

Installation Manual Edition 1/2007



MAXUM™ edition II
Sensor Near Electronics Assembly (SNE)

process

GAS CHROMATOGRAPHY

SIEMENS

Sensor Near Electronics Housing (2021753-001)

Sensor Near Electronics Controller (SNECON)

(2017591-006)

[Replacement for 2017500-005]

Detector Personality Modules (DPM)

(2021796-001, 2021797-001/-002, 2021798-001, 2020988-002, 2020960-001/-003,
2021232-001, 2021328-001/-002/-003)

[Replacement for 2017973-001/-002/-003, 2017974-801, 2020963-001]

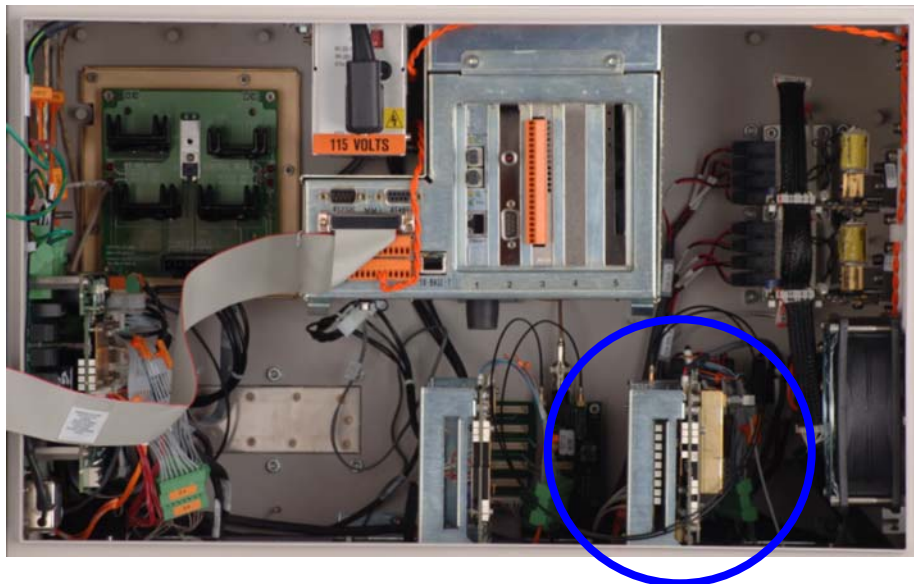


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Getting Help

Contacts for Help

Siemens provides support for the Maxum System worldwide. Contact information is provided on all Siemens products at the web sites noted below.

This page provides contact information for Maxum System technical support, training, spare parts, and field service callout. Worldwide e-mail requests can be submitted 24 hours a day, 7 days a week. Service contracts can be established for direct remote phone service for products or for regular field service visits to the site.

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Before You Call

When contacting Siemens Customer Service for installation technical assistance, the user will need to provide the unit serial number and a detailed description of the problem.

Indicate the installation problem encountered and provide any other information that will aid the customer service representative in correcting the problem.

Safety Practices and Precautions

Safety First

This product has been designed, tested, and supplied in a safe condition in accordance with IEC Publication 61010-1, Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements. This manual contains information and warnings, which have to be followed to ensure safe operation and to maintain the product in a safe condition.

Terms in This Manual

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

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

Terms as Marked on Equipment

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

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

Symbols in This Manual



This symbol indicates where applicable warning, caution, or other information is to be found.

Symbols Marked on Equipment



DANGER - High voltage



Protective ground (earth) terminal



ATTENTION - Refer to Manual

Hazardous or Poisonous Gases

When hazardous gases (such as poisonous, flammable, or oxygen depleting) are potentially present in or around the Maxum edition II Process Gas Chromatograph (hereafter referred to as Maxum II) area, all national and international requirements must be fulfilled to protect personnel and the environment against hazards that could arise. All process conditions (such as normal, backup, and upset) must be considered in the determination for potential hazardous gas presence. To avoid leaks, scheduled preventive maintenance and inspection for leaks should be performed by the customer. Leak sources should also be minimized as is noted in the procedure by external venting of the oven exhaust and analyzer vents. This reduces (does not eliminate) the sources for leaks, so personnel protection is a requirement whenever hazardous/poisonous gases may be present. Disregarding this warning could result in serious injury or death and damage to equipment.

Safety Practices and Precautions, Continued

Danger Arising from Loss of Ground

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

Safe Equipment

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

Use the Proper Fuse

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

Safety Guidelines

DO NOT perform electrical parts replacement or repairs until all power supplies have been disconnected.

Only an adequately trained technician should service or repair the equipment.

When opening covers or removing parts, extreme care should be taken since hot surfaces and "live" parts or connections can be exposed.

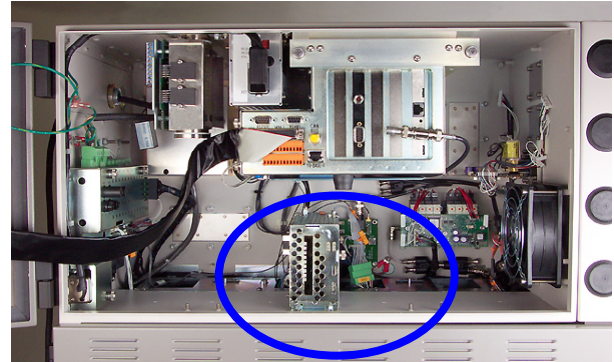
Sensor Near Electronics (SNE) Overview

Introduction

This section describes the Sensor Near Electronics Assembly (SNE) that is available for use in the Maxum Edition II system. This product is intended for use solely in the Maxum Process Gas Chromatograph.

Sensor Near Electronics Assembly (SNE)

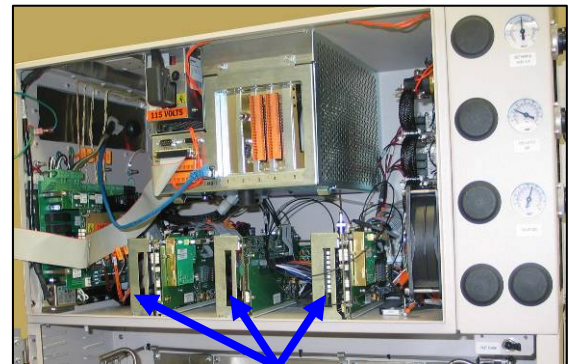
The Sensor Near Electronics (SNE) contains the electronics that interfaces the detector and other oven components into the Maxum II GC. The SNE is a single physical unit including a mechanical cage assembly that provides physical integrity and electronic noise protection. The SNE is composed of one or two other major electronic assemblies plus cables and mechanical brackets. The two electronic assemblies – the SNECON and the DPM – are described next. Also described in the following paragraphs are issues concerning *temperature control* in Maxum.



Sensor Near Electronics Assembly in Electronics Enclosure

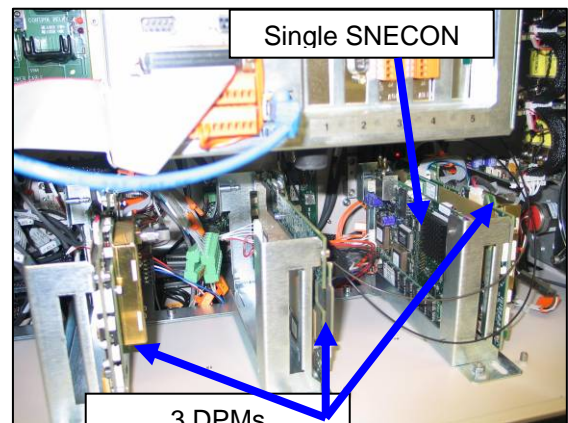
Sensor Near Electronics Controller (SNECON)

This is a single electronic circuit board which contains a microprocessor and memory. The amount of memory supplied with this board has increased since its original introduction. It is currently supplied with 16 Mbytes of DRAM (p/n 1330001-069). Current versions of Maxum software require the larger amount of memory so the 16 Mbyte DRAM module is available as a spare part for purposes of making field upgrades to older SNECONs. However, the change occurred very early in Maxum production life and is not application dependent. The SNECON also has FLASH memory used for storing operating system software. This FLASH has not changed since the original introduction of the part and it is not field changeable. The board itself has changed in Versions – from Version 1 to Version 3 – reflecting changes to embedded software and some hardware characteristics.



3 SNEs (Detectors below)

One SNECON is needed in all Maxum GCs; additional SNECONs can be used optionally. The Maxum GC may have from one to three SNE assemblies – corresponding to the possibility of one to three detector assemblies in the chromatograph oven. It is possible to put a SNECON into each of the three SNEs. This may be required in certain very stringent application situations such as a large number of detectors operating at very fast detector scan rates. However, multiple SNECONs are very rarely used. A single SNECON can easily accommodate a Maxum oven fully loaded with up to eighteen Thermistor Detectors scanning at up to twenty points per second. Or it can accommodate fewer detectors scanning at much higher scan rates. It is also the preferred situation to use



Single SNECON

3 DPMs

Sensor Near Electronics (SNE) Overview, Continued

a single SNECON because it simplifies the user interface and operating requirements and reduces cost, maintenance and spare parts.

The single SNECON is connected by cabling to a DPM located in its own SNE assembly and by cable to the Wiring Distribution Board (to interconnect to other DPMs and devices in the analyzer). The SNECON also provides physical control of oven valves and carrier and other gas pressures. It does this by connecting with cables to the Solenoid Valve Control Module (SVCM), Power Entry Control Module (PECM), and the Electronic Pressure Control (EPC) module. The connection uses an internal signaling system called the I²C Bus.

Detector Personality Module (DPM)

This is an electronic assembly which provides physical interface to the detectors in the chromatograph oven. A different type of DPM is required for each different type of detector because of the physical factors of the detector technology.

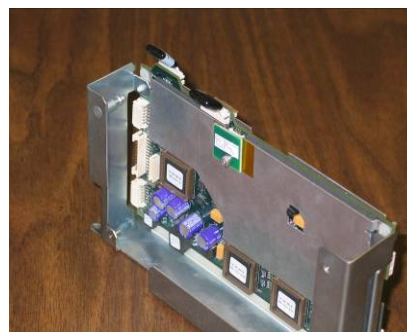
- The DPM for the Thermistor Detector module (TD DPM) and Filament Detector module (FD DPM) are each a single printed circuit board. Note, there is also a version of the TD DPM which does not have temperature control circuits (TEMPCON). This is further described below.
- An additional DPM is available for Filament detectors. This is used when the primary detector being utilized for a particular slot is the Filament detector.
- The DPM for the Flame Ionization Detector module (FID DPM) and Flame Photometric Detector module (FPD DPM) is composed of two different printed circuit boards. One of these is a “base” board which provides digital signal interface to the Maxum and is common to all forms of the FID and FPD. The other is a “mezzanine” board which provides the specific analog amplifiers needed for different voltage ranges and gains on the FID and FPD.

The FID DPM and FPD DPM each also provided circuitry to interface a small 2-cell Filament Detector which is often used as a maintenance detector in the Maxum oven. This extra detector is called the “Intercolumn Detector” or “ITC.”

Temperature Control Issues

The DPMs just described usually also provide temperature control circuitry to control oven or valve heaters. In this case, small cables connect the DPM to the temperature sense elements in the GC oven and to the power-switching relays that control the related heater elements.

