User's Manual Edition 9/2012

ADVANCE NETWORK ACCESS UNIT

process

GAS CHROMATOGRAPHY

SIEMENS

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Advance Network Access Unit

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U.S.A.

Table of Contents

Preface

Audience & Purpose

This manual provides installation personnel with instructions for proper and safe installation of the Advance Network Access Unit (NAU).

Chapter Contents

The manual provides the following information:

Technical Support

Contacts for Help

Siemens provides support for the Maxum family of products worldwide. Contact information is provided on all Siemens products at the websites 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.

When the analyzer is mounted and all of the connections are made, a specialist can be sent to assist you in starting up the equipment and preparing it for use. To schedule, contact Customer Service.

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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 and tested in accordance with IEC Publication 1010-1, Safety Requirements for Electronic Measuring Apparatus, and has been supplied in a safe condition. This manual contains information and warnings which have to be followed by the user to ensure safe operation and to retain the product in a safe condition.

Terms in This Manual

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

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

Terms as Marked on Equipment

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

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

Symbols in This Manual

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

Symbols Marked on Equipment

DANGER - High voltage

Protective ground (earth) terminal

ATTENTION - Refer to Manual

Grounding the Product

A grounding conductor should be connected to the grounding terminal before any other connections are made.

Correct Operating Voltage

Before switching on the power, check that the operating voltage listed on the equipment agrees with the available line voltage.

Danger Arising From Loss of Ground

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

Safe Equipment

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

Use the Proper Fuse

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

Safety Guidelines

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

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

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

Capacitors in the equipment can retain their charge even after the unit has been disconnected from all power supplies.

Chapter 1

Advance Network Access Unit

Introduction

Overview

The Advance Network Access Unit (NAU) connects to our Advance Communications System (ACS) network to access operational information from any Maxum or Advance Optichrom Gas Chromatograph that is also connected to the ACS network. The NAU provides three basic functions:

- human-machine interface (HMI) which maintenance personnel can use for remote control of chromatographs and other analyzers
- housing for electronic boards which supply input and output signals representing data in the analyzers
- serial digital connections to ASCII printers and/or to external HOST computers

These basic functions permit the NAU to be used for centralized maintenance access to a large number of chromatographs or other analyzers in a single process network and for centralized data input and output facilities, which are shared by many analyzers on a common network.

I/O Options

The NAU provides space for up to 7 input/output boards (CAN I/O Modules in older configurations or I^2C I/O Modules in newer configurations). I^2C I/O boards require the SYSCON2 controller board which supplies the I^2C bus.

In preexisting applications needing additional I/O boards, a legacy CAN Extension Unit (CEU) may have been installed. This device allowed up to 10 additional CAN I/O boards. The CEU, if used, connects to the NAU via a Serial Link (CAN Bus).

Analog & Digital I/O Boards – CAN Bus

Preexisting systems use I/O boards that utilize an internal CAN bus controlled by the SYSCON.

- Analog I/O board (AO8): has eight channels of analog fully isolated output channels.
- Digital I/O board (DIO-8): has 4-digital inputs and 4-digital outputs
- Input/Output board: has 2-digital inputs, 2-digital outputs, 2-analog outputs, and 4-analog inputs (2 for current and 2 for voltage)
- The DOs are rated for 1A resistive load. Inductive loads are different. A DO should not drive an inductive load greater than 0.5A. An example is the typical block and bleed application which uses two parallel solenoids at 0.4A each. Separate DOs should be used to drive each solenoid. Each DO connected to a solenoid should have a diode to suppress the solenoid load.

Analog & Digital I/O Boards – I^2C bus

The newest version of I/O board connects to an I^2C bus. The I^2C I/O boards are the version generally available for new installation.

- Analog I/O board (AIO): has 8 analog output channels, 8 analog input channels, and 2 digital input channels
- Digital I/O board (DIO): has 8 digital outputs and 6 digital inputs
- Analog and Digital I/O board (ADIO): has 4 digital outputs, 4 digital inputs, 4 analog outputs, and 4 analog inputs
- The DOs are rated for 1A resistive load. Inductive loads are different. A DO should not drive an inductive load greater than 0.5A. An example is the typical block and bleed application which uses two parallel solenoids at 0.4A each. Separate DOs should be used to drive each solenoid. Each DO connected to a solenoid should have a diode to suppress the solenoid load.

