and a file to be loaded. [Continue]
Result	The target unit will contain the applications and other application configuration. EZChrom methods will need to be restored using EZChrom restore and Modbus address maps will need to be restored used Modbus Load.

Load/Unload a Modbus Map

Description	Modbus Address maps can be loaded onto a unit or unloaded into a text file suitable for editing with Excel. Excel is the tool normally used to develop an address map for a unit. An address map can be easily unloaded, edited, and loaded to make changes.

System Manager Procedure for Modbus Unload	**Tools > Maxum Utilities "Loader > "Modbus Unload"**
Result	A file will be created at the designated location. This file can be opened in Excel and edited. It can be reloaded to the unit or another unit.

System Manager Procedure for Modbus Load	**Tools > Maxum Utilities "Loader > "Modbus Load".** Select a unit and a file to be loaded. This file must be the proper comma-delimited format created in Excel.
Result	The target unit will have a Modbus address map that can be set up to participate in serial Modbus communications.

Calibration

Auto-Calibrate an Application

Description
From the Monitor menu, Auto Calibration is the only form of calibration available. This procedure can be performed if Auto Calibration was configured for the application needing to be calibrated. The user documentation sent with the GC will show whether Auto Calibration is configured. While navigating the menus, the analyzer may prompt the user for a password that is required to enter the level associated with the menu or function operation. When running Auto Calibration most users have automated systems to start calibration gasses flowing through the analyzer. If manual connection of calibration gasses is used, the application should be placed in Hold and the calibration gas should be connected (opened) prior to beginning this procedure.

MMI Procedure
"Monitor Menu" > "Calibration" > [START AUTO] > If the application is in HOLD at this point, press [Run]

Result
A message indicating that Calibration is in Progress will be printed to the screen. When calibration is complete, a message will be printed on the screen. At the end of the auto calibration sequence the response factor's percent change for each method will be tested against the Percent Calibration Margin set in the method's peak table. If the response factor's percent change calculated during auto calibration are within the Percent Calibration Margins (Calibration Pass) then all of that method's response factors will be updated. If auto calibration fails the Percent Calibration Margins, then no factors are updated for that method.

NOTE
If the procedure started with the GC in Run mode, it will exit the calibration and return to the stream running when autocal was scheduled automatically at the end of the calibration sequence. If the procedure was started in the Hold mode to allow for manual Calibration connections, the GC will have to be placed in Run after the Process connections have been restored.

Calibration, Continued

Change Auto-Calibration Margins

Description

Auto-Calibration allows the user to recalibrate an Application automatically based upon a time (*e.g.* time of day and day of week), or by simply activating the Activating the Auto-Calibration Sequence from the MMI. The Analyzer compares the new Response Factors achieved with the Old Response Factors and, if they are within the allowed Margin, updates the Response Factors in the Method. These Margins can be changed if desired.

MMI Procedure

"Maintenance Menu">"Method, Calibration and Validation">"Adjust Peaks, Blends and Factors">{2}

Use the up and down arrows to select the desired component

[CHANGE MARGIN]>(new value)>[ACCEPT CHANGE]

Repeat for each component that needs to be changed.

CAUTION

⚠

Too large of a tolerance may allow the Application to recalibrate when the Analyzer is not working properly.

Connect to a Remote GC

Description

Remote GC's may be selected and viewed through the MMI (Man-Machine Interface), System Manager, or Maxum EZChrom. The MMI can be accessed from any GC or NAU (Network Access Unit) front panel or launched from within System Manager as a Windows application.

MMI Procedure

"Monitor or Maintenance Menu" > **"Select Analyzer"** > Press **[Select]** > Press [▲] or [▼] to select the desired remote GC > Press **[Remote Connect]**

Result

The remote analyzer menu is displayed. The remote analyzer number, name, application name, stream name, date, time is displayed in the upper left corner.

Calibration, Continued

Connect to a Remote GC, Continued

System Manager

System Manager provides several ways to display and view remote analyzer data.

To connect to a remote GC and display a tree view of the analyzer database tables complete <u>one</u> of the following connection steps.

1. Double click the analyzer icon in the System View Window (located under the ALL tab). The System View Window is typically located in the bottom portion of the System Manager display.

2. Right click on the analyzer icon in the System View Window (located under the ALL tab). Select **"Connect"** from the drop-down menu.

3. From the main menu select **"System" > "Open Connection"**. From the *Analyzer Selection* dialog box scroll down, select the desired analyzer and click on **[Connect]**.

4. From the main toolbar click on the Connect icon (second from left) From the *Analyzer Selection* dialog box scroll down, select the desired analyzer and click on **[Connect]**.

Result

The remote analyzer database table structure is displayed in the Analyzer Frame Window.

To connect and view the remote analyzer using MMI complete <u>one</u> of the following connection steps:

1. From System Manager's main menu select **"Tools" > "MMI".** From the *Analyzer Selection* dialog box scroll down, select the desired analyzer, and click on **[Connect]**.

2. From System Manager's main toolbar click on the MMI icon. From the *Analyzer Selection* dialog box scroll down, select the desired analyzer, and click on **[Connect]**.

3. From System Manager right click on the analyzer icon in the System View Window (located on the ALL tab). Select **"MMI"** from the drop-down menu.

Result

The remote analyzer Monitor Menu is displayed. The remote analyzer number, name, application name, stream name, date, time is displayed in the upper left corner.

Connect to a Remote GC, Continued

EZChrom

To connect and view a remote analyzer using Maxum EZChrom complete one of the following connection steps:

1. From System Manager's main menu select **"Tools" > "EZChrom".** Double-click the remote analyzer's icon to connect and access the remote analyzer.

2. From System Manager's main toolbar click on the **EZChrom** icon. Double-click the remote analyzer's icon to connect and access the remote analyzer.

Result

The remote analyzer is connected and the EZChrom Instrument window is displayed.

Manually Calibrate an Application

Description

Each Application in the analyzer is normally calibrated with a Calibration Blend. For Manual Calibration the calibration blend is normally turned on by hand. Once the flow of Calibration Blend is established, the Analyzer is instructed to perform a Manual Calibration.

Select Stream to Calibrate

{Home}>[SELECT MENU]>"Maintenance Menu">"Method, Calibration and Validation">"Calibration and Validation"

Use the up and down arrows to select the desired stream or [NEXT SEQNCE] until the desired stream is available for selection

[START MANUAL] [RUN]

When finished [STOP CALIB]

To accept Response Factors

[RESP FACTORS]>[ACCEPT FACTORS]

To return Analyzer to Run [RUN]

NOTE

If the blend is different than the last time calibration was performed the Blend Values must be updated. See "Update A Calibration Blend" in the Calibration section.

If multiple levels of calibration are required, a stream will be defined for each level. Repeat this procedure for each level.

Calibration, Continued

Update a Calibration Blend

Description

Each time a calibration bottle is changed, the calibration blend values must be updated in the methods that use that blend. The values are used to calculate the correct GC response factors the next time the GC application is calibrated.

MMI Procedure

"Maintenance Menu" > "Method, Calibration & Validation" > "Adjust Peaks, Blends & Factors" > {2}

Use the up and down arrows to select the desired component

[Change Blend]>(new value)>[Accept Change]

Repeat for each component that needs to be changed.

Result

The new blend values will be displayed in the New Blend column on the display.

NOTE

These values will not replace the old blend values until a calibration is performed and accepted. For multi-level calibrations, repeat the above procedure for all levels needing to be adjusted by using [Next Level].

To change a blend again after a successful adjustment, it is necessary to first run a process stream before activating the calibration stream again.

CAUTION

⚠

If the values are changed in an EZChrom Method and downloaded to the Analyzer they will be active immediately and may cause errors until Calibration is actually performed.

Chromatograms

Re-analyze a Chromatogram

Description   A selected chromatogram(s) from the last completed analysis cycle or one that has been archived may be re-analyzed to evaluate a parameter change in the method (peak detection window, integration selections, etc.).

MMI Procedure   (This function does not exist for the MMI.)

EZChrom Procedure   With analyzer connected, and the current chromatogram displayed, from top menu bar, click on "Analysis". From drop down menu, select "Analyze".

NOTE   Refer to EZChrom sections for instructions regarding modification of method.

Result   Chromatograms on screen are re-analyzed using latest workstation method for that stream.

Save Chromatograms

Description   The chromatogram(s) from the last completed analysis cycle may be saved in memory on the analyzer or workstation for future reference.