Sometimes the temperature control circuitry is not required – particularly when a Thermistor Detector module is used. For these cases there is a version of the TD DPM which provides detector amplifiers only and no temperature controllers. This special version is used in some configurations of Maxum to reduce cost.



Thermistor DPM in housing



Flame Ionization DPM and Mezzanine



Flame Ionization DPM with Mezzanine installed

Sensor Near Electronics (SNE) Overview, Continued

In Maxum, there can also be two other places that temperature control circuitry is available.

- There are two channels of temperature control circuitry on the Power Entry and Control Module, Version 2 (PECM-2).
- There is a special version of the Detector Personality Module (TEMPCON) that contains no detector amplifiers and provides only 2 channels of Temperature Control.

Therefore, temperature control in Maxum can be implemented in various ways and this creates certain special cases. Considerations about each of these cases can be described as follows:

Situation	Possible Configurations	Comments
Maxum with 2 or fewer temperature control requirements and uses a Thermistor Detector.	<ul style="list-style-type: none"> • Original PECM; • TD DPM with Temperature Control • New PECM-2 with Temperature Controllers; • New TD DPM without Temperature Control 	<p>Original Maxum Configuration</p> <p>Newer components. Lower cost.</p>
Maxum with 2 or fewer temperature control requirements and uses a Flame Ionization or Flame Photometric Detector.	<ul style="list-style-type: none"> • Original PECM; • FID DPM (or FPD DPM) including Temperature Control • New PECM-2 with Temperature Controllers; • FID DPM (or FPD DPM) including Temperature Control 	<p>Original Maxum Configuration</p> <p>Newer components. System now has 2 extra and unused temperature control circuits. But there is no extra cost or spare parts requirement.</p>

Sensor Near Electronics (SNE) Overview, Continued

<p>Maxum with 3 or 4 temperature control requirements but only one Detector of any type.</p>	<ul style="list-style-type: none"> • Original PECM; • TD, FID or FPD version of DPM with Temperature Control; • Extra “Temperature-Control-Only DPM” • New PECM-2 with Temperature Controllers; • TD, FID or FPD version of DPM with Temperature Control; 	<p>Original Maxum Configuration</p> <p>Newer components. Eliminates need for “Temperature-Control-Only DPM”. Reduces system cost and spare parts requirement.</p>
<p>All other variations and combinations of temperature control requirements and detector combinations.</p>	<ul style="list-style-type: none"> • Original PECM = no temperature control circuits available • New PECM-2 = two temperature control circuits available • Thermistor Detector Personality Module (TD DPM) available with 2 temperature control circuits or with none. • The TD-DPM with no temperature control circuits costs less. • Flame Ionization and Flame Photometric Detector Personality Modules (FID DPM and FPD DPM) always have two temperature control circuits. • “Temperature Control-Only DPM” provides two control circuits but does not interface to any detector module. 	<p>PECM without Temperature Control is the original version. The PECM-2 with temperature control is the newer version but costs the same.</p> <p>If a PECM-2 is in use, then it may be possible to reduce cost by using the TD-DPM without temperature controls.</p> <p>These DPMs always work in any combination with original or newer components.</p> <p>If a PECM-2 is in use, then it may be possible to eliminate use of this board entirely which reduces spare parts and costs.</p>

Sensor Near Electronics Specifications

Sensor Near Electronics Controller (SNECON)

Communications	1 channel of 10 Mbit Ethernet, configurable between 10BaseT and 10Base 2 2 channels of 400 Kbits/second I ² C, running a proprietary protocol for communication in the Maxum II. 1 RS232 debug/monitor port 1 PC104 interface
Processor	486 processor operating at 25Mhz
Memory	16Mbytes of RAM
Power	24 VDC

Optional Detector Personality (DPM - one per SNE)

Temperature Controller	2 channels of heater control, with independent temperature limit and over temperature shut down
Thermistor Detector Personality Module	This module contains the interface for a thermistor based thermal conductivity detector with two banks of thermistors (each bank contains reference plus three detector channels) 2 channels of heater control, with independent temperature limit and over temperature shut down
Filament Detector Personality Module	This module contains the interface for a filament based thermal conductivity detector with one bank of filaments configurable as a reference plus three detector channels or two reference/detector pairs 2 channels of heater control, with independent temperature limit and over temperature shut down
Base Detector Personality Module (FID, FPD, or Analog Detector Input)	This module contains the interface for a flame detector (or input for specialty detector) with a single filament reference/detector channel 2 channels of heater control, with independent temperature limit and over temperature shut down A Mezzanine board is required from the options below to complete this assembly and select the input range(s)

Optional Detector Mezzanine Boards (one per DPM)

Flame Ionization Mezzanines	300V bias source Spark ignite channel for flame ignition Selection of one of the ranges noted below: <ul style="list-style-type: none"> ▪ 200 pA single range ▪ 1 / 20 nA dual range ▪ 100 / 1000 nA dual range
Flame Photometric Mezzanines	FPD detector power and power enable Glow plug channel for flame ignition Selection of one of the ranges noted below: <ul style="list-style-type: none"> ▪ 100 nA single range ▪ 100 nA single range, 0.18 Hz bandwidth
Analog Input Mezzanine	300V bias source Configurable igniter control for spark ignite or glow plug ignite Optional "flame out" thermocouple input Utilized to support Valco Pulsed Discharge Detector (PDD)

Replacements for Obsolete Parts

Introduction

In some cases, the part being replaced is obsolete and the replacement part has a different part number(s). This section is provided to detail the recommended spare part replacement for obsolete parts though the user should check the description of the parts to ensure that the parts will perform the replacement desired.

Global Part Numbers

The part numbers listing in the manual have been abbreviated to a shortened form of the global Siemens part number. The global number will have a prefix of "GWK-AI" so a number listed below as 2017501-006 would have a global Siemens part number of GWK-AI2017501-006.

Selecting a Replacement Part

The table below lists the obsolete parts by part number and the recommended spare part or parts that will perform the functional replacement of the spare part. In some cases, there will be parts not used for the particular replacement as the kits are designed for working with a number of configurations.

Part Number	Description	Replacement Part Number
2017500-005	Sensor Near Electronics, Version 3, in cage assembly	2017501-006 plus 2021753-001
2017974-801	TCD Personality Module	2021232-001
2017973-001	FID Personality Module, 10 n-amp full scale	2022008-701 plus 2020960-003
2017973-002	FID Personality Module, 2 n-amp full scale	2022008-701 plus 2020960-003
2017973-003	FID Personality Module, 0.2 n-amp full scale	2022008-701 plus 2020960-001
2020963-001	Base Detector Personality Module Base Assembly	2022008-701
2020960-005	FID Mezzanine, single range, standard - low sensitivity, 20-n-amp range	2020960-003
2020960-004	FPD Mezzanine, Standard - high sensitivity, 1 n-amp range	2020960-003

Configuration Options

Introduction

From one to three Sensor Near Electronics assemblies (SNE) may be located in each Maxum II. The SNE assembly is composed of up to three parts: (part A) a metal housing, (part B) a SNE controller board, and (part C) another module which is typically a detector personality module. Parts A and C will always be in the SNE assembly and at least one of the SNE assemblies will have Part B. Some of these are optional, and there are many choices for DPMs. The spare part kits have extra items in them to permit current parts to be used for existing configurations as well. The Installation section details the parts in each item and how these are to be installed. Refer to your Custom Application Drawing Package to see what is installed in the Maxum II.

This section is to provide a description of how these may be configured to make a SNE assembly. When repairing a module, all of the component parts may not be required, though replacement of an entire module may be the quickest way to make a repair and get the entire unit back into operation. The configuration options are discussed below for each of the parts A, B, and C.

Initially, the temperature controllers were only found in the SNE assembly, though current configurations have two controllers on the PECM, so this has created new configuration possibilities which are discussed here.

Part A - Housing

The housing for the SNE assembly can be either the original enclosed metal cage, or the open cage that is the current version of the housing. A restriction for the original enclosure is that some of the FID detector personality modules will not fit into the cage; in the cases where these are used, the user will need to upgrade to the current version of the housing. The housing has space for two items: (part B) a SNE controller board, and (part C) a detector personality module.

2021753-001 SNE Housing kit.

Part B – SNE Controller (SNECON)

At least one SNE assembly will have a SNECON as a part of this assembly in each Maxum II. If there are multiple SNE assemblies in a Maxum II, then usually only one of the SNE assemblies will have a SNECON. There is only a single board that is currently used for this as noted below. For older versions, there is a memory upgrade listed below that can be used to provide additional memory on the board.

2017501-006 SNECON board

1330001-069 DRAM Module for memory upgrade on earlier versions of the SNECON

Part C – Detector Personality Module (DPM)

The third part of the SNE assembly is typically a DPM, though a temperature control only module can be installed. This is the electronic interface to the detector, so it must be selected based on the detector being used: thermistor detector, filament detector, flame ionization detector, or flame photometric detector. Only one of the following DPMs can be selected for each SNE assembly:

The Thermistor Personality Module has two versions, one with temperature controllers and one without. If a unit is being used without the PECM temperature controllers, then probably the DPM with temperature controllers was used. The DPM with temperature controllers can be used to replace any TCD DPM.

2021797-001 TCD with temperature controllers

2021797-002 TCD without temperature controllers

Configuration Options, Continued

The Filament Detector Personality module has no options or selections, so this is the selection if interfacing to a filament detector.

2021798-001 Filament Detector Personality Module

The Flame Ionization Detector and Flame Photometric Detector utilize a base module with a plug-on module for the particular analysis needed called a “mezzanine” board. One of the mezzanine boards is designed to permit other types of detectors to be interfaced into the system (referred to as the Analog Input Mezzanine). To have a working detector module, both the personality module and a mezzanine board are required. The base personality module is listed below.

2022008-701 Base Personality Module (must have a mezzanine board to install). This part is a kit which contains several parts for retrofit and the new housing as follows:

- (1) 2021796-001 Base DPM with shield/connector board
- (2) 2017596-001 SNE Heater Cable
- (1) 2021753-001 SNE Housing (open frame)
- (2) 1312420-332 SST Socket Head Cap Screw M3X, 6
- (1) 1901381-001 6 Inch Shielded 30 Conductor Laminated Flexible Cable
- (1) 2020910-001 OEFT Adapter PCBA
- (1) 2020902-001 OEFT Flexible Cable PCBA
- (1) 2021278-001 DPM2/OEFT1 High Voltage Cable
- (1) 2021277-001 DPM2/OEFT2 High Voltage Cable
- (1) 2021276-001 DPM Glow Plug Ignition Cable
- (1) 2017911-001 FID DPM to OEFT Signal Cable
- (1) 2021275-001 CABLE, ELECTROMETER, SIGNAL, SMA, DPM2/OEFT2

Detector mezzanine boards are selected for the detector and specific analysis requirements. A set of the six mezzanine boards and one base personality module would permit any flame (or specialty) detector DPM to be replaced. If not all of the types of mezzanines are used for a location, then the set would be reduced to only those in use at that location.