CEMS Software Option

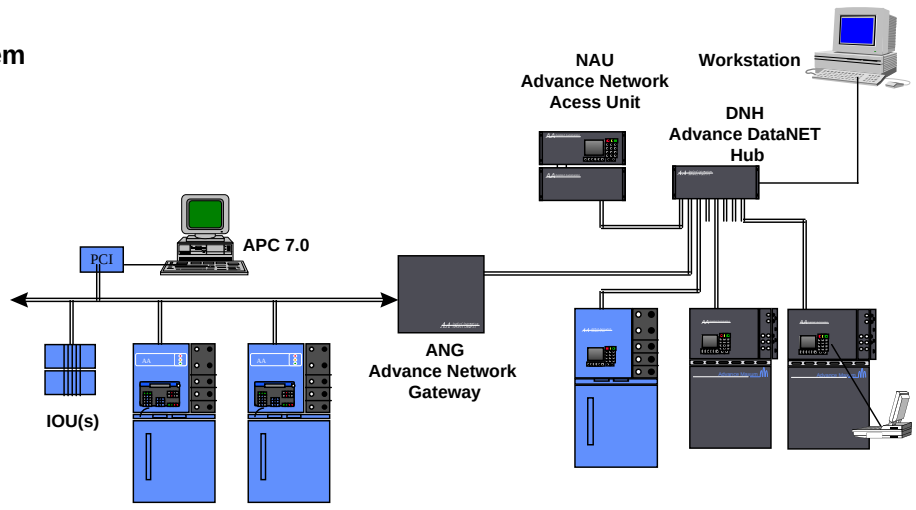
The Continuous Emission Monitoring Systems (CEMS) software option for the NAU provides sample system control and general data acquisition for up to four Siemens continuous analyzers or most other analyzers or devices. When connected via our Advance Communications System (ACS) the NAU can be remotely accessed from the Maxum workstation. The CEMS option is described in Appendix 3 of this manual.

Advance Communications System

The Advance Communications System (ACS) is a high-speed communications system that uses TCP protocols and IP addressing to interconnect chromatographs and other process analyzers in a common network. Figure 1-1 shows the NAU and Advance Network Gateway (ANG) connected to the ACS. The ANG is used to connect Siemens' equipment residing on an Advance Data Hiway to the ACS.

The NAU communications can be configured for an Ethernet network or a DataNET network using wire or fiber optics. The type of networking hardware used in the ACS determines the option selected. The ACS and its configuration choices are fully described in the Appendix 1 of this manual.

Figure 1-1: Advance Communication System (ACS)



Specifications

Dimensions	Rack Mounted Package Configuration See Figure 1-2 for Outline Drawing and Dimensions Wall-Mounted Package Configuration See Figure 1-3 for Outline Drawing and Dimensions
Housing, Explosion Protection, Ratings and Certifications	Wall Mounted Configuration NEMA 3 (IP-54) CSA Certified for Class I, Division 2, Group A,B,C,D CENELEC non-Ex (Air purge is not required for fire protection as indicated; however, the unit may be air purged, if desired, for additional protection from environmental elements.) Rack Mounted Configuration NEMA 2 (IP-20) CSA Certified for Class I, Division 2, Group A,B,C,D CENELEC non-Ex Electromagnetic and Radio Frequency Compatibility and Electrical Safety CE Compliance; certified to 89/336/ECC (EMC directive) CE Compliance; certified to 73/23/EEC (Low Voltage directive) Tested per EN 61010-1 / IEC 1010-1 Housing Materials and Colors Stainless steel (1.4016); Front and top are commercial gray B (RAL 7043), housing is light gray (RAL 7035) Weight Rack/Wall: 15 kg (35 pounds) approximately