MMI Procedure   "Maintenance Menu" > "Results & Chromatograms" > press [^] or [V] to select stream > [ADD to ARCHV].

Result   Chromatograms for selected stream are saved in archive file on GC per date, time, and stream designation.

EZChrom Procedure   With analyzer connected, and the current chromatogram displayed, from top menu bar, click on "File". From drop down menu, select "Data". From its drop down menu, select "Save as 32 bit…". In dialog box, use normal WINDOWS commands to select folder, enter desired file name, etc.

Result   Chromatograms for selected stream are saved in a file on workstation in folder specified.

Chromatograms, Continued

View a Real-time Chromatogram

Description

A detector signal may be selected to be viewed in real time during the cycle to avoid waiting until the end of an analysis cycle to observe the effect of a parameter change. The function may also be used to view the detector baseline if the analyzer is in HOLD.

MMI Procedure

"Monitor Menu" > "View Detectors & RealTime chroms" > press [^] or [V] until detector is selected > press [View Chrom]

Maintenance Menu" > "Detectors & RealTime chroms" > press [^] or [V] until detector is selected > press [View Chrom]

Result

Detector signal is displayed across MMI screen.

NOTE

The vertical scale can be changed by pressing [change Max Y] and in-putting a new value in the pop-up box, followed by [accept change].

Press "Back" or "Home" to exit this function.

EZChrom Procedure

With analyzer connected, from top menu bar, click on "Data". From drop down menu, select "Real-Time Chromatogram". From dialog box select detectors to monitor (may be multiple), and press [Start]. Click [OK] on warning box.

In next dialog box, enter User Name (operate, calibrate, maintain, con-figure, super) and the appropriate password for the User Name entered. Followed by [OK].

Result

Detector signal is displayed across workstation screen.

To exit this function, Click on "Data" on menu bar; from drop down menu, select "Real-Time Chromatogram". From dialog box select [Stop], then [Done].

Chromatograms, Continued

View Chromatograms

Description

The chromatogram(s) from the last completed analysis cycle may be viewed on the MMI. This function can be used to indicate appropriate presence of peaks during the cycle.

MMI Procedure

"Monitor or Maintenance Menu" > "View Results & Chromatograms" > press [^] or [V] until desired stream is selected > press [Select Chrom]. Stream number and detector name will appear; use [Next Channel] to select desired detector > press [Display Chrom].

Result

Detector signal for entire cycle is displayed across MMI screen.

NOTE

The horizontal and/or vertical scale can be changed by pressing [Manual Zoom] and inputting new values in the pop-up box, followed by [accept change].

Press "Back" or "Home" to exit this function.

EZChrom Procedure

With analyzer connected, from top menu bar, click on "File". From drop down menu, select "Data". From its drop down menu, select "Import". In dialog box click on desired stream and [Import].

Result

Detector signal(s) are displayed across workstation screen. From top menu bar, click on "Window", and from drop-down menu, select different detectors to be viewed as desired.

NOTE

To enlarge an area of the displayed chromatogram, left-click & drag to highlight the desired area, which will be then displayed. To return to displaying full chromatogram, right-click on it, and select "Full Unzoom".

Normal Windows commands may be used to maximize, restore, minimize, close, etc. each view as necessary. Use "Window", and from the drop-down menu select "Tile Horizontally" to display all detectors on the screen.

Cycle

Change Cycle Time

Description

Each method used by an application has a unique cycle time. This is the time allotted for the analysis cycle to run. It may need to be changed if the application changes and you desire to shorten or lengthen the cycle time.

MMI Procedure

"Maintenance Menu" > "Method, Calibration & Validation" > Press [Next Method] until the correct method is displayed > "Adjust Channel & Cycle" > [Change Cycle]

Result

The cycle time on the display should show the value just entered. This value will be used the next time the method runs.

Run a GC Application

Description

Each application can be activated to analyze samples independently from other applications. This allows an application to be placed in "Run" or "Hold" regardless of the state of other applications. This independence allows one application to be modified or calibrated while another application continues to "Run" normally.

MMI Procedure

"Monitor, Maintenance or Configuration Menu" > Press [Next App] until the desired application is displayed at the top of the MMI screen > [RUN]

Result

The running cycle clock and progress bar will be displayed at the top right hand corner of screen.

NOTE

If two applications are related as Master/Slave, the Master application must be the one started. The slave application will be started automatically by the Master application.

Detectors

Bridge Current of TCD (MicroSAM Only)

Description

The detector bridge current can be adjusted to meet the requirements of a particular application.

MMI Procedure

"Maintenance Menu" > "Detectors & RealTime Chroms" > press [^] or [V] until detector is selected > press [Details]> press [^] or [V] until bridge current is selected> press [Modify]> enter the value> press [Done] **See Caution below.

Result

Bridge current is immediately set to the new value.

CAUTION

⚠

Setting the bridge current too high for a given flow rate will damage or destroy the filament.

NOTE

There is no bridge current adjustment for Maxum. The Maxum circuit automatically adjusts for maximum sensitivity for a given carrier and flow rate, and protects the filament from burnout.

Ignite the FID (MAXUM Only)

Description

Manual FID ignition sequence

MMI Procedure

"Maintenance Menu" > "Detectors & RealTime Chroms" > press [^] or [V] until detector is selected > press [Ignite]

Result

The ignition sequence will start for the selected detector.

NOTE

If ignite fails, check DPM connections and fuel and air flows against supplied documentation and retry.

Automatic FID Ignition is available and is the preferred process.

NOTE

Flame Status indication is not valid for the Maxum II FID. Flame Status can only be verified by checking for condensation at the detector vents or by special software and or database configuration.

Detectors, Continued

Ignite the FPD (MAXUM Only)

Description   Manual ignition sequence. To ignite the FPD, it is necessary to increase the air to fuel ratio. This is done by increasing the air pressure using the EPC for the FPD air supply. Review supplied documentation for the correct ignition and normal-operation settings for the EPC. The ignite setting is typically about 3 times the air pressure used during normal operation, but usually no more than 60 psi. In the example below, 24 psi is used as the setting for normal operation, and 60 psi is used for the ignite setting.

MMI Procedure   "Maintenance Menu" > "App I/O, Temperature, & Pressure"> "Pressure Controller"> highlight "FPD_Air"> [Change Set Pt]> {6}> {0}> [Accept Change]> [Home]> "Detectors & RealTime Chroms" > press [^] or [V] until detector is selected > [Ignite]

After ignition: "Maintenance Menu" > "App I/O, Temperature, & Pressure"> "Pressure Controller"> highlight "FPD_Air"> [Change Set Pt]> [2]> [4]> [Accept Change]> [Home]

Result   Ignite sequence executes.

NOTE   If ignite fails, check DPM connections and fuel and air flows against supplied documentation and retry.

Automatic FPD ignition is available and is the preferred process.

NOTE   Flame Status indication is not valid for the Maxum II FPD. Flame Status can only be verified by checking for condensation at the detector vents or by special software and or database configuration.

Detectors, Continued

Polarity of Detector Signals

Description
Some applications result in inverted peaks due to the properties of the sample with respect to the carrier gas being used. This can be corrected.

MMI Procedure
"Maintenance Menu" > "Detectors & RealTime Chroms" > press [^] or [V] until detector is selected > press [Details]> press [^] or [V] until "Invert" is selected> press [Modify]

Result
The selected detector signal will be immediately inverted. Negative peaks will become positive. The status will change to show that invert is "On". Pressing Modify again will turn invert "Off".

NOTE
Some applications will contain software that changes the state of the DO that controls inversion. In this case, the software will override the manual settings when a cycle is run.

Status and Settings of Detector

Description
Detector status and current settings may be viewed on the "Detectors & RealTime Chromatograms" screen. Additional information is available in the Maintenance Menu by pressing [Details].

MMI Procedure
"Maintenance Menu" > "Detectors & RealTime Chroms" > press [^] or [V] until detector is selected > press [Details] "Monitor Menu" > "Detectors & RealTime Chroms"

Result
Detector status and settings are visible.

I/O, Discrete

View/Modify I/O

Description

Each individual Input/Output channel can be viewed and/or modified. The I/O may consist of individual or a combination of Analog Inputs, Analog Outputs, Digital Inputs and Digital Outputs. It may be necessary to check what the actual input or output device is reading and/or change it to verify if an internal or external device is operating normally. The I/O screens are used for troubleshooting, to verify that data is being sent or received, and to manually control a particular I/O.

