

Maxum II

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Maxum edition II Analyzer General Maintenance

Manual

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General Analyzer Functions, Troubleshooting, and Maintenance for Maxum II Gas Chromatographs. The information in this manual supercedes the applicable topics in previous manuals.

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.
--

WARNING
--

indicates that death or severe personal injury may result if proper precautions are not taken.

CAUTION
--

indicates that minor personal injury can result if proper precautions are not taken.
--

NOTICE

indicates that property damage can result if proper precautions are not taken.
--

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

WARNING
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Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.
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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

This manual provides maintenance information common to various Maxum Edition II Gas Chromatograph models.

1.1 Analyzer Specific Documents

Included with each analyzer is a custom documentation-drawing package. This package provides drawings and information pertinent only to a specific analyzer. Contents of this package are application-dependent and vary for each analyzer. Typical drawings included are:

- System Block and Utility Requirements
- System Outline and Dimensional Drawings
- Sampling System - Plumbing and Spare Parts List
- Sampling System Dimensional Diagram
- Sampling Probe
- Electronics Compartment - Internal Layout
- Applicable Wiring Diagrams
- Oven Plumbing Diagram - Sensor Near Electronics
- Recommended Spare Parts - Analyzer
- Manufacturing Test Charts
- Stream Composition Data
- Database

Safety notes

Maxum II Analyzers have varying levels of certification for operating in hazardous environments. See the *Maxum II Explosion Protection Safety Standards Manual* (A5E02220442001), and the *Maxum edition II Installation Manual* (2000595) for complete information.

The Maxum edition II Process Gas Chromatograph, also called the Maxum II, employs several design and construction features which conform to various international safety standards. These standards are to ensure that the Maxum II and related products can be safely installed and operated in hazardous areas. Each individual detail and component of these safety systems is important to help ensure that the chromatograph does not ignite flammable vapors and gases which may be present in the environment surrounding the analyzer. Therefore, it is important that any personnel that come in contact with the analyzer be familiar with the operation of the safety systems so that they do not compromise safe operation while performing routine maintenance, operation, or other tasks.

DANGER

Explosion risk

Do not install, operate, or service this equipment without reading and understanding all documentation for the equipment and the Safety Data Sheets for all chemicals used in the installation and operation. Failure to follow safe procedures with chemicals commonly used in gas chromatography greatly increases the risk of severe injury or death, and destruction of equipment.
--

2.1 Approved Use

The Maxum edition II gas chromatograph is primarily used in all branches of the fine chemicals, refining, and hydrocarbon processing industries. It performs chemical composition analysis of gases and liquids that are present in all phases of production. The application flexibility of the Maxum II allows it to analyze a wide variety of samples including feedstock, partially processed streams, final products, and process byproducts including wastes and environmental hazards.

The Maxum II product is intended to be used only in conjunction with other devices and components which have been recommended and approved by Siemens. Appropriate safety standards were used in the development, manufacture, testing, and documentation of the Maxum II. Under normal operation, this product is safe for use providing that all safety and handling guidelines are observed with respect to configuration, assembly, approved use, and maintenance.

This device has been designed with safe isolation between high and low voltage circuits. Low voltages which are connected must also be generated using safe isolation. If any part of the Maxum II is opened, certain parts of the device are accessible which may carry dangerous voltages. Therefore, only suitably qualified personnel may work on this device as indicated in the next section which is titled "Qualified Personnel".

2.2 Qualified Personnel

Only suitably qualified personnel may operate or perform maintenance on the Maxum II. For the purposes of safety, qualified personnel are defined as follows:

- Those who have been appropriately trained for the tasks which they are performing (for example, commissioning, maintenance, or operation).
- Those who have been appropriately trained in the operation of the Maxum II process gas chromatograph and are sufficiently acquainted with Maxum II documentation.
- Those who are familiar with the safety concepts of the Maxum II process gas chromatograph and are sufficiently acquainted with Maxum II documentation.
- Those who are authorized to energize, ground, and tag circuits and devices in accordance with established safety practices may perform those tasks for which they are trained.



WARNING

Avoid injury and property damage

Operation or Maintenance of the Maxum II by unqualified personnel or failure to observe the warnings in this manual or on the device may lead to severe personal injury and/or extensive property damage.



WARNING

Do not connect analyzer to the internet.

This equipment must not be connected to the internet except by a secure connection using a network security appliance administered by qualified IT personnel.

Failure to implement robust network security may expose your company to internet hacking attacks that could result in theft or loss of sensitive data, equipment damage, serious injury or death.

For more information see the Maxum II Explosion Protection Safety Standards Manual (A5E02220442001) at Maxum II Explosion Protection Safety Standards Manual (<https://support.industry.siemens.com/cs/document/42017542/maxum-edition-ii%3A-explosion-protection-safety-standards?dti=0&pnid=17741>).

System Functions

3.1 Chromatography Overview

Gas Chromatograph Terminology

The following are some of the terms that are used in this manual.

Application: The supporting hardware and software required to perform the analysis. Supporting hardware consists of hardware channels: detector channel, Solenoid Valve Control Module channel, Electronic Pressure Control channel, Temperature Controller. Streams are defined to applications. If there are 3 or 4 simultaneous streams, they are defined as a single group called a Method. Applications can run only one Method at a time. Two applications can run if there are two cycle clocks in the Maxum II.

Method is the part of the application that contains the parameters for controlling the hardware. Methods control the hardware associated with an Application. The method controls the hardware, including all cycle-clock timed events. Methods are defined to streams. That is, several stream sequences can make up one Method. Methods also control the integration and calculations of the chromatogram. There is one cycle clock per method.

Applet refers to pre-engineered chromatographic segments of common applications, which have been optimized and standardized.

Applet Module refers to a complete assembly including Model 50 valve(s), detector and interconnecting tubing all mounted as a single module. The module includes columns and restrictors

Parallel Chromatography

With the Maxum II hardware and software, a complex single-train chromatograph analysis can be broken it into multiple simple trains. Each simple train then runs simultaneously – in parallel. This parallel chromatography procedure simplifies the overall analysis and increases reliability.

Redundant Measurements

Using parallel chromatography can reduce calibration requirements by running two identical modules in parallel on the same stream to obtain redundant measurements. As long as the results remain the same within a predefined error limit, the analysis is known to be accurate. Deviations outside the error limit can trigger notification or activate analyzer calibration. Overall, the Maxum II calibration requirements are significantly lower because of the parallel measurement configurations and standard modular applications.

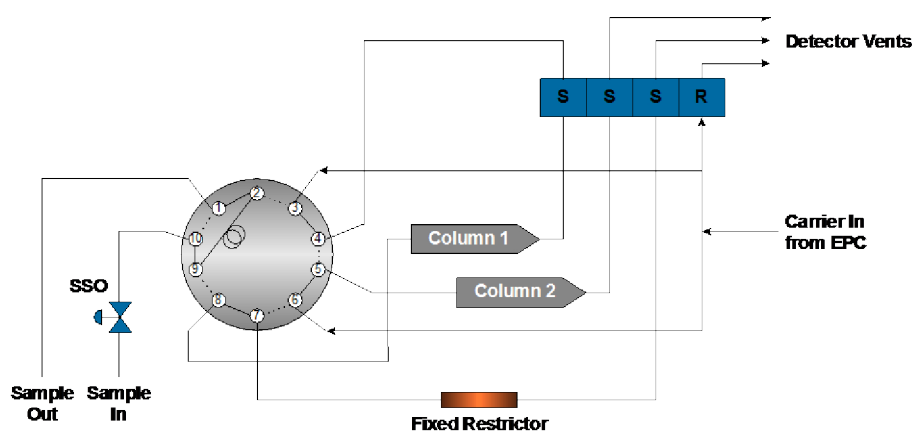


Figure 3-1 Example Applet

3.2 Functions

Overview

This section provides an operational overview of the real-time functional tasks of the Maxum II.

- Startup Tasks
 - Applying Power
 - Valid Database
 - Oven Temperature
 - Cycle Control Flag
- Timed Event Scheduling
 - Time-Of-Day Clock
 - Schedule of Events • Frequency Events
- Analysis Cycle Clock
 - Accessing System Controller
 - Analysis Cycle Clock
 - SYSCON Cycle Clock
 - Valve Events
- Manual Operations via User Interface

Startup Tasks

On start-up, when primary AC power is applied to the analyzer, the analyzer first processes whatever electronic self-tests and diagnostics are required such as PROM, RAM, A/D, and communication ports. This processing occurs within 5 seconds.

System-related initial messages are generated and output to the network ports. Appropriate initial messages are then displayed on the Maintenance Panel and completed within 20 to 25 seconds. If the analyzer cycle clock is in RUN or CAL mode, an appropriate alarm may be generated during this internal test and the following startup period.

Self Test

After the self-test, the following conditions occur:

- Installed hardware is initialized.
- Interrupts are enabled.
- Oven temperatures and carrier pressure default set points are output.
- Analog input system(s), associated with detector inputs, are initialized and begin scanning.

The System Controller (SYSCON) verifies that a valid database is resident, then outputs the appropriate temperature and carrier set points. If a valid database is not verified, default set points are left in place.

Oven Temperature

The analyzer monitors the oven temperature to ensure that it has stabilized at the set point before automatically proceeding. Depending on how long primary AC power has been off, this may take from 2 seconds to 45 minutes.

Cycle Control Flag

Cycle Control Flags can be used to run optional diagnostic cycles to validate analytical hardware including solenoid valves, detectors, or carrier regulators. This option is typically based on a custom application being initiated by a power-fail alarm.

Cycle Control Flags indicate if any analyzer cycle clocks are to be in RUN mode. If they are not, the analyzer remains in the HOLD mode until operator intervention. If the cycle clock is in RUN mode, based on having been in RUN mode prior to powering down, then RUN mode starts in progress without waiting for intervention.

Program Event Scheduling

The Time of Day (TOD) clock schedules events on a second, minute, hourly, daily or weekly basis. The clock is maintained on the system controller and schedules events from the residing SYSCON database.

The TOD clock has one-second resolution that is maintained and generated by a hardware device that maintains accurate time independent of analyzer power. This allows a power recovery event to determine duration of power down state.

Certain events are scheduled on a frequency basis, which are independent of the TOD or analysis cycle clocks. The frequency clock has a resolution of 1 second, which is used to schedule repetitive events, such as reading DI and AI signals for alarm purposes. Scheduling of frequency events can be set to 5 seconds or greater. They occur regardless of whether the analyzer is in Run or Hold.

Description

A schedule event can be for instrument calibration and special calibrations. Special calibrations include daily or shift averages, report logging to a printer or Host computer. When these tasks are scheduled by the TOD clock, they are put into queue. This allows them to be performed at the next appropriate time. Typically, this is after completion of current analysis cycle.

If a calibration is scheduled, it is put in queue. The calibration then initiates after completion of the current cycle, and when the appropriate time has passed for the calibration blend to flow through the sampling valve. If shift average reports are to be calculated and printed, the report should include all cycles, which started, or sampled, during the specified shift. To have data available for calculation, a wait period may occur for completion of the current sample analysis.

Analysis Cycle Clock

The Analysis Cycle Clock (ACC) is another clock that provides the timebase for all events associated with the actual chromatograph analysis cycle. SYSCON cycle clocks can be configured to provide timed event resolutions of 0.1 second, 0.01 second, 0.01 minute, or 0.001 minute. This is the Sensor Near Electronics software module (SNE) Event Table Scan Rate, which is independent of detector scan rates.

All SYSCON cycle clocks and associated SNE MUST BE of the same second or minute time units. This clock works in conjunction with the Stream Sequence Table and associated sample stream enable and skip flags. This controls sampling order and analysis of process streams connected to the analyzer.

Accessing SYSCON

The clock cycle RUN mode is controlled by the SYSCON upon command from SNE. When a clock cycle is started, the associated SNEs, for that method, initiate a mirror of the cycle clock.

The SNE clock is the true basis of timed events relating to the Gas Chromatograph oven valve timing, detector digitization and peak integration.

SNE Cycle Clock

The SNE cycle clock is used to schedule the following events.

- Analysis valve timing
- Detector balances
- Temperature set points start and stop for PTGC
- Cycle Reset
- Pressure set point timing for pressure programming
- Analysis result calculations and reporting

Note

Scheduled solenoid valve events cause Solenoid Valve Control Module (SVCM) hardware to be activated within 5 milliseconds of stated cycle time. Any scheduled pressure set-point adjustments are transferred to the actual Electronic Pressure Control Module (EPCM) hardware within 5 milliseconds.

Manual Operations

Manually controlled functions can be initiated through the color touchscreen. A manually-controlled event can occur asynchronously with any event and control some of the analyzer operations. Controlled items include:

- Activation of solenoid valves
- Balancing detectors
- Changing a pressure or temperature set point
- Initiating a calculation
- Report logging event
- Change the cycle time of an event
- Initiate a calibration

3.3 Analyzer Operation

This section provides an overview of the operation of the Maxum II analyzer. The examples show a Maxum II Airless/Airbath model in order to include many optional features. Most analyzers will have only some of these features; for example, the Modular Oven model has no detector compartment.

The operational block diagram shows how a sample is processed within the analyzer. The SNE functions are performed in software in new systems; older systems still have hardware versions.

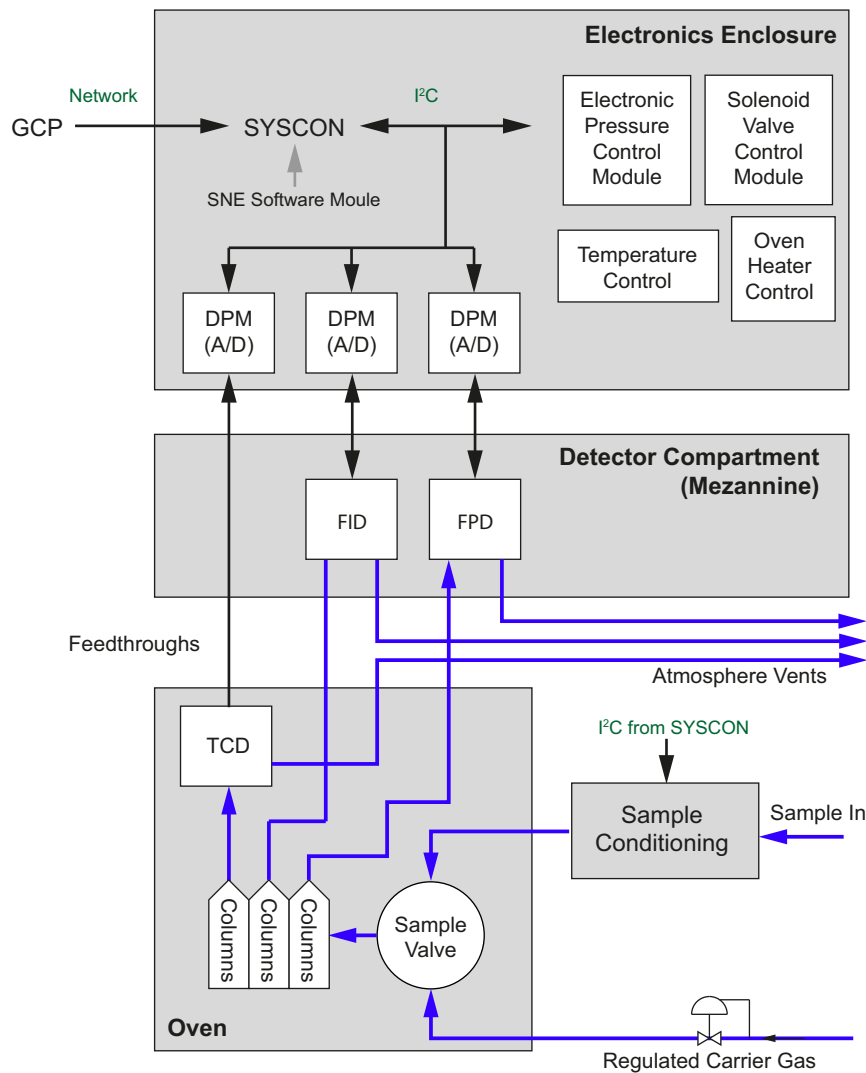


Figure 3-2 Operational Block Diagram (Maxum II Airless Airbath model shown)

Power On

The Power Entry Control Module (PECM), in response to commands on internal bus, accepts system primary power and provides switching and control of AC power for oven heaters and other AC powered devices.

Sample Conditioning

Before being piped to the analyzer, the sample from the process is sent to a sample conditioner system. The sample conditioner ensures that the process sample is compatible with the requirements of the analyzer. That is, it assures that the phase, pressure, temperature and flow rate to the analyzer are suitable, that the sample is filtered, that condensates are removed and other treatments are carried out. The resultant conditioned sample is typically piped via 1/8-inch stainless steel tubing to the sample valve(s) located in the oven of the Maxum II.

Sample Valve

The type of sample valve used in a Maxum II is application dependent. Five primary types of sample valves are available.

- The first is the 10-port Model 50 valve that is designed for vapor sample only.
- The second is the Model 11 valve for vapor or liquid samples.
- Third is the Model 20 valve for liquid high-pressure samples.
- The fourth type is the set of Valco valves that are designed for high temperatures and very low sample volumes.
- The fifth is the independently-heated Siemens Liquid Injection Valve.

The sample valve(s) and any column valves are controlled by a Solenoid Valve Control Module located in the Maxum II's electronics compartment. There can be up to three SVCMs installed in an electronics compartment (EC).

Solenoid Valve Control Module

The Solenoid Valve Control Module (SVCM) provides pneumatic on/off control for both sampling and oven systems functions. The SVCM manifolds are connected as a group of four 4-way and four 3-way solenoids. The (SVCM) receives commands from the I²C bus. Solenoid commands are received from the SNE software module. Solenoid relay status is read back to the SNE software module to indicate whether a selected solenoid is to be deactivated or activated. Timing is controlled by SNE software module timing. There is no timebase in the SVCM.

Commands from I²C bus control the deactivation or activation of solenoid valves. If fault or warning conditions have occurred, pressure control and SVCM status information is returned to the SYSCON database.

Columns

Samples are injected by the sample valves into the chromatograph columns where the samples are separated into individual components. Many different types of columns may be used including 1/16-inch micro-packed, 1/8-inch packed and fused silica or metal capillaries. The columns used are dependent on the requirements of the application.

Column Valves

In most applications, there are multiple columns in use that are typically switched by column valves located in between them. These column valves are not shown in the illustration, but like the sample valves described above they are also controlled by the Solenoid Valve Control Module and SNE software module.

Electronic Pressure Control

The carrier gas pressure that is used to push the sample through the columns is controlled by an Electronic Pressure Control Module (EPCM) or in some applications by mechanical regulators. The EPCM is mounted on manifolds located on the EC right-side wall. The EPCM pneumatics are digitally controlled by the Sensor Near Electronics (SNE) software module. Up to four EPCMs can be mounted in an EC. Each EPCM contains two channels, and each channel can use a different gas at a different pressure. EPCMs are also used to control the fuels for some of the detector modules. Each Electronic Pressure Control Module (EPCM) communicates the actual pressure back to the SNE software module. Information may then be displayed on the Maintenance Panel. Depending on model and application, up to 3 or 4 EPCMs may be installed.