Specifications, Continued

Ambient Installation Conditions	Operation: -18° to +50°C (0° to 122°F) 0-99% relative humidity (non-condensing) maximum 0-75% relative humidity year-round average (Purge with dry air or nitrogen if required in tropical conditions.) Must not be exposed to direct sunlight. Must be protected from rain. Storage and Transport: -25° to +65°C
Power	Nominal: 115 VAC / 230 VAC (field switchable) Tolerance: 85-140 VAC or 185-250 VAC; 47-63 Hz 300 Watts Power line protection: G fuse element per IEC 127-2, 4 A rating, slow-blow Power wiring in field made to screw terminals on two part connectors; 16 AWG (1.5 mm) or smaller power wiring is accepted; must conform to local installation codes and requirements. If conformance to CE certified installation requirements is required, power cable must be shielded or installed in conduit.
Input and Output Capacity	<u>Standard Built in I/O</u> 2 Isolated Analog Outputs (1 can be assigned for chromatogram output) 4 Digital Inputs 4 Digital Outputs (1 indicates system error; 3 are user-configurable) Serial Outputs RS-485, RS-232 <u>Optional I/O Boards</u> I2C AIO:8 analog inputs, 8 analog outputs, 2 digital inputs I2C DIO: 6 digital inputs, 8 digital outputs I2C ADIO:4 analog inputs, 4 analog outputs, 4 digital inputs, and 4 digital outputs Note: The NAU is also compatible with original version CAN bus I/O from Siemens. CAN I/O boards have lower I/O channel count and capacity; consult factory for detail as needed

Input and Output Specifications

Digital Outputs

Floating double-throw contacts, maximum contact load rating 1 A at 30 V (AC or DC). External diode shunt suppression should be used for inductive DC loads, preferably at the load.

Digital Inputs

Optically coupled with a common for all inputs. Self powered floating contact input, or configurable for sinking or sourcing current. Sourcing current mode: 24V internal isolated supply, with positive terminal of supply at common. Sinking current mode: 5V internal isolated supply, with negative terminal of supply at common.

Analog Outputs

0/4 to 20 mA into 750 ohms maximum, common negative pole, galvanically separated from ground, freely connectable to ground.

Analog Inputs

Each input configurable for current or voltage; -20 to +20 mA into 50 ohms or -10 to +10 V with 100K. Ohm input resistance, fully differential. Each differential channel operates within the range of -100 to +100V common mode to chassis ground.

Serial Ports

One standard RS-232 and one standard RS-485 (for original SYSCON)
or
Four serial ports, each configurable as either RS-232 or RS-485 (for SYSCON2)

Ports may be used for data logging printer or for connection to an external Host computer such as a DCS system. Protocols for connection to an external computer include Modbus and are described in a separate document. RS-232 ports may be used for attachment of a computer, such as a laptop computer, running Maxum workstation software.

Internal Power Supply Capacity

The internal power supply can source current that is switched by the Digital Output or regulated source from the Analog Outputs and intended to be absorbed externally. The total capacity of the supply available for use by all I/O channels is:

24 VDC at 1.2 Amperes

This is sufficient for a maximum product capacity of 58 analog output channels or 32 digital output channels or any combination where each digital output channel sources not more than 35 mA at 24 VDC. However, since the contact capacity of the digital outputs can exceed 35 mA (as specified above) more than 35 mA of external load per digital channel can be switched by using fewer channels or by using an external power supply.

If more total output capacity is required, an external power supply should be used.

Analyzer Communication System Interface

Protocol and Addressing:
Open Systems standard TCP/IP protocol and addressing (Transmission Control Protocol/Internet Protocol); Full Class A, B and C addresses and subnet masking supported.

Hardware Connections:
Ethernet option (for original SYSCON):

- Cable connection by 10Base-T (twisted pair) cable
- Shielded cable or unshielded cable in conduit is required for conformance to CE certified installation
- 8-pin RJ-45 jack provided
- 10 mbps standard Ethernet

Ethernet option (for SYSCON2):

- Up to four ethernet connections by 10/100Base-T (twisted pair) cable, or (optionally) three 10/100Base-T and one 100Base-FX fiber with ST connector.
- Shielded cable or unshielded cable in conduit is required for conformance to CE certified installation
- 10 or 100 mbps standard Ethernet, or (optionally) 100 mbps fiber

DataNET option, standard cable:

- Cable connection by Belden 9182 (single pair) or Belden SSD1743 (two pairs) or equivalent; two pairs of wires are required to support redundancy
- Shielded cable or unshielded cable in conduit is required for conformance to CE certified installation
- Two part connectors with screw-terminals provided for field connection
- Approximately 3 mbps base transmission rate; uses dedicated transmission technique that does not require collision detector to achieve high data throughput efficiency

DataNET option, fiber optics:

- Fiber optics connection by 62.5 multi-mode cable corresponding to 10BaseFL Ethernet specification
- Two pairs of fibers are required to support redundancy
- Type ST mating connectors provided for field connection
- Approximately 3 mbps base transmission rate; uses dedicated transmission technique that does not require collision detection to achieve high data throughput efficiency

Specifications, Continued

Signal Connections

Power Connections
Power wiring in field made to screw terminals on two part connectors; 16 AWG (1.5 mm) or smaller power wiring is accepted; must conform to local installation codes and requirements. If conformance to CE certified installation requirements is required, power cable must be shielded or installed in conduit.