MMI Procedure

[Select Menu], "Maintenance Menu", "App I/O, Temperature & Pressure". Scroll down [V] and push [SELECT] or press the number on the keypad, for the type of I/O you want to view and/or modify. [Disable] or [Enable] will change the status of the selected I/O. [Details] will display the details of the selected I/O. When displayed, [Modify] will allow modification of the selected detail. When modification is complete, [DONE].

Result

The modified detail will be displayed in the details screen.

Integration

Modify Data Acquisition Time

Description
The analyzer only acquires (stores) detector signals when instructed to do so. Many methods do not require Data Acquisition during the entire Analyzer Cycle. The Data Acquisition time can be different for different detectors. It must be continuous and there can be only one acquisition time for each detector per cycle. The detector signal must be stored for it to be processed (e.g. integrated or displayed later). The times can be modified if chromatographic conditions change such as adding longer columns.

MMI Procedure
"Maintenance Menu">"Method, Calibration and Methods">"Adjust Channel and Cycle". Use the up and down arrows to select the desired detector. [Change Cycle]> Use [Next Field] and [Accept Change] to make the desired changes.

EZChrom Procedure
Click on the "Instrument Setup" icon on the first Tool Bar (Monitor below "Control" on the Menu Bar. Click on the "Detector "tab. The "Start" and "Stop" times can be modified in the table for each detector.

NOTE
No changes take place in the analyzer until the method is exported to the Analyzer.

Modify Peak Detection and Integration

Description
There are a number of Integration Events that can be adjusted in EZ-Chrom that will affect peak detection and integration. Only three of these are used routinely. This section will only address these three Integration Events. The method of changing the other Integration Events is analogous the procedures listed here. Peak Width and Peak Threshold are required Integration Events and affect the sensitivity of peak detection. The Peak Width is normally set to match the width of the narrowest peak of interest in the chromatogram. The Peak Threshold is then set to achieve peak detection without integrating noise (non peaks). The third Integration Events commonly used is Integration Off. Integration Off can be used to prevent integration of chromatographic artifacts such as valve switching upsets. In some cases these upsets can interfere with proper baseline assignment if Integration Off is not used.

Integration, Continued

Modify Peak Detection and Integration, Continued

MMI Procedure	"Maintenance Menu">"Method, Calibration and Validation">"Adjust Integration Events"

Use [NEXT CHANNEL] to select the desired Detector.

Use the up and down arrows to select the Integration Event to be adjusted then [MODIFY]

Use [NEXT FIELD] to select the time or value to be modified

Use [ACCEPT CHANGE] to accept the changes. |
| **NOTE** | Only Integration Events that were created within EZChrom on the Workstation can be modified here. |

EZChrom Procedure	To modify or create Integration Events it is helpful to have a chromatogram loaded into EZChrom. Select the Detector chromatogram from "Window">"*Detector desired*" (*e.g.* L_FID). Also, select the detector from the Detector Selection drop down box in the upper left portion of the screen on the top Tool Bar.
NOTE	The detector selected from the drop down must match the chromatogram or errors will likely occur. The changes made to the Integration Events apply to the detector selected not to the chromatogram. EZChrom does not automatically match them up for you.

Select the Integration Events table by clicking on the Integration Events icon (green icon directly below "Reports). Editing existing events can be done by clicking in the table at the desired point. "Start Time", "Stop Time" and "Value" can be edited. A new event can be created by using the drop box on the last (empty) line under "Event". Existing events can be disabled by clicking on red check mark after the event #. |
| **NOTE** | No changes take place in the analyzer until the method is exported to the Analyzer. |

LED's

Description   There are 4 LED's on the MMI. These LED's give a quick visual indica-
                         tion of the alarm status of the analyzer.

Purge LED   A red LED that indicates a failure of the electronics purge system.

CAUTION   This condition may affect the safety of the analyzer.

⚠

Fault LED   A red LED that indicates a Fault Alarm(s) exists for this analyzer.

Warning LED   A yellow LED that indicates a Warning Alarm(s) exists for this analyzer.

Power LED   A green LED that indicates the analyzer electronics has electrical power.

MaxBasic

Change a MaxBasic Program Schedule (Frequency or Time of Day)

Description   MaxBasic programs can be scheduled by frequency or time of day. This type of scheduling is independent of an analysis cycle.

MMI Procedure   "Configure Menu" > "BASIC Events" > [VIEW SCHED]

Result   A list of the current scheduling information appears. Adding and modifying the program schedule must be done using System Manager.

System Manager Procedure   "System Tables" > "Program Schedule"

Result   A list of all program schedules for all the MaxBasic programs on the viewed unit.

To Add a schedule: "Edit" > "Add Record"   Select a program to schedule and give it a unique schedule number. It is possible to enter multiple schedules for a program.

To Change a schedule

Time of Day scheduling   Enter time in attribute Schedule_time (examples: 10:00, 13.00, 9)

Enter day of week mask in Schedule_day: This is an integer constant (1-127 or 201-231) that specifies the days of the week, or day of the month, that the program will be scheduled. For days of the week, the precise number is determined by adding the numbers for all desired days together.

Saturday = 1, Friday = 2, Thursday = 4, Wednesday = 8, Tuesday = 16, Monday = 32, Sunday = 64

Example:

    127= 1111111 – every day
    21=0010101 – T Th Sa
    42=0101010 – M W F

Or

    Enter day of month + 200 in Schedule_day (examples: 201, 216, 220)

Frequency Scheduling: Enter units in Freq_Unit(1=hour, 2=minute, 3=day, 4=sec)
Enter amount in Freq_amt

NOTE   A program cannot be scheduled more frequently than 5 seconds. A disabled program will not run (see enable attribute in Program table).

MaxBasic, Continued

Change a MaxBasic Program Schedule (from an event)

Description

MaxBasic programs can be scheduled by an internal or external event. These can be run from a cycle_event within a method, an external Advance DataHiway command or Maxum command, a limit/alarmhandler, another program, or at the end of a cycle.

Cycle Event

After the program is saved into the program table from MaxBasic, reconfigure the EZChrom instrument. Select the program as an event to run at a particular cycle time by attaching the program to a cycle event in EZChrom and enabling it. Export the method to the analyzer.

EZChrom Procedure

Open the EZChrom instrument and edit the method by importing the method from the analyzer: . **"File" > "Method" > "Import".**
View events: **"Method" > "Instrument Setup" > "Events".**
Insert or modify an event to run a program at a certain cycle time.
Export to analyzer: **"File" > "Method" > "Export".**

System Manager Procedure

 Mvrpgm (end of cycle) - "Tables" > "Stream Method"

Enter the program id into the mvrpgm attribute of the stream and method that will run the program.

NOTES

The Program must be designated to release the end of cycle processing after the program runs by placing a "99" in the pgmfunction attribute of the Program table ("System Tables" > "Program")

A disabled program will not run.

MaxBasic, Continued

Run a MaxBasic Program Manually

Description   MaxBasic programs can be run on demand from the MMI.

MMI Procedure   "Configure Menu" > "BASIC Events" > [RUN]

Result   The MaxBasic program will run on the analyzer. The status of the program will be Run and, when the program is complete, Ok or Error. If the program finishes with Error status, there will be an alarm.

NOTE   A program that is disabled can still be run manually.

View/Change Program Parameters

Description   MaxBasic programs use parameters in order to get variable information. This information may be constant information or settings or it may be information that comes from other database tables. The value of a parameter is passed to the program at its run time through program arguments or may be directly accessed from within the program.

MMI Procedure (View   "Configure Menu" > "BASIC Events" > "Details" > [View Args]
Parameters)

Result   A list of the parameters that are passed at run time to the selected program.

NOTE   A program might use other parameters by accessing them with SQL statements.

MaxBasic, Continued

View/Change Program Parameters, Continued

System Manager Procedure (Change Parameters)	"System Tables" > "Parameter" > [Continue]
Result	A list of the parameters for all applications and all programs are listed.
NOTE	Parameters may be shared by programs. Also, a parameter that appears in the list more than once may be specific to an application or stream.