Oven Heaters

For the columns and detectors to work correctly, they must usually be operated at elevated temperatures. The Maxum II uses electrical heater(s) to elevate the temperature. These heaters (not shown in block diagram) are connected to relays in the electronics compartment and, like the valves and the Electronic Pressure Control Modules, are controlled by the SNE software module.

Detector

The sample eluted from the columns is transported to the associated detector that senses the presence of the sample and converts it to an electrical signal. Depending upon the application, the Maxum II can include up to three detector modules. Each detector module can have multiple detector sensor elements. Several detector module types are available including Thermistor, Filament, Flame Ionization, Flame Photometric, and Pulsed Discharge. The resulting electrical signal from the detector is then connected to the Detector Personality Module (DPM) located in the EC.

Sensor Near Electronics (SNE) Software Module

The detector signal(s) is routed to the Detector Personality Module (DPM). The DPM (unique for each detector type) amplifies the analog signal and converts it to a digital signal. The digital signal output from the DPM is processed by the SNE software module. The DPM is interfaced to installed peripherals connected to the I²C bus through a set of digital and analog I/O signal commands. All accessible I/O's are uniquely addressable through the module type, enclosure ID, SNE, location ID and module channel number.

In earlier analyzers, the SNE control and processing functions were performed by a separate processor board, called the SNE controller (SNECON) mounted in the DPM cage assembly and connected to the SYSCON by an Ethernet cable.

System Controller (SYSCON)

The System Controller (SYSCON) resides in a pullout drop-down assembly located in the EC and controls all external communications and internal communication. The SYSCON houses the primary processor, plug-in I/O boards (for external signal control), communication interfaces, and an interface to the maintenance panel display. All internal communication between modules and SYSCON is via the internal I²C signal bus.

The original SYSCON consists of a single controller board. The newest version of SYSCON, called SYSCON2, is a base SIB (SYSCON Interface Board) with an attached CAC3 (Communication and Control board). The SYSCON combines all data results and performs additional high level data processing and calculations. The SYSCON connects to a color touchscreen display, strip chart recorder, other analyzers, printers, the Advance Communication System (ACS), or other connected networks.

The SYSCON is the analyzer control system in addition to containing the application database. The application database also contains analytical hardware database definitions that are used to perform the following functions:

- Obtain desired sampling measurements
- I/O and SNE schedule of timing events
- Sequence of sampling streams
- Calculations of reported values
- Formatting of results and location and outputting results
- How to report or correct error conditions

3.4 Data Communication

Internal Communication

An I²C Internal Bus provides communication between the SYSCON, SVCM, EPC, PECM and to the I/O bus. External communication is through an Ethernet link. The interface for each type of module is described in the Component Descriptions and Maintenance Procedures section.

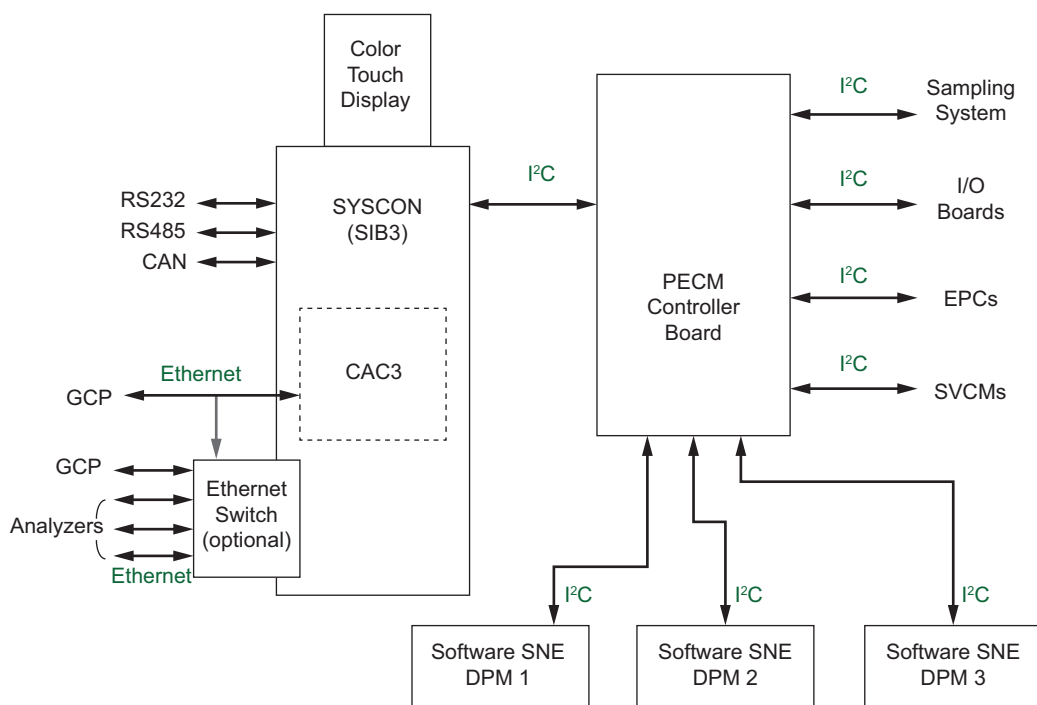


Figure 3-3 Data Communication Paths

Module Addressing

The Maxum II modules located in the electronic compartment have their own physical address and communicate via the I²C Internal Bus, shown in the diagram below. Address information is contained in the SYSCON database and identifies modules by their location. Each DPM is associated with a software SNE module that appears in the list as a separate device.

Identification Number

All modules within the Maxum II electronic compartment have a unique identification number as related to the software SNE module which controls them. The identification relationship between the SNE and the modules it controls is referred to as the SNE ID String.

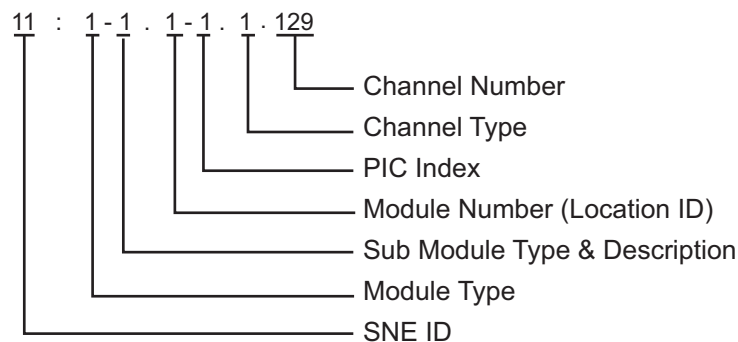


Figure 3-4 Identification Number

Address information is located in the analyzer local I/O Table. The I/O points are identified by module type, mounting location within the electronic compartment and channel number. This allows module addressing from either the SYSCON database, SNE Tables or from Advance Database.

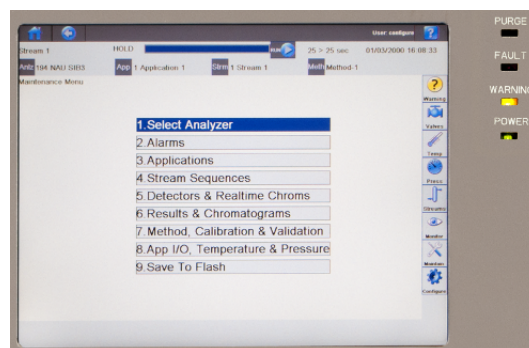
General Maintenance and Troubleshooting

4.1 Analyzer Status Indicators

4.1.1 Operator Controls

Color Touchscreen

The color touchscreen displays all maintenance functions and data in a graphical display. In addition it can also display both real-time and stored chromatograms. The stored chromatograms include voltages and cycle times for future comparison as well as zoom and pan features. Operational and routine maintenance tasks for the analyzer can be performed from the color touchscreen interactive display screens and menus. System security is assured with multiple levels of password protection for all analyzer-operating functions.



A color touchscreen emulator (also called a Human Machine Interface, or HMI, emulator) is available from the Maxum Gas Chromatograph Portal (GCP) software. This emulator allows a user to perform color touchscreen tasks without being located at the unit.

Status LEDs

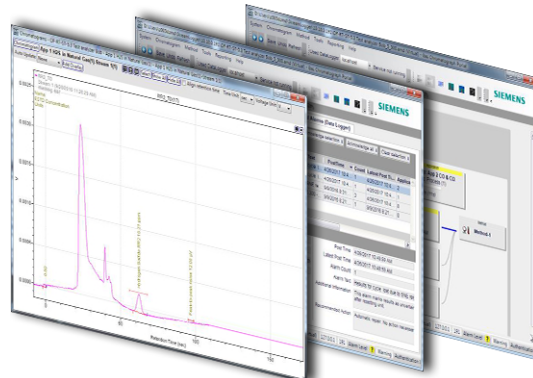


Purge (Flashing Red)	Purge pressure lost
Fault (Red)	"Failure" status is active
Warning (Yellow)	"Maintenance request" status signal is active
Power (Green)	24 V power supply is on

All LEDs are on during power-up boot.

Workstation

The Maxum II uses a PC based network workstation for programming and data processing. Analyzers can be programmed and monitored from a single location, and, like the color touchscreen, the workstation includes graphical displays for operation, maintenance, and diagnostics. It also supports PC printers to print chromatograms and alarm logs in order to meet record keeping requirements.



The Maxum II workstation software, Gas Chromatograph Portal (GCP), is designed for PCs with Microsoft® Windows operating systems. PC workstations can be connected through existing LANs for wide access to monitoring or maintenance tasks. The graphical interface recognizes and displays all network hardware. The system monitors the alarm status of all analyzers connected to the network to centralize system maintenance. More information can be found in the Gas Chromatograph Portal User Manual (A5E03944542001) at <https://support.industry.siemens.com/cs/document/109745485/gas-chromatograph-portal-user-manual-maxum-microsam?lc=en-WW&pnid=17741> (<https://support.industry.siemens.com/cs/document/109745485/gas-chromatograph-portal-user-manual-maxum-microsam?lc=en-WW&pnid=17741>).

Chromatography Software

Using GCP, it is possible to set up methods and component peak identification.

GCP allows a user to choose the best peak gating and basing methods automatically. It is also possible to:

- Re-process captured chromatograms with different methods
- Measure unknown component peaks automatically
- Record multiple detector measurements simultaneously.

4.1.2 LED States Inside the Electronics Cabinet

4.1.2.1 Base3DPM Status Indicator LEDs



Figure 4-1 Base3DPM Status LEDs

4.1.2.2 SIB3 LEDs

LED Locations

The SIB3 has several LEDs that indicate useful information about the operating status of various interfaces.

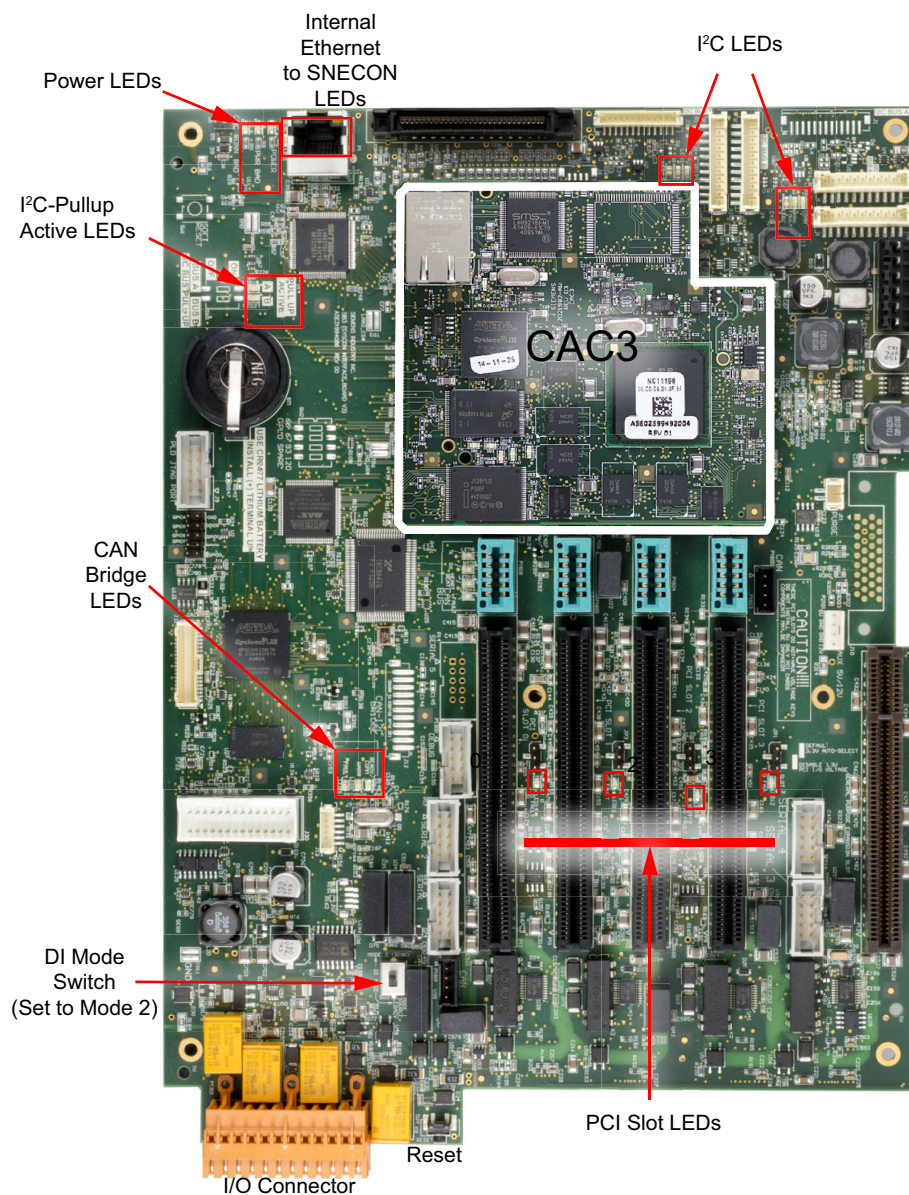


Figure 4-2 SIB3 LEDs and Switches

Power LEDs

Located at the back of the board near the RJ 45 connector

Description	Color and Meaning
Power	Green – 3.3V power is available. Should be on at all times
Power Bad	Red – Power is faulty or SYSCON hardware reset switch is being pressed
CAC Conn Bad	Red – Connection from the SIB3 to the CAC3 is faulty or incomplete. After power up, this LED should turn off once CAC3 to SIB3 connection is completely initialized.

I²C Bus LEDs, Buses A and B

Located next to I²C Bus connectors

Description	Color and Meaning
LED2/5 Norm/Comm	Dim Green – I ² C Bus is normal Bright Green - I ² C Bus is communicating
LED3/6 Warning	Yellow – Warning on the I ² C Bus
LED4/7 Fault	Red –I ² C Bus fault

I²C Bus Pullup-Active LEDs

Located next to battery holder

Description	Color and Meaning
LED19, 20	The Auto-pullup feature is supplying pullup current on the I ² C Bus.

Can Bridge LEDs

Located to the left of the far left PCI slot

Description	Color and Meaning
LED16 Ready/Comm	Dim Green – Can Bridge is normal Bright Green – Can Bridge is communicating
LED17 Warning	Yellow – Warning on the Can Bridge
LED15 Fault	Red – Can Bridge fault

Can I/O LEDs

Located next to far left CAN direct connector, CAN direct 5

Description	Color and Meaning
LED8 TX	Green – On when a valid CAN I/O message (other than a heartbeat reply) has been received and queued for processing
LED9 RX	Green – On when a CAN message (other than a heartbeat transmission) has been queued for sending to the CAN hardware

4.1 Analyzer Status Indicators

Description	Color and Meaning
LED10 Heartbeat	Green – Flashes once for each heartbeat message transmitted. This LED will flash once every 1.5 seconds for each active CAN card
LED11 Fault	Red – On when an error state is detected on the CAN bus hardware

PCI Slot LEDs

Located between PCI slots

Description	Color and Meaning
LED14 Slot 0 Fault	Red – Overcurrent or thermal shutdown on PCI slot 0
LED13 Slot 1 Fault	Red – Overcurrent or thermal shutdown on PCI slot 1
LED18 Slot 2 Fault	Red – Overcurrent or thermal shutdown on PCI slot 2
LED12 Slot 3 Fault	Red – Overcurrent or thermal shutdown on PCI slot 3

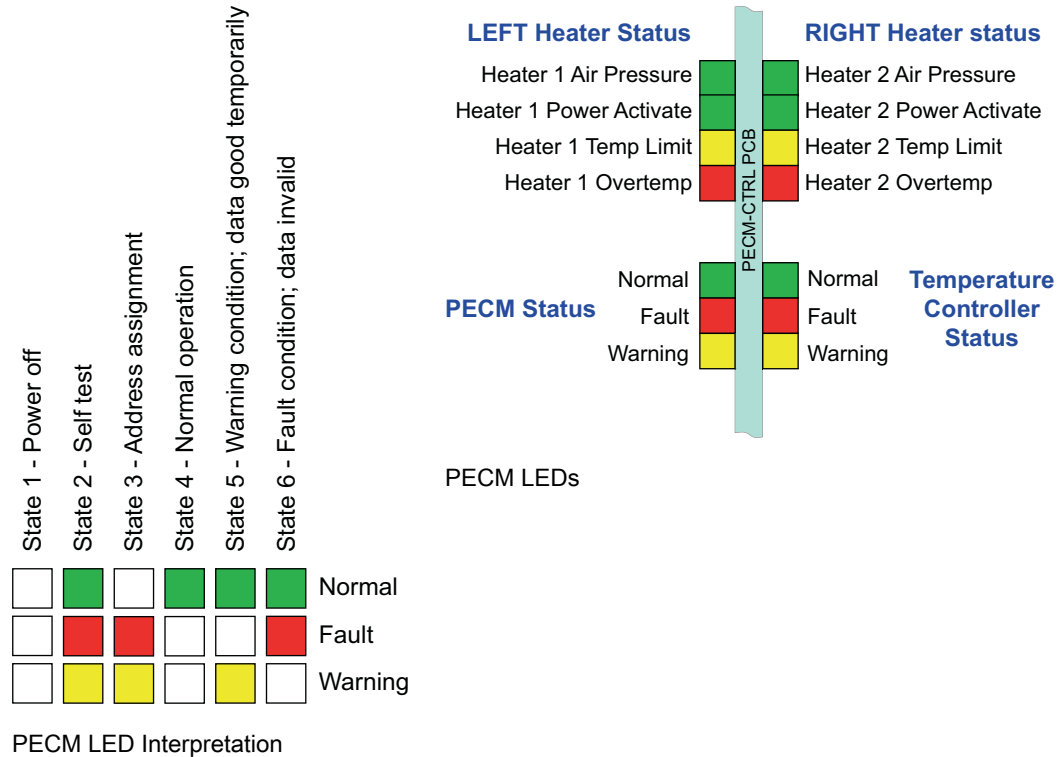
Internal Ethernet LEDs

Located next to and on SIB3 RJ-45 connector

Description	Color and Meaning
Green LED on RJ-45	Green – LED is green when link is in full duplex mode
Yellow LED on RJ-45	Yellow – LED is on when link is active. Will flash off for transmit or receive activity.
LED1 Speed	Green – On – Speed is 100 Mb/sec (or auto-negotiating) Off – Speed is 10 Mb/sec (or disconnected)

4.1.2.3 PECM LEDs

The LEDs on the PECM board can help with troubleshooting problems. There are two sets of LEDs: one on each side of the front board as shown in the diagram to the right. The bottom set of three LEDs is the same as used on other boards. The left set is for the PECM software and the right set is for the temperature controller software. Each will go through a separate display on power up and normal operation. The top two sets of four LEDs each are for the operation of each of the two temperature controllers on the front board. Heater 1 is on the left and heater 2 is on the right side of the board.