Network Connections
Ethernet: 8-pin RJ45 plugs or (optionally with SYSCON2) ST fiber connector.
-or-
DataNET: 2 part screw-terminal connectors

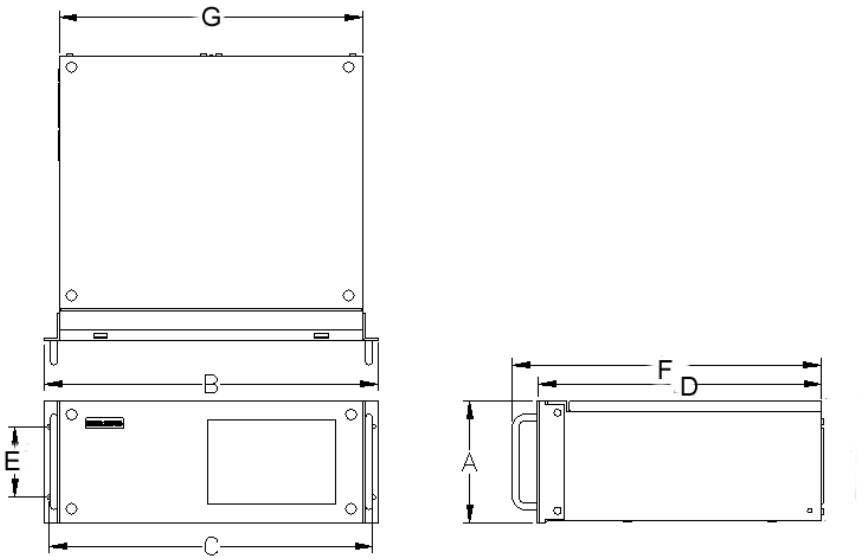
Serial Digital Input and Output Connections (original SYSCON)
RS 232C 9-pin Sub-D plug (male provided on unit)
RS 485C 9-pin Sub-D plug (female provided on unit)

Serial Digital Input and Output Connections (SYSCON2)
9-pin Sub-D plugs (male provided on unit) configurable for RS-485 or RS-232

Discrete Analog and Digital Input and Output Connections
Standard built-in I/O: 2 12-pin 2-part screw terminal connectors
Optional plug-in I/O boards: 1 22-pin 2-part screw terminal connector per board

Note:
All screw terminal connectors used on DataNET or I/O field wiring accept 16 AWG (1.5mm) or smaller stranded or solid copper wire.

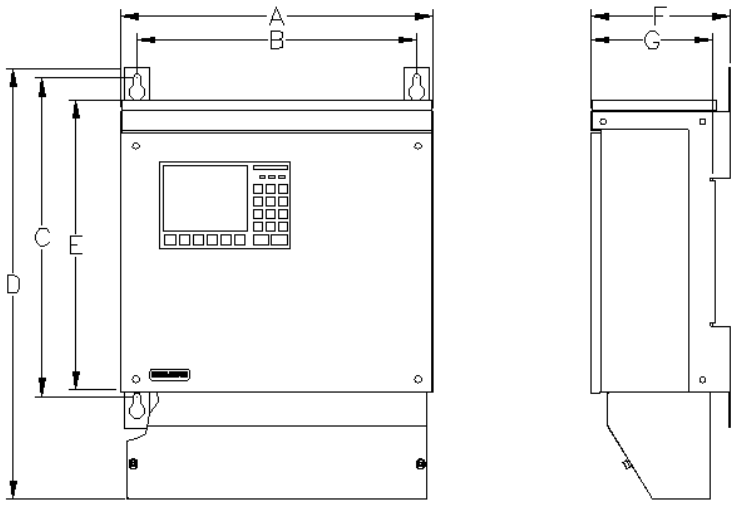
Figure 1-2: Rack Mount Dimensions



Dimension Table

Figure 1-3	Description	U.S. Inches	Metric mm
A	Rack Height	6.97	177
B	Rack Total Width	19	483
C	Rack Mounting Holes Spacing	18.43	468
D	Rack Depth Case Only	16.26	413
E	Rack Handle	6.83	174
F	Rack Depth with Handles	17.63	448
G	Case Width	17.32	440