To add a new parameter: "Edit" > "Add Record"
To modify a parameter:
Enter "Appcontext" > use –1 for all applications
Enter "Streamcontext" > use –1 for all streams
Caution: a specific stream must be entered if using "Qtypes" 3,4,5,6,7
Enter "Parameter_Name" > used for easy reference when editing the table
Enter "value" > used as a constant, if "Qtype" is null or 0.
Or
Enter "Qid" > id in queried table – used to make execution time queries to a table designated in "Qtype"

And enter "Qtype">   table for query
       null = use parameter "value" as a constant
       0=none
       1= AI
       2= DI
       3= buffered result
       4= saved result
       5= external result
       6= stream current error
       7= stream current warning
       8= application current error
       9= application current warning
       10=flowing stream
       11=application mode
       12=active sequence id
       13= next sequence id
       14= DO

Passwords

Description

The selection of Users and the associated passwords can be used to provide different levels of authorization for various analyzer operation or maintenance activities. When a maintenance person accesses the GC with the correct user/password combination, they can modify any menu items or parameters assigned to that user level.

There are five predefined user levels. The items that can be modified at these user levels are defined in the system manager. The available user levels are:

Operate (Monitor)
Calibrate
Maintain
Configure
Super

IMPORTANT

Remember to Log Out when your work is finished (from any menu, [Select Menu] > "Logout"). Unauthorized people can cause problems if your password is still active.

MMI Procedure

"Configure Menu" > "Users/Passwords". Use [Next User] to scroll though the user choices until "super" is selected. Enter the correct password for that level (default is 555). "Configure Menu (reappears) > "User/Passwords". A table will appear with the users and all passwords listed. Use [^] or [V] to select the desired user. Press [Modify]. Enter the new password (numeric, 1 to 6 digits), press [Done].

NOTE

The passwords can only be modified with a "super" level authorization.

Result

Table should now show the new password for that user.

Pressure Controller

Change a Pressure Controller Set Point

Description
Changing the set point on pressure controllers can be used for trouble-shooting, fine tune a method, verify that a method is working correctly and to manually set up a method.

MMI Procedure
From home menu, [Select Menu], "Maintenance Menu", "App I/O, Temperature & Pressure". Scroll down [V] to "Pressure Controller" or press the number [6] on the keypad, press [SELECT]. A list of Pressure Controllers will be displayed. Scroll down [V] to the Pressure Controller to be modified and press [CHANGE SET PT]. Enter new set point and press [ACCEPT CHANGE].

Result
The new Pressure Controller set point will be displayed in the Cur Setpt column.

Enable/Disable a Pressure Controller

Description
Enabling and disabling pressure controllers can be used for trouble-shooting, to verify that a method is working correctly and to manually set up a method.

MMI Procedure
From home menu, [Select Menu], "Maintenance Menu", "App I/O, Temperature & Pressure". Scroll down [V] to "Pressure Controller" or press the number [6] on the keypad, press [SELECT]. A list of Pressure Controllers will be displayed. Scroll down [V] to the Pressure Controller to be enabled or disabled and press [ENABLE] or [DISABLE].

Result
If enabling the Pressure Controller an asterisk will be removed from in front of the Pressure Controller name. If disabling the Pressure Controller an asterisk will be placed in front of the Pressure Controller name indicating that it is disabled.

Results

Save Results

Description
The analytical results from a completed analysis cycle may be saved in memory on the analyzer or workstation for future reference.

MMI Procedure
From home menu, select "Maintenance Menu" > "Results & Chromatograms" > press [^] or [V] to select stream > [ADD to ARCHV].

Result
The component concentrations for the last completed analysis cycle on the selected stream are saved in archive file on GC per date, time, and stream designation.

System Manager (DataLogger) Procedure
In System Manager, from top menu bar, select "Tools". From drop-down menu, select "Maxum Utilities". From Maxum Utilities top menu bar, select "Data Logger". From drop-down menu, select "New Log Setup". From "IP Address Selection" dialog box, select desired analyzer and [OK]. From "Log Setup" box, select stream(s) to be logged by clicking in "Enable" column; and then [OK].

To select which results are to be logged, on Maxum Utilities top menu bar, select "Data Logger". From drop-down menu, select "Modify Log Setup". In the "DataLogger Modify Settings" dialog box, select the application/stream desired, and then select the "Results", "Others" desired, and click on [Select Peaks]. In "Peak Setup" dialog box, select the peaks to be logged, and click [OK]. [Close] the "DataLogger Modify Settings" dialog box.

On Maxum Utilities Screen, right click on the desired stream, select and left click on the "Start Logging" choice. (The choice will be "Stop Logging" for a stream which is already logging.)

NOTE
Default file names are "analyzer name"-1-"stream #".txt. Once datalogging has been stopped, the saved file name can be changed using normal WINDOWS commands.

Result
The selected results for each analysis on the selected stream(s) will be saved in a file on the workstation in subdirectory: Maxum System Manager\Results\). This will continue until the logging is stopped.

Results, Continued

Save Results, Continued

EZChrom Procedure (Chrom Logging)

With analyzer connected, from top menu bar, click on "Data". From drop down menu, select "Log Stream". In "Stream Chromatogram Logging" dialog box, use cursor to select the ID (stream) to be logged, and click [Apply]. (Normal WINDOWS commands may be used to modify the file name and folder path, etc.)

NOTE

The logging format is normally set to numeric.

Result

Chromatograms and associated results for each analysis cycle for the selected stream are saved in the selected file on workstation in folder specified until this menu sequence is repeated and [Stop all] is applied.

Transmit Results

Configure a DCS Connection for (Modbus, OPC, HCI-A, HCI-C01, HCI-C04)

Maxum analyzers support multiple communication protocols for transferring process analytical data to a Distributed Control System. Maxum edition II and MicroSam support Maxum Modbus (NAU) or OPC communication protocols. In addition, Maxum edition II also supports the Optichrom Host Computer Interface protocols HCI-H (Modbus), HCI-A, HCI-C01, and HCI-C04.

Advance Optichrom analyzers support all of the Optichrom Host Computer Interface protocols, Maxum Modbus, and OPC. Optichrom analyzers require an Optichrom Data Server (NAU w/Gateway) when using Maxum Modbus or OPC.

Maxum Modbus, HCI-H, HCI-A, HCI-C01, HCI-C04 Procedure

Setup a GC to transmit results to a Host Computer Interface.

1.) **Add a Host Computer Interface record to the GC's *host* table.**
Using System Manager, connect to the remote GC.
Display the host table: **[system tables]-> [host].**
Add an entry to the host table: From the Main Menu select **[edit]** -> **[add record].**
From the *Add Record* dialog box enter the *host_id*. Typically *host_id's* start at '1' and continue sequentially. **[1]->[OK].**

Results, Continued

Transcript Results, Continued

2.) Follow this step when transmitting results to an Advance Opti-chrom Host Computer Interface board (HCI-H, HCI-A, HCI-C01, HCI-C04)

IMPORTANT: MicroSam does not support Optichrom Host Computer Interface communication. Use the Maxum Modbus (NAU) protocol.
Configure the *host* record added in step #1 for operation with an Advance Optichrom Host Computer Interface.

a) **Set the Host Computer Interface Loop and Unit number in the *host* record.** Every node or device on the Optichrom Advance Data Hiway must be assigned a unique Loop (1-8) and Unit (1-31) number. Using System Manager, edit the *host* entry added in step #1 above.

Display the host table: [system tables]-> [host]. Select the *loop* column and enter the Host Computer Interface Loop number {1-8}. Then, select the *unit* column and enter the Host Computer Interface Unit number {1-31}.

b) **Set the Host Computer Interface protocol <u>type</u> in the *host* record.** The *type* attribute defines the communications protocol the GC will use when sending results to the Optichrom Host Computer Interface. Set the *type* field equal to the type of Opti-chrom Host Computer Interface board used. (1=HCI-C01, 2=HCI-C04, 3=HCI-H, 4=HCI-A).

Using System Manager, edit the *type* attribute in the *host* table. Display the host table: [system tables]-> [host]. Select the *type* attribute from the *host* record. Enter the chosen protocol number in the *type* field.

c) **Set the *scale_factor* attribute in the host record.**
This step is required only if using the HCI-H or HCI-C04 boards. *Scale_Factor* is an attribute or column in the host table, *host* re-cord used for component scaling. Both the HCI-H and HCI-C04 protocols transmit component values as a fraction of range. Each component or result in the *result* table has an associated attribute called EUHI (Engineering Units, High). EUHI defines each component's full scale value.

Results, Continued

Transmit Results, Continued

Scale_Factor defines the numeric value (counts) that full scale will be represented by. (*scale_factor* * Result value) / EUHI = scaled result

Example :
If the component concentration is 35 mole % and the EUHI is set to 50 mole % and the desired scale is 0 to 9,999. Then the value transmitted to the Host Computer Interface is: 9999 * 35 / 50 = 6999

To set the *scale_factor* using System Manager, display the host table: [system tables]-> [host]. Select the *scale_factor* attribute in the host record and enter the value to be used as the scaling factor for all components. Typical values for *scale_factor* are 999, 4095, 9999.

d) **Assign an Advance Data Hiway address (Loop & Unit number) to the GC.**
Every device communicating on the ADH must have a unique network address assigned. ADH addressing consists of a Loop (subnetwork) (1-8) and Unit (device address) (1-31) number.