- 2020960-001 FID Mezzanine, single range, high sensitivity, 0.2 n-amp
- 2020960-003 FID Mezzanine, dual standard range (high/low), 1 n-amp / 20 n-amp
- 2021328-002 FID Mezzanine, dual high range (low/very low), 100 n-amp / 1000 n-amp
- 2021328-001 FPD Mezzanine, single range, standard sensitivity, 100 n-amp
- 2021328-003 FPD Mezzanine, single range, standard sensitivity, 100 n-amp, 0.18 Hz bandwidth
- 2021326-001 Analog Input Mezzanine for specialty detectors

A fourth type of item that may be placed in the DPM slot is the Temperature Controller Personality Module. This does not interface to any detector; it only provides for two temperature controllers. Where additional temperature controllers are needed in a system, this may be utilized:

2020988-002 Temperature Controller Personality Module

Determining What Parts are Installed

Introduction

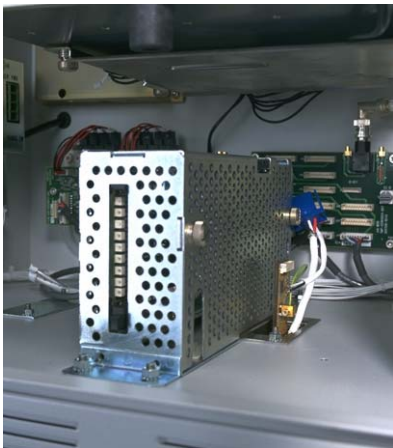
This section describes the various versions of parts which may be installed in the unit. In some cases the part being replaced has a new version of the part. In these cases, it is necessary for the user to be aware that an upgrade is occurring, and during the installation process the procedure may refer the user to special instructions for installation of the new part, which may include installing extra parts from the kit to make the conversion from the existing equipment to the new parts.

The Custom Drawing Package delivered with the equipment shows what parts were installed by the factory. If no replacements have been made from installation, then the Custom Drawing Package will provide the user with the part numbers of the items in the unit. If changes have been made, this may still provide information on the type of parts that are currently installed.

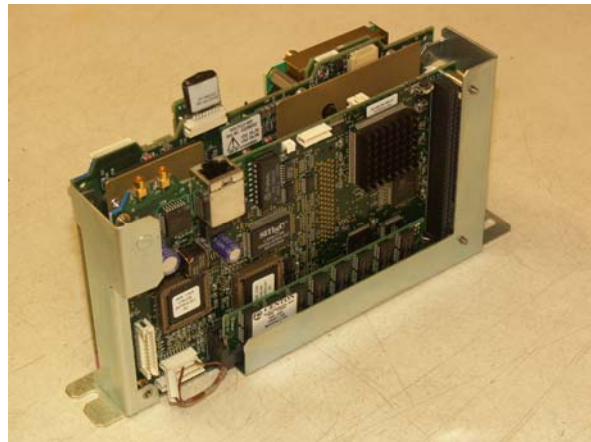
Identification of Parts

The photos included here are a quick way to identify which part the user has installed or is to install. Be sure to verify that the part numbers match. This is the best way to ensure that a misidentification is not made, since some of the parts are very similar in appearance.

The SNE housing comes in two versions: an enclosed housing with perforated holes in the metal housing or an open frame housing with a place to mount the two boards. The left side (looking at this from the front while installed in the enclosure) is the slot for the SNECON board and the right side is the slot for the Detector Personality Module board or Temperature Controller Board.



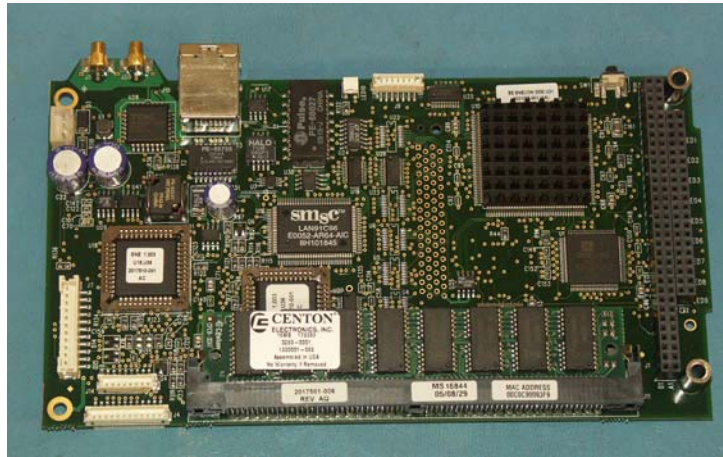
SNE enclosed housing



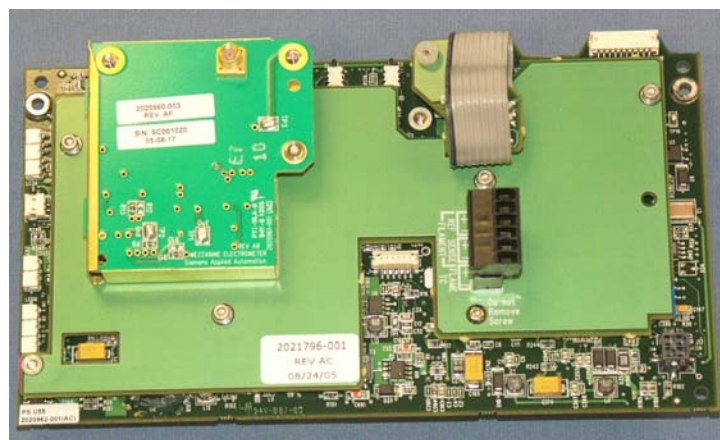
SNE open housing

Determining What Parts are Installed, Continued

The SNECON board (2017501-006) has not changed with the exception that the attached memory board was increased in size to 16 Mbytes of memory. This is on the DRAM memory board (1330001-069) that is on the SNECON. If this board is not the one used, then it should be upgraded to this board. If multiple SNE housings are in the electronics enclosure, then usually only one of these will have the SNECON board mounted in the SNE housing. A key part of the SNECON board is the version of the software installed. This should be version 3.2 or later.



The Detector Personality Module board or Temperature Controller board slot on the right side is the one with the most options. Therefore, the user should ensure that the correct identification is made and correct replacement is being used. Five different boards may be installed, and one of these boards has six different mezzanine boards that may be installed on it. There are also three versions of the detector feed-through, each of which uses different interconnects to attach to the Detector Personality Module.



FID DPM board with mezzanine board attached

Installation

Introduction

This section is intended for installation personnel. The Maxum II has special instructions in the custom documentation. These must be followed to ensure safe operation of the Maxum II. This section contains information for removal and installation of the SNE assembly, SNECON controller, DPMs, and Mezzanine boards. Refer to the specific section for each of these devices.



WARNING Voltage dangerous to life exists. Before performing the removal and installation procedures, it is important that primary AC power to the Maxum II be turned off from the main circuit breaker. Observe all plant safety requirements before performing any repair or maintenance on the Maxum II.



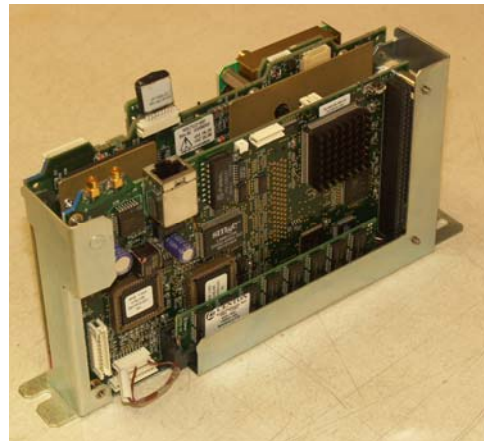
WARNING Specific additional instructions are provided with tags placed on the Maxum II and in the custom application drawing package noted below. Installation should include all of the items noted in both of these as well as the manuals. The tagging and the custom application drawing package are unique to the particular Maxum II.

Custom Application Drawing Package

Included with your analyzer is a custom application drawing package that provides drawings and information pertinent only to your analyzer. Because the drawing package has specific information concerning the specific Maxum II, you should have this package readily available during installation.

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
- Electronic Controller – Internal Layout
- Applicable Wiring Diagrams
- Oven Plumbing Diagram – Sensor Near Electronics
- Recommended Spare Parts - Analyzer
- Manufacturing Test Charts
- Stream Composition Data
- Data Base Information Files



SNE Assembly

This section presents the procedures for removal or installation of the Sensor Near Electronics (SNE) assembly. The assembly is located on lower part of electronic enclosure directly below SYSCON.

Installation, Continued

Sensor Near Electronics Assembly (SNE)

Up to a total of three SNE assemblies can be installed within a single electronic enclosure. The removal and installation procedures, presented in this section, are applicable to each installed SNE assembly. Some of the SNE assemblies will not have all of the individual parts installed, such as the SNECON board which is usually only mounted in one of the SNE assemblies in each unit.

All interface wiring connections on the SNE assembly, are on the back-top, left, and right sides of SNE. The cabling is normally easily accessible. If the system is an earlier version with the oven electronics feed-through, cabling on right side is obstructed by the close proximity of the feed-through assembly connector extension. This requires the top and left side connectors be disconnected first. To access right side connections, it is necessary that SNE assembly be released and rotated from its mounting assembly.

The cabling attached to the right side is fragile and must not be bent or pinched during removal and installation.

The following details the procedure for removal and installation of the SNE assembly.

- Follow procedure for shutdown of analyzer to remove power.
- Open electronics door.



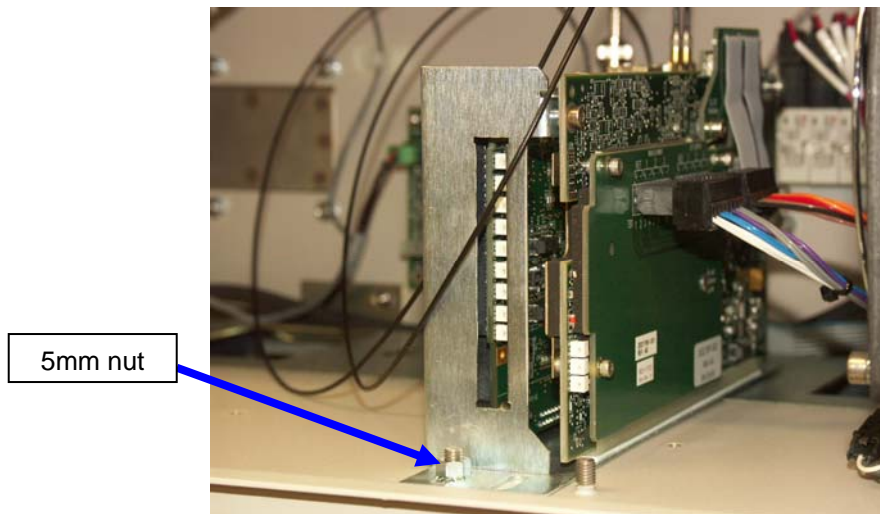
WARNING Some of the cables may have an orange tag. These cables must be reconnected to the same location after replacement of the assembly and have a matching tag on the assembly which should be moved to the replacement part. Failure to reconnect these to the same location can cause the T-rating of the unit to be exceeded which could become an ignition source for combustibles if present.

- Remove interface cables from top and left side of SNE assembly. Identify each cable connection point. This may preclude making a wrong connection during installation. Long interface cables interface to top mounted connectors and short cables interface to bottom connectors. The cables which will be removed are:
 1. If the SNE assembly contains a SNECON, then there are two Ethernet micro cables at the top back of the SNECON, and possibly three connections at the back bottom left side of the SNECON board: I²C bus cable connections, module ID (not removed unless a wiring harness is used), and debug connector. None of these will have orange tags. The micro cable connections are removed by pulling on the gold connector to unlatch the connector. The JST connectors (the white ones with the individual wires) are designed to be removed by pulling on the wires so you do not have to pry on the housing to remove it.
 2. For the right hand side part in the SNE assembly, there may be several cables. Some of the cables may have orange tags attached, and these must be reconnected to the same location on the replacement part. Additional orange tags may be included to label the new part, or the user can move the tags to ensure that these are reconnected properly. See the warning above. The other cables should be disconnected, ensuring that the labeling is done to permit reconnection to the same location on the replacement part.