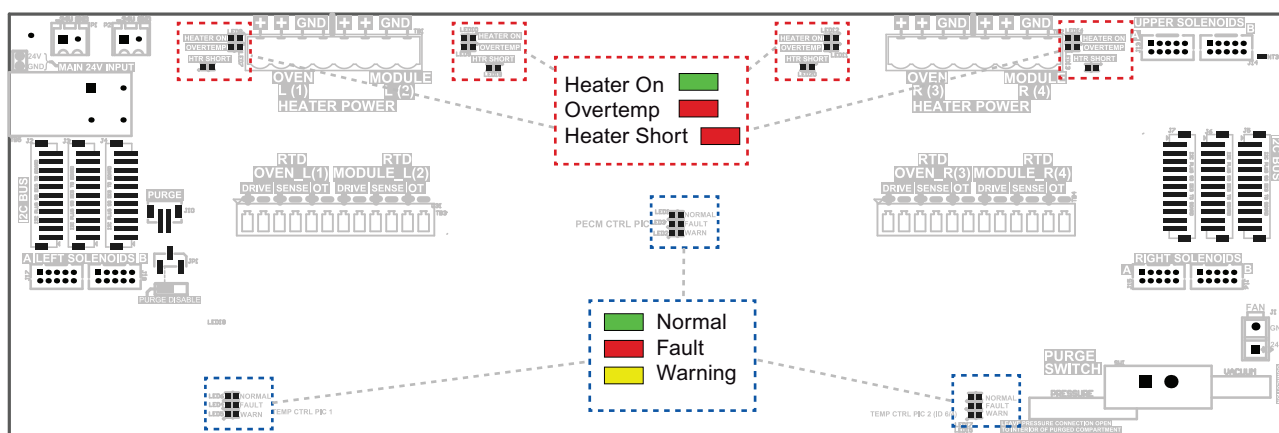


4.2 Leak Testing

4.1.2.4 Modular Oven Model PECM-DC LED Locations

LED Status Indicators

The PECM-DC LED locations are shown below.



4.2 Leak Testing

A gas chromatograph is a complex device with many gas fittings. Under normal thermal and vibration stresses, these can develop leaks. Therefore, periodic leak testing must be performed in accordance with local safety ordinances and rules.

General Overview of Leak Test Methods

An overall static pressure test of the analyzer installation can detect if a leak exists somewhere in the system.

1. Install caps on all vents.
2. Make sure the system is properly purged.
3. Increase EPC settings to maximum, or to pressures specified by safety rules.
4. Open the gas supply valves and allow the entire system to be pressurized.
5. Close gas supply valves and watch for a pressure drop over a minimum time period. This time period will be application specific and may be specified in local safety rules.
6. Operate the column and sample valves to ensure all parts of the system are pressurized. Some pressure drop may be seen upon valve operation; shortly afterward the pressure should stabilize and hold the current pressure.
7. If no pressure drop is observed, then the test can be ended, the vent caps removed, and the analyzer safely placed into service.
8. If a pressure drop is observed, a leak exists. Leaks can affect the application reliability and the safe operation of the analyzer. The leak must be isolated and repaired.

4.3 General Analyzer Shutdown Procedure

Back Up the Database

If a current database has not been saved, first save a database to a remote device to provide a potential method of reloading if a CAC3 has been replaced or an earlier database needs to be restored to the analyzer. Generally, a database reload will not be needed, though in some cases this may be required.

1. Put the Maxum II in Hold and wait for the cycle to complete. This will provide the quickest restart of the application when power is restored.
2. After the cycle has completed and the analyzer is in Hold:
 - Turn off carrier gas, valve gas, instrument air, and sample flows.
 - Remove power from the unit.

WARNING

Voltage dangerous to life exists. Failure to follow appropriate safety procedures may result in severe injury or death.

Before beginning to work inside the electronics compartment, the power must be externally removed from the GC. AC power comes directly into the electronics enclosure, so power must be removed and secured/tagged to prevent inadvertent application while work is being performed.

4.4 General Analyzer Startup Procedure

The startup procedure described in this section explains the principle steps necessary to power the Maxum II in a manner that does not compromise the safety systems of the analyzer.

Note

The specific application and the facility in which this equipment is installed will impose additional requirements for startup and shutdown.

This section does not explain the startup procedures required that relate to software functions or the analytical application of the analyzer. Please see other documentation and manuals for information and startup steps that relate to these other aspects of startup.

4.4.1 Procedure

Following is the procedure for safe startup of the Maxum II.

1. Verify that AC power is turned off at main power feed lines. All indicator lights should be off.
2. Verify that the analyzer has been mounted and installed correctly.
3. (If APU is used) Verify that all power and signal lines have been connected correctly through the APU power-disconnect relay and signal-disconnect relays.

NOTICE

APU Considerations

When an APU is used, there must not be any wiring entering the Maxum II EC that is powered from any outside source without connecting through the APU signal-disconnect relays. This warning includes the Advance Data Hiway, Ethernet, and any other input or output signal lines that are connected to other equipment which may source power onto the signal lines.

4. Verify that clean (free of particulates and flammable gases and vapors), dry instrument air has been attached correctly to the analyzer air lines. Refer to separate installation documentation for instructions on making required attachments. Air flow should be set to off at this time.
All air, gas supply and sample lines should be blown down and cleared of any particulates or chemicals prior to pressurizing these lines to the Maxum II gas chromatograph.
5. Make a physical inspection of all analyzer safety systems to verify that there is no mechanical damage and that all systems are in good repair. This inspection must include the Methanator (if in use), the Air Treater (if in use), the oven heater systems, and all detector assemblies. Refer to the "Maintenance Considerations" sections provided throughout this manual for specific inspection tasks for different components.
6. Inspect the EC door gasket. Verify it is clean and will seal all the way around the door. Check all ports both gas and electrical to verify they are sealed to the cabinet and any electrical wiring external connections have a proper wire seal.
7. (If APU is equipped) Verify that the maintenance switch for the APU is set for normal operation.
8. (If APU is not equipped) Verify that fast purge valve is set to off.
9. Close the EC door and oven door. Turn on instrument air and verify that cable access points and other openings in the EC are properly sealed or closed off.

Note

The remainder of the startup process is dependent on whether an APU is installed.

If py (not equipped with APU)

10. Set the air pressure to the value stated on the purge tag.

11. Turn on the fast purge switch and allow fast purge air to flow for at least 8 minutes. Flow of fast purge air can be verified because of the louder sound of the air flow. The fast purge relief valve opens slightly and the air can be heard as it leaves the EC.
12. Turn off the fast purge switch. Flow of normal purge air should continue.
13. Turn on electrical power to the system.

If px (equipped with APU)

14. Turn on electrical power to the system. The remainder of the startup process is automatic and is described as follows.
15. APU power comes on. The Purge LED next to the maintenance switch begins to blink.
16. The APU activates the fast purge function. Activation of fast purge can be verified by the louder sound of air flow. Fast purge continues for approximately 8 to 20 minutes. During this time the Purge LED next to the maintenance switch should blink intermittently. Allow at least 30 minutes before interrupting the startup purge to diagnose a delay.
17. Once the APU determines that the analyzer is properly purged, it activates power to the analyzer. At this point the Purge LED next to the maintenance switch should stay on constantly.

Note

If the fast purge process does not complete correctly ending in the Purge LED light remaining on, then turn off power and repair any leaks that may exist.

(For all systems)

18. Once power has been applied to the main analyzer, complete startup of the system (refer to startup procedures available in installation documentation). For systems with APU, the Purge light next to the maintenance switch should remain on. For systems without APU, the purge light on the Maintenance Panel or CIM display should remain off.

Note

(For systems without APU) If there is ever a loss of purge, the Purge alarm LED on the display will light and a software purge alarm is logged.

(For systems with an APU) If there is ever a loss of purge, the APU will turn off power to the analyzer.

4.5 Accessing the Bootloader

Accessing the Bootloader to Set the Network Address

This procedure is needed when a CAC3 is replaced, when the memory backup battery is removed, or when the CAC3 is removed from a CIM or SIB3. In this procedure, the term "SYSCON" can mean either a SYSCON assembly in a Maxum Airless/Airbath model or a CIM in a MAXum Modular Oven model analyzer. To prepare, disconnect the analyzer from the network by unplugging the Ethernet cable.

From the color touchscreen in the door of the analyzer, use this set of steps to set the IP addresses. This allows the GCP software to communicate with the device so that a database may be loaded.

1. Push the reset button through the opening on the SYSCON cage. This provides access to the bootloader.
2. Press the Home key when the message "To enter the bootloader menu, press the Home key now..." appears.
3. Press the 5 key to select the "Configuration" menu.
4. Press the 4 key to select "Choose Device Mode".
5. Press the 2 key to select "Standalone SysCon".
6. The SYSCON reboots into standalone mode.
7. Press the Home key to re-enter the boot loader
8. Press the 5 key to select the "Configuration" menu again.
9. Press the 2 key to select "Primary Ethernet IP Configuration".
10. The question "Do you want to change this configuration?" appears: Press the 9 key to select "Yes".
11. Press the 0 key to disable DHCP.
12. Press the 9 key to change the IP address.
13. Enter the desired IP address. Press the "Home" key to return to the menu.
14. Press the 9 key to change the subnet mask.
15. Enter the correct subnet mask. Press the "Home" key to return to the menu.
16. Press the 9 key to change the Default Gateway address.
17. Enter the Default Gateway address. Press the "Home" key to return to the menu.
18. Press the 0 key to select "No" to the question "Change the DNS?"
19. Press any key to continue.
20. Press the Back key to return to the bootloader menu.
21. Press the 9 key to reset the device.

The external Ethernet cable may now be reconnected to the network, and the analyzer should be visible in the GCP Network list.

4.6 Alarm Codes, Descriptions, and Suggested Actions

4.6.1 Alarms 301 - 324

GCP Alarm Descriptions 301 - 324

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
301	?	External Message: send failure %3	A message was received by the device from itself; or source of message can't be identified; or Gateway is too busy or communication was disrupted between the GC and the message handler.	Reset Gateway or SYSCON.
302	?	External Message: server lost	System Error	Contact Customer Support.
303	+	External Message: Rec'd invalid communication from unit %3	Message was received from Advance DataHiway unit that had previously broadcast with no slots or slot is out of range.	Reset Advance DataHiway unit.
304	+	External Message: Orphan message received from %3	An Advance DataHiway external PANDSP message was received with no matching PANKEY; or an ATTACH was received with no matching RATCH; or an internal timeout was generated for non-existent message.	Ignore or reset SYSCON.
305	?	External Message: Invalid Message Length for %3	Advance DataHiway Results, print, HAE, or Service Panel messages received from GC that have no length.	Check database set up for these messages.
306	+	External Message: Send invalid communication to unit %3	Message from GC is directed to an Advance DataHiway unit that has no slots, an invalid range of slots, or no UID has ever been received.	Check Advance DataHiway unit.
307	?	External Message: Duplicate anlz_id %3 detected ; setting to zero	An Advance DataHiway ZIP message was received from another Advance DataHiway unit, or another GC has broadcast with the same analyzer number. Check other units on network.	Check other units on network.
308	?	External Message: Duplicate UNIT %3 detected; setting loop/unit to zero	An Advance DataHiway SLEEP message has been received. Another Advance DataHiway unit has broadcast with the same loop/unit.	Check other units on Advance DataHiway and correct loop/unit of GC.
309	?	External Message: RUD:Unit does not respond; loop/unit %3	Occurs when Advance DataHiway loop/unit does not respond to a RUD message - originates from I/O, Host, or Printer table in GC.	Remove extraneous references to non-existent units. Check Advance DataHiway connection.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
310	?	External Message: Unit not known for %3	GC is trying to communicate with an unknown unit on the Advance DataHiway.	Wait 10 minutes to see if this condition will correct itself. If it does not, verify that the Gateway is communicating with the GC.
311	?	External Message: Error for Activation of EVT on %3	Bad Advance DataHiway Host Activation Event message was sent by GC to message handler.	Check MaxBasic programs for invalid setting of attributes on the analyzer table.
312	?	External Message: Send error for %3	Send failure for UDP outgoing message sequences.	This is a general failure that indicates a network fault.
313	?	External Message: Invalid TOR sequence on %	An Advance DataHiway SEND message was received from external unit when there are no results to send.	Check result transmit, # of results.
314	?	External Message: Anlz: %3 & Anlz: %4 have loop/unit conflict	Two Advance GCs have duplicate Advance DataHiway addresses (loop,unit).	Check for duplicate loop,unit addresses on the two analyzers and correct the duplication.
315	?	External Message: Anlz id exceeds allowable limit for ADH	FUNCT 88 Advance DataHiway Alarm message received from HCI-H; or GC attempted a broadcast with an analyzer_id greater than 255.	Check analyzer ID.
316	?	External Message: Host: Anlz 1 to 50 config conflict	FUNCT 89 Advance DataHiway Alarm message received from HCI-H.	Check # results and # streams against HCI-H limitations.
317	?	External Message: Host: for anlz 51-254 stream>1 or # of components>9	FUNCT 90 Advance DataHiway Alarm message received from HCI-H.	Check # results and # streams against HCI-H limitations.
318	?	External Message: Host: invalid data received from anlz	Advance DataHiway H card is sending alarm back to GC.	Check trtval in result table.
319	?	External Message: no results marked to transmit for stream %3	No results are marked for transmission. Comes from GC prior to transmission.	Check trtval in result table.
320	?	External Message: %3 Timeout for %4	Advance DataHiway message timeout for ADREQ, REXD, results, HAE, Print, FUNCT.	Reset SYSCON. If the alarm occurs again, contact Customer Support.
321	+	External Message connection opened on: %3	Normal message from reset.	No action necessary.
322	?	No ADH connection detected %3 failed	No message handler. This means that that certain software components are not working.	Contact Customer Support.
323	?	External Message: Invalid LOOP %3 detected ; setting loop/unit to zero	An Advance DataHiway WRLP message has been received.	Check Loop of GC.
324	!	Error processing database command %3	An error has occurred in SQL messaging to a remote or local database table for Modbus or remote I/O.	Check network communication and contact Customer Support.

4.6.2 Alarms 330 through 359 SNE Communication

GCP Alarm Descriptions 330 - 359

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
331	!	Run Method: No SNE found or bad status on module: %3	The connection between the GC and the SNE is invalid.	Check cable between the SNE and SYSCON. Check the LEDs on the SNE to see if it is running.
332	!	Run Method: No module found for detr: %3	The SNE has not reported the detector, pressure controller, or temperature controller.	Check hardware connections to SNE. The GC can contain references to invalid hardware channels. Check the pressure, temperature, and detector channels defined in the application for correct assignments.
333	!	Run Method: No Detr found or bad status for method.channel: %3	Realtime chromatogram attempt on invalid detector, or bad status on detector.	Check hrdwr_id, module for app_detector. The GC can contain references to invalid hardware channels. Check the detector channels defined in the application for correct assignments.
334	!	Run Method: No Channel found for method: %3	No channels are present or can't find detector for channel.	Check app_detector, EZChrom method for proper hardware channel assignments.
335	+	SNE connection opened on %3	System error	Contact Customer Support.
336	!	SNE connection closed on %3 error: %4	SNE connection closed due to timeout or error.	If IP address specified is not a 192.168.144.# network address, check for appropriate grounding of system. Otherwise check SNE for appropriate connections and software versions.
337	!	SNE connection replaced on %3	System error	Contact Customer Support.
338	?	SNE %3 Method %4 Cannot Store Chrom	Results received from SNE for unknown stream.	Check stream table. It is possible to delete streams during the run of a cycle. If that is done, then this alarm may occur.
339	?	SNE %3 Method %4 Application %5 not found	Can't find application or method to match SNE results. This indicates that messages between the SNE and SYSCON are corrupted.	Reset SNE to synchronize messages. It is possible to delete applications during the run of a cycle. If that is attempted, then this alarm may occur.
340	!	SNE %3 Method %4 Load - Invalid Method	SNE has sent a status message that the method is invalid. No other information is available.	Download method from EZChrom again.
341	!	SNE %3 Method %4 Inactive	SNE sent message that method is inactive. No other information is available.	Restart the application.
342	!	SNE %3 Method %4 Load - Max Method exceeded	SNE sent message that maximum methods has been exceeded.	Reduce number of methods, reset SYSCON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
343	!	SNE %3 Method %4 Load - Invalid Mode	Invalid run/hold sent to SNE.	Reset SYSCON or try placing application in run.
344	!	SNE %3 Method %4 status - unknown error %5	Unknown error from SNE method status.	Reset SNE/SYSCON.
345	!	Stream Valve does not exist	Can't find appdo or sys_do for DO set in cycle_events. Digital Output on cycle_event may not be valid.	Check DO on application I/O tables to see if the DO exists for this application and has a normal status.
346	!	SNE %3 Write IO %4 does not exist %5	IO write was sent to SNE, where I/O does not exist.	Reset SNE/SYSCON. Check the sys_hardware table for normal I/O status. If any I/O is not normal, investigate the cause.
347	!	SNE %3 Read IO %4 does not exist	IO read was sent to SNE where the I/O does not exist.	Reset SNE/SYSCON Check the sys_hardware table for normal I/O status. If any I/O is not normal, investigate the cause.
348	?	SNE %3 RT chrom %4 does not exist	Realtime chromatogram request to non-existent SNE.	Reset SNE/SYSCON Check the sys_hardware table for normal I/O status. If any I/O is not normal, investigate the cause.
349	?	SNE %3 Method %4 - Write attempted on active method		Ignore: Alarm was removed from Versions 4.3 and later.
350	!	SNE Module I/O error 0x %3 on %4	An operation attempted on an attached SNE module failed.	Report the error number and the module to Customer Support.
351	!	SNE pSOS error 0x %3 on %4	System Software Failure.	Report the error number and the module to Customer Support.
352	!	SNE pSOS Driver error 0x %3 on %4	Driver Software Failure.	Report the error number and the module to Customer Support.
353	!	SNE AAI Driver error 0x %3 on %4	AAI custom driver failure.	Report the error number and the module to Customer Support.
354	?	SNE TFTP load Error on %3 : %4	TFTP load failure during download of SNE software.	Verify that TFTP server is running Verify correct IP address Verify correct file location Retry TFTP load
355	?	SNE FLASH Driver Error on %3 : %4	Flash Memory Failure.	If persistent, replace SNE.
356	!	SNE %3 Stream/Method %4 / %5 does not exist	Results received from SNE: Can't locate stream/method. Deleting streams and methods or downloading methods while a cycle is running can cause this error.	Check sequence. Place application in hold and then run again.
357	!	SNE Method %3 - Invalid message argument	This indicates that the SNE has an obsolete software version or the messages between the SNE and SYSCON have been corrupted.	Check the SNE and SYSCON software versions with the upgrade tool. Reset the SYSCON and SNE.