Using System Manager, edit the *loop* and *unit* attributes located in the *system_control* table. Display the *system_control* table: **[system tables]**-> **[system_control]**. Select the *loop* column and enter a valid Loop number {1-8}. Then select the *unit* column and enter a valid Unit number {1-31}.

3.) Follow this step when transmitting results to a Maxum NAU configured as a Host Computer Interface. (Maxum Modbus)

a.) **Enter the NAU's *anlzref* in the host record.** *Anlzref* is an attribute or column in the host table, host record and should contain a logical reference to the Host Computer Interface (NAU). A logical reference or LID is a system unique, user assigned, numerical value used to reference a particular device. *Anlzref* must be assigned the NAU's LID. First determine the NAU's LID. Then, using System Manager, display the *host* table: [system tables]-> [host]. Click on the host record's *anlzref* column created in step #1 to display a drop-down list box. Click on [▼] to display a list of the available devices (LID). Scroll down and select the NAU's LID. If the NAU's LID does not show up in the list, wait ten minutes. System Manager will automatically update the list when a device broadcast is received. Each analyzer or NAU broadcasts its' LID every ten minutes.

Results, Continued

Transmit Results, Continued

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b.) **Set the Host Computer Interface protocol type in the *host* record.** Using System Manager, edit the *type* attribute in the *host* table.
Display the host table: [system tables]-> [host]. Select the *type* attribute from the *host* record. Enter the protocol number in the *type* field. For NAU Maxum Modbus set *type = 6*.
(6 =Maxum Modbus, 7=Maxum Modbus freeform).

4. **Set *host_def* to enable transmission of results.**
Using System Manager, edit the *host_def* attribute in the *host* table.
Display the host table: **[system tables]-> [host].** Set the *host_def* attribute equal '1' to enable the transmission of results to the Host Computer Interface. Results can be sent to multiple Host Computer Interface boards (or NAUs) by setting *host_def* equal to '1' in each *host* table record.

5. **Set *autotrt* attribute in the *stream_method* table.**
Setting the *autotrt* attribute in the *stream_*method table enables the automatic transmission of results at the end of each cycle.
Using System Manager, display the *stream_method* table. **[application]-> [tables]->[stream_method].** Set the *autotrt* attribute equal to '1'.
Set *autotrt* on each application/stream of interest.

6. **Set *trtval* attribute in the result table.**
The *trtval* attribute, located in the result table, defines the order results are sent to the Host Computer Interface. Set the *trtval* attribute for each stream/result to be sent to the Host Computer Interface. *Trtval* values can be assigned in any order provided the sequence starts with a '1'. Duplicates are not allowed. Repeat this step for each application/stream. Using System Manager, display the *result* table. **[application]-> [tables]->[result].** Assign each application/stream/
result a sequential integer value based on the desire transmission order. Save and close the result table.

Result Communication between the analyzer network and the DCS system should now work with no alarms generated on the transmitting GC's.

Results, Continued

Transmit Results, Continued

Setup NAU for Maxum Modbus

1.) **Configure the NAU communication port for DCS communications.**
Using System Manager, display the *system_control* table.
[system tables]-> [system_control]. Enter a value in the *modbus_setting* attribute based on the following parameters.

Y = serial port address (1 for the RS-232, 2 for RS-485)
a = baud rate (50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600,   19200, 38400)
 b = parity (e, o or n)
 c = data bits (8 only)
 d = stop bits

For Maxum: Y:a,b,c,d(example--1:19200,n,8,1)
For MicroSAM: Y is COM1(example--COM1:19200,n,8,1)

2.) **Load the Modbus address map.**
Using System Manager's Load MODBUS utility, (located under Tools/Maxum Utilities/Loader/Load MODBUS) to add the address map to the GC or NAU.

3.) **This step is <u>only</u> needed when using Advance Optichrom Analyzers with Maxum Modbus (NAU).**

a.) **Assign a Loop and Unit number to the NAU.**
The NAU must have a loop and unit number defined to communicate with Advance Optichrom devices. ADH addressing consists of a Loop (subnetwork) (1-8) and Unit (device address) (1-31) number.
Using System Manager, edit the *loop* and *unit* attributes located in the *system_contro*l table. Display the *system_control* table:
[system tables]-> [system_control]. Select the *loop* column and enter a valid Loop number {1-8}. Then select the *unit* column and enter a valid Unit number {1-31}.

b.) **Modify the Advance Optichrom analyzer(s) Host Event (typically Event32) to transmit results to the newly assigned NAU loop and unit number.** Edit and/or create the Host Event in the Advance Optichrom analyzer(s) to send results to the NIU address (Loop & Unit). Typically Evt32 is used to transmit results at the end of cycle with Advance Optichrom.

Result

Communication between the analyzer network and the DCS system should now work with no alarms generated on the transmitting GC's.

Results, Continued

Setup a GC to transmit results to an OPC Server

1.) **Configure the remote GC or NAU database.** Using System Manager, connect to the analyzer and display the *system_control* table. Set the *opcflag* attribute to a '1' in the *system_*control table.

2.) **Set the *autotrt* attribute in the *stream_method* table.** Using System Manager, display the *stream_method* table and set the *autotrt* attribute to a '1' for each stream. Repeat this step for each application and stream. Save and close the stream_method table.

3.) **Set the transmit sequence order.** Using System Manager, display the *result table* and set the *trtval* attribute to the desired transmit sequence number. Transmit sequence numbers must be sequential, starting with 1. Duplicates are not allowed. Results (components) that do not have the *trtval* set will not show up in the OPC Server configuration screens. Repeat this step for each application. Save and close the result table.

4.) **This step is required for Advance Optichrom analyzers <u>only.</u>**

   a.) Advance Optichrom analyzers use a Maxum GC or NAU to collect and convert analysis results into Maxum database format. Using System Manager, display the *system_control* table and set the *adh_trt* attribute equal to the host computer format supported in the Optichrom analyzer(s): 0=HCI-H, 1 = HCI-C01, 2 = HCI-C04, 3 = HCI-A.

   b.) Assign a unique Loop and Unit number to the GC or NAU. Using System Manager, display the *system_control* and set the *loop* and *unit* attributes to an unused value. Legal values for loop are in the range 1 – 8. Legal values for unit numbers are in the range 1-31. Duplicate unit numbers are not allowed.

   c.) Modify the Optichrom analyzers Transmit Event (typically Event 32) to send to the Loop and Unit number assign above.

5.) **Run at least one analysis cycle on each stream.** The OPC table located in the analyzer database must be initialized before configuring the OPC Server. Run at least one cycle on every stream that will report results to OPC Server, including any calibration streams. OPC table entries are automatically created and updated at the end of the analysis cycle.

6.) **Configure Maxum OPC Server.**

Results, Continued

Transmit Results, Continued

NOTE	The attributes in these tables must be setup correctly prior to adding the analyzer(s) to Maxum OPC Server. If the tables are not setup correctly the OPC Server will not recognize the analyzer during setup and/or some attributes will not be available for OPC Server. Maxum OPC Server is compatible with firmware version 4.0 and greater.
Results	Communications between the analyzer network and the DCS system should now work with no alarms generated on the transmitting GC's.
Important Note	Maxum OPC Server is compatible with any OPC Data Access 2.0 client. Some DCS vendors provide the OPC Server interface only. A third party client-to-client interface may be required to store and forward data between the OPC servers. Contact the DCS vendor to obtain a recommended list of OPC client-to-client programs and other useful OPC related utilities.

Modify a Maxum Modbus Address Map

Description	The Maxum Modbus Address Map is a text file used by the Network Access Unit (NAU) to map analyzer results to Modbus addresses (registers and coils) for Host computer access. An Address Map is typically created with Microsoft Excel then downloaded to the NAU using **"System Manager">[TOOLS]>[Maxum Utilities]> [Loader]->[Modbus Load]**. Once the Address Map has been loaded onto the NAU, it may be viewed and values may be edited with System Manager. However, records should be added with the procedure below.
System Manager	**Once the Address Map has been loaded onto the NAU, it may be viewed and edited with** "System Manager" >[System Tables]> [MODBUS_addmap]. **The recommended procedure for adding records or making other significant changes to the Modbus Map is to export the map to a text file, modify the text file, then re-load the file**.
	1.) UnLoad (save) the Address map file using Maxum Utilities: **Using System Manager, select** [TOOLS]>[Maxum Utilities]> [Loader]->[Modbus UnLoad]. **When the *Modbus Address map unload* dialog box is displayed enter the desired saved file name in the File name list box**.
	2.) Using Microsoft Excel or any standard text editor modify the saved Address map file.