A picture of the connectors of the boards with connector identification appears in the section for the particular board replacement.

Installation, Continued

- Remove the 5mm nut (two nuts if old enclosed cage) from front SNE mounting bracket; see the picture below. If the new open housing has been installed, then only one of the two bolts will fit through the new housing, and thus only one nut will need to be removed.



SNE Assembly Mounting Nut

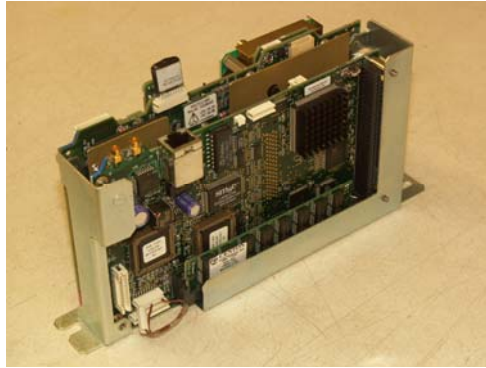
- Pull SNE slightly forward to release assembly from rear mounting guide.
- Remove SNE from electronic enclosure.
- See procedures following for changing of the SNE housing, SNECON board (and associated DRAM board), and Detector Personality Module (and associated mezzanine board if applicable) or Temperature Control Module.
- Move all termination or ID cables or from the part on the removed unit to the replacement unit. These are required for the assembly to function properly.
- Ensure that the replacement parts being used are a replacement for the items being removed. If the replacement part is not the same part number as that being replaced, then refer to the section below concerning how to upgrade the part and make the connection. In some cases, a new interconnecting cable found in the kit may be used to permit connection to the new device. If the housing is the perforated metal enclosed housing and a DPM with mezzanine board is in the replaced hardware, then a new open housing will be required in order for the DPM with mezzanine board to fit into the enclosure (this is a part of the 2022008-701 kit).
- To reinstall new SNE assembly, perform steps above in reverse order. Check to see that all cables have been reconnected securely, as a loose connection can cause failure or intermittent operation of the system. Securing the SNE cage is also a grounding function (lack of grounding can cause detector noise.)
- Before reapplying AC power, be certain SNE assembly is securely fastened to electronic enclosure mounting facility and interface.

Installation, Continued

Sensor Near Electronics Housing

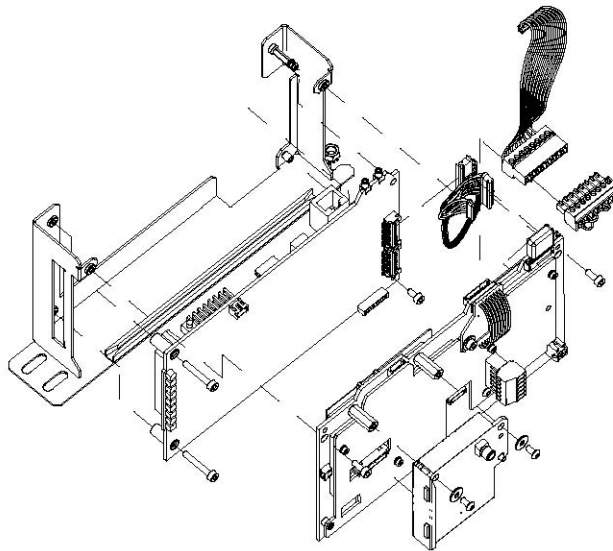
The housing typically will not need to be replaced. In some cases it will be required because a Detector Personality Module is used which requires the new housing in order to be installed. In other cases it may be desirable to eliminate the fan and disassembly of the housing to get to the embedded boards in the housing.

The current open frame housing permits easy removal and installation of the boards without disassembly of the housing. The picture below shows the two boards installed in the housing.



SNE open housing with pc boards

The diagram below shows the disassembly of the boards from the housing. The open housing makes it much easier for the user to access the items, and some things can be done without removing the housing from the electronics enclosure.



SNE Assembly

Installation, Continued

Sensor Near Electronics Controller Board (SNECON)

The following is the procedure to remove and install the Sensor Near Electronics Controller Board (SNECON) from the SNE housing.

- To replace a SNECON board, it is necessary to first remove SNE assembly from the electronics enclosure (see SNE assembly removal procedure on page 16).
- The controller board is located in expansion slot against left side of assembly. This board incorporates LED status lights. Remove all external cables to and from the SNECON board.
- Remove controller board. Also remove any termination or ID cables from the SNECON to be moved to the new board. These are critical to making the replacement assembly operate correctly. Check to see that the memory of the replacement SNECON contains 16 Mbytes, and, if not, replace that DRAM module with the current 1330001-069.
- To install replacement board, perform steps above in reverse order. If the enclosed housing is used, then reassemble the housing for installation into the EC.
- Install the SNE assembly back into the EC, and ensure that the two nuts securely fasten the SNE assembly in the EC.
- Reconnect all I/O wiring to the replacement board.

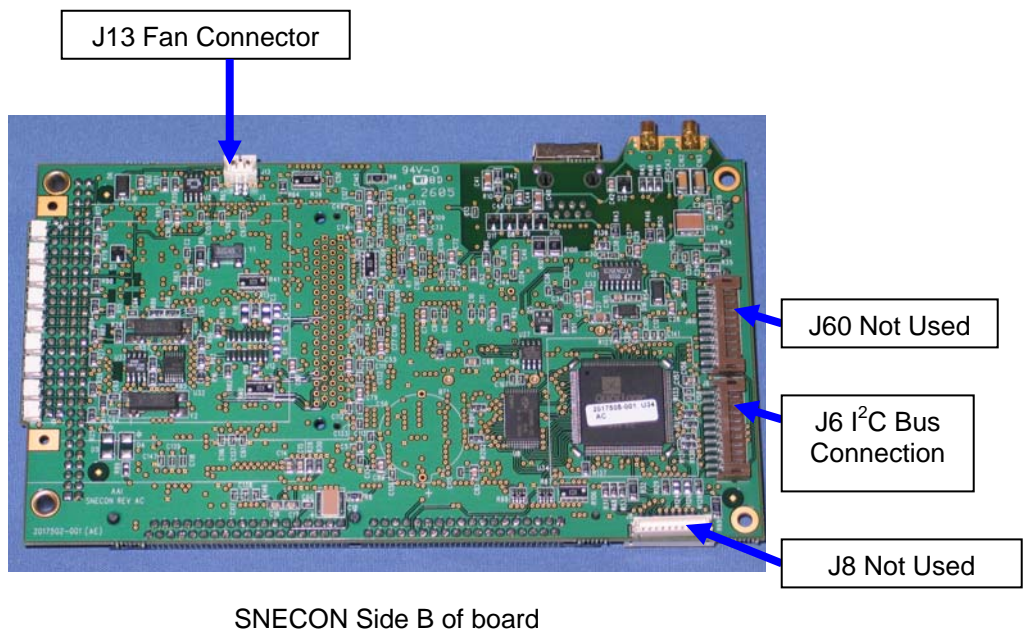
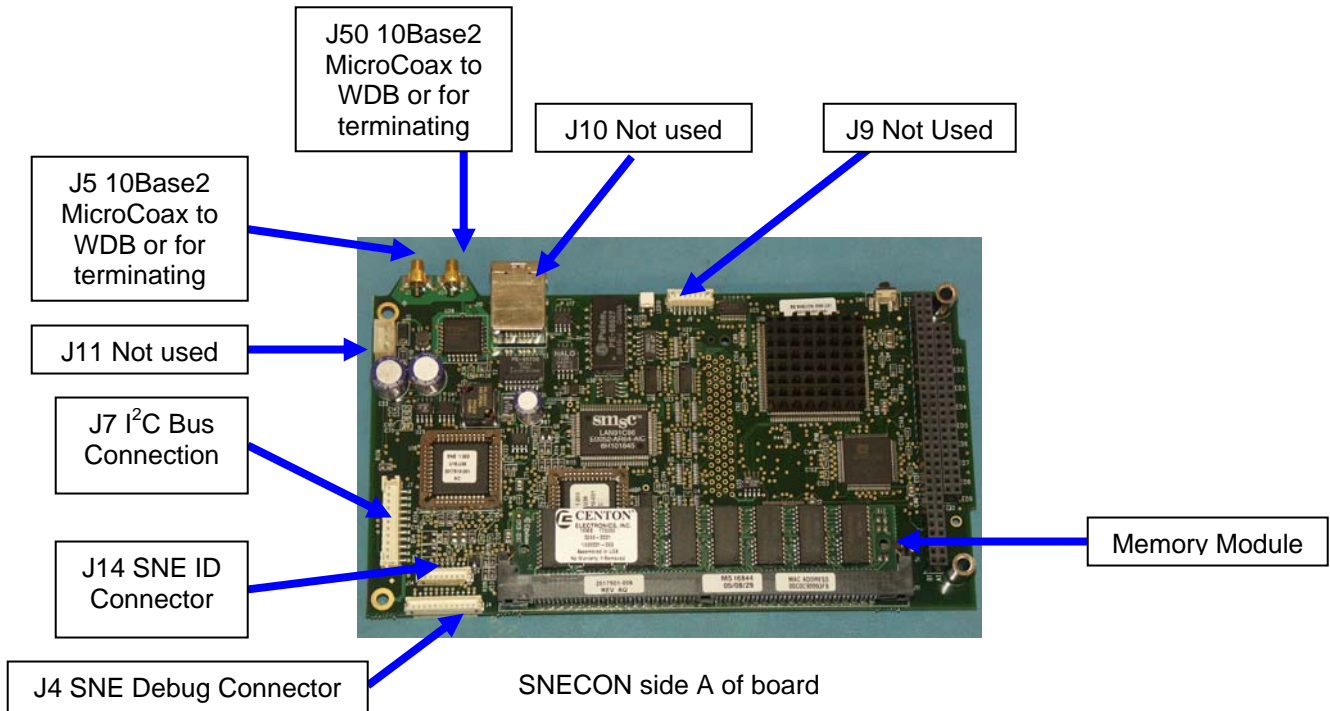


SNECON in SNE Assembly

Installation, Continued

SNECON Connector Identification

This is to show what connectors may be connected on a particular installation. Not all of the connectors are used, so be sure to see what is implemented on the particular installation. In some cases, plugs will need to be moved from the installed board to the replacement board, though there may not be a cable attached.

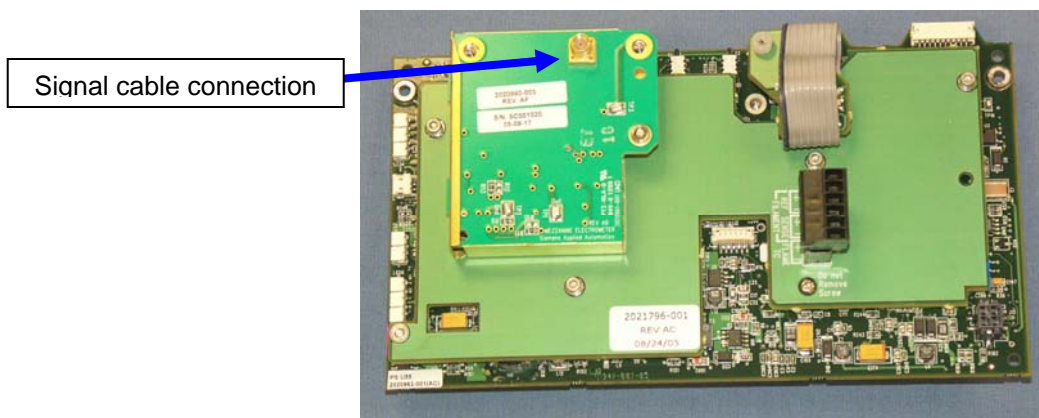


Installation, Continued

Mezzanine Board

This section provides the instructions for removal and installation for a Mezzanine board.