#		Text	Description	Action
358	!	SNE Invalid I/O Write from SNE on %4 , command %5	This should only occur if the SNE has an old software version or the messages between the SNE and SYSCON have been corrupted.	Check the SNE and SYSCON software versions with the upgrade tool. Reset the SYSCON and SNE.
359	!	SNE I/O not found on I/O Write from SNE: %4	This should only occur if the SNE has an old software version or the messages between the SNE and SYSCON have been corrupted.	Check the SNE and SYSCON software versions with the upgrade tool. Reset the SYSCON and SNE.

4.6.3 Alarms 360 - 399

GCP Alarm Descriptions 360 - 399

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
360	!	%!3 %4	General SNE Fault.	Contact Customer Support.
361	?	%3 %4	General SNE warning.	Contact Customer Support.
362	+	%3 %4	General SNE note.	Contact Customer Support.
363	!	Invalid function request %3 from SYSCON	This indicates that the SNE has an obsolete software version, or that the messages between the SNE and SYSCON have been corrupted.	Check the SNE and SYSCON software versions with the upgrade tool. Reset the SYSCON and SNE.
364	?	No real-time buffer exists for detector %3 on DPM %4	Detector data is being collected for a detector that wasn't properly enabled.	If received during a load sequence, it is an artifact of the shutdown sequence. Otherwise, record occurrence and DPM information and report to Customer Support.
365	!	Incomplete Analysis on channel %3	EZChrom analysis was not completed on channel.	Modify integration events in method. Send method to Customer Support.
366	!	Data Corruption Error	Major Data corruption on SNE	Reset SNE Report error to Customer Support.
367	!	System Error %3 in File %4 line %5	System Software Failure.	Record sequence of events leading to occurrence and report error, along with the complete contents of the alarm message, to Customer Support.
368	!	Unable to find %3 number %4	Hardware specified in method is not in analyzer.	Verify that the method is correct.
369	!	Unsupported channel type %3	Hardware channel operation requested for an invalid channel type.	Inspect for current version of SNE software. May require a reload or rebuild of corrupted SYSCON database.
370	?	No channel %3 on DPM %4 for realtime display	Realtime display requested for a detector channel that doesn't exist. Indicates database corruption.	Restore an older version of the database.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
371	!	Invalid channel acquisition overlap on %3	Two channels referencing the same hardware detector are scheduled to acquire at the same time.	If multiple application detector channels are assigned to the same hardware detector, do not allow their times to overlap.
372	!	Scheduling error %3 scanning %4 # %5 channel %6	Unable to schedule all event and polling routines. May indicate a memory or hardware failure.	If method schedules many events as well as all 18 detectors, try removing some of the events or deleting some of the detectors, then resetting the SNE.
373	!	Module I/O error %3 on %4 # %5 channel %6	Error between module and channel. Indicates obsolete analyzer.	Consider upgrading analyzer.
374	!	Internal communication error %3	Software modules inside SNE are failing to communicate. Usually happens with out of memory condition resulting from SYSCON timeout.	Reduce processing requirements on SYSCON.
375	!	End of cycle missed; stopping cycle	The message that coordinates the end of a method around the SNE tasks was lost.	Reset SNE. Reduce the complexity of the SNE set-up. Replace SNE.
376	+	Adjusting cycle clock master	Obsolete software version.	Contact Customer Support.
377	!	Error %3 scheduling cycle clock master adjustment	Resource not found for scheduling adjustment of event clock. SNE may be overloaded.	Reduce complexity of tasks for SNE. Reset SNE to prevent event clock overflow.
378	+	%3 samples adjusted on chrom from channel %4	An excessive number of samples required adjustment on chromatogram. Occurs in conjunction with DPM alarms.	Replace affected DPM.
379	!	Error %3 preparing analysis for channel %4	EZChrom processing error.	Check integration events; modify events that may cause problems.
380	!	Error %3 finding chrom peaks for channel %4	EZChrom processing error.	Check integration events and peak table; modify events that may cause problems.
381	!	Error %3 generating results for channel %4	EZChrom processing error. Example error: Setting the threshold value too low, causing many peaks to be detected in the noise of the chromatogram.	Check method for problems that could affect results.
382	!	EZChrom server failed error %3 on channel %4	Resource problem on SNE.	Reduce SNE workload. Replace SNE.
383	?	Software Watchdog Timeout	SNE is running out of processing capacity.	Reduce SNE workload. Replace SNE.
384	!	Method Modification Failed	An attempt to modify a running method failed, most likely due to invalid data.	Verify that modification was valid.
385	?	Event occurred before modification request	Before a modification of a running method was completed, the event occurred.	Contact Customer Support.
386	!	Invalid Cycle Length %3	A cycle length larger than the maximum size was specified in a method. Usually caused by a corrupt method. Maximum cycle length is approximately 2 days.	Verify correct values in method.
387	!	Invalid Sample Rate %3 on channel %4	Invalid sample rate value chosen for channel in method.	Verify the methods and use only a supported detector sample rate.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
388	!	Acquisition time greater than cycle length on channel %3	Start and stop acquisition times for a detector exceeded the method cycle length.	Decrease acquisition time or increase cycle method time.
389	!	Invalid Event Type %3 for event %4	Invalid event downloaded with method.	Check for proper SNE version. Rebuild method.
390	!	Invalid Start Time %3 for event %4	Event time specified that is outside the cycle start and stop times.	Correct the method using EZChrom.
391	?	%3 messages not sent to SYSCON from SNE	Some messages that the SNE attempted to send to SYSCON were lost. Results may be unpredictable.	Reset the device.
392	?	%3 Detector underflows detected on channel %4 of module %5	Detector is reading a raw value of 0. It is potentially clipping the signal at the low value.	Check the method.
393	?	%3 Detector opens detected on channel %4 of module %5	Detector channel is not connected.	Verify the detector hardware to ensure that it is properly connected and that the detector is not damaged.
394	?	%3 Unexpected Calibration points on channel %4 of module %5	Detector channel unexpectedly went into calibration mode.	Replace DPM if persistent.
395	?	%3 Detector overflows on channel %4 of module %5	Detector is reading above its maximum value and the signal is being clipped.	Reduce the amount of sample or, if possible, the detector gain.
396	!	SNE out of memory at %3 line %4	SNE is out of memory.	Reduce SNE workload. Report to Customer Support.
397	!	Invalid Trace from channel %3	System error	Contact Customer Support.
398	!	Invalid Number of Temperature or Pressure Program Segments	The number of temperature program setpoints was different from the number sent.	Rebuild temperature events for method.
399	+	Results not calculated for Channel %3	System error	Contact Customer Support.

4.6.4 Alarms 400 - 562

GCP Alarm Descriptions 400 - 478

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
400	!	Sync Bus Failure %3	Sync Bus Test failed.	Replace SNE.
401	!	No detector present for configured detector %3	On Advance Plus unit, configured detector is invalid.	Check sys_detector_cfg configuration.
402	+	SNE reset requested	SYSCON requested a reset from the SNE. Usually means that the communications between the SNE and SYSCON timed out. This can happen when SYSCON is overloaded.	Reset SNE. Reduce processing demands on SYSCON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
403	!	Configured Detector %3 Balance Failure	Balance Failure from an Advance+ detector.	Check sys_detector_cfg configuration.
404	?	All Methods must be in Hold before Configuring Detectors	All methods must be in hold while changing the configuration of any configured detectors.	Set all application in hold and wait for cycles to complete. Then reconfigure Advance Plus configured detector.
405	!	Method not on tracking list: Count = %3 Track ID = %4	SNE processing error.	Contact Customer Support.
406	!	Error %3 Monitoring Purge Signal	SNE or I2C error.	Reset unit.
407	?	SYSCON-SNE Communications Overload Detected	SNE or I2C messaging error.	Contact Customer Support.
408	?	Spurious detector acquisition	SNE error.	Contact Customer Support.
409	?	SNE low on Memory	SNE error.	Reduce the memory consumption. Some examples of how to do this include: Reduce the number of peaks detected by increasing the threshold. Reduce the length of cycles. Reduce the detector sampling rate.
420	!	Heartbeat timeout	MicroSAM: error	Contact MicroSAM support for assistance.
421	!	Heartbeat lost	MicroSAM: error	Contact MicroSAM support for assistance.
422	!	Cannot connect to RSP	MicroSAM: error	Contact MicroSAM support for assistance.
423	!	Method %3 has more than 8 simultaneous events	MicroSAM: error	Contact MicroSAM support for assistance.
424	!	Method %3 has more than 255 events	MicroSAM: error	Contact MicroSAM support for assistance.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
425	!	EZChrom Method Verification failed, code %3	The method was successfully downloaded from the SYSCON to the EMSNE but failed an integrity verification test. The method is likely corrupted or may contain a feature which is not supported. Code values are listed below: 0: Unknown error, the method is likely corrupt. 1: Invalid Method Binary, the method is likely corrupt. 10: Invalid Cycle Lag time. The Cycle Start value must be ≤ 0 sec. 11: Invalid Cycle Length. The Cycle Stop value must be greater than the Cycle Start. 20: Invalid Event List Binary. The method is likely corrupt. 21: Invalid Event List Binary. The method is likely corrupt. 22: Pulse DO duration too short for a pulse DO event started at the time indicated by alarm Cycle Time. 23: Pulse DO extends beyond the end of cycle, for a pulse DO event started at the time indicated by alarm Cycle Time. 24: Invalid Pulse Polarity for a Pulse DO event started at the time indicated by alarm Cycle Time. 25: Pulse DO overlapping another DO event, on the same channel, started at the time indicated by alarm Cycle Time. 26: Multiple DO events at the same time and on the same channel, at the time indicated by alarm Cycle Time. 40: The start time of a detector channel is invalid. 41: Invalid Run Duration for a detector channel. 50: Invalid Temperature Program segment. The start time of the segment is not within the cycle and was requested to start at the time indicated by alarm Cycle Time. 51: Invalid Pressure Program segment. The start time of the segment is not within the cycle and was requested to start at the time indicated by alarm Cycle Time.	The action to be taken is determined by the code value in the alarm message, as follow: 0: Replace the method. 1: Replace the method. 10: Change the Cycle Start value to be smaller or equal to 0 sec. 11: Change the Cycle Stop value to be greater than the Cycle Start. 20: Replace the method. 21: Replace the method. 22: Extend the pulse DO duration to at least 1 ms. 23: The Cycle Stop value must be increased or the pulse duration must be reduced to fit within the cycle. 24: The pulse polarity must be set to positive or negative. 25: One affected event must be deleted or moved to another time in the cycle, in order to eliminate the overlap. 26: One affected event must be deleted or moved to another time in the cycle. 40: The detector start time must be changed to be within the cycle (between Cycle Start and Cycle Stop). 41: The detector stop time must be changed to be greater than the detector start time. 50: The start time of the temperature segment must be changed to be within the cycle. 51: The start time of the pressure segment must be changed to be within the cycle.
426	!	SIMDIS not supported	The EZChrom method contains the simulated distillation analysis option which is not supported by the EMSNE.	Remove the SIMDIS option from the method or use a separate SNECON if SIMDIS is needed for this application.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
427	+	Detector simulation activated	The detector data reported by the DPM is from a simulation chromatogram read from the EZChrom trace binary and not from actual data acquired by the DPM. This is normal when running a simulation.	If simulation is not desired, the trace (TRC) binary must be removed from the EZChrom method for non-simulated chromatogram data to be collected.
428	!	Invalid configuration for smoothing noise measurement	The method contains a channel with smoothing noise measurement and the time range used for noise measurement is outside of the time range of the chromatogram. The analysis was aborted and the results for this channel could not be calculated.	Correct the method (on the workstation) so that the time range used for noise measurement falls within the time range of the chromatogram.
460	!	Invalid Method Write	System error	Not applicable
461	!	Argument %3 , Invalid Type %4	System error	Not applicable
462	!	Invalid Method Section %3	System error	Not applicable
463	!	Unable to Run Method, Hardware Initializing	System error	Not applicable
464	!	Unable to Run Method, Instrument Busy	System error	Not applicable
465	!	Error Running Method	An I/O error was detected while executing a cycle event associated with a running method. This is probably caused by a missing or invalid I/O module or by re-using the same detector channel in more than one application.	Verify the status of all I/O modules and correct as needed. To identify the I/O module associated with this alarm, read the alarm cycle time information and use while looking up the list of cycle events in the method. The problematic I/O is one of the events with the cycle time matching the cycle time reported with the alarm.
466	!	Error Installing Method	System error	Not applicable
467	!	Error Retrieving Method	System error	Not applicable
468	!	Unable to Run Method, Not on Method List	System error	Not applicable
469	!	Invalid component results	System error	Not applicable
470	!	Invalid Spectrum results	System error	Not applicable
471	!	Invalid calibration file %3 line %4	System error	Not applicable
472	?	Unknown method status %3	System error	Not applicable
473	?	Multiple component sets not allowed	System error	Not applicable
474	?	Multiple component scans not allowed	System error	Not applicable
475	!	Component report invalid	System error	Not applicable
476	!	Arguments do not match script	System error	Not applicable
477	!	Component report with no associated method	System error	Not applicable
478	!	Internal reset commanded	System error	Not applicable

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
511	!	Program Failed event # %3 %4	Error running MaxBasic program.	Check message and program. If this program was written by Siemens, contact Customer Support.
512	?	Program execution cancelled: event # %3	Cancellation requested from HMI or CIM Display.	Informational. No action necessary.
513	!	Program Failed: Run requested on running event # %3	Occurs when overrun_option is set to 2 and event is run while event is still running from a previous request.	Check event timing or change overrun option.
514	!	Program Invalid frequency; disabling event # %3	Invalid program frequency.	Check program_schedule setup.
515	?	Program Overrun for event # %3	Occurs when overrun_option is set to 1 and warns that a program is running when a previous run of the same program has not finished.	Check cycle event timing or frequency of program or ignore.
516	!	Formula Failure: %3	The condition given in the alarm text prevented the formula from returning a result.	Investigate the condition given in the alarm text.
561	+	EZChrom download	Informational message.	No action necessary.
562	+	EZChrom upload for app %1 method %3	Informational message.	No action necessary.

4.6.5 Alarms 671 - 699

GCP Alarm Descriptions 671 - 699

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
671	!	Database: Failure: %3	1. Cannot find method; 2. Cannot find MaxBasic program; 3. Invalid stream for program; 4. Bad status on external result.	Check methods and sequences. Check program table. Check program streamcontext. Verify extresult table entries.
672	!	Database: Remote Service lost on %3	A connection for remote I/O or result transmission has been closed. This alarm is normal when the remote unit becomes unavailable.	Check the status of the remote unit.
673	!	Database:value > limit: %3	Limit exceeded.	See Alarm Text. See the Limits and Alarm Handlers tables under the GCP Application View.
674	!	Database value < limit: %3	Limit exceeded.	See Alarm Text. See the Limits and Alarm Handlers tables under the GCP Application View.
675	!	Database: No Stream at cycle start on applicaton %1	Cannot locate stream to start.	Check sequence to make sure that the entries are enabled.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
676	!	Database: delay limit exceeded on stream %3	Temperature or pressure wait set in the method has been exceeded.	Check temp or press controller. Check wait_delta and maxwait in temperature or pressure controller table.
677	?	Next Stream Error	Cannot locate next stream in sequence after a stream step.	Check sequence to ensure that there is an enabled stream.
678	!	End of Cycle occurred before events completed	System error	Contact Customer Support.
679	!	Application is out of service	Attempt was made to move (approve) results for an out-of-service application.	Put application in service.
680	?	Print job failed: %3 for Printer: %4	Print failure.	Check printer.
681	!	Application is disabled	Attempt was made to set disabled application to run.	Enable application.
682	!	Database: I/O failure: %3	Bad status on AO, DO write.	Check I/O channels.
683	?	Database: no normal sequence for application: %3	No active sequence.	Check sequences.
684	?	Database: no enabled entries in sequence	Cannot find enabled entry in sequence.	Check sequence.
685	?	Printer: TCP connection or queue failed	Printer connection failed.	Check address in printer table.
686	?	Printer: TCP Print failed	Communication failure with TCP printer.	Try printing again.
687	!	Results for cycle %3 lost due to SNE reset	This alarm marks results as uncertain until a cycle has been completed after resetting unit.	Automatic repair: No action necessary.
688	!	Method is corrupt: %3 reload from EZChrom	Method is corrupt.	Download method from EZChrom.
689	!	Database: Fault on Slave Application %3	A fault is being transferred from the slave to the master to invalidate the master's results.	Check fault in slave application.
690	!	Database: Slave Application not Complete %3	Master application is trying to run when slave is not in hold. The slave must complete before the master.	Check cycle length of slave application; should be shorter than master. Also could occur if autocalibration sequence for master is shorter than for the slave.
691	?	Database: Warning: %3	System error	Contact Customer Support.
692	!	Database: Divide by zero in %3	Peak measured value is zero during calibration for an autocalibration, so margin-checking cannot occur.	Check method.
693	?	Database: I/O warning: %3	System error	Contact Customer Support.
694	?	Database:value > limit: %3	Limit exceeded. Message should contain sufficient information.	See the Limits and Alarm Handlers tables under the GCP Application View.
695	?	Database value < limit: %3	Limit exceeded. Message should contain sufficient information.	See the Limits and Alarm Handlers tables under the GCP Application View.
696	?	DB: Screen access denied	System error	Contact Customer Support.
697	!	DB: Run requested on disabled program: %3	System error	Contact Customer Support.

#		Text	Description	Action
698	?	NAU %3 not available for communication	1. No analyzer reference in host table for Maxum Modbus 2. Cannot open connection to remote analyzer for Maxum Modbus or remote I/O. This is a sometimes-temporary error that indicates a problem in the host table or a network problem.	Check the cables at the sending and receiving ends.
699	?	MODBUS: result is not in address map %3	Cannot find address in map for result or analyzerstatus that came from an analyzer.	Check modbus_addmap for an incorrect anlz attribute.