Figure 1-3: Wall Mount Dimensions



Dimension Table

Figure 1-4	Description	U.S. Inches	Metric mm
A	Wall Width	17.48	444
B	Wall Mount Holes Horizontal Spacing	15.59	396
C	Wall Mount Holes Vertical Spacing	17.72	450
D	Wall Height Including Cable Housing	24.04	611
E	Wall Height w/o Cable Housing	16.32	415
F	Wall Mount Total Depth	7.81	199
G	Wall Mount Depth Case Only	6.91	176

Chapter 2

Installation

Overview

This chapter is intended for installation personnel.

After completing the procedures, within this chapter, the NAU will be ready for operation. All factory installed CAN I/O Modules have been pre-configured. To ensure a safe and trouble free installation, follow all procedures and associated advisory information.

Installation Hint

It is highly recommended that the user thoroughly read through this Chapter to establish an installation plan. Before beginning the unpacking and installation process refer to the wiring and illustration diagrams supporting installation procedures.

Chapter Highlights

In this Chapter the following NAU unpacking and installation information is provided.

Unpacking and Inspection

Description

This section provides the steps to follow when receiving and unpacking the Advance Network Access Unit (NAU).

Receipt of NAU

When NAU is received, examine the shipping container for evidence of external damage. Outside damage may be an indicator of damage to the NAU. Record any external damage.

Unpacking

Open the carton containing the NAU and remove all internal and packing material. Carefully remove the unit from the carton and inspect it for damage that may have occurred during transportation. Carefully examine shipped contents with those listed on the Bill of Lading. All items should match those on the Bill of Lading.

Perform the following inspections:

- Inspect NAU exterior for dents, chipped paint, scratches etc.
- Open NAU hinged top cover and visually inspect interior mounted assemblies, connectors and any installed CAN boards.
- If NAU is to be rack or wall mounted, be certain the proper mounting hardware is provided.
- Inspect installed CAN board field wiring connectors and wire openings. There must not be any damage to these connectors. Damaged connector(s) will impair NAU operation.
- Check internal power supply AC power connector and voltage selector switch for damage.

Reporting Damage

If there is any evidence of damage to the shipping carton or the NAU, notify your local Siemens representative. Keep all shipping materials as evidence of damage for carrier's inspection. Immediately contact your representative who will arrange for immediate repair or replacement. The Customer Service department can be contacted using the contact information for Support at the beginning of this manual.

Wall or Rack Mounting Installation

Instructions

The Advance Network Access Unit (NAU) should be:

- Installed in a location that is as free from shock and vibration
- Protected from direct sunlight and extreme temperatures.
- It is recommended that the NAU be mounted within a shelter. This prevents NAU from being exposed to outside environmental conditions.

Package Configurations

The NAU is available in two models;

- Wall mount unit
- 19-inch rack unit

Wall Mounting

The mounting wall must be capable of supporting the weight of the **NAU**; see Chapter 1, Specifications and Figures 1-2 through 1-3.

Wall Mount Unit: Use four, 5/16-inch (M8) or 3/8-inch (M10) lag bolts to mount the NAU to the wall. Mounting bolts must be secured to solid wall construction members such as studs and into the wall only. Allow adequate clearance on the left side to allow the door to swing open.

Optional Conduit Connection Box

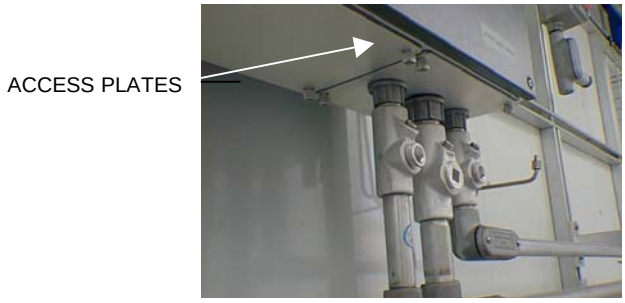
If your wall mounted NAU unit has a Conduit Connection Box, holes must be drilled into the side or bottom of the box to accommodate the moisture protected cable glands or conduit fittings.

Routing Cables

Cable routing and entry must be done in accordance with the local safety practices and regulations.