- To replace a Mezzanine board, it may be possible to do this by loosening the mounting nuts on the SNE cage without removing it from the electronics enclosure. Otherwise, remove SNE assembly from the electronics enclosure (see SNE assembly removal procedure). Note: The Mezzanine board can be removed and installed without removing the DPM board from the SNE assembly.
- Refer to the picture below and remove the attaching hardware securing the mezzanine board to the DPM board. Lift module out from SNE.
- To reinstall replacement board, perform steps above in reverse order.
- Reconnect all I/O wiring to the assembly.



Mezzanine board on the base DPM board

Installation, Continued

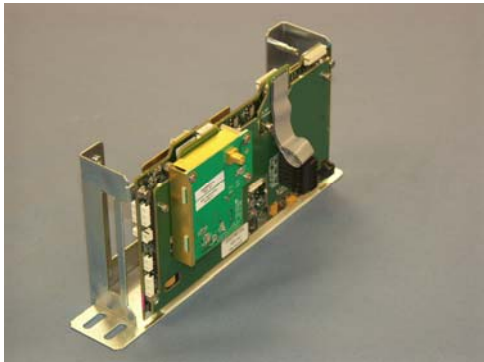
Detector Personality Modules (DPM)

To remove or install a Detector Personality Module (DPM), it is first necessary to remove the SNE from the electronics enclosure. See the procedure given above to accomplish this. Once the SNE assembly has been removed, then the following procedure can be used to remove and install a DPM into the SNE assembly.

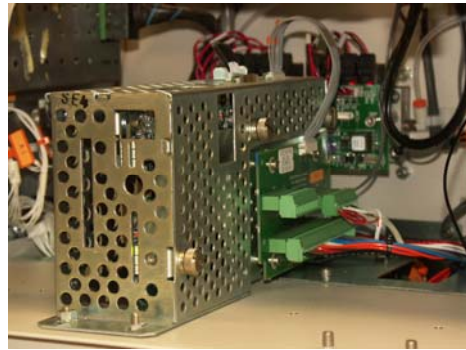
If the SNE assembly removed from a Maxum Edition I unit that uses the Oven Electronics Feed-through (OEFT), then parts other than just the DPM may be used in order to interface the current spare to the existing equipment – see the following section on interfacing to previous equipment. To tell if the unit is a Maxum Edition I or Edition II, it can be quickly determined by examining the section between the top electronics enclosure and the chromatographic oven section. If this has a 2" grate, it is a Maxum Edition I. If this section is about 5" with a hinged door, it is a Maxum Edition II. Thus, if you have a unit with this small grate, then you need to refer to the section below for interfacing to existing Maxum I equipment if the SNE has not already been replaced previously with the current kit.

- If the DPM is mounted in the enclosed housing, then remove the screen cover by unscrewing the three fastening screws. These are captive screws and will remain with the panel.
- Loosen the thumbscrew that secures the connector board assembly to the DPM and remove the assembly (this is only found on earlier Maxum II units).
- Remove any termination or ID cables from the SNECON and place on the replacement board. *Be sure to move the TL/OT board that controls the T-rating to the replacement board.* These are critical to making the replacement assembly operate correctly. For the base DPMs used for the flame detectors, the mezzanine board must also be moved to the replacement DPM or a replacement mezzanine board utilized.
- Verify that any cables that were attached with an orange label have the same label on the new card to ensure that the cables are reconnected to the same location. See the warning on page 16 concerning the connection of these cables.
- Remove DPM board. Refer to the section on interfacing to existing equipment if the unit is a Maxum I unit.
- To reinstall replacement board, perform steps above in reverse order.
- Reconnect all I/O wiring to the replacement board.

Since parts are provided for three different versions of installation, there will be parts not utilized from the kit when the replacement is completed. The table below shows the parts that will be used for each of the three different kinds of installations.



DPM in open housing

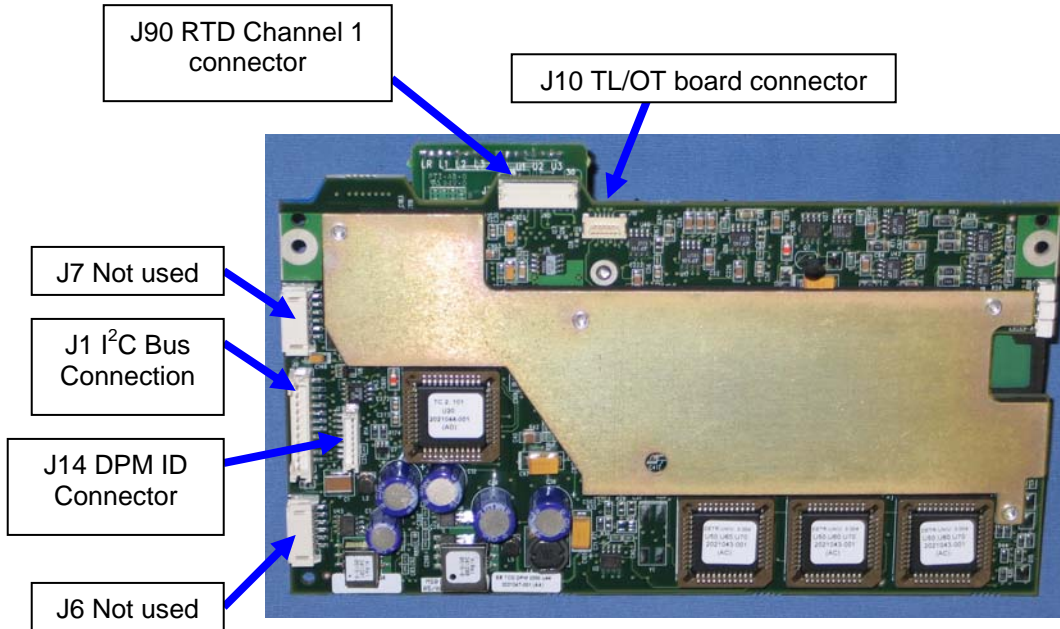


DPM in enclosed housing

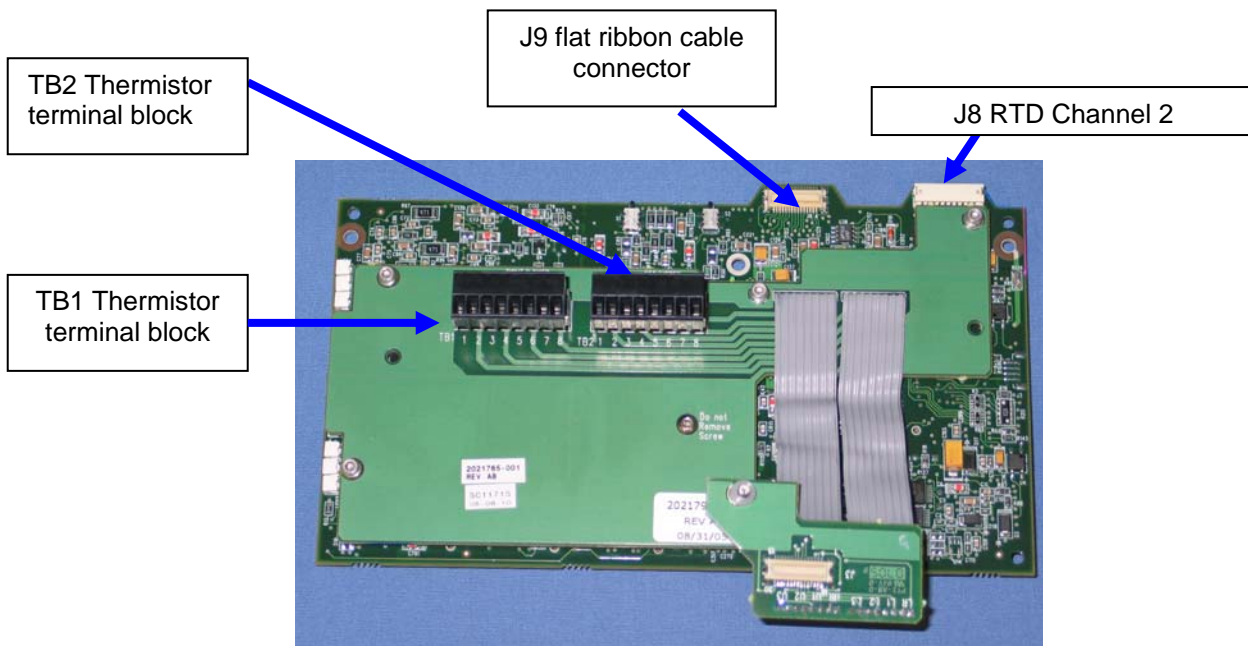
Installation, Continued

TCD DPM Connector Identification

This is to show what connectors may be connected on a particular installation. Not all of the connectors are used, so be sure to see what is implemented on the particular installation. In some cases, plugs will need to be moved from the installed board to the replacement board, though there may not be a cable attached.



TCD DPM Side A of board



TCD DPM Side B of board

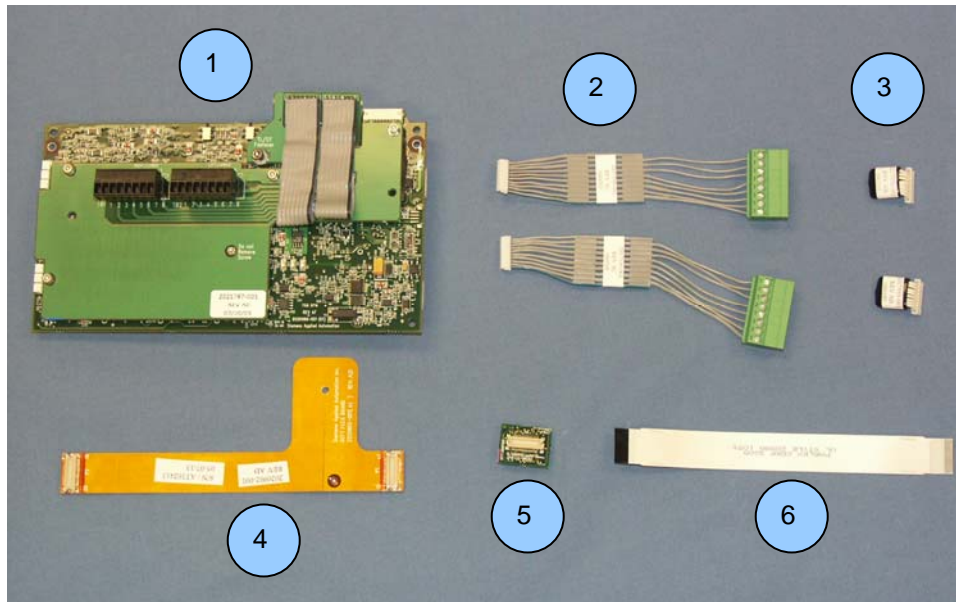
Installation, Continued

Part No.	ID	Description	----- Used On -----	
			Maxum II	Maxum I
			Revised OEFT2	Original OEFT1
2021232-001		Universal Spare Part Kit for TCD Personality Module		
2021797-001	1	TCD DPM with shield connector board with temperature control	X	X
2017596-001	2	RTD cable	*	
2017959-001	3	RTD termination plug	spare	spare
2020902-001	4	OEFT flex cable PCBA		*
2020910-001	5	OEFT Adapter PCBA		some
1901381-001	6	Shielded 6 inch 30 conductor laminated flex cable		*

X => Used for replacement of the particular system type.