4.6.6 Alarms 700 - 737

GCP Alarm Descriptions 700 - 736

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
700	?	Network: Analyzer %3 not available	Analyzer cannot be opened from NAU to receive message from the DCS.	Check network. Reset SYSCON.
701	?	MODBUS: scale factor or euhi absent for %3	Scale factor or EUHI is absent for scaled results.	Check contents of modbus_addmap.
702	?	MODBUS: host command for %3 invalid; undefined database location	A DCS command has been received for an undefined address.	Check contents of modbus_addmap.
703	?	MODBUS: host command for undefined address: %3	DCS message received that is for an unknown address.	Check contents of modbus_addmap.
704	?	MODBUS: host cannot write to this address: %3	The address written to by the DCS is not defined with a value_type that the host can send messages to.	Check value_type of address in modbus_addmap.
705	?	MODBUS: modbus_msg_buffer cannot be processed: %3	1. Invalid DCS command was sent to an Optichrom or 2. EUHI, calibrate, stream select, skip stream, run/hold, doset set from host that cannot be located in analyzer table.	1. Cannot clear alarms on optichrom or 2. Check analyzer table to see if entry occurs or wait until analyzer broadcasts.
706	?	MODBUS: cannot locate euhi %3	Cannot find EUHI for result.	Check EUHI address in modbus_addmap_result table.
707	?	Calibration rejected: margin exceeded for %3	Peak or group margins exceeded on auto calibration.	Check peak or group margins in EZ-Chrom.
708	?	MODBUS: Data type failure for address: %3	Data_type mismatch with value_type.	Check modbus_addmap. This is usually self-correcting, but changes should be checked.
709	!	DB: AI averaging %3	Averaging is occurring on an AI with no result designated to receive the average.	Check configuration of AI averaging.
710	?	DB: AI averaging %3	Averaging is occurring on an AI with no result designated to receive the average.	Check configuration of AI averaging.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
711	+	Database: %3	System error	Contact Customer Support.
712	!	%6 Start Ver: %3 - %4 on %5	SYSCON has been reset. Informational message.	No action necessary.
713	+	System backed up	System error	Contact Customer Support.
714	+	All alarms cleared	System error	Contact Customer Support.
715	+	Database Build	System error	Contact Customer Support.
716	?	DB: Invalid Sourcekey or SourceAttribute for StatMon table: ID %3	Occurs when StatMon table is not properly configured.	Consult documentation.
717	?	DB: Calibration : margin check/reports are invalid for curve type	Occurs when a margin is set in EZChrom for a curve type that does not support margin checking.	Remove margin or change curve type.
718	?	Validation failed for %3	Validation has failed.	Check report or validation results screen on the HMI or CIM Display.
719	+	Database: SNE reset requested	SNE is indicating that it has been reset from a database request.	May indicate a communication overload.
720	?	Database: Reprocess during Run not allowed	Reprocess button pushed while application in run.	Only push reprocess button when application is in hold.
721	+	Application is in service	Informational message.	No action is necessary.
722	?	Reference Component not found; Component %3 , Reference %4	Quantra alarm.	Contact Customer Support
723	!	Database: Method ID %3 not found	Method ID is in sequence, but not in method table.	Check method table.
724	?	Calibration or Validation failed; application in hold	Calibration or validation was requested while one was already running.	Check timing of calibration or validation events.
725	?	DB: Method %3 halted	Application was halted from the HMI, CIM display, or a MaxBasic program. Informational message.	No action necessary.
726	!	DB: Slave application stream is invalid %3	A stream ID in slave does not line up with master application stream ID (new requirement for version 4.0).	Check master and slave sequences.
727	?	DB: Master app autocalibration completed before Slave app %3	Master autocalibration sequence is finishing before slave autocalibration.	Check length of sequences. Master autocalibration sequence must finish after slave autocalibration.
728	?	DB: application cannot autocalibrate	Autocalibration was requested on application that is not defined for autocalibration.	Check autocal attribute in application table.
729	!	DB: message processing timeout for message %3; attempting recovery	System error	Contact Customer Support.
730	!	DB: Unnamed peak processing exceeded (2000) for channel %3	Processing for unnamed peaks must not exceed 2000 peaks for a channel. Excess peaks were discarded.	Increase the EZChrom threshold value to reduce the number of peaks.
731	!	CAN initialization failure for application %3	Application does not start until CAN cards required by the application are initialized. The application starts regardless of the error after 30 seconds.	Verify that all application I/Os are properly initialized. Remove any I/O that depends on a CAN card that is not present.

#		Text	Description	Action
732	!	IO: underflow or lower fail-safe condition detected for %3	The firmware is reporting an under-range error for analog NAMUR data types 6 or 8.	Check the wiring for the secondary device being used. Verify proper ranges for the I/O.
733	!	IO: overflow or upper fail-safe condition detected for %3	The firmware is reporting an under-range error for analog NAMUR data types 7 or 8.	Check the wiring for the secondary device being used. Verify proper ranges for the I/O.
734	!	%3 Process not communicating	Occurs when ADHMaxumD or I2CDB connection is not present.	Contact Customer Support.
735	?	IO: AO value was clamped for %3 to %4	Indicates clamping of AO value. Informational message.	No action necessary.
736	?	Untrusted Connection Refused from %3	A connection was refused from an external client due to the trusted-connection function.	Trusted Connections are defined on the HMI. Please contact your site's administrator or Siemens Customer Service.
737	?	System Time is Incorrect	System Time is Incorrect	Set Analyzer Time or set TimeServer IP Address as described in "Regional Settings" Help in GCP.

4.6.7 Alarms 801 - 999

GCP Alarm Descriptions 801 - 999

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
801	?	System Error %3 in File %4 line %5	System Error	Contact Customer Support.
802	?	Error %3 opening Flash File %4	System Error	Reset the device. If the error persists, replace the Flash/SRAM module.
803	?	Error %3 closing Flash File	System Error	Reset the device. If the error persists, replace the Flash/SRAM module.
804	?	Error %3 reading Flash File	System Error	Reset the device. If the error persists, replace the Flash/SRAM module.
805	?	Error %3 writing Flash File	System Error	Reset the device. If the error persists, replace the Flash/SRAM module.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
806	?	Memory Corruption Error from Task %3	An attempt to free a block of memory was unsuccessful because the header was overwritten. The block of memory was not returned to the free pool.	1. Save a fresh copy of the database to your Maxum Workstation. 2. Connect to the SYSCON Debug port with hyperterminal or equivalent with 'save to file' turned on. 3. Type the login and password individually when prompted (maxum, maxum) 4. Type each of the diagnostic commands one at a time from the following list: ps, id, fr, st a, ck netstat, ifstatus, uptime. 5. Send the debug file and the .amd file to Customer Support.
807	+	Region 0 Memory Low: %3	The amount of free memory in the SYSCON is low.	Verify the amount of memory installed in the SYSCON. Contact Customer Support.
808	+	Excessive Network Communications	The internal network communication buffers (PNA buffers) are abnormally low. This indicates that the network traffic to the analyzer is abnormally high.	Investigate the cause of the high network traffic.
809	+	System is excessively busy	This is an overload situation, the processor cannot keep up with the requests.	To reduce processor load: • Reduce the size of the Modbus table. • Reduce the number and poll rate of AIs and DIs. • Reduce the number of concurrent applications running. • Reduce the communication burden with Optichrom analyzers.
810	?	Invalid dbdat file	The db.dat file, containing the 'cold' database on a Compact flash system, is missing or invalid. This may happen if the system was reset or powered down during a user initiated save to flash (initiated from the HMI, CIM display, or the workstation).	Perform a manual save to flash as soon as possible in order to have a valid db.dat file.
811	+	Excessive Maxum broadcasts were dropped	Other analyzers on the network are generating network broadcast messages at an abnormal rate (greater than 200/min). The excessive traffic is ignored. As a result, the status of the analyzers in the analyzer table may not be up to date.	Investigate the network traffic. Contact Customer Support for assistance.
812	?	Network communication overload	The internal network communication buffers (PNA buffers) are full; the system may not function normally.	Reset the device. Contact Customer Support.
813	+	SYSCON-SNE Comm Debug: %3	Debugging information, for internal use.	No action necessary.
814	?	Invalid CMOS time, check the battery	The built-in SYSCON clock has an invalid time.	Check SYSCON clock battery and replace if needed.

#		Text	Description	Action
997	+	%3	General alarm used for information. Used most often by MaxBasic programs.	No action necessary.
998	?	%3	General warning alarm used for information. Used most often by MaxBasic programs.	Immediately report runtime errors to Customer Support (please make careful note of the alarm message).
999	!	%3	General fault alarm used for information. Used most often by MaxBasic programs.	Immediately report runtime errors to Customer Support (please make careful note of the alarm message).

4.6.8 Alarms 1002 - 1128

GCP Alarm Descriptions 1002 - 1128 SNE Common Module Errors

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
1002	!	ID Key Not Connected on %4	All PICs: The module location ID connector is disconnected or set to 0. This is an abnormal condition; the module may not be operational.	Verify that the location ID connector is in good condition and connected properly.
1003	!	ID Key Change on %4	All PICs: The module location ID value was changed while the module was operating. This is a transient error that causes the module to automatically reset. The module can then be addressed and operated at the new location ID.	Verify that the location ID connector is in good condition and connected properly. Check for intermittent connection.
1004	!	EEPROM Bad Checksum on %4	All PICs: A checksum error was detected in the module EEPROM. The firmware will still use all the information that it can read from the EEPROM. However, the module may not operate normally.	Cycle power. If the error repeats, replace the module.
1005	?	Temp Diag Error on %4	All PICs: The on-board temperature sensor (LM-75) diagnostic failed. This alarm indicates that the ability of the board to detect a module overheat (alarm #1044) may be compromised. This alarm is may happen occasionally following a board reset. This alarm is in no way related to and should not be confused with the Over-temp Shutdown related to heater temperature controls.	No action is required unless the error happens every time the board is reset. For these repetitive errors replace the module.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1007	!	Firmware Fault on %4	All PICs: A 'run-time' error was detected in the PIC firmware. For example, a timer is turned off at a point where the firmware expects it to be on. The firmware will attempt to recover. Usually an additional specific flag will be set to provide more information about the cause of the fault.	Contact Customer Support.
1008	!	EEPROM Bad Value on %4	All PICs: A value read from EEPROM is out of range or invalid. This may happen if a board's EEPROM was incorrectly initialized during manufacturing.	Cycle power. If the error repeats, replace the module.
1009	!	Local I2C error on %4	All PICs: A fatal error was detected while accessing the internal, on-board I2C bus (not the private bus between a SNE and a DPM). The communication with the on-board EEPROM or the LM75 (on board temperature sensor) is not working normally.	Cycle power. If the error repeats, replace the module.
1010	!	Fatal error on %4	All PICs: An error or an invalid operational condition was detected by the PIC firmware. The board is shut down to a failsafe mode.	Contact Customer Support.
1041	?	AO Out Of Range on %4	All PICs: An AO was set to a value outside of the allowed range. The value was clipped to the allowed range. For example, an EPC has a 0 to 100 psi nominal range for the pressure setpoint. An attempt to set the setpoint to 150 psi results in an "AO out of range" and the setpoint is clipped to remain within the allowed range (100 psi).	Locate the problematic AO and change the AO value to a value within the proper range.
1042	?	Invalid Group Channel on %4	All PICs: The hardware I/O channel(s) requested does not exist on the module.	Check the 'Sys Hardware' table for invalid entries. Check that only detector channels are specified in the detector I/O table. Check that only EPC are defined in the pressure controller table. Check that only temperature controllers are defined in the temperature controller table.
1043	?	Invalid EEPROM Address on %4	All PICs: The on-board EEPROM addresses requested do not exist or cannot be accessed within a single command.	Report to Customer Support for further investigation.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1044	?	Board overheating on %4	All PICs: A module temperature greater than the defined maximum operating temperature (default 65°C) has been detected. Overheating must be corrected as soon as possible to avoid permanent damage to the analyzer electronics, including reduced module life expectancy or other board failures. Note: This alarm can occur together with alarm 1005 (Temp Diag Error) in which case the board may not actually be overheating. This alarm concerns the temperature in the electronics enclosure. This alarm is not related to the Overtemp Shutdown related to heater temperature controls.	If the overheating condition is real, determine and correct the cause of high operating temperature. Possible causes include ambient temperature higher than specification or an inoperative fan in the electronics enclosure (restricted air flow inside the EC).
1045	?	Output Locked on %4	All PICs: The state of the DO or the value of the AO are locked and cannot be changed. The AO or DO command was ignored. Some DO and AO are locked during a board self-test.	When performing a board self-test, suspend all other operations affecting the board.
1047	?	PIC firmware diagnostic 47 on %4	System error	Contact Customer Support.
1048	?	PIC firmware diagnostic 48 on %4	System error	Contact Customer Support.
1049	?	PIC firmware diagnostic 49 on %4	System error	Contact Customer Support.
1050	?	PIC firmware diagnostic 50 on %4	System error	Contact Customer Support.
1051	?	PIC firmware diagnostic 51 on %4	System error	Contact Customer Support.
1052	?	PIC firmware diagnostic 52 on %4	System error	Contact Customer Support.
1053	?	PIC firmware diagnostic 53 on %4	System error	Contact Customer Support.
1054	?	PIC firmware diagnostic 54 on %4	System error	Contact Customer Support.
1055	?	PIC firmware diagnostic 55 on %4	System error	Contact Customer Support.
1056	?	PIC firmware diagnostic 56 on %4	System error	Contact Customer Support.
1081	+	Data Not Ready on %4	All PICs: The data requested is not available.	Contact Customer Support.
1082	+	Reset Detect on %4 %5	All PICs: A reset was detected. Normal indication that the PIC was reset.	No action necessary.
1083	+	Power Up on %4 %5	All PICs: A power-up cycle was detected. Normal indication that the PIC was powered up.	No action necessary.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1084	+	I2C Timeout on %4	All PICs: An I2C communication timeout timer has expired. The timer is reset after each successful character processed. Only an addressed module may generate a timeout. The timeout can occur on incoming and outgoing characters.	Contact Customer Support.
1085	+	I2C Read Past End on %4	All PICs: The I2C communication master did not stop reading after the complete response had been sent.	Contact Customer Support.
1086	+	I2C Buffer Overflow on %4	All PICs: The combination of the transmit and receive I2C message was too large, causing a buffer overflow. (With kernel revision 1: SSP_READ_UNEXPECTED_STOP, a stop condition occurred before the end of the response).	Contact Customer Support.
1087	+	I2C Write Past End on %4	All PICs: In an I2C message, more than the number of bytes specified by the length was written. The extra bytes are ignored.	Contact Customer Support.
1088	+	I2C Resync Error on %4	All PICs: Severe I2C error, causing the current message to be dropped. Communication will re-synchronize after the next START or STOP condition. Usually associated with alarm 1092.	Contact Customer Support.
1089	+	I2C Write Unexpected Stop on %4	All PICs: A new I2C message was received in the middle of a write. The old message was discarded and the new message is served (this message may be out of sequence and therefore cause other flags to be set). [With kernel revision 1: SSP_WRITE_UNEXPECTED_STOP, during a slave write a stop condition occurred before the message was completed. The message is ignored.]	Contact Customer Support.
1090	+	I2C Write Unexpected Start on %4	All PICs: A new I2C message was received in the middle of a read. The old message was discarded and the new message is served (this message may be out of sequence and therefore cause other flags to be set). [With kernel revision 1: SSP_WRITE_UNEXPECTED_START, during a slave write a Start or Repeat Start (RS) condition was detected before the entire message was received (according to the length field). The message is ignored and processing resumes following the Start or Repeat Start.]	Contact Customer Support.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1091	+	I2C Write Before Read on %4	All PICs: An attempt was made to write an I2C message before reading the response from a previous message. This indicates that an attempt was made to do a Slave Write - RepeatStart - Slave Write combination.	Contact Customer Support.
1092	+	I2C Read Unexpected on %4	All PICs: An I2C read from the peripheral was attempted before a slave write loaded a command.	Contact Customer Support.
1093	+	I2C Invalid Checksum on %4	All PICs: An I2C message with an invalid checksum was received. The message was ignored.	Contact Customer Support.
1094	!	Data not available on %4	All PICs: Some data was lost and is no longer available. For a detector channel it means that a 'Detector Read' command was received with an invalid index. This can happen when a request to retransmit detector data came too late when the data was already gone from the buffer. This situation may also happen while accessing the I/O related to the LM75 (BOARD_TEMPERATURE and OVERTEMP_SETPOINT). It indicates that the local I2C bus was not available to perform the desired action.	Cycle power. If the error repeats, replace the module or the SNECON.
1095	+	Invalid Message on %4	All PICs: An I2C message with a valid checksum was not recognized or had an invalid op-code.	Cycle power. If the error repeats, replace the module or the SNECON.
1096	+	Diagnostic mode enabled on %4	Informational message.	No action Necessary.
1121	!	Firmware Math error on %4	All PICs: An unexpected math operation error was detected by the PIC. It can be an un-handled overflow, underflow, etc. This flag is always associated with a FIRMWARE_FAULT flag.	Cycle power. If the error repeats, replace the module.
1122	!	Firmware Mem error on %4	All PICs: A jump or a call was made to an invalid PIC memory location causing the PIC to be reset. This flag is always associated with a FIRMWARE_FAULT flag.	Cycle power. If the error repeats, replace the module.
1123	!	Firmware Table error on %4	All PICs: An error was detected when addressing an internal PIC firmware table. The index in the table is likely to be invalid. This flag is always associated with a FIRMWARE_FAULT flag.	Cycle power. If the error repeats, replace the module.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1124	!	Firmware Watchdog on %4	All PICs: The PIC watch dog timer has expired causing a module reset. This flag is always associated with a FIRMWARE_FAULT flag. It can be an indication that the I2C clock or data line was held low for more than the timeout duration (nominally 30 ms). It can also indicate that the PIC oscillator is not working normally.	Cycle power. If the error repeats, replace the module.
1125	!	Firmware System Monitor on %4	All PICs: The background system monitoring task has discovered a problem causing the PIC to be reset. It can be that the interrupt or timer were disabled when they should have been enabled, or some similar error. This flag is always associated with a FIRMWARE_FAULT flag.	Cycle power. If the error repeats, replace the module.
1126	!	Firmware Application on %4	All PICs: A general PIC firmware error was encountered causing a board reset.	Cycle power. If the error repeats, replace the module.
1127	!	Firmware Stack Overflow on %4	An abnormal condition was detected in the firmware of a specified module.	Reset the device. If the condition persists, replace the affected module.
1128	!	Firmware Unknown Reset on %4	An abnormal condition was detected in the firmware of a specified module.	Reset the device. If the condition persists, replace the affected module.

4.6.9 Alarms 1317 - 1319

GCP Alarm Descriptions 1317 - 1319

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#	!	Text	Description	Action
1317	!	Valve Switch Error on %4	SVCN PIC: The SVCN firmware has detected an invalid condition in the circuit driving the solenoid valves. One or more valves is likely to be malfunctioning.	Replace the module.
1318	!	J10 Disconnected on %4	SVCN PIC: The SVCN J10 connector is not properly connected and the corresponding bank of solenoids may not work.	Check the J10 connection.
1319	!	J11 Disconnected on %4	SVCN PIC: The SVCN J11 connector is not properly connected and the corresponding bank of solenoids may not work.	Check the J11 connection.