Results, Continued

Transcript Results, Continued

3.) Load (download) the edited Address map file back to the NAU.
Using System Manager, select [TOOLS]>[Maxum Utilities]>
[Loader]->[Modbus Load].

Result   **A modified Modbus Address map is loaded onto the NAU. The re-
sults can be viewed using** "System Manager" >[System Tables]>
[MODBUS_addmap].

View Component Results for an Application

Description   Results in the form of component concentrations can be viewed on a per
stream basis for each application.

MMI Procedure   If not already at the monitor menu, press <HOME> to get to the main
screen, then press [SELECT MENU] and select 1. "Monitor Menu".

Check the upper left hand corner of the screen to ensure you are viewing
the correct application.

Press [NEXT APP] until the appropriate application is displayed on the
screen.

Select menu item 5. "View Results & Chromatograms". Use the [^] and
[V] soft keys to select the stream of interest and press [VIEW RESULTS].

**System Manager
Procedure**   Double-Click the Icon of the unit that you wish to view results. The win-
dow that opens up for the Analyzer will show a tree in the left pane that
shows all the applications in the analyzer. Double-Click the application
icon of interest and select the Results icon from the list that opens up
underneath the icon. All results of all streams from that application will
be displayed.

View Component Results for an Application, Continued

EZChrom Procedure

Double-Click icon associated with the instrument and application of interest. From the File Menu select Data $\Rightarrow$ Import. From the dialog box select the stream of interest. The system will load all the results and chromatograms for the stream. The trace display shows the results of the analysis. If the desired result does not appear, right-click the mouse on the desired trace and select the Annotations… option. Select from the "Available Annotations" list the result items that you wish to view. Press the right arrow button to add these annotations to the list. Press the [OK] button and the results will be present on the trace.

Software Upgrade

Upgrade Maxum Software from 4.1 Workstation

Description

Each device has multiple pieces of software that must be upgraded when software is upgraded. The Operating System (OS) for the Syscon board shares the processor resources between communications and the following software modules: Database, Display Manager. The SNECON board also has an OS and an application that must be matched to the Database. The upgrade tool available in 4.1 automatically selects the software components that should be upgraded for the select version and manages the process.

Step	Procedure
1.	Place the applications in hold for the device to be up-graded.
2.	If the device is a GC, open EZChrom on the Workstation and import all methods for the analyzer to be upgraded. (See "Import a Method" in the Methods section)
3.	From Advance Utilities select –> [Tools] > "Upgrade Unit…" > Select unit to upgrade from the list box > Select the Upgrade Directory if the latest version is not desired > [OK]
4.	If the device is a GC, open EZChrom on the Workstation and export all methods for the analyzer to be upgraded. (See "Export a Method" in the Methods section)

Results

The software components in the selected device should now match the revisions listed in the file Versions.txt found in the directory that you used in step 2.

Software Upgrade, Continued

Upgrade MicroSAM Software from 4.1 Workstation

Description

Each device has multiple pieces of software that must be upgraded when software is upgraded. The Operating System (OS) for the CAC board shares the processor resources between communications and the Database. The RSP board also has software that must be matched to the CAC board software. The upgrade tool available in 4.1 is used to upgrade the MicroSAM database. For other MicroSAM software components refer to the MicroSAM documentation.

Procedure

Step	Procedure
1.	Place the applications in hold for the device to be upgraded.
2.	Open EZChrom on the Workstation and import all methods for the analyzer to be upgraded. (See "Import a Method" in the Methods section)
3.	From Advance Utilities select –> [Tools] > "MicroSAM" > "Software Upgrade" > Select unit to upgrade from the list box > Select the Upgrade Directory if the latest version is not desired > [OK]
4.	Open EZChrom on the Workstation and export all methods for the analyzer to be upgraded. (See "Export a Method" in the Methods section)

Results

The software components in the selected device should now match the revisions listed in the file Versions.txt found in the directory that you used in step 2.

Streams

Enable/Disable a Stream

Description

When an analyzer has more than one stream, it can be useful to disable one or more of them. If a stream is disabled, sampling and analysis will be skipped for that stream. The analyzer proceeds to the next active (enabled) stream and performs a measurement on that stream.

MMI Procedure

"Maintenance Menu" > "Stream Sequences" > press [^] or [V] until stream is selected > press [Disable]

Result

The disabled stream will be skipped; no sampling or analysis will be performed. Also, the [Disable] button becomes an [Enable] button which is used to enable the stream and resume analysis.

NOTE

Disabling the current stream (the one being analyzed) will cause the stream to be marked for disabling at the end of the current cycle.

Force a Stream

Description

When an analyzer has multiple streams, it can be forced to analyze a particular stream on the next cycle.

Refer to the section that describes disabling and enabling streams for more information that can be helpful in circumstances where it might be desirable to Force a Stream.

MMI Procedure

"Maintenance Menu" > "Stream Sequences" > press [^] or [V] until desired stream is selected > press [Set Active]> [More]> [More]> [Stream Step]

Result

The selected stream becomes the next to be analyzed, and sample from that stream begins flowing through the sample valve.

NOTE

The [Stream Step] portion of the command is necessary to switch the sample to the new stream so that the new sample can flush the previous sample from the sample valve and sample loop. If this is not done with sufficient time to completely flush the previous sample before the next sample injection occurs, then the analysis will likely have inaccurate results.

To return to normal operation hit [Resume Sequence]

Temperature Controller

Change a Temperature Controller Set Point

Description

Changing the set point on temperature controllers can be used for troubleshooting, fine tune a method, verify that a method is working correctly and to manually set up a method.

MMI Procedure

[Select Menu], "Maintenance Menu", "App I/O, Temperature & Pressure". Scroll down [V] to "Temperature Controller" or press the number [5] on the keypad, press [SELECT]. A list of Temperature Controllers will be displayed. Scroll down [V] to the Temperature Controller to be modified and press [CHANGE SET PT]. Enter new set point and press [ACCEPT CHANGE].

Result

The new Temperature Controller set point will be displayed in the Cur Setpt column.

Enable/Disable a Temperature Controller

Description

Enabling and disabling temperature controllers can be used for troubleshooting, to verify that a method is working correctly and to manually set up a method.

MMI Procedure

[Select Menu], "Maintenance Menu", "App I/O, Temperature & Pressure". Scroll down [V] to "Temperature Controller" or press the number [5] on the keypad, press [SELECT]. A list of Temperature Controllers will be displayed. Scroll down [V] to the Temperature Controller to be enabled or disabled and press [ENABLE] or [DISABLE].

Result

If enabling the Temperature Controller an asterisk will be removed from in front of the Temperature Controller name. If disabling the Temperature Controller an asterisk will be placed in front of the Temperature Controller name indicating that it is disabled.

Time & Date

Set GC Time/Date

Description

The GC uses the current time and day to tag analyzer data and trigger time of day MaxBasic programs. The user can set the time/date, time zone and daylight savings transitions.

MMI Procedure

From the MMI Main screen; [SELECT MENU]>"Configure Menu" > "System Setup" > [TIME INFO]. Use the numeric keypad to select the settings to be changed. After entering any change, press [ACCEPT CHANGE] to implement, [CANCEL CHANGE] to go back to the screen without saving changes.

1. Local Date: Enter the date in the form MM.DD.YYYY, where MM is the month code (01-12), DD is the Day code (01-31) and YYYY is the year code.

2. Local Time: Enter the time in the form HH.MM.SS, where HH is the hour in 24-hour format, MM is the minutes and SS is the seconds.

3. TimeZone: Enter in the number of minutes <u>west</u> of UTC (Universal Coordinated Time). I.E. U.S. Central time is 6 hours west of UTC and uses a value of 360.

4. day light on: Set the date/time at which daylight savings time is enabled of the form MM.WW.DD.mmm, where MM is the month of the change (1-12), WW is the Week of the Month (1 - 5), DD is the Day of the Week (0 – 6) and mmm is the minutes after Midnight that the change occurs. A setting of 0.0.0.0 disables the daylight savings feature.