* => Used for the first replacement of the particular system type. Subsequent replacements can utilize the part installed earlier.

+ => Used for the first replacement of the particular system type. Subsequent replacements should move the part from the replaced board to the new board.

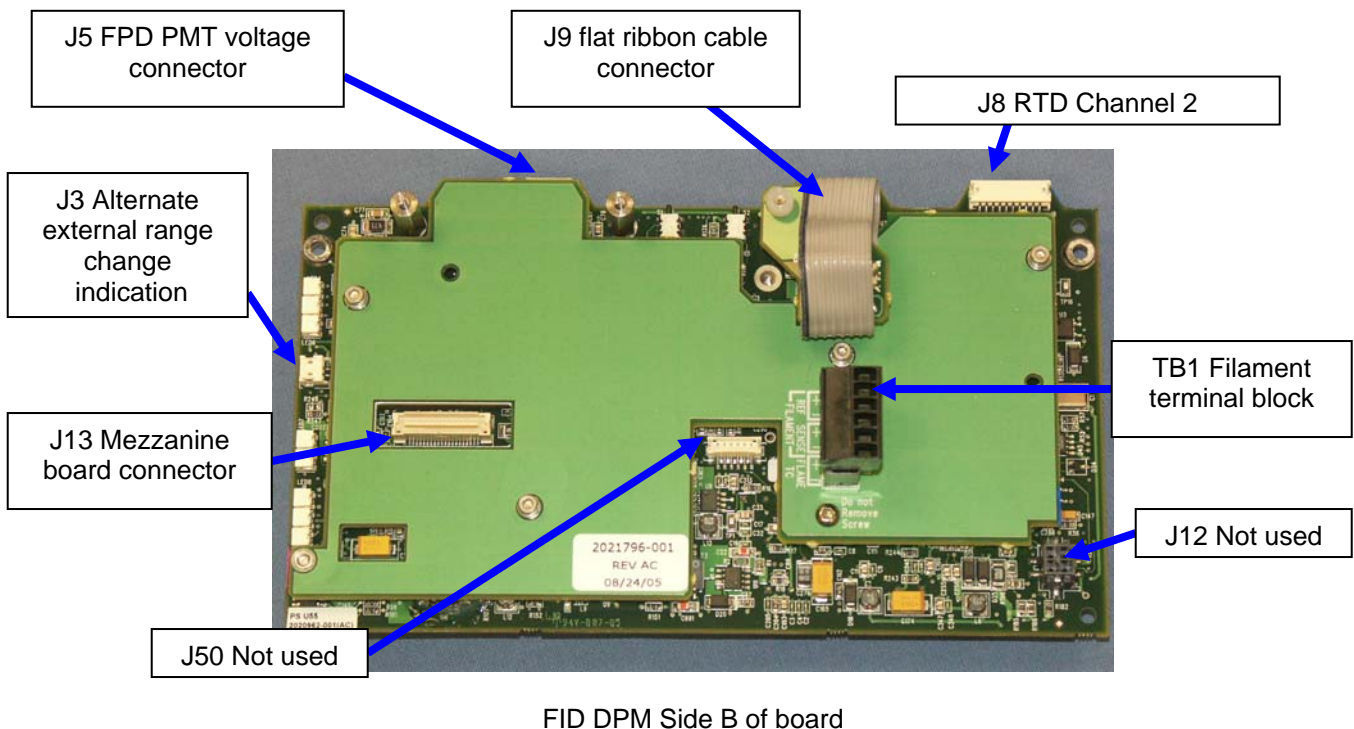
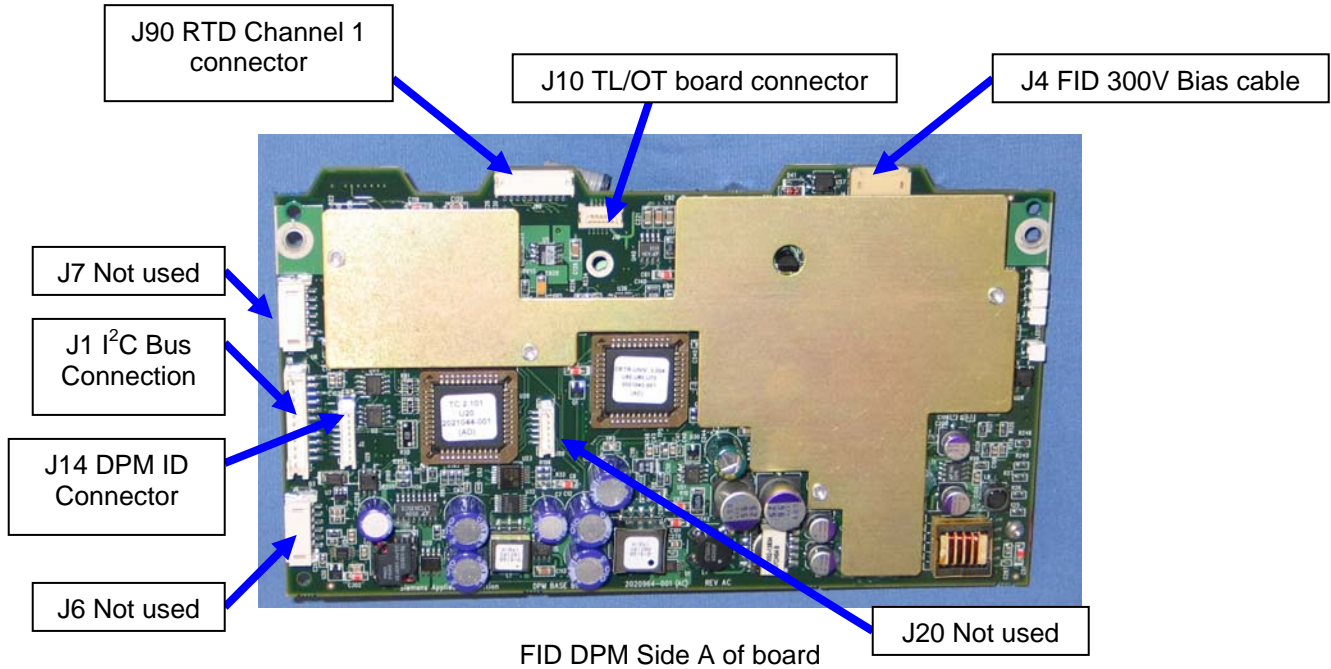


The number corresponds to the ID in the list of the kit above.

Installation, Continued

FID/FPD DPM Connector Identification

This is to show what connectors may be connected on a particular installation. Not all of the connectors are used, so be sure to see what is implemented on the particular installation. In some cases, plugs will need to be moved from the installed board to the replacement board, though there may not be a cable attached.



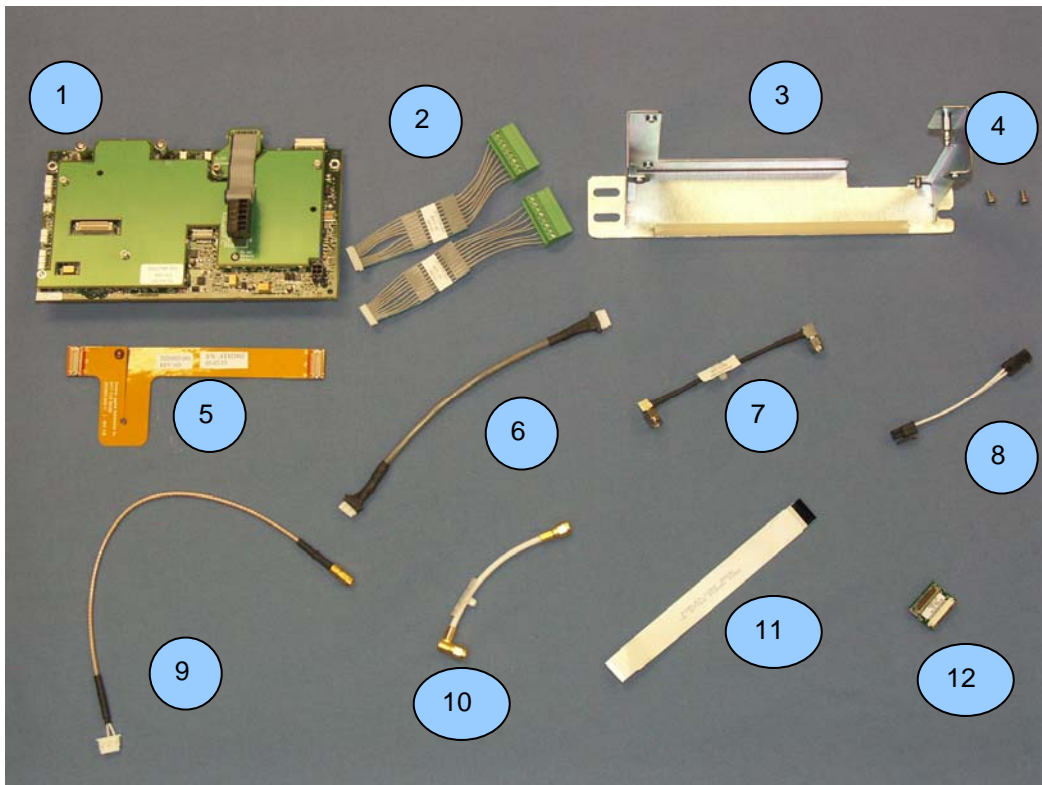
Installation, Continued

Part No.	ID Description	Maxum II -----	Maxum I	
			Revised OEFT2	Original OEFT1
2022008-701	Base DPM with connector board and cables base kit			
2021796-001	1 Base DPM with shield/connector board	X	X	X
2017596-001	2 RTD cable	*		
2021753-001	3 SNE unshielded housing (reduced size new style)	*	*	*
1312420-332	4 SST socket head cap M3 x 6 screws	*	*	*
2020902-001	5 OEFT flex cable PCBA		*	
2021277-001	6 DPM2/OEFT2 high voltage cable		*	
2021275-001	7 DPM2/OEFT2 SMA signal electrometer cable		*	
2021276-001	8 Glow plug DPM ignition cable		*	*
2021278-001	9 DPM2/OEFT1 high voltage cable			*
2017911-001	10 FID DPM to OEFT signal cable			*
1901381-001	11 Shielded 6 inch 30 cond laminated flex cable			spare
2020910-001	12 OEFT adapter PCBA			*

X => Used for replacement of the particular system type.

* => Used for the first replacement of the particular system type. Subsequent replacements can utilize the part installed earlier.

+ => Used for the first replacement of the particular system type. Subsequent replacements should move the part from the replaced board to the new board.



The number corresponds to the ID in the list of the kit above.