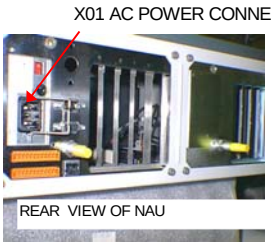
Always use the correct sized compression fitting for the size cable being run. Alternatively, all cabling may be installed in conduit, which is fit or adapted to the safe wiring box as required in the field.

Two removable access plates provide power and I/O entry through the underside of the NAU. The plates can be punched to accommodate conduit or cable gland connectors



NAU SYSCON Connections

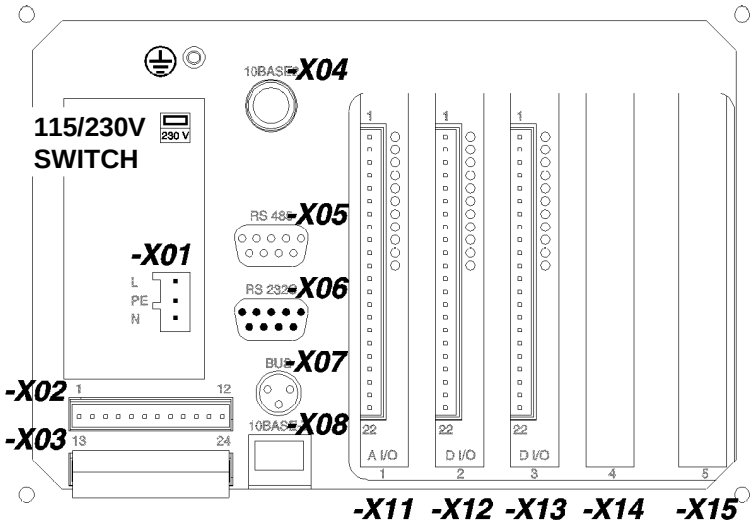
Description



This section shows the connections to the NAU System Controller (SYSCON). The SYSCON connections are visible at the rear of the NAU. If you are installing a wall-mounted unit you must first remove the front or side covers to see the SYSCON connections.

Figure 2-1: Electronic Module Connections

The connections to SYSCON are shown below. Applicable I/O connection diagrams are shown on the following pages.

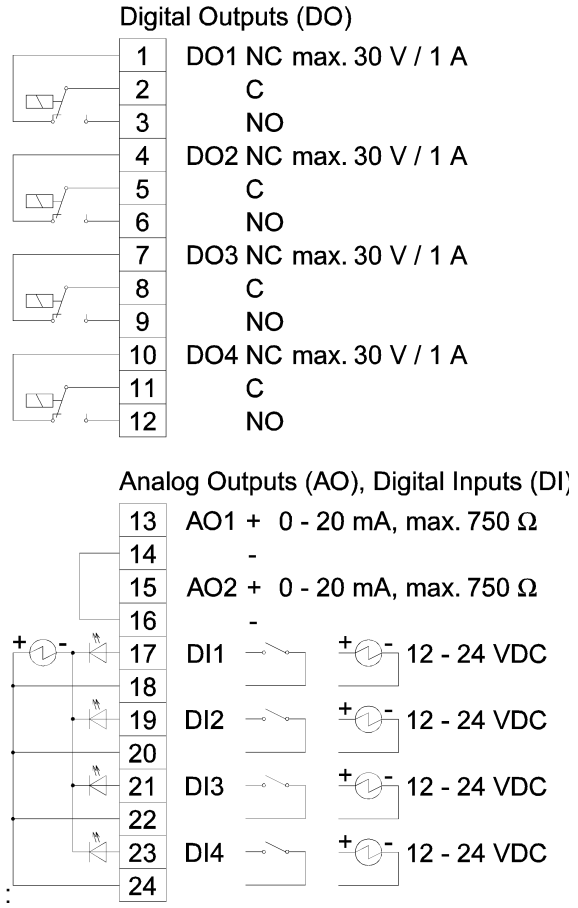


-X01 115 VAC or 230 VAC power supply
-X02 Digital outputs (system controller)
-X03 Analog outputs and digital inputs (system controller)
-X04 Ethernet 10BASE2
-X05 RS-485 port for MODBUS communications
-X06 RS-232C port connection for serial devices. For example a printer
-X07 System bus for add-on CAN Extension Unit
-X08 Ethernet 10BASE-T
-X11 ***-X15*** Analog and digital I/O boards
115/230 Switch 115-230 AC voltage selector switch.