4.6.10 Alarms 1617 - 1697 Pecm Errors

GCP Alarm Descriptions 1617 - 1697 PECM Errors

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
1617 - 1624	!	[LWH1; LWH2; LWH3; LWH4; LWH5a; LWH5b; LWH6a; LWH6b] Output Fault on %4	PECM PIC: On-board diagnostic indicating that a LWH is not working correctly. This diagnostic is active only when a SSR output is configured for PECM self-control, when the loop-back connector is present. The diagnostic is not active when the control is from a temperature controller. If this happens when the output is controlled by a temperature controller, it indicates a defective harness between the DPM and the PECM. (The PLUG_DETECT pin (#5) is not grounded and the output is turned on).	If associated with an 'Invalid configuration alarm' (1659), then check the J connector on the PECM associated with the specified LWH. Otherwise, replace the PECM or the cable between the DPM and PECM.
1625, 1626	!	ABH [1 - 2] Output Fault on %4	PECM PIC: On-board diagnostic indicating that an ABH is not working correctly. This diagnostic is active only when a SSR output is configured for PECM self-control, when the loop-back connector is present. The diagnostic is not active when the control is from a temperature controller. If this happens when the output is controlled by a temperature controller, it indicates a defective harness between the DPM and the PECM. (The PLUG_DETECT pin (#5) is not grounded and the output is turned on).	If associated with an 'Invalid configuration alarm' (1659), then check the J connector on the PECM associated with the specified ABH. Otherwise, replace the PECM or the cable between the DPM and PECM.
1627	!	ABH Ctrl Plug Missing on %4	PECM PIC: The air bath heater control cable is missing in J9 and at least one of the air-bath heaters is non-disabled. If the cable is missing, the NO_AIR_ABH_x flag will also be set on the non-disabled air-bath heater channels.	If the air bath heater is not used, then disconnect J91 and J92 on PECM in order to eliminate the alarm. Otherwise check J9.
1628	!	ABH Air Plug Missing on %4	PECM PIC: The air-bath heater air-sensor connector is missing and at least one of the air bath heaters is non-disabled.	Check J10 on PECM.
1629	!	Purge Indicator not available on %4	PECM PIC: Neither the SYSCON nor the HMI level 1 LED panel is connected. It indicates that there is no purge indicator connected, the PECM has nowhere to report the purge information.	Check J1302 and J101 on PECM. Verify the cable connected into J1302.
1630	!	The low wattage relay board is missing	PECM PIC: The low wattage relay board is not connected properly to the PECM electronics.	Confirm that the relay board is connected properly. Replace the relay board and/or the PECM electronics.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1633 - 1638	!	Output error on solenoid valve, [left location, left group; left location, right group; right location, left group; right location, right group; upper location, left group; upper location, right group]	PECM PIC: The solenoid output status read-back value is incorrect for at least one valve in the group. This can happen when a solenoid cable is disconnected, even momentarily. Note that the read-back check can only be accomplished when the state of the output to a solenoid is OFF (no verification can be done on an output when it is ON).	Verify the cable connections. Replace the solenoid group cable. Replace the solenoid group. Replace the PECM board.
1657 - 1658	?	ABH[1 - 2] No Air on %4	PECM PIC: The air bath heater #n is turned off, as the air pressure is too low for a safe operation of the heater. This flag is set only if the corresponding air bath heater is in use. The PECM considers the air bath heater in use if a loopback connector or a cable from a temperature controller is connected.	If the channel is not in use, disconnect the loopback connector or temperature controller cable. Check the air pressure on the corresponding air bath heater. Make sure that it is 10 psi or above. Electrically disconnect the pressure switch: 1. Verify that it operates normally by measuring the contact resistance with a multimeter at 0 and 10 psi. 2. Verify with a multimeter that there is no continuity to ground. Verify the harness with a multimeter. Replace the PECM.
1659	?	Invalid Configuration on %4	PECM PIC: An attempt was made to control a heater output with a DO command while the corresponding loopback is not installed.	Install or verify the corresponding PECM loopback plug.
1665 - 1670	?	Solenoid valve disconnected, [left location, left group; left location, right group; right location, left group; right location, right group; upper location, left group; upper location, right group]	This alarm can be generated as a result of either of the following: 1. The cable to the corresponding valve group was disconnected since the last time the PECM board was reset. As a result, all valves in that group may not work properly. 2. A digital output was invoked to a disconnected valve group. The output cannot be controlled.	Verify that the solenoid valve cable is properly seated in the connector and reset the device. Verify the configuration of the DOs in all applications to ensure that no DO is referencing a valve in a non-connected group.
1697	?	Purge Loss on %4	PECM PIC: Purge failure in the EC enclosure. The pressure differential between the interior and exterior of the EC is not high enough. Depending on the environment classification where the analyzer is installed, this alarm may indicate an unsafe condition that requires immediate action to correct. Check supply-air pressure.	Verify that door is closed. Check for damaged door gaskets. Verify that all cables and tubes entering the EC are sealed properly.

4.6.11 Alarms 1917 - 2005 DPM TCD

GCP Alarm Descriptions 1917 - 1999 DPM Errors

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
1917	!	Balance Hardware Failure TCD L %5 on %4	System error	Contact Customer Support.
1918	!	Balance Hardware Failure TCD U %5 on %4	System error	Contact Customer Support.
1919, 1920	!	A/D Failure TCD [L; U] %5 on %4	TCD DPM Detector PIC: Set when the corresponding Analog to Digital Converter hardware does not work properly. The flag will be set if the A/D internal calibration cycle is not completed within a pre-determined period of time or the A/D does not report any valid data within a pre-defined timeout period. Note: A firmware problem affecting the version 1.000 of the TCD detector PIC may cause an A/D failure flag to show-up occasionally following a PIC reset. This is not a sign of a defective A/D converter.	Cycle power. If the error repeats consistently, replace the module.
1921	!	PIC Timeout on %4	System error	Contact Customer Support.
1922	!	Incompatible Hardware on %4	TCD DPM Detector PIC: The PIC firmware is not compatible with the DPM board.	Replace the module.
1925	?	Glow Plug bad	FID DPM Detector PIC: The glow plug is not working correctly. The diagnostic is performed when the board is reset or when an attempt is made to light the flame. The hardware diagnostic verifies that a minimum current and voltage is present, checking for a short and open glow plug. This may also indicate that a spark igniter that is not connected properly.	Confirm that the glow plug or spark igniter cable is securely inserted in the corresponding connector. Replace the glow plug. Replace the DPM.
1926	!	Invalid PIC index	DPM Detector PIC: The PIC index is not valid, the DPM board is not working normally.	Replace the module.
1927	!	Mezzanine module disconnected	FID DPM Detector PIC: The mezzanine-module ID value is 0 or 15 indicating that no module is present or is malfunctioning.	Verify that the mezzanine module is properly connected. Replace the module on the DPM. Replace the DPM.
1928	!	Mezzanine-module ID changed	FID DPM Detector PIC: The mezzanine-module ID value has changed since the last time the board was reset. Indicates a bad contact or a bad component.	Verify that the mezzanine module is properly connected. Replace the module on the DPM. Replace the DPM.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1929	!	Mezzanine-module ID invalid	FID DPM Detector PIC: The mezzanine-module ID value is not supported by this DPM board. More specifically, the module value is pointing to a non-initialized EEPROM region on the DPM. This may indicate an invalid mezzanine module or an older revision of the DPM that was manufactured before the mezzanine module was defined.	Verify the DPM revision level and replace as needed. Replace the mezzanine module on the DPM.
1930	!	Mezzanine-module ID reserved	FID DPM Detector PIC: The mezzanine-module ID value is set to a value reserved for future expansion.	Verify the DPM revision level and replace as needed. Replace the mezzanine module on the DPM.
1957, 1958	!	Balance Failure TCD [L; U] %5 on %4	TCD DPM Detector PIC: For Rev 1 TCD DPM: A detector balance sequence failed because of a hardware failure, an improper configuration, or sequence of events. Some possible causes include: The detector beads are too unbalanced to be 'balance-able'. The detector signal is not stable enough and proper balance could not be obtained before the maximum number of iterations was reached. The A/D or D/A do not work properly. The detector is not configured for acquisition or turned off. SIMULATE_TCD_x is set to '1' (the detector cannot be balanced in detector simulation mode). The balance is disabled (DISABLE_BALANCE_TCD_x is set to '1'). The sampling period was changed during the balance sequence.	Contact Customer Support.
1959, 1960	?	Balance Out Of Limit TCD [L; U] %5 on %4	TCD DPM Detector PIC: For Rev 1 TCD DPM: A detector balance value is above the normal limits. The balance may still work as this is an early warning.	If associated with a balance failure (alarm 1957), then the source of the balance failure must be corrected. If not associated with a balance failure and the balance limits are normal (greater than 9 Volts or 90%) then schedule maintenance to replace the detector beads. If using Rev 2 TCD DPM or FID DPM, contact Customer Support.
1961, 1962	!	The ADC missed a sample on channel [1 - 2] on %4	A transient error was detected by the Analog-to-Digital Converter of the DPM, channel #n. The missing or invalid data point was replaced by a point with a value of zero.	Reset the DPM. If the error repeats, replace the DPM.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
1965	?	Flame ignition failure	TCD DPM Detector PIC: The FID flame could not be lit within the predefined delay (25 or 60 sec). No other attempt will be made to automatically light the flame until the MANUAL IGNITION DO is activated.	If associated with an alarm 2225 (Glow plug failure), then diagnose and fix this other alarm first. If a BASIC program is used to control the electronic pressure controller (EPC) to adjust the gas mixture for proper ignition, confirm that the poll rate of the 'IGNITE' DI is set to 2 sec. Check that the gas supply pressure is adequate. Verify the proper operation of the EPC.
1966	?	Gain override	TCD DPM Detector PIC: An external signal is applied to the DPM, overriding the DPM gain control. This is a normal situation if a signal is connected to the external gain-select connector.	If no external signal is connected, replace the DPM.
1967	?	Gain select not supported	TCD DPM Detector PIC: An attempt was made to change the gain on a configuration that does not support the dual gain feature. The request was ignored.	Remove access to the GAIN_ALT_SELECT DO.
1968	?	Igniter type changed	TCD DPM Detector PIC: The spark igniter was connected or disconnected during an ignition sequence, causing the ignition sequence to be aborted.	Verify that the igniter is properly connected. Replace the igniter. Replace the DPM.
1997, 1998	!	Buffer Overflow TCD [L; U] %5 on %4	DPM Detector PIC: The PIC detector data buffer filled up before an I2C command was received to retrieve the data. Some data was lost. The SNECON was not fast enough to retrieve the points or the SNECON stopped polling without turning off the corresponding detector channel. This may happen with a combination of a very high speed detector with a large burst of I/O commands.	Stagger the balance events and valve switching events by approximately 10-20 ms to distribute the load on the I2C bus. Disconnect the SNECON debug cable (if connected) and reset. Reload the SNECON OS and APP software.
2005	!	Firmware error	Firmware error	Contact Customer Support.
2006	!	Bias off	FID DPM Detector PIC: The detector is used while the 300 Volts bias is disabled. The data validity is unknown.	Set the 'disable bias' DO to '0'.

4.6.12 Alarms 2217 - 2306 DPM FID

GCP Alarm Descriptions 2217 - 2306 DPM Errors

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
2217	!	Balance Hardware Failure FID L %5 on %4	System error	Contact Customer Support.
2218	!	Balance Hardware Failure FID U %5 on %4	System error	Contact Customer Support.
2219, 2220	!	A/D Failure [FID; TCD] %5 on %4	DPM Detector PIC: Set when the corresponding Analog to Digital Converter hardware does not work properly. The flag will be set if the A/D internal calibration cycle is not completed within a pre-determined period of time or the A/D does not report any valid data within a pre-defined timeout period.	Cycle power. If the error repeats consistently, replace the module.
2221	!	PIC Timeout on %4	System error	Contact Customer Support.
2222	!	Incompatible Hardware on %4	The firmware has detected an invalid condition indicating that the hardware is not compatible with the firmware.	Replace the module.
2225	?	Glow Plug Bad on %4	FID DPM Detector PIC: The glow plug is not working correctly. The diagnostic is performed when the board is reset or when an attempt is made to ignite the flame. The hardware diagnostic verifies that a minimum current and voltage is present, checking for a short and open glow plug. This may also indicate that a spark igniter is not connected properly.	Confirm that the glow plug or spark igniter cable is securely inserted in the connector. Replace the glow plug. Replace the DPM.
2226	!	Invalid PIC index	DPM Detector PIC: The PIC index is not valid; the DPM board is not working normally.	Replace the module.
2227	!	Mezzanine module disconnected	FID DPM Detector PIC: The mezzanine-module ID value is 0 or 15 indicating that no module is present or is malfunctioning.	Verify that the mezzanine module is properly connected. Replace the module on the DPM. Replace the DPM.
2228	!	Mezzanine-module ID changed	FID DPM Detector PIC: The mezzanine-module ID value has changed since the last time the board was reset. Indicates a bad contact or a bad component.	Verify that the mezzanine module is properly connected. Replace the module on the DPM. Replace the DPM.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2229	!	Mezzanine-module ID invalid	FID DPM Detector PIC: The mezzanine-module ID value is not supported by this DPM board. More specifically, the module value is pointing to a non-initialized EEPROM region on the DPM. This may indicate an invalid mezzanine module or an older revision of the DPM that was manufactured before the mezzanine module was defined.	Verify the DPM revision level and replace as needed. Replace the mezzanine module on the DPM.
2230	!	Mezzanine-module ID reserved	FID DPM Detector PIC: The mezzanine-module ID value is set to a value reserved for future expansion.	Verify the DPM revision level and replace as needed. Replace the mezzanine module on the DPM.
2257	!	Balance Failure FID on %4	FID DPM Detector PIC: A detector balance sequence failed because of a hardware failure or because of an improper configuration or sequence of events. Some possible causes are: The detector signal is not stable enough and proper balance could not be obtained before the maximum number of iterations was reached. The A/D or D/A do not work properly. The detector is not configured for acquisition or turned off. SIMULATE_FID is set to 1 (the balance cannot be done in detector simulation mode). The balance is disabled (DISABLE_BALANCE_FID is set to 1). The sampling period was changed during the balance sequence.	Contact Customer Support.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2258	!	Balance Failure TCD %5 on %4	FID DPM Detector PIC: A detector balance sequence failed because of a hardware failure or because of an improper configuration or sequence of events. Some possible causes are: The detector beads are too mismatched to be balance corrected. The detector signal is not stable enough and proper balance could not be obtained before the maximum number of iterations was reached. The A/D or D/A do not work properly. The detector is not configured for acquisition or turned off. SIMULATE_TCD is set to '1' (the balance cannot be done in detector simulation mode). The balance is disabled (DISABLE_BALANCE_TCD is set to '1'). The sampling period was changed during the balance sequence.	Contact Customer Support.
2259	?	Balance Out Of Limit FID on %4	FID DPM Detector PIC: A detector balance value is above the normal limits. The balance may still work as this is an early warning.	If associated with a balance failure (alarm 2257), then the source of the balance failure must be corrected. If not associated with a balance failure and the balance limits are normal (greater than 9 Volts or 90%), schedule maintenance to clean or replace the FID detector.
2260	?	Balance Out Of Limit TCD %5 on %4	TCD DPM Detector PIC: A detector balance value is above the normal limits. The balance may still work as this is an early warning.	If associated with a balance failure (alarm 2258), then the source of the balance failure must be corrected. If not associated with a balance failure and the balance limits are normal (greater than 9 Volts or 90%) then maintenance should be scheduled to replace the detector beads.
2261, 2622	!	The ADC missed a sample on channel [1 - 2] on %4	A transient error was detected by the Analog-to-Digital Converter of the DPM, channel #n. The missing or invalid data point was replaced by a point with a value of zero.	Reset the DPM. If the error repeats, replace the DPM.
2265	?	Flame Ignition Failure on %4	FID DPM Detector PIC: The FID flame could not be ignited within the predefined delay (25 or 60 sec). No other attempt will be made to automatically ignite the flame until the MANUAL IGNITION DO is activated.	If associated with an alarm 2225 (Glow plug failure), then diagnose and fix that alarm first. If a BASIC program is used to control the electronic pressure controller (EPC) to adjust the gas mixture for proper ignition, confirm that the poll rate of the 'IGNITE' DI is set to 2 sec. Verify adequate gas-supply pressure. Verify the proper operation of the EPC.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2266	?	Gain override	FID DPM Detector PIC: An external signal is applied to the DPM, overriding the DPM gain control. This is a normal situation if a signal is connected to the external gain-select connector.	If no external signal is connected, replace the DPM.
2267	?	Gain select not supported	FID DPM Detector PIC: An attempt was made to change the gain on a configuration that does not support the dual gain feature. The request was ignored.	Remove access to the GAIN_ALT_SELECT DO.
2268	?	Igniter type changed	FID DPM Detector PIC: The spark igniter was connected or disconnected during an ignition sequence, causing the ignition sequence to be aborted.	Verify that the igniter is properly connected. Replace the igniter. Replace the DPM.
2297, 2298	!	Buffer Overflow [FID; TCD] on %4	FID DPM Detector PIC: The PIC detector data buffer filled up before an I2C command was received to retrieve the data. Some data was lost. The SNECON was not fast enough to retrieve the points or the SNECON stopped polling without turning off the corresponding detector channel. This may happen with a combination of a very high speed detector with a large burst of I/O commands.	Stagger the balance events and valve switching events by approximately 10-20 ms to distribute the load on the I2C bus. Disconnect the SNECON debug cable (if connected) and reset. Reload SNECON OS and APP software.
2299	!	Detector Disabled on %4	FID DPM Detector PIC: An attempt was made to read detector information from a disabled detector.	Cycle power. If the error repeats replace the module.
2305	!	Flame Out on %4	FID DPM Detector PIC: The flame is out; the data generated on the FID channel is invalid.	Verify adequate flame gas supply. Verify the operation of any associated EPC.
2306	!	FID Bias off on %4	FID DPM Detector PIC: The detector is used while the 300 Volts bias is disabled. The data validity is unknown.	Set the 'disable bias' DO to '0'.