5. day light off: Sets the date/time at which daylight savings is turned off. It uses the same settings as day light on:

Results

Local Time and Data updates the system local time. After setting Time-Zone, and daylight savings settings there will be a two-tone beep emitted by the unit indicating a save of the parameters to flash.

CAUTION

⚠

If the unit is reset before the completion of the two-tone beep sequence, analyzer parameters can be lost and hamper instrument operation.

CAUTION

⚠

When editing the data field that changes the parameters, use the [BACK] soft key to backspace over characters. Use of the fixed key <BACK> will revert the screen back to the Maintenance Main menu without changing any values.

Time & Date, Continued

Set GC Time Server

Description

Time for the Analyzer can be synchronized with a common server. This can be another Maxum unit, or a workstation running the Maxum TFTP server program.

MMI Procedure

From the MMI Main screen; [SELECT MENU]>"Configure Menu" > "System Setup" > [IP SET INFO]. Use the numeric keypad to select setting 7. Time Server IP adr. Enter the IP Address of the workstation or analyzer with which the system needs to be synchronized. After entering any change, press [ACCEPT CHANGE] to implement or [CANCEL CHANGE] to go back to the screen without saving changes.

Results

After setting there will be a two-tone beep emitted by the unit indicating a save of the parameters to flash. The system will then synchronize with the Server at that point and on a roughly 24 hour periodic basis.

CAUTION

⚠

If the unit is reset before the completion of the two-tone beep sequence, analyzer parameters can be lost and hamper instrument operation.

NOTE

When editing the data field that changes the parameters, use the [BACK] soft key to backspace over characters. Use of the fixed key <BACK> will revert the screen back to the Maintenance Main menu without changing any values.

Validation

Change Auto-Validation Values & Margins

Description

A Validation Blend (or Sample) is a sample that has previously analyzed and is used to verify the operation of an Analyzer. It can be a synthetic blend or a process sample that is kept for validation. If the validation sample is changed the Blend Values must be updated in the Analyzer. The allowed Margin between the Analyzer Result and the Blend Value determines if a Validation Passes or Fails. This Margin can be changed in the same location as the Blend Values. Each component has its own Blend Value and Margin.

MMI Procedure

"Maintenance Menu" > "Method, Calibration & Validation" "

"Calibration & Validation"

Select the Validation Sequence by pressing [NEXT SEQNCE]

[VIEW RESULTS]

[VIEW CONFIG]

Select the component desired using the up and down arrows

[MODIFY]

Enter the new blend value and then [ACCEPT CHANGE]

Or [NEXT FIELD] to modify the Margin

Repeat for each component

Validate an Application

Description

A Validation Blend (or Sample) is a sample that has previously analyzed and is used to verify the operation of an Analyzer. It can be a synthetic blend or a process sample that is kept for validation. The results of the validation run will be compared with the Blend Values stored in the Analyzer. The allowed Margin between the Analyzer Result and the Blend Value determines if a Validation Passes or Fails.

MMI Procedure

"Monitor Menu" > "Validation" >[START VAL]

The Analyzer will run the Validation Sequence and determine whether it passes or fails.

NOTE

Validation will only show up if there is a validation sequence defined in the application.

Chapter 4

Adjustments

MMI Display Contrast Adjustment (Maxum only)

Adjust MMI Contrast

Description

Due to changes in the operating environment or aging, it is possible that the MMI display contrast may require adjustment. If the display appears washed out, has turned dark, or has dark streaking, adjusting the contrast should remedy the problem. To make the adjustment, a small screwdriver or potentiometer adjustment tool is required. It is recommended that the adjustment tool be non-conductive.

MMI Contrast Adjustment Procedure

While the analyzer is operating, open the analyzer door and locate a small round hole in the cover on the back of the MMI. Looking into the hole, you should be able to see the potentiometer and the adjustment screw. Using the adjustment tool, rotate the potentiometer adjustment screw until the display appearance improves. One direction will make the display characters darker. The other direction will make them lighter.

CAUTION

⚠

Though there is no danger of electrocution, it is possible to damage the printed circuit board if the screwdriver should slip out of the slot on the potentiometer. Therefore, it recommended that a non-conductive tool be used for making the adjustment, preferably a potentiometer adjustment tool which is made expressly for this purpose.

Chapter 5

How to Obtain Additional Help

On-line help is available for each of the Workstation tools. The access point is through standard "Windows" help conventions via a "help" selection in the toolbar at the top of the screen. In addition to information concerning the workstation tools, this help often provides valuable details concerning GC functionality.

Another source of information is the Maxum Manual Library CD (Part # 2000597-001) and the printed version of the Manual Set (Part # 2000597-002). This additional information is available in English.

For more detailed information on use of the MMI, the Training Manual has a significant amount of detail, with pictures. Refer to the chapter titled "MMI Ver 4 Menu Overview". For convenience, this training manual chapter has been included as part of the CD with this compact manual.

If you need further assistance contact one of the following offices:

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Appendix A

Glossary

Acronyms

10 Base T	The ethernet standard specified in IEEE 802.3, which uses unshielded twisted pair cable transmitting at 10Mbps
10 Base2	The ethernet standard that uses thin coaxial cable
ABH	Air Bath Heater
ADH	Advance Data Hiway
BOOTP	Bootstrap Protocol
CAN	Controller Area Network
CF	Compact Flash
DPM	Detector Personality Module
EC	Electronic Enclosure
ECD	Electron Capture Detector
EPCM or EPC	Electronic Pressure Control Module
FID	Flame Ionization Detector
FPD	Flame Photometric Detector
I$_2$C	Inter-Integrated Circuit
MMI	Man Machine Interface
NAU	Network Access Unit
PECM	Power Entry Control Module
PWM	Pulse Width Modulation
SLIV	Siemens Liquid Injection Valve
SNE	Sensor Near Electronics
SNECON	Sensor Near Electronics Controller
SVCM	Solenoid Valve Control Module
SYSCON	System Controller
TCD	Thermo Conductivity Detector
TCP/IP	Transmission Control Protocol/Internet Protocol
TFTP	Trivial File Transfer Protocol
WDB	Wiring Distribution Board

Important Definitions

Actual Retention Time   The time it takes for a peak to travel through the columns, from sample inject until it reaches the detector.

ADH Default Application   When connecting a Maxum to an Advance Data Hiway communication system, remote access is limited to only one application because the advance data hiway does not understand multiple applications. If a Maxum has more than one application in the database a default application must be selected. The default application is what is displayed when a remote connection is made over the Advance Data Hiway.

ADH Loop   One of eight networking segments used with the Optichrom analyzer with a limited number of units on each used for networking communications.

ADH Unit   Unique Optichrom analyzer identification number (0 thru 31) within one of up to eight loops used for networking communications.

Applications   Applications share the GC hardware. Parts of the system table are assigned to each application through the configuration of application tables. An application can be thought of as a virtual GC. Each application is typically independent from other applications. An application can have sample flows, one or more sample sequence lists, inputs/outputs, EZChrom methods, basic programs, chromatograms, temperature controllers, pressure regulators, and results that are independent of other applications. Each GC can have several applications that are configured to work independently or in concert with one other on the same GC. An application has a cycle clock that is unique from the other applications. This allows applications to be placed in run or hold without affecting other independent applications.

Chromatograms

Cold Start   Refers to restarting the analyzer with the saved database.

Cycle Time   Stop time of an application's cycle run clock.

Database   All parameters of a chromatograph are saved in a database. This contains configuration data and applications of the System Manager, EZChrom methods, sample sequences, archive and alarm log. This database can be viewed in static or dynamic mode.

Static corresponds to a snapshot of the database, i.e. tables are imported from the database into the PC, edited, and subsequently exported to the chromatograph again. The display is not automatically updated. The data must be imported again in order to view modifications.

Dynamic values are updated as soon as they change. Most of the MMI displays are dynamic. With the System Manager, only the result and alarm displays are dynamic. EZChrom displays are always static, except for the Control Window and Real Time Chromatogram Displays, which are dynamic. In the System Manager, copies of the database can be saved on the hard disk or saved databases can be loaded into the GC (file extension .AMD).

Important Definitions, Continued

Database Version The current version level of the database.

Datanet Datanet is one of the choices available for connecting multiple devices on a network together. Datanet is a redundant, proprietary network communication protocol used in the Maxum analyzer.

DM Version The current version level of the display manager.