Connection Diagrams

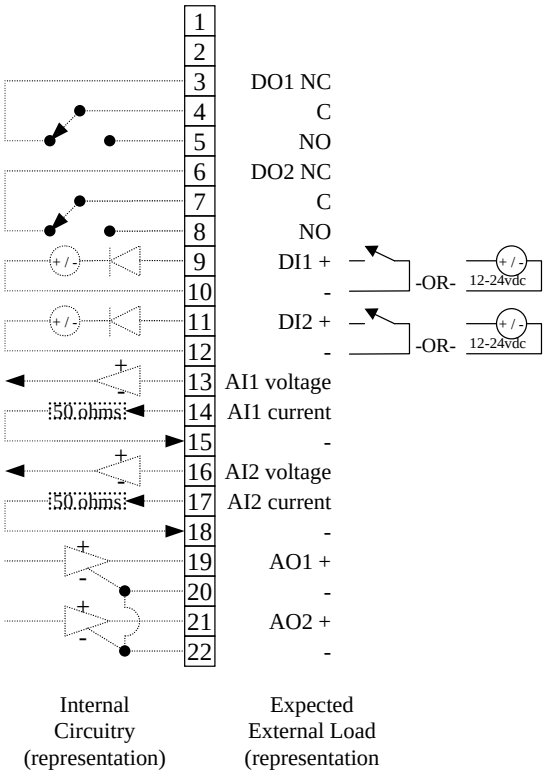
Figures 2-2 through 2-5 are connection diagrams for the NAU system controller and analog/digital boards show standard input and output pin layouts. The actual pin layouts with input and output signals in a delivered NAU will be shown in the applicable custom documentation package.

Figure 2-2: System Controller Connection Diagram -X02,XO3



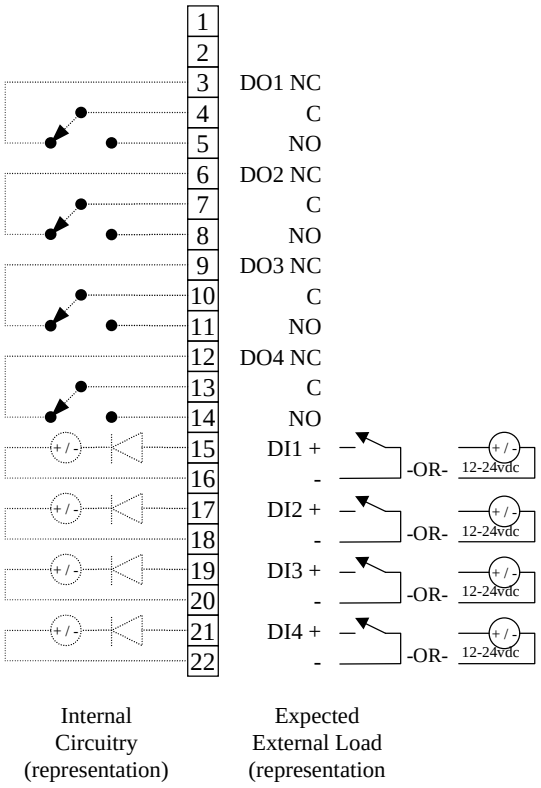
DO1-DO4	Digital Outputs: Floating double-throw contacts, max. contact load rating 30 V/1A. DO1 is not administrable and is dedicated to “Fault” (active when the SYSCON has an active alarm).
AO1-AO2	Analog Outputs: 0/4-20mA. Common negative pole, galvanically separated from ground, freely connectable to ground, max. gain vs. local protective ground potential 50 B, max. working resistance 75 ohms.
DI1-DI4	Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole
Design	Two 12-pin terminal strips for braided or solid conductors with a maximum section of 1.5 mm^2 or 16 AWG.