4.6.13 Alarms 2500 - 2577 Access Bus Driver Errors

GCP Alarm Descriptions 2500 - 2577 Access Bus Driver Errors

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
2500	?	I2C Premature Stop on %4	SNECON I2C driver: A stop condition was detected in the middle of a transfer (SNECON hardware revision 2.x).	Contact Customer Support.
2501	?	I2C No Acknowledge (Module Disconnected?) on %4	SNECON I2C driver: No module responding to the I2C address. A module was disconnected or is no longer responding. This can also happen if the PIC-index is erroneously set to 0 as this is a way to bypass the I2C address resolution table and directly address the I2C bus.	Reset the analyzer.
2502	?	I2C NS486 Timeout Overflow on %4	SNECON I2C driver: An I2C communication timeout condition was detected (SNECON hardware revision 2.x).	Contact Customer Support.
2503	?	I2C Address is Odd on %4	SNECON I2C driver: Illegal I2C address.	Reset the analyzer. Reload SNECON OS software.
2505	?	I2C Driver Not Initialized	SNECON I2C driver: An attempt was made to communicate to the I2C driver before it was initialized.	Reset the analyzer. Reload SNECON OS and APP software.
2508	?	I2C Improper Acknowledge on %4	SNECON I2C driver: No module responding to the I2C address. A module was disconnected or is no longer responding (SNECON hardware revision 2.x).	Contact Customer Support.
2509	?	I2C Invalid Message Checksum Received on %4	SNECON I2C driver: A message was received with an invalid checksum.	(SNECON hardware revision 2.x): Verify that the application does not use a hardware address that does not exist.
2510	?	I2C Module Not Found: %4	SNECON I2C driver: No module of this 'module type' and 'location id' is listed in the address table.	Reset the analyzer. Verify that the application does not use a hardware address that does not exist.
2511	?	I2C Invalid Opcode Received from %4	SNECON I2C driver: The message received corresponds to an unrecognized opcode.	Reset the analyzer. Reload SNECON OS and APP software. Replace the SNECON.
2512	?	I2C Error Reading ISR Queue	SNECON I2C driver: An error was detected reading a communication queue (SNECON hardware revision 2.x).	Reset the analyzer.
2513	?	I2C Message Too Big on %4	SNECON I2C driver: The I2C message received is too large and is not valid.	Contact Customer Support.
2515	!	I2C Address Table Full	SNECON I2C driver: No free addresses on the I2C bus. There is a limit of 120 addresses per bus (each PIC occupies one address).	Reset the analyzer.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2516	?	I2C Invalid Bus on %4	SNECON I2C driver: Invalid I2C bus identification number.	Reset the analyzer.
2518	?	I2C Unknown Address Received on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2519	?	I2C Invalid Data Type on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2520	?	I2C Invalid Number of I/O Channels on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2521	?	I2C Bus Conflict; Lost Arbitration on %4	SNECON I2C driver: An I2C communication error was detected (SNECON hardware revision 2.x).	Confirm that only one SNECON is present on the bus; a revision 2 SNECON cannot share the I2C bus.
2522	?	I2C Using a Free Message Buffer on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2523	?	I2C NS486SXF-C0 Patch Timeout on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer. Replace the SNECON.
2525	?	I2C Invalid Driver Control Command on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer Reload the SNECON OS and APP software. Replace the SNECON.
2526	?	I2C Capability Information Too Big on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2527	?	I2C Message Lost in a Controller Reset: %4	SNECON I2C driver: A pending I2C message could not be sent and was lost as a result of a reset of the I2C interface. The cause of the reset is usually a recurring communication error.	Contact Customer Support.
2529	?	I2C Invalid Capability Version; Incompatible Firmware on %4	SNECON I2C driver: An I2C module has provided an invalid device capability information message. The associated 'Sys_Hardware' table may be invalid.	Replace the module Reload newer SNECON OS and APP software.
2530	?	I2C Internal Error; Invalid Daemon Function on %4	System error	Contact Customer Support.
2531	?	I2C Internal Error; Invalid Info on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2532	?	I2C Invalid Device ID Version; Incompatible Firmware on %4	SNECON I2C driver: An I2C module has provided an invalid device ID information message. The module type and location ID information may be invalid.	Replace the module. Reload SNECON OS and APP software.
2534	?	I2C Internal Error; Bus Manager Invalid Command on %4	System error	Contact Customer Support.
2537	?	I2C Address Table not initialized on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer.
2538	?	I2C ISR Lockup	SNECON I2C driver: The SNECON message receive indicator is stuck (SNECON revision 3.0 hardware only).	Reset the analyzer. Replace the SNECON.
2539	?	I2C Invalid Message Status Size on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer. Replace the SNECON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2540	?	I2C Message Too Short on %4	SNECON I2C driver: An I2C message received by the SNECON is too short to be valid.	Contact Customer Support.
2541	+	I2C FPGA Queue Full on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Replace the SNECON.
2542	?	I2C FPGA Write Before End on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Replace the SNECON.
2543	?	I2C FPGA Write After End on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Replace the SNECON.
2544	?	I2C FPGA Message Too Short on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Replace the SNECON.
2545	?	I2C FPGA Invalid Checksum on %4	SNECON I2C driver: SNECON on-board communication error. Known to happen very infrequently with SNECON I2C FPGA rev 23 or lower (SNECON revision 3.0 hardware only).	Ignore the alarm. If occurring frequently, replace the SNECON.
2546	?	I2C FPGA Invalid Size on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2547	!	I2C Heartbeat Timeout Expired; Resetting Controller	SNECON I2C driver: A SNECON PIC was not responding and was reset (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2549	?	I2C Heartbeat Counter Mismatch on %4	SNECON I2C driver: One or more messages were lost on the on-board communication (SNECON rev 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2550	?	I2C Invalid Message Status on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2551	?	I2C Internal Error; Invalid Block Structure ID on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2552	?	I2C Internal Error; Invalid Block Offset on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2553	?	I2C Internal Error; Invalid Block ID on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2554	?	I2C Internal Error; New Block Offset Non-Zero on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2555	?	I2C Internal Error; Block Table full	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2556	?	I2C Not Enough Memory	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2557	?	I2C Internal Error; Block Too Large on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2558	?	I2C Internal Error; Block Not Found on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2559	?	I2C Internal Error; Invalid Block Size on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2560	!	I2C Driver OS and Application version mismatch	SNECON I2C driver: The version number of the SNECON OS is incompatible with the SNECON APP version.	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2562	?	I2C Internal Error; Bad state on %4	SNECON I2C driver: SNECON firmware internal error.	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2563	!	I2C FPGA bad version	SNECON I2C driver: The SNECON I2C FPGA is incompatible or broken.	Reload the SNECON OS with the newest version. Replace the SNECON.
2564	!	I2C Temperature Block Version Invalid	SNECON I2C driver: The temperature controller PID parameter data block supplied by the SYSCON is incompatible.	Reload the SNECON OS and APP software to the corresponding SYSCON version.
2565	?	I2C Opcode not expected in current state on %4	SNECON I2C driver: Unexpected I2C message opcode received by the SNECON from a module. I2C communication error.	Contact Customer Support.
2566	!	I2C Modules were reset following multiple errors	SNECON I2C driver: A fatal error or multiple consecutive retries have forced the I2C controller to reset.	Contact Customer Support.
2567	!	I2C Header Index Mismatch; Message Lost	System error	Contact Customer Support.
2568	?	I2C Internal Error; Invalid Block Index on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software.
2569	?	I2C FPGA Queue Full on %4	SNECON I2C driver: The SNECON I2C FPGA queue is full, the PIC is no longer processing I2C messages.	Reset the analyzer. Reload the SNECON OS software.
2570	?	I2C FPGA Packet Too Big on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
2571	?	I2C FPGA Recovery Failed on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2572	?	I2C FPGA Read in progress not set after header on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2573	?	I2C Not enough memory in ISR on %4	SNECON I2C driver: SNECON firmware internal error (SNECON revision 3.0 hardware only).	Reset the analyzer. Reload the SNECON OS software. Replace the SNECON.
2574	!	I2C PIC Reset Detected on %4	SNECON I2C driver: A problem was detected by a SNECON PIC and it went through a reset. Can also be caused by an I2C communication error.	If occurring frequently, replace the SNECON.
2575	?	I2C General AO error on %4	SNECON I2C driver: A channel specific error was detected while an AO command was processed (Example AO out of range) . A more specific alarm will be reported by the module on the next poll.	Provides the channel information for an alarm reported on the same module.
2576	?	I2C General DO error on %4	SNECON I2C driver: A channel specific error was detected while an DO command was processed (Example DO out of range) . A more specific alarm will be reported by the module on the next poll.	Provides the channel information for an alarm reported on the same module.
2577	?	I2C bus configuration changed	The configuration between internal I2C (5V I2C) and external, SSSI (10V I2C) was changed. The configuration change is ignored until the next reset.	If the configuration was changed intentionally, simply reset the device. Otherwise, verify that the cable in J3 and J13 on SNECON V4 or J1 and J3 on the SIB are properly inserted.

4.6.14 Alarms 2817 - 2904 DPM Temperature

GCP Alarm Descriptions 2817 - 2904 - DPM Temperature

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#	!	Text	Description	Action
2817	!	12V Error on %4	Temperature controller PIC: The 12 volt supply is not working normally.	Disconnect the RTDs and feedthrough connector. If the error does not go away, replace the DPM. If the error goes away, confirm that there is no continuity between any RTD lead and ground.
2818	!	Setpoint Board Missing on %4	Temperature controller PIC: The OTS and temperature limit configuration board (t-rating configurator) is not detected on J10. The temperature controller is non-functional.	Install or replace the TLIM-OTS T-rating configuration board.
2819, 2820	!	RTD Failure [1 - 2] on %4	Temperature controller PIC: An attempt was made use a temperature channel that has an invalid RTD signal. The RTD is shorted or open circuit. The temperature controller cannot function.	Verify the 4-wire temperature sense RTD on channel #1. The RTD resistance must be between 81 and 269 ohms. Confirm that none of the leads have any continuity with ground.
2823, 2824	!	SSR Cable [1 - 2] Missing on %4	System error	Contact Customer Support.
2825	!	A/D Failure on %4	Temperature controller PIC: An Analog to Digital Converter chip does not work properly. The flag will be set if the A/D internal calibration cycle is not completed within a pre-determined period of time or the A/D does not report any valid data within a pre-defined timeout period. Note: A firmware problem affecting the version 1.002 of the Temperature controller PIC may cause an A/D failure flag to show-up occasionally following a PIC reset. This is not a sign of a defective A/D converter.	Cycle power. If the error repeats consistently, replace the module.
2899, 2900	!	Over Temp Shutdown [1 - 2] on %4	Temperature controller PIC: The Over-Temp Shutdown function is active on channel #1. The heater cannot be turned on. The overtemp shutdown condition indicates that the temperature reached the absolute limit..	Check for: A disconnected TLIM-OTS configuration board. A temperature setpoint too high for the allowed T-rating. A defective OTS or T-limit temperature probe. A defective DPM A defective (shorted) SSR.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#	!	Text	Description	Action
2901, 2902	?	Deviation [1 - 2] Exceeded on %4	Temperature controller PIC: The measured temperature deviation (TEMP_DEVIATION) has exceeded the corresponding MAX_DEVIATION value. The PID control was not successful to control the heater with the desired precision on channel #1. A large deviation is normal on power-up and immediately following a change in the temperature setpoint.	Check for: Improper controller type 'temptype' selected in the 'App_tempctl' table. The PID parameters are not optimal. Fast variation in the ambient temperature, airflow or line voltage. Insufficient air flow. For an air bath heater with 1/8 inch spargers, 3 cfm is adequate for up to 100 DegC and then 4 cfm should be used. A temperature setpoint too high for the allowed T-rating. An Air pressure switch that works intermittently. A defective DPM. A defective PECM. A defective Solid State relay.
2903, 2904	?	Ramp has no origin [1 - 2] on %4	Temperature controller PIC: A ramp rate was set without a prior temperature setpoint on channel #1. A ramp must have an initial temperature defined by the previous setpoint value.	Set the power-up default ramp value to 0.

4.6.15 Alarms 3117 - 3204 EPC

GCP Alarm Descriptions 3117 - 3204 EPC

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
3117, 3118	!	Pressure [1 - 2] Out-Of-Control on %4	EPC (Electronic Pressure Controller) PIC: The measured pressure, on channel #n, has exceeded the absolute maximum allowed pressure and the corresponding channel was shutdown. The pressure controller is no longer working.	Confirm that the flow is greater than the minimum specification. Replace the EPC.
3119, 3120	!	A/D [1 - 2] Failure on %4	EPC (Electronic Pressure Controller) PIC: The Analog to Digital Converter chip does not work properly. The flag will be set if the A/D internal calibration cycle is not completed within a pre-determined period of time or the A/D does not report any valid data within a pre-defined time-out period. Note: A firmware problem affecting the version 0.250 of the EPC PIC may cause an A/D failure flag to show-up occasionally following a PIC reset. This is not a sign of a defective A/D converter.	Cycle power. If the error repeats consistently, replace the module.
3157, 3158	?	Low Supply Pressure [1 - 2] on %4	EPC (Electronic Pressure Controller) PIC: Set when the contact on the optional supply pressure sensor on [J5 or J6] is closed indicating that the supply pressure is getting low and that the bottle must be changed soon.	Check air supply. Replace supply bottle.
3159, 3160	!	Deviation [1 - 2] Exceeded on %4	EPC (Electronic Pressure Controller) PIC: The measured pressure deviation has exceeded the corresponding MAX_DEVIATION value. The PID control was not successful in controlling the pressure with the desired precision on channel #n.	MAX_DEVIATION_x that is too small. An improper setting of TIME_LIMIT_DEVIATION_UP_x or TIME_LIMIT_DEVIATION_DN_x. Insufficient supply pressure. Flow too small or too large. Defective EPC.
3161, 3162	?	Setpoint [1 - 2] changed following a change in Max Pressure	EPC (Electronic Pressure Controller) PIC: The SETPOINT_[n] AO value was modified internally as a result of the SETPOINT_MAX_[n] AO value set to a value lower than the SETPOINT_[n] value.	Set the SETPOINT_MAX_[n] value first and then set the setpoint.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
3163, 3164	!	EPC Shutdown on %4, Channel [1 - 2]	The [n] channel of the Electronic Pressure Control (EPC) was temporarily shut down. This happens when the EPC control valve is fully opened for more than 5s and is meant to prevent overheating of the valve. This situation typically happens when the input pressure is too low, as from an empty cylinder.	No action required. The shutdown is temporary and the operation will automatically resume after 15s.
3203, 3204	!	EPC ramp has no origin on %4, Channel [1 - 2]	The starting point of the pressure ramp was set to the current measured pressure as the setpoint value was not previously set. When no prior setpoint is available, this alarm is issued and the current measured pressure is used as a substitute for setpoint #1.	Set a static setpoint first, and then set the ramp rate, followed by a new setpoint. With this sequence, the starting point of the ramp will be setpoint #1 and the ending point will be setpoint #2.

4.6.16 Alarms 3401 - 3454 TFTP

GCP Alarm Descriptions 3401 - 3454 TFTP

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
3401	?	TFTP Protocol Error	Protocol error detected, such as receipt of a non-DATA packet or lack of an expected message acknowledgment. Most likely the gateway settings on the SNE are wrong.	Power up the SNE connected to a serial terminal and change the settings in the startup dialog.
3402	?	TFTP Timeout	The TFTP client didn't receive a response from the server.	Verify that the TFTP server is running on the host computer, and that the host computer is connected to the SNE through the network.
3403	?	TFTP Server out of Sync	The data packets requested by the TFTP client to not match those sent by the TFTP server. Either the TFTP client or TFTP server is not working properly.	Reset the SNE. Restart the TFTP server on the host computer.
3404	?	TFTP Server out of Sockets	TFTP server cannot create a portal from which to communicate. SNE or host computer is low on resources.	Wait for problem to clear. Contact Customer Support.
3405	?	TFTP Max Channels exceeded	Too many TFTP load requests have been commanded.	Only request one TFTP load at a time.
3406	?	TFTP Driver Not Initialized	TFTP driver was not successfully initialized. Usually a problem of resource.	Verify that the SNE has sufficient memory. Upgrade SNE. Reset SNE.
3450	?	TFTP Client Out of Memory	Client ran out of memory loading file.	Verify that the SNE has 16Mb SIMM. Reset SNE.

#		Text	Description	Action
3451	?	TFTP Client Checksum Error	File loaded had invalid checksum.	Verify that loadfile is correct and uncorrupted.
3452	?	TFTP Client Missing End of File	Attempt to load truncated file.	Verify that loadfile is correct and uncorrupted.
3453	?	TFTP Client Invalid OS File	Attempt to load OS with invalid address range.	Verify that loadfile is correct and uncorrupted.
3454	?	TFTP Client Invalid App File	Attempt to load App with invalid address range. Loadfile may be OS file or corrupt.	Verify that loadfile is correct and uncorrupted.

4.6.17 Alarms 3500 - 3528 Advance

GCP Alarm Descriptions 3500 - 3528 Advance

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
3500	?	Reserved	System error	Contact Customer Support.
3501	!	Advance Adapter Initialization Failure	Advance Adapter detected, but responding improperly.	Repair or replace adapter.
3502	?	Invalid Channel for Advance Adapter %4	Reference to invalid channel on Advance Adapter.	Check reference to I/O channels in application tables.
3503	?	Advance Adapter Backplane Timeout on %4	The referenced I/O on backplane board did not respond.	Reseat or replace board corresponding to hardware ID.
3504	?	Advance Adapter Backplane Error on %4	The referenced I/O on backplane responded improperly.	Reseat or replace board corresponding to hardware ID.
3505	?	Resource for %4 not available on Advance Adapter	Memory or operating system object not available for hardware access.	Verify that SNE has sufficient memory. Upgrade SNE. Reset SNE.
3516	!	No Advance Adapter detected	System error	Contact Customer Support.
3517	!	Advance Adapter Driver Out of Memory	Driver initialization failure due to lack of memory.	Verify that SNE has sufficient memory. Upgrade SNE. Reset SNE.
3518	!	Invalid Advance Adapter Driver Command	Application requested invalid command from Adapter Driver. Most likely a mismatch between the SNECON OS and application.	Reload SNECON software.