Expected Retention Time The time a peak of interest is expected to take to reach the detector from inject under normal operation.

Flash Flash memory (sometimes called "flash RAM") is a type of constantly-powered nonvolatile memory that can be erased and reprogrammed in units of memory called *blocks*. It is a variation of electrically erasable programmable read-only memory (EEPROM) which, unlike flash memory, is erased and rewritten at the byte level, which is slower than flash memory updating. Flash memory is often used to hold control code such as the basic input/output system (BIOS) in a personal computer. When BIOS needs to be changed (rewritten), the flash memory can be written to in block (rather than byte) sizes, making it easy to update. On the other hand, flash memory is not useful as random access memory (RAM) because RAM needs to be addressable at the byte (not the block) level.

GC Gas Chromatograph refers to the Maxum or MicroSAM product.

Import/Export When working within EZChrom, methods, data, and sequences are not automatically updated and must be imported to view and modify the database. Once changes have been made in EZChrom to a method it must be exported to the analyzer's database for the changes to take effect.

Injection Lag Start time of an application's cycle run clock, can be a negative number.

LAN 1 IP Address In the most widely installed level of the Internet Protocol (IP) today, an IP address is a 32-bit number that identifies each sender or receiver of information that is sent in packets across a network. Each analyzer must have a unique static IP address when connecting multiple devices together on a network. This is the address for the 10 Base T connection located on front of the SYSCON and used for network communications.

LAN 2 IP Address In the most widely installed level of the Internet Protocol (IP) today, an IP address is a 32-bit number that identifies each sender or receiver of information that is sent in packets across a network. This is the address for the 10 2 wire that is connected from the SYSCON to the SNEs for internal network communications.

LAN 1 IP Mask Part of the local address can identify a subnet work or subnet address, which makes it easier for a network that is divided into several physical subnet works (for examples, several different local area networks or) to handle many devices.

Important Definitions, Continued

LAN 2 IP Mask	Part of the local address can identify a subnet work or subnet address, which makes it easier for a network that is divided into several physical subnet works (for examples, several different local area networks or) to handle many devices.	
Level	Type in the exact amount of each compound (corrected for purity) in your first calibration standard in the column labeled "Level1".	
Load Information	Boot	
	Options	Some options are available that prevent some actions from happening:
		• 0 = normal • 1 = no warm start • 2 = no database save • 16 = no ADH • 32 = no BOOTP
	TFTP Host IP	The network address of the database where the TFTP software is running, with the TFTP software running the analyzer can initiate an upload from the database to the analyzer.
	Start Mode	Location of file to load at start up:
		• 1 = Flash Module • 2 = Always TFTP • 3 = One time TFTP
	DB last save	The last time the database was saved.
	DB save interval	Interval that the analyzer will initiate a save to flash command.
Logical Analyzer ID	Unique Maxum analyzer identification number used with networking communications.	
Metastable	A state of stability that is barely stable. Metastable states may be easily stimulated to become unstable.	
Methods	A method contains information required to analyze a sample stream: configuration data for detectors, valves etc., peak detection parameters, evaluation parameters, and time programs. Methods are generated using EZChrom and exported to the chromatograph's database.	

Important Definitions, Continued

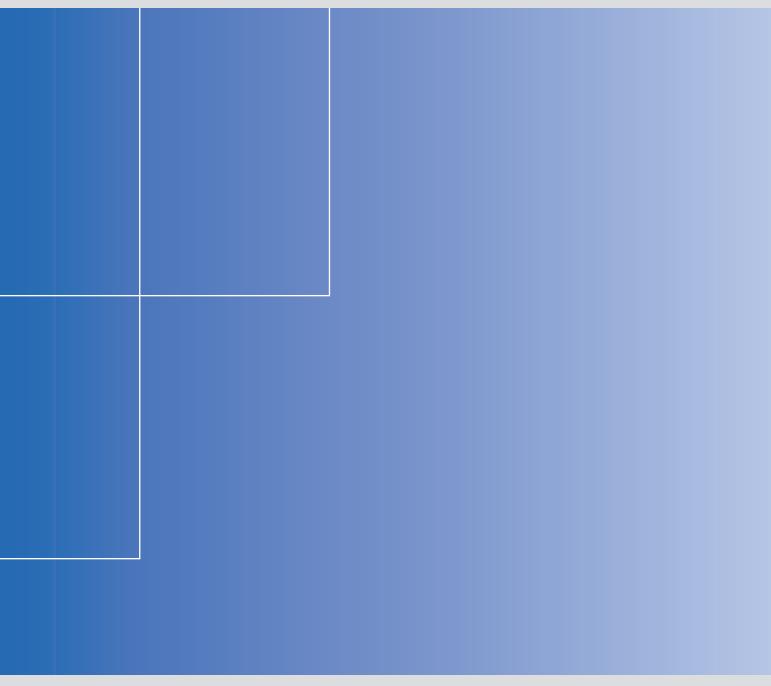|	
MMI	Man-Machine-Interface refers to the user interface present on the front of most Maxum GC's. It is made up of a one quarter VGA screen with an associated keypad. The local MMI on a Maxum can be used to access any other Maxum, MicroSAM or Optichrom GC attached to the analytical network.
MMI Emulation	Man-Machine-Interface Emulation refers to one of the applications on the Maxum Workstation. This application graphically emulates the physical MMI located on the front of a Maxum GC. The MMI Emulation Application can be used to access any other Maxum, MicroSAM or Optichrom GC attached to the analytical network.
MODBUS	Communication protocol developed by Modicon; widely used in process control applications. The Maxum Modbus Address map allows a host system to read and write some Boolean, integer, and floating point values. Most of the values read are data from the analyzers. Some of the values read are generated by the Maxum Modbus interface.
OS Version	The current version level of the operating system.
Peak Width	One of two required integration events for each detector run within a method Peak Width is set using the width of the narrowest peak and use to calculate the sampling rate for the chromatogram used by the EZ-Chrom software.
Printer	A printer can be set up for logging results and alarms using network communications or serial ports located on the SYSCON. The Maxum used LPD/LPR Short for **l**ine **p**rinter **d**aemon/**l**ine **p**rinter **r**emote, a printer protocol that uses TCP/IP to establish connections between printers and workstations on a network. The technology was developed originally for BSD UNIX and has since become the de facto cross-platform printing protocol. The LPD software typically is stored in the printer or print server and the LPR software must be installed in the client device. The LPR client sends the print request to the IP address of the LPD printer/server, which in turn queues the file and prints it when the printer becomes available.
Remote DM Version	The current version level of the remote display manager.
Response Factor	A numeric value calculated from a measured peak area to equal that of the known concentration for that peak.
Retention Time	The calibrated peak's expected retention time.

Important Definitions, Continued

Retention Window	Retention time window for calibrated components, used for identification of calibrated peaks.
Router IP Address	A router is a device or, in some cases, software in a computer, that determines the next network point to which a packet should be forwarded toward its destination. The router is connected to at least two networks and decides which way to send each information packet based on its current understanding of the state of the networks it is connected to. A router is located at any gateway (where one network meet another), including each Internet point-of-presence. A router is often included as part of a network switch. The router IP address must be set in the analyzer in order to forward information through the router.
Scripts	In computer programming, a script is a program or sequence of instructions that is interpreted or carried out by another program rather than by the computer processor (as a compiled program is).
Soft Key	These are keys that are displayed at the bottom of the MMI screen. They are called soft keys, because their meaning changes depending on what screen you are currently displaying.
Stream Sequences	These are lists of sample streams and assigned methods, which are used to control the order of analysis for multi-stream GC's. Each application has at least one normal sequence and one calibration sequence. Although an application can have several sequences, only one is active at a time.
SYSLOG IP Address	Address of the location for logging debug information when using CompactFlash. Logging debug information increases system resource usage and system performance will be lower. You modify the SysLogIP attribute (A.B.C.D) and change A to 255 to enable CF logging, Set C nonZero to get output to the file debug1.log, set D to nonzero to continue to get debug info out the serial port. After the debug1.log files reaches 1 Mib in size, it changes its name to debug2.log then continues to gather data in debug1.log.
Text Version	The current version level of the text file (screen messages).
Threshold	One of two required integration events for each detector run within a method. Threshold is set using a section of flat baseline to calculate the triggering voltage used during integration to identify and set gate times by the EZChrom software.

Important Definitions, Continued

Time Service IP Address   The IP address of the server being used on the network for synchronizing time on network devices.

Warm Start   Refers to restarting the analyzer with the open database.

SIEMENS