Installation, Continued

Interfacing to Existing Maxum I Equipment

The current spare part will directly replace current manufactured Maxum Edition II equipment. If replacing a DPM in system prior to Edition II, then some additional items provided in the kit will permit the user to replace the DPM in these systems. If the part has previously been replaced with a current spare, then no other special equipment will be needed as this occurred on the previous installation.

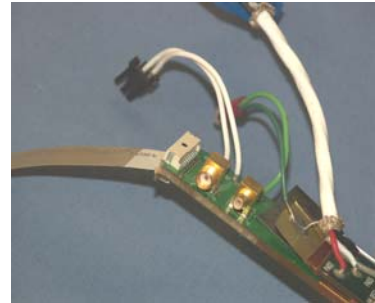
There is a spare kit for both the FID/FPD DPMs and the TCD DPMs. Each of these is described below on what is required to interface to existing systems.

Interfacing to TCD DPMs

Two versions of the Oven Electronics Feed-through (OEFT) have been used in previously delivered systems. There is an original feed-through and a revised feed-through. These are shown in the pictures below and the user must determine which of these has been used in the particular system in order to interface correctly with the current spare parts kit.

Original Feed-through Interfacing – The following is the procedure for upgrading a system with the original feed-through if replacing with the current spare for the first time.

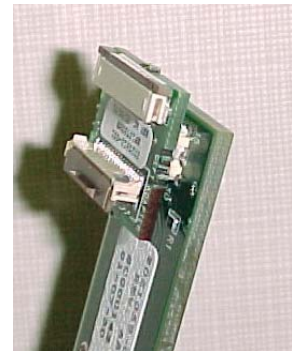
- The 2020910-001 is used to connect the shielded 6 inch 30 conductor laminated cable (1901381-001) to the FID DPM connector.
- Attach the Shielded 6 inch 30 conductor laminated flex cable (1901381-001) to the OEFT Adapter PCBA as shown in the picture. Open the connector door from the laminated flex cable. Install the laminated flex cable and close the door on the connector. The door on the connector is fragile.
- For each of the heater control cables connections, connect the RTD cable (2017596-001) to the DPM which will allow connection to the existing heater cable connections (J8 and J90). If either of the existing heater cable connections is not used, then insert the RTD termination plug (2017959-001) into the DPM instead of the cable.
- Perform the procedure noted in the DPM section to complete the replacement.



Original Feed-through

Revised Feed-through Interfacing – The following is the procedure for upgrading a system with the revised feed-through if replacing with the current spare for the first time.

- Attach the OEFT Adapter PCBA (2020910-001) to the OEFT as shown in the picture (installs on J9 of the OEFT). Note that the notches in the corners of the two connectors must match.
- Attach the OEFT flex cable PCBA (2020902-001) to the OEFT as shown in the picture. It will then connect to the DPM connector (J9).
- For each of the heater control cables connections, connect the RTD cable (2017596-001) to the DPM which will allow connection to the existing heater cable connections (J8 and J90). If either of the existing heater cable connections is not used, then insert the RTD termination plug (2017959-001) into the DPM instead of the cable.
- Perform the procedure noted in the DPM section to complete the replacement.



Revised Feed-through with 2020910-001 PCBA, OEFT ADAPTER

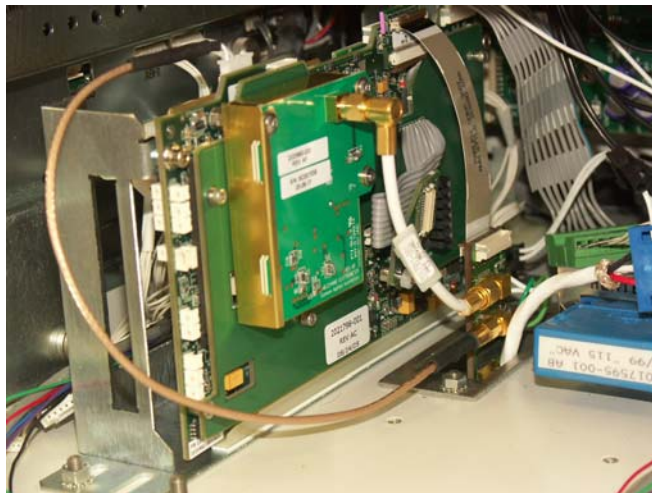
Installation, Continued

Interfacing to FID/FPD DPMs

The user utilizes selected equipment from the kit based on whether you are interfacing to an original feed-through or revised feed-through. Refer to the previous TCD DPM section to determine which feedthrough is utilized. Then follow the instructions specific to the feed-through noted below.

Original Feed-through Interfacing –

- Replace the original covered cage assembly with the new open cage assembly so that the DPMs will fit into the cage without modification of the cage.
- Attach the OEFT Adapter PCBA (2020910-001) to the DPM board (connector J9) as shown in the picture. Note that the notches in the corners of the two connectors must match.
- Attach the Shielded 6 inch 30 conductor laminated flex cable (1901381-001) to the OEFT Adapter PCBA as shown in the picture. Open the connector door from the laminated flex cable. Install the laminated flex cable and close the door on the connector. The door on the connector is fragile.
- Replace the current high voltage cable with the DPM2/OEFT1 high voltage cable (2021278-001).
- Replace the current signal cable with the FID DPM to OEFT signal cable (2017911-001).
- Install the Glow Plug DPM ignition cable from the DPM to the OEFT1 (2021276-001).
- For each of the heater control cables connections, connect the RTD cable (2017596-001) to the DPM which will allow connection to the existing heater cable connections (J8 and J90). If either of the existing heater cable connections is not used, then insert the RTD termination plug (2017959-001) into the DPM instead of the cable.
- Perform the procedure noted in the DPM section to complete the replacement.

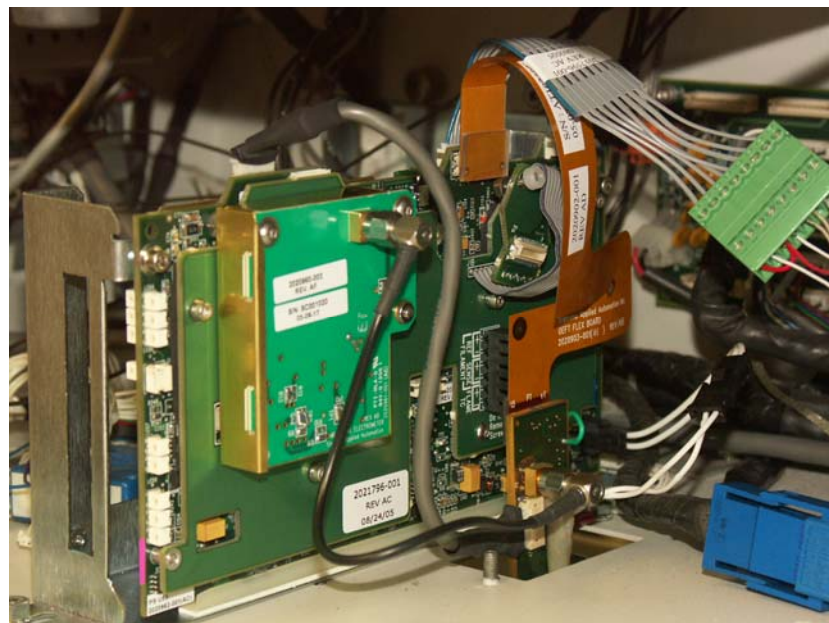


Picture of DPM interfaced to original feed-through

Installation, Continued

Revised Feed-through Interfacing –

- Replace the original covered cage assembly with the new open cage assembly so that the DPMs will fit into the cage without modification of the cage.
- Attach the OEFT flex cable PCBA (2020902-001) to the OEFT as shown in the picture. It will then connect to the DPM connector (J9).
- Replace the current high voltage cable with the DPM2/OEFT2 high voltage cable (2021277-001).
- Replace the current signal cable with the DPM2/OEFT2 SMA signal electrometer cable (2021275-001).
- Install the Glow Plug DPM ignition cable from the DPM to the OEFT1 (2021276-001).
- For each of the heater control cable connections, connect the RTD cable (2017596-001) to the DPM which will allow connection to the existing heater cable connections (J8 and J90). If either of the existing heater cable connections is not used, then insert the RTD termination plug (2017959-001) into the DPM instead of the cable.
- Perform the procedure noted in the DPM section to complete the replacement.



Picture of DPM interfaced to revised feed-through

Startup

Instructions

Once the SNE assembly has been properly installed in the Maxum Edition II electronics enclosure, it is ready to be started up. Start up consists of re-applying power to the unit, and the SNE assembly should come up automatically. When power is applied, the SNECON board will go through a self test sequence (described in the troubleshooting section) and then begin initialization. Within 5 minutes, the unit should complete the initialization and the communication between modules in the electronics enclosure should be normal.

If the unit does not begin to work normally, refer to the troubleshooting section following to determine the problem and take corrective action. It would be good to first review the installation process to ensure that all of the connections have been made correctly and the needed parts moved from the old SNE assembly to the new one.

If the unit still does not operate correctly, contact Siemens for assistance as noted on page 2 of this manual.

Troubleshooting

Instructions

The following procedures provide a means for troubleshooting the SNE assembly. A quick way to determine if the assembly is working is that there should be no yellow or red LEDs remaining on. If so, then this indicates a problem that needs to be resolved. The yellow LEDs are warnings which usually indicate a problem that needs attention, though the analysis on the unit is able to proceed. The red LEDs are fault indications which usually indicate a problem that prevents the unit from getting valid analysis data, and needs to be fixed as soon as possible.

The most probable cause of the SNE assembly not working is a loose cable or part connection. Be sure that all of the connections are made firmly. Also check to ensure that all of the moveable parts were moved to the new board.

Before beginning to determine any problem with only the assistance of the SNE assembly LEDs, check for alarms on the analyzer. The alarms have text that help the user easily and quickly identify the problem, and often these messages in conjunction with the LEDs are the best way to resolve the problem. First solve the problems indicated through the analyzer alarms. When they are resolved, or the problem indicated is in the SNE assembly, then use the following LED descriptions on the SNE assembly to see what needs to be fixed.

LED Indicators

The LED indicators are a quick way to see if there is an indicated problem with the installed part. In some cases such as communications alarms, the problem could be with the device, the connection to the cable, the cable itself, or another device on the communications link.

The LED indicators are described below for each of the boards that have indicators in the SNE, along with the suggested actions to take for each of these. These are described for the boards currently available, though other previous boards will have similar indicators which will also lead the user to corrective actions.

The SNECON board (2017501-006) is always located on the left side of the SNE assembly. This board has a single column of nine LEDs as indicated in the diagram to the right. Each LED is on to indicate a particular condition, though in the case of some green LEDs, there is a "dim" and full "ON" state for the LED. The LEDs are all single color LEDs. To the right of the LEDs in the diagram in some cases is a number. This number indicates what correction actions might be taken to resolve the problem. These are described on page 33 at the bottom of this section, as these actions are similar for the SNE assembly boards. To the left of the LED in the diagram is the description of what the particular LED is indicating. An on condition of the LED indicates the condition described. In some cases the LED may flicker if this is a transitional error, such as an addressing error. In some of these cases, the software will generate an alarm which the user can interrogate to determine the cause of this error. Normal operation will show the normal LED either as DIM or ON with other green LEDs flashing as communications occur. The "Fault" LED is always on for hardware versions of this board prior to 3.0.