4.6.18 Alarms 3718 - 3804 SNE I/O

GCP Alarm Descriptions 3718 - 3804 SNE I/O

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
3718	!	FPGA Error Full on %4	SNECON PICs: The FPGA queue to the NS486 was full and a packet could not be sent. A best attempt is made to continue but one or more packets were lost.	Reset the SNECON. Replace the SNECON.
3719	?	FPGA error reset_W on %4	SNECON PICs: A FPGA reset was detected during a packet write from the PIC. The packet and any packet still in the FPGA queues were lost.	Reset the SNECON. Replace the SNECON.
3720	?	FPGA error reset_R on %4	SNECON PICs: A FPGA reset was detected during a packet read by the PIC. The packet and any packet still in the FPGA queues were lost.	Reset the SNECON. Replace the SNECON.
3721	?	FPGA error_W on %4	SNECON PICs: An error was detected while writing the packet header or data to the FPGA. A best attempt is made to continue but one or more packets may be lost.	Reset the SNECON. Replace the SNECON.
3722	?	FPGA error_R on %4	SNECON PICs: An error was detected when reading the packet header or data from the FPGA. A best attempt is made to continue but one or more packets may be lost.	Reset the SNECON. Replace the SNECON.
3725	!	Error SCL on %4	SNECON PICs: An abnormal situation was detected on the I2C 'Serial Clock' line. This is an indication that the WDB is broken, a cable harness is broken or one board connected to the I2C bus is malfunctioning, pulling the I2C data signal to a logical low.	Contact Customer Support.
3726	!	Error SDA on %4	SNECON PICs: An abnormal situation was detected on the I2C 'Serial Data' line. This is an indication that the WDB is broken, a cable harness is broken or one board connected to the I2C bus is malfunctioning, pulling the I2C data signal to a logical low.	Contact Customer Support.
3727	!	I2C will not align on %4	SNECON PICs: I2C communication error.	Contact Customer Support.
3728	?	I2C msg not allowed on %4	SNECON PICs: A packet containing an I2C message was received by the PIC (from the NS486 through the FPGA) at a time when it is not allowed but after a valid configuration message was received. The message was discarded.	Reset the SNECON. Reload the OS for the SNECON. Replace the SNECON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
3757	?	NACK address on %4	SNECON PICs: An I2C message transaction failed after the required number of retries. A cause of this failure was a unacknowledged destination address byte (first byte in the message). This may happen if a module was disconnected from the bus after its address has been reassigned.	Reset the analyzer.
3758	?	NACK Byte on %4	SNECON PICs: An I2C message transaction failed after the required number of retries. A cause of this failure was a unacknowledged byte that is not the first byte in the message (any byte other than the destination address was not acknowledged). This may happen if a module is seriously corrupted or the I2C signal integrity is a problem (noise, etc...).	Contact Customer Support.
3759	?	NACK Message on %4	SNECON PICs: An I2C message transaction failed after the required number of retries. A cause of this failure was a NACK message with a non-zero flag. This may happen if the firmware of the peripheral module is not responding properly. Reset the analyzer.	Replace the module being addressed.
3760	?	Invalid Checksum on %4	SNECON PICs: An I2C message transaction failed after the required number of retries. A cause of this failure was an invalid checksum in the reply message. This may happen if the firmware of the peripheral module is not working properly or the electrical properties of the I2C signals are marginal.	Contact Customer Support.
3761	?	Invalid Opcode on %4	SNECON PICs: An invalid private opcode was received from the NS486. The message was ignored. This may happen if the PIC firmware is out-of-date relative to the SNE software.	Reload the OS and APP software for the SNECON. Replace the SNECON.
3762	?	Invalid Message on %4	SNECON PICs: An I2C message transaction failed after the required number of retries. A cause of this failure was a reply message that had a valid checksum and valid opcode but was invalid in any other way. This may happen if the firmware of the peripheral module is not working properly or the SNECON software is too old.	Reload the OS and APP software for the SNECON. Replace the module being addressed. Replace the SNECON.
3763	!	Arbitration Loss on %4	SNECON PICs: An I2C message transaction failed after the required number of retries and a cause of this failure was that the PIC could not successfully arbitrate its way to the bus. Other bus-master devices are using all the I2C bus bandwidth.	Contact Customer Support.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
3764	?	Timeout SCL on %4	SNECON PICs: An I2C message transaction failed because the I2C clock was stretched beyond the allowed timeout period specified in the configuration. A module may be malfunctioning.	Contact Customer Support.
3765	?	Timeout SDA on %4	SNECON PICs: An I2C message transaction failed because the I2C data line was held beyond the allowed timeout period specified in the configuration. A module may be malfunctioning.	Contact Customer Support.
3766	?	Bus Not Sync on %4	SNECON PICs: The master-mode operation generated a start condition that was not detected by the FPGA.	Reset the SNECON. Replace the SNECON.
3767	?	Timeout Buffer on %4	SNECON PICs: A master-mode message has not been processed within a timeout period. This is a broad alarm with multiple possible causes. The PIC will discard the message and attempt to recover.	Contact Customer Support.
3768	?	Invalid Handle on %4	SNECON PICs: The received header handle was not sequential. One or more I2C messages were lost.	Reset the SNECON. Replace the SNECON.
3769	?	High I2C traffic on %4	The amount of traffic on the I2C bus has exceeded a configurable threshold. A heavy traffic may delay the I/O activity which ultimately can affect the operation (accuracy, repeatability) of the analyzer.	Check the methods to ensure that the I/O activity is distributed in time and not all at the same exact cycle time (Detector balance event, valve events, temperature and pressure setpoint, etc).
3797	+	Invalid Checksum Slave on %4	SNECON PICs: An unsolicited I2C message was received with a bad checksum. The message was discarded and it is expected that the master will retry the message. This is a communication error that can be ignored if not frequent.	Reset the SNECON. Replace the SNECON.
3798	+	Invalid Message Slave on %4	SNECON PICs: An unsolicited I2C message was received with an invalid message size, invalid opcode or invalid data. The message was discarded. There may be a firmware version conflict.	Reload the OS and APP software to all SNECONs.
3799	?	Invalid Status Summary on %4	SNECON PICs: A packet was received by the PIC from the NS486 and the packet had an undefined bit set in the Status_summary field of the packet. The packet was processed normally.	Reload the OS and APP software for the SNECON. Replace the SNECON.
3800	?	Module Not Ready on %4	SNECON PICs: An I2C message transaction failed after the required number of retries and the cause of the failure was a series of consecutive message NACKs, all with a 0 flag. This may happen if the firmware of the peripheral module is not responding properly.	Reload the OS and APP software for the SNECON. Replace the module being addressed. Replace the SNECON.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
3801	?	Invalid Status Data on %4	SNECON PICs: The content of the status buffer, 'Status_data', was invalid and not recognized by the PIC. This may happen if the PIC firmware is out of date relative to the NS486 software.	Reload the OS and APP software for the SNECON. Replace the SNECON.
3802	?	Invalid Status Type on %4	SNECON PICs: The value of the status_type was invalid and not recognized by the PIC. This may happen if the PIC firmware is out of date relative to the NS486 software.	Reload the OS and APP software for the SNECON. Replace the SNECON.
3803	+	Invalid Msg Size on %4	SNECON PICs: A packet was received with an invalid I2C message size or no I2C message at all. The packet was discarded.	Reload the OS and APP software to all SNECONs.
3804	+	Arbitration Loss Slave on %4	SNECON PICs: The PIC lost a slave read arbitration. It indicates that at least one other module responded to the same message request.	If sporadic, no action is necessary. If repeating frequently, reset the analyzer.

4.6.19 Alarms 4001 - 4124 EZChrom

GCP Alarm Descriptions 4001 - 4124 EZChrom

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
4001	?	TFTP cannot load with active method %3	Method currently running when software load was commanded.	Put method on hold and wait for it to complete before loading SNE software.
4003	!	Zero Correction Out of Limits on %4	System error.	Contact Customer Support.
4022	?	I/O channel not found on %4	Hardware resource requested not present.	Reload and or repair SYSCON database.
4024	?	Slope check failure on channel %4	Slope check commanded with invalid parameters.	Check method for slope check events and review data.
4025	?	Detector channel underflow occurred on %4	A/D converter for detector reading lowest possible value. This error may also be a secondary error caused by an overflow on an FID DPM.	Check A/D inputs, potentially replace referenced DPM.
4026	?	Detector channel open occurred on %4	Open connection detected on A/D detector input. This error may also be a secondary error caused by an overflow on an FID DPM.	Verify proper operation of the DPM.
4027	?	Detector channel overflow occurred on %4	A/D converter for detector reading maximum value possible.	Check A/D inputs, potentially replace referenced DPM.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
4028	?	Detector channel unknown error occurred on %4	Undeterminable error occurred on detector channel circuit. This error may also be a secondary error caused by an overflow on an FID DPM.	Reset. If error repeats, replace DPM.
4029, 4030	?	Zero Correction failure on [first/lower/right; second/lower/left] channel of %4	Should occur only with a revision 2 TCD DPM or revision 3 baseboard (PIC firmware revision 2.006 and up). Or, the zero correction value exceeded the maximum allowed value for that particular board. This is a balance failure situation.	Eliminate the cause of the balance failure: On TCD detector, replace the detector bead or filament. On FID detector, clean or replace the FID.
4031	!	Flame out on %4	Flame out detected on an Advance+ FID or FPD Board.	Ignite flame on unit. If flame is burning, board may be defective.
4032	?	Purge Loss on %4	Loss of purge pressure has been detected. Possible causes include low pressure for supply air, open door, and failed gaskets. Depending on the environment classification where the analyzer is installed, this alarm may indicate an unsafe condition that requires immediate action to correct.	Investigate and correct cause of pressure loss.
4033	!	Zero Correction Out of Limits on %4	The value of the zero correction (software balance of the detector) has exceeded the balance limits.	Confirm that the corresponding balance limit values are not too small. See the maintenance instructions for the specific detector type.
4120	?	Pulse DO Within a Pulse DO is Not Allowed on %4	A pulse DO was requested by the SY-SCON while a pulse DO was already in progress. The latest requested pulse DO was ignored.	Wait until the on-going pulse has completed before requesting another pulse DO.
4121	+	Pulse DO Aborted on %4	A pulse DO was aborted as a result of a standard (non-pulsed) DO command. The non-pulsed DO command has precedence.	Informational message. No action necessary.
4122	!	Method Conflict: Concurrent Chromatogram Channel Acquisition on %4	It is not allowed to use the same detector channel for more than one chromatogram acquisition at a time, whether within a method or across methods. The newest request was cancelled.	Verify that the method does not contain 2 concurrent uses of the same detector channel hardware. Verify that the methods running in separate applications are not erroneously reusing the same detector channels.
4123	!	Unsupported detector sampling rate on %4	A request was made to run the specified detector channel at a standard rate but the DPM hardware does not support that rate. The method file is likely corrupt. It may be necessary to rebuild the method.	Contact Customer Support for assistance.
4124	!	Run-time Operational Conflict on %4	An operation was requested at a time when it is not allowed. e.g.: GainSelect VDO: A gain select was initiated before the previous GainSelect sequence was completed.	Revise the method to remove the conflicting events.

4.6.20 Alarms 4217 - 4320 CAN Bridge

GCP Alarm Descriptions 4217 - 4320 CAN Bridge

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
4217	!	CAN:Underflow %4	System error	Contact Customer Support.
4218	!	CAN: Overflow %4	System error	Contact Customer Support.
4220	!	CAN: External AO uncalibrated	The EEPROM does not contain valid factory calibration information for a local AO channel. Default calibration values are used. The module is operational.	Replace the SIB to eliminate the alarm.
4257	?	CAN: Underflow	System error	Contact Customer Support.
4258	?	CAN: Overflow	System error	Contact Customer Support.
4259	?	CAN: Node init failure	Indicates that at least one CAN node failed during the initialization process. No I/O operations are allowed on the node.	Reset the device. If the problem persists, replace the CAN card.
4260	?	CAN: Node failure	Indicates that at least one CAN node failed during normal operation. This flag is generated only if the node worked properly during initialization but failed at a later time. No further I/O operations are allowed on the node. The communication with the card will be stopped and the card will set itself to failsafe output.	Reset the device. If the problem persists, replace the CAN card.
4261	?	CAN: Bus HW init failure	Indicates a failure of the CAN bus detected during the CAN bus initialization. No communication is possible with any node. This can be as a result of either: a) No CAN card is present, but yet at least one card is defined in the database b) The CAN hardware cannot communicate with a CAN device as a result of a hardware error (e.g. broken or shorted cable) and the PIC CAN module is reporting a transmitter error.	Check the Database CAN node list for a stray card. Check data cable and power to CAN Extension Unit (CEU).
4262	?	CAN: Bus HW Failure	Indicates a fatal failure of the CAN bus detected during the normal operation. This flag is generated only if the CAN system worked properly during initialization but failed at a later time. No communication is possible with any node.	Check power to CAN Extension Unit (CEU).
4263	?	CAN: Invalid channel %4	A read or a write was attempted to a channel that does not exist.	Verify the hardware ID of the I/O for valid addresses.
4264	?	CAN: Node changed	Indicates that at least one serial number has changed and that, as a result, the CAN bridge PIC will soon reset. This is normal as a result of a CAN node list configuration change.	No action necessary.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
4265	?	CAN: Receive Init Buffer Overflow	The CAN bus receive buffer that processes messages from uninitialized CAN cards has overflowed. Initialization will likely fail.	Contact Customer Support.
4266	?	CAN: Receive Heartbeat Buffer Overflow	CAN card heartbeat replies have overflowed the heartbeat buffer. The heartbeat buffer is large enough to hold replies from all 20 cards. Overflow would indicate a serious loading problem.	Contact Customer Support.
4267	?	CAN: Receive I/O Buffer Overflow	CAN card I/O replies/updates are not processing fast enough. This indicates that some received CAN messages have been lost because the CAN bridge cannot process them fast enough. Since CAN messages take longer to transmit on the CAN bus than it takes to process them this flag is unlikely to occur. If it ever occurs, the likely cause is very heavy I2C traffic combined with a large number of ADIO boards which add considerable CAN traffic to the bus.	Reset the device. If the problem persists, the I2C traffic to the CAN bridge or the number of ADIO boards in the system must be reduced.
4268	?	CAN: Transmit Buffer Overflow	There are too many pending CAN messages and the transmit buffer is full. This indicates that the SYSCON is performing I/O operations faster than they can be transmitted on the CAN bus. The most likely cause would be heavy DO traffic since the I2C protocol can update many DO bits per transaction but it takes one CAN message for EACH DO bit.	Contact Customer Support.
4269	?	CAN: Channel not responding	Indicates that one or more channels have not properly communicated and recovery efforts have failed. For outputs, this flag is set after several retries writing to a channel without proper confirmation from the CAN card that the message was received and handled. For inputs, this flag is set after enough time passes without getting an update from the channel.	Reset the device. If the problem persists, replace the CAN card.
4270	?	CAN: Hardware FIFO Overflow	The PICs hardware CAN message buffer has overflowed.	Contact Customer Support.
4297	+	CAN: init complete	The initialization of the CAN card has completed. Informational message.	No action necessary.

#		Text	Description	Action
4300	+	CAN: Unrecognized card	This flag is set when an uninitialized card is detected on the bus after the init sequence is complete. The most common cause of this condition is a Node/SN list that does not precisely match the card mix on the bus either due to missing entries or typographical errors.	Verify the node list in the database for an exact match of all serial numbers. Make sure that no unused CAN card is present in the system. If this is associated with a 'CAN: Node x abnormal' error, replace the corresponding card.
4301 - 4320	+	CAN: Node [1 - 20] abnormal	CAN card I/O malfunction that causes initialization failure, loss of heartbeat responses from a CAN card or loss of communication with one or more channels of the node.	Verify the node list in the database for an exact match of all serial numbers. If this is associated with a 'CAN: Node x abnormal' error, replace the corresponding card.

4.6.21 Alarms 4525 - 5220 Advance TC

GCP Alarm Descriptions 4525 - 5220 Advance TC

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
4525	!	AD Failure on %4	Advance Adapter Temperature Controller PIC: The Advance Adapter temperature A/D converter is not generating data points within the prescribed time interval.	Reset the analyzer. Replace the Advance Adapter.
4526	!	Over Temp Shutdown Power Supply Failure on %4	Advance Adapter Temperature Controller PIC: The power supply used for overtemp shutdown is not working properly.	Replace the Advance Adapter.
4557	?	Setpoint Changed following a change of Max Temp %4	Advance Adapter Temperature Controller PIC: The SETPOINT AO value was modified internally as a result of the SETPOINT_MAX AO value set to a value lower than the SETPOINT value.	Set the SETPOINT_MAX value first, then set the setpoint value.
4599	!	Over Temp Shutdown on %4	Advance Adapter Temperature Controller PIC: The Over-Temp Shutdown function is active, the heater cannot be turned on. The overtemp shutdown condition indicates that the temperature reached the absolute limit.	Check for: A temperature setpoint too high for the allowed T-rating. A defective temperature probe. A defective Advance Adapter. A defective (shorted) SSR.

4.6 Alarm Codes, Descriptions, and Suggested Actions

#		Text	Description	Action
4601	?	Temperature Deviation Exceeded on %4	Advance Adapter Temperature Controller PIC: The measured temperature deviation (TEMP_DEVIATION) has exceeded the corresponding MAX_DEVIATION value. The PID control did not successfully control the heater with the desired precision. A large deviation is normal on power-up and immediately following a change in the temperature setpoint. Only small deviations are expected during normal operation.	Check for these causes of temperature instability: Fast variation in the ambient temperature, airflow or line voltage. Insufficient air flow. A temperature setpoint too high for the allowed T-rating. A defective DPM. A defective Solid State relay.
4817	!	AI Underflow Fault on %4	One or more AIs on the module has encountered a voltage or current underflow situation.	Make sure that the signal going to all AIs is within the range of the inputs.
4818	!	AI Overflow Fault on %4	One or more AIs on the module has encountered a voltage or current underflow situation.	Make sure that the signal going to all AIs is within the range of the inputs.
4819	!	External ADC HW is not responding on %4	Timeout or communication error with an Analog to Digital Converter.	Reset the device. If the problem recurs, replace the module.
4820	!	External AO is not calibrated on %4	One or more AO channel has an invalid calibration record in the EEPROM of the module.	Reset the device. If the problem recurs, replace the module.
4821	!	External AI is not calibrated on %4	One or more AI channel has an invalid calibration record in the EEPROM of the module.	Reset the device. If the problem recurs, replace the module.
4857	?	External AI underflow on %4	One or more AIs on the module has encountered a voltage or current underflow situation.	Make sure that the signal going to all AIs is within the range of the inputs.
4858	?	External AI overflow on %4	One or more AIs on the module has encountered a voltage or current overflow situation.	Make sure that the signal going to all AIs is within the range of the inputs.
5117 - 5140	!	Alarm [5117 - 5140] on %4	A fault alarm was generated on an unrecognized I2C module.	Update to the latest software version. Make sure that the latest text files are loaded.
5157 - 5199	?	Warning [5157 - 5199] on %4	A warning alarm was generated on an unrecognized I2C module.	Update to the latest software version. Make sure that the latest text files are loaded.
5200 - 5220	+	Note [5200 - 5220] on %4	A note alarm was generated on an unrecognized I2C	Update to the latest software version. Make sure that the latest text files are loaded.

4.6.22 Alarms 10000 - 11536 MicroSAM

GCP Alarm Descriptions - 10000 - 11536 MicroSAM

The following tables list the alarm number (#), type (+ information, ? warning, ! error) alarm text, description, and actions.

#		Text	Description	Action
10000	!	Temperature control failure on %4	MicroSAM alarm	Contact MicroSAM Support.
10001	!	Temperature sensor (RTD) of %4 defective	MicroSAM alarm	Contact MicroSAM Support.
10002	!	Temperature deviation on %4 exceeds limits	MicroSAM alarm	Contact MicroSAM Support.
10003	!	Temperature controller %4 disabled	MicroSAM alarm	Contact MicroSAM Support.
10004	!	Carrier gas pressure low on %4	MicroSAM alarm	Contact MicroSAM Support.
10256	!	Detector %4 disabled	MicroSAM alarm	Contact MicroSAM Support.
10257	!	Detector %4 shorted	MicroSAM alarm	Contact MicroSAM Support.
10258	!	Detector %4 not connected	MicroSAM alarm	Contact MicroSAM Support.
10259	!	Carrier gas pressure low on %4	MicroSAM alarm	Contact MicroSAM Support.
10512	!	Pressure controller %4 disabled	MicroSAM alarm	Contact MicroSAM Support.
10513	!	A/D converter failure on %4	MicroSAM alarm	Contact MicroSAM Support.
10514	?	Operating pressure low on %4	MicroSAM alarm	Contact MicroSAM Support.
10515	!	Pressure exceeds limits on %4	MicroSAM alarm	Contact MicroSAM Support.
10516	!	Setpoint exceeds limits on %4	MicroSAM alarm	Contact MicroSAM Support.
10517	!	Pressure out of control on %4	MicroSAM alarm	Contact MicroSAM Support.
10518	!	Voltage exceeds limits on %4	MicroSAM alarm	Contact MicroSAM Support.
10519	!	Operating pressure low	MicroSAM alarm	Contact MicroSAM Support.
10768 - 10775	!	Valve [1 – 8] operation failure on %4	MicroSAM alarm	Contact MicroSAM Support.
11536	!	General RSP communication error on %4	MicroSAM alarm	Contact MicroSAM Support.

Appendix A - Contact Information

Register at the Siemens Industry Online Support (SIOS) website:
<https://support.industry.siemens.com>

International	USA
Siemens AG I IA SC PA PM Process Analytics Oestliche Rheinbrueckenstrasse 50 76187 Karlsruhe Germany Web site: www.siemens.com/processanalytics Support Information: https://support.industry.siemens.com Spares Contact your local Siemens sales representative Support Requests www.siemens.com/automation/support-request	Siemens Industry, Inc. 5980 West Sam Houston Parkway North Suite 500 Houston, TX 77041 USA Tel: +1 713 939 7400 Fax: +1 713 939 9050 Email: saasales.industry@siemens.com Web site: www.usa.siemens.com/pa Training Tel: +1 800 448 8224 (USA) Email: saatraining.industry@siemens.com Spares Tel: +1 800 448 8224 (USA) Email: PAspareparts.industry@siemens.com Support Requests www.siemens.com/automation/support-request Tel: +1 800 448 8224 (USA) Email: GCsupport.industry@siemens.com

Singapore	Online Support Request
Siemens Pte. Limited I IA SC Process Analytics 9 Woodlands Terrace Singapore 738434 Web Site: http://www.siemens.com.sg	Web site: www.siemens.com/automation/support-request

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