SNECON board (2017501-006)	Description	LEDs
	Power	Green
	Not Used	Yellow
	Board Error	Red 4
	External SNE I ² C Bus	Green
	Internal SNE I ² C Bus	Green
	Warning	Yellow 1
	Fault (see note below)	Red 1
	Ethernet Receive	Green
	Ethernet Transmit	Green

Troubleshooting, Continued

The SNE assembly can have one other board mounted besides the SNECON, and this appears on the right side of the assembly. These are the Detector Personality Modules with or without temperature controllers or a temperature controller board without detector module included. With the advent of the Power Entry Control Module with temperature controllers, the Detector Personality Module without temperature controllers may be used.

The TCD Detector Personality Module comes with temperature controllers (the one shown in the diagram here) and without temperature controllers. Applications frequently use the TCD DPM without temp controllers, which is described below. These are easy to distinguish as this DPM has LEDs on both sides of the boards at the top of the board and the one without has only the three LEDs on one side. See the description on page 31 for explanation of the diagram to the right. For a description of the corrective actions noted by the number beside the LEDs refer to the description on page 33.

TCD DPM board with temp controllers (2021797-001)

LEDs		LEDs	
Description	L	R	Description
Heater 1 power activate			Heater 2 power activate
Heater 1 temp limit			Heater 2 temp limit
Heater 1 Overtemp			Heater 2 Overtemp

	Normal
1	Fault
1	Warning

The TCD Detector Personality Module without temperature controllers is the normal board used for the thermistor detector applications with the introduction of the new PECM. See the description on page 31 for explanation of the diagram to the right. For a description of the corrective actions noted by the number beside the LEDs refer to the description on page 33.

TCD DPM board without temp controllers (2021797-002)

LEDs	
Description	

	Normal
1	Fault
1	Warning

The Filament Detector Personality module is similar to the Thermistor Detector Personality Module with temperature controllers. The LEDs have the same meaning. See the description on page 31 for explanation of the diagram to the right. For a description of the corrective actions noted by the number beside the LEDs refer to the description on page 33.

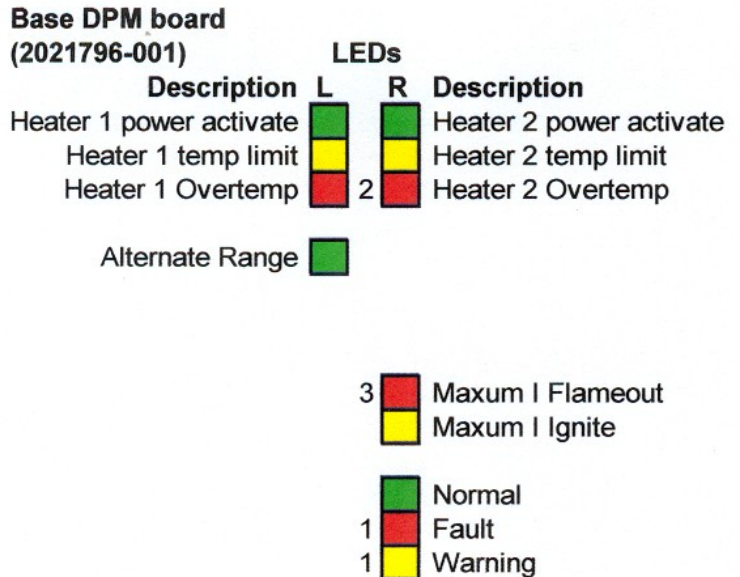
Filament DPM board (2021798-001)

LEDs		LEDs	
Description	L	R	Description
Heater 1 power activate			Heater 2 power activate
Heater 1 temp limit			Heater 2 temp limit
Heater 1 Overtemp			Heater 2 Overtemp

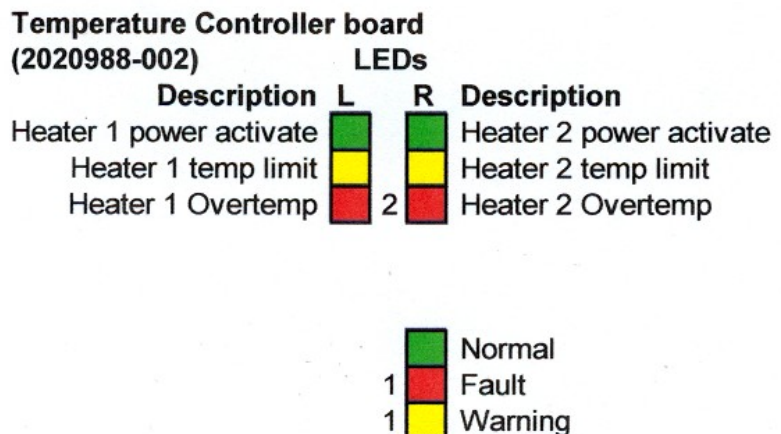
	Normal
1	Fault
1	Warning

Troubleshooting, Continued

The Base Detector Personality Module has the most LEDs of any of the boards. It has all of the LEDs that are found on the Thermistor DPM with temperature controllers with the addition of three additional LEDs. The green LED on the left side of the board below the three for the temperature controllers is the “Alternate Range” LED. The Base DPM can have two different ranges that are selectable by the software during the analysis cycle. This LED when ON denotes that the software (or manual select on the board) has selected the alternate or second range on the mezzanine board. Some of the mezzanine boards have only one range, so this should not be activated for those boards. The other two LEDs that are added from the Thermistor DPM are the “Flameout” and “Ignite” LEDs. These are located on the right side of the DPM board between the upper three temperature controller LEDs and the lower three operation LEDs on the board. On the Maxum I FID, the “Flameout” LED indicates that the flame in the detector flame is out. On current production there is a software detect for flame out, so the LED will not be active. The yellow LED below it is the ignite LED. This LED indicates that the hardware is attempting to relight the flame in the detector. This occurs automatically in the device, so this is just an indication that this event is occurring. See the description on page 31 for explanation of the diagram to the right. For a description of the corrective actions noted by the number beside the LEDs refer to the description on page 33.



The Temperature Controller Board has the same layout as the Thermistor Detector board with the same meaning for each of the LEDs. See the description on page 31 for explanation of the diagram to the right. For a description of the corrective actions noted by the number beside the LEDs refer to the description on page 33.



Troubleshooting, Continued

The information below provides the suggested corrective actions noted in the diagrams above in the case the LEDs on devices on the SNE assembly indicate that there is a problem which should be corrected. Intermittent yellow or red LEDs are not indicative of a problem to be fixed. *If any alarms are present on the analyzer, first check these to see if a specific problem is indicated that may resolve the error indication on the device.* Once the analyzer alarms have been resolved, then proceed to take corrective action as indicated by the LED alarms shown by the numbers beside the LEDs on each of the boards above.

Corrective Action 1. The Normal, Warning, and Fault LEDs are common to most boards used in the SNE assembly. There are six States, five of which are abnormal States. These are defined by LEDs with the color showing ON. The normal green LED is DIM in State 4. When communication occurs in States 4, 5, or 6, then the green normal LED will flash ON during the communication.. SNECON has no green normal LED – just a green power LED. Note that the order of the LEDs is different on the DPMs and the SNECON board.

Normal	Warning	Fault	
			State 1 - power off
Green	Yellow	Red	State 2 - self test (about 1/2 second)
	Yellow	Red	State 3 - Initializing (≤ 3 minutes)
Green			State 4 - Normal operation
	Yellow		State 5 - Warning condition
		Red	State 6 - Fault condition

If one of the abnormal States (1, 2, 3, 5, or 6) persists, then corrective action is required as noted below (corrective actions are listed in order of precedence for performing, so the user should do one item and then check to see if the issue is resolved before attempting the next item):

- State 1 –
 - a. if all units in this state, then power to the analyzer is not active
 - b. reset the device or cycle power
 - c. check power connection to board
 - d. replace unit
- State 2 –
 - a. reset the device or cycle power
 - b. replace unit.
- State 3 –
 - a. reset the device or cycle analyzer power
 - b. if all modules are in State 3 then SNECON is not communicating (check cabling and connections)
 - c. replace unit.
- State 5 –
 - a. reset the device or cycle power
 - b. check communication cable connections.
- State 6 –
 - a. reset the device or cycle power
 - b. check communication cable connections
 - c. replace the unit
 - d. replace other connected units.

Troubleshooting, Continued

Corrective Action 2. Overtemp for either of the heater circuits will cause a shutdown of this board. It indicates that the temperature has exceeded the temperature limit point window. This maintains the T-rating, though it says that something is not working in the control circuit. The unit must have the power reset before the board will begin functioning again. If this is not the result of the oven temp test button on the board to test this circuit, then the heater relays should be checked to make sure that they have not failed in the ON position, that the TL/OT temperature probes are operational, there is no loose connection of wires or connectors, and that none of the connecting wires have been switched to the wrong device.

If there is a software overtemp alarm and there is no overtemp LED active on the base DPM, then replace the board.

If the DPM is controlling a cartridge heater, the setpoint may be too close to the limit temperature. If this is the case, then the temperature setpoint should be adjusted to a lower temperature.

Corrective Action 3. This is only used for the Flame Photometric detector, as flameout is done via software on the flame ionization detector. This is an indication that there is no flame in the detector. The DPM will initiate a sequence to ignite the flame whenever it powers up initially or when it goes out. If the flameout LED is on and the ignite LED is not coming on, this indicates the automatic sequence has failed. In this case the user should verify that the right mixture of flame fuels and air is present in the detector for ignition.

Corrective Action 4. The most probable cause for this is the ID connector is not installed or loose. So check to see that this is properly installed. If it is correctly installed, then replace the board.

Spare Parts

Spare Parts List

Please refer to page 2 for information on where to order spare parts. Providing the unit serial number of the instrument will expedite the ordering process.

Description	Part Number (Siemens global)	Part Number (Americas)
SNE Metal Housing	GWK-AI2021753-001	2021753-001
Sensor Near Electronics Controller (SNECON) Board, Version 3 without cage	GWK-AI2017501-006	2017501-006
DRAM Memory module for SNECON	GWK-AI1330001-069	1330001-069
TCD Personality Module, with Shielding, with Temperature Controllers	GWK-AI2021797-001	2021797-001
TCD Personality Module, with Shielding, <i>without Temperature Controllers</i>	GWK-AI2021797-002	2021797-002
Filament Detector Personality Module, with shield	GWK-AI2021798-001	2021798-001
Universal Spare Part Kit for TCD Personality Modules	GWK-AI2021232-001	2021232-001
Base Detector Personality Module, (requires a mezzanine board below to complete module)	GWK-AI2022008-701	2022008-701
FID Mezzanine, Single range, High sensitivity, 0.2 n-amp	GWK-AI2020960-001	2020960-001
FID Mezzanine, Dual standard range (high/low), 1 n-amp / 20 n-amp	GWK-AI2020960-003	2020960-003
FID Mezzanine, Dual high range (low/very low), 100 n-amp / 1000 n-amp	GWK-AI2021328-002	2021328-002
FPD Mezzanine, Single standard range, 100 n-amp, 0.18 Hz Bandwidth	GWK-AI2021328-001	2021328-001
FPD Mezzanine, Single standard range, 100 n-amp	GWK-AI2021328-003	2021328-003
Analog Input Mezzanine for specialty detectors	GWK-AI2021326-001	2020326-001
Temperature Controller Personality Module	GWK-AI2020988-002	2020988-002

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