Figure 2-3: CAN Combination Analog Digital I/O Board Connection Diagram -X11-X15



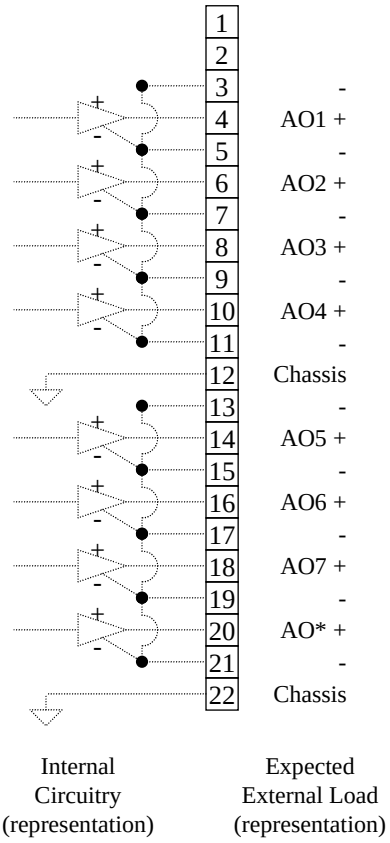
DO1-DO2	Digital Outputs: Floating double-throw contacts, max. contact load rating 30 V/1A
DI1-DI2	Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole
AI1-AI2	Analog Inputs: -20 to +20 mA into 50 ohms or -10 to +10V, R_{10}= 1 M-ohm, mutually isolated to 10 V
AO1-AO2	Analog Outputs: 0/4-20mA. Common negative pole, galvanically separated from ground, freely connectable to ground, max. gain vs. local protective ground potential 50 B, max. working resistance 750 ohms.
Design	One 22-pin terminal strips for braided or solid conductors with a maximum section of 1.5 mm^2 or 16 AWG.

Figure 2-4: CAN Digital I/O Board Connection Diagram -X11- X15



DO1-DO4	Digital Outputs: Floating double-throw contacts, max. contact load rating 30 V/1A
DI1-DI4	Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole.
Design	One 22-pin terminal strips for braided or solid conductors with a maximum section of 1.5 mm^2 or 16 AWG.

Figure 2-5: 8 CAN Analog Output Board Connection Diagram X11-X15



A01-A08	Analog Outputs: 0/4-20mA. Common negative pole, galvanically separated from ground, freely connectable to ground, max. gain vs. local protective ground potential 50 B, max. working resistance 750 ohms.
Design	One 22-pin terminal strips for braided or solid conductors with a maximum section of 1.5 mm^2 or 16 AWG.

I²C Analog I/O Board (AIO) Connections

Circuits on the AIO board are wired as shown in the following table. The table is the view is as seen when looking at the connector while the board is installed.

AIO I²C Wire Side View					
Lead	Pin			Pin	Lead
AI8 -10V	2	∎	∎	1	AI8 +10V
AI7 -10V	4	∎	∎	3	AI7 +10V
AI6 -10V	6	∎	∎	5	AI6 +10V
AI5 -10V	8	∎	∎	7	AI5 +10V
AI4 -10V	10	∎	∎	9	AI4 +10V
AI3 -10V	12	∎	∎	11	AI3 +10V
AI2 -10V	14	∎	∎	13	AI2 +10V
AI1 -10V	16	∎	∎	15	AI1 +10V
AO_GND	18	∎	∎	17	AO8 Current
AO_GND	20	∎	∎	19	AO7 Current
AO_GND	22	∎	∎	21	AO6 Current
AO_GND	24	∎	∎	23	AO5 Current
AO_GND	26	∎	∎	25	AO4 Current
AO_GND	28	∎	∎	27	AO3 Current
AO_GND	30	∎	∎	29	AO2 Current
AO_GND	32	∎	∎	31	AO1 Current
DI Common	34	∎	∎	33	DI2 Signal
DI Common	36	∎	∎	35	DI1 Signal

Analog Inputs: -20 to +20 mA into 50 ohms or -10 to +10V, R_{10}=1 M-ohm, mutually isolated 10 V

Analog Outputs: 0/4-20 mA. Common negative pole, galvanically separated from ground, freely connectable to ground, max. gain vs. local protective ground potential 50B, max. working resistance 750 ohms.

Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole.

Design: Terminal strips for braided or solid conductors with a maximum diameter of 1.5 mm or 16 AWG.

Table 2-1: I²C AIO Board Connection Diagram -X10 - -X11

I²C Digital I/O Board (DIO) Connections

Circuits on the DIO board are wired as shown in the following table. The table is the view is as seen when looking at the connector while the board is installed.

DIO I²C Wire Side View					
Lead	**Pin**			**Pin**	**Lead**
DI Common	2	∎	∎	1	DI6 Signal
DI Common	4	∎	∎	3	DI5 Signal
DI Common	6	∎	∎	5	DI4 Signal
DI Common	8	∎	∎	7	DI3 Signal
DI Common	10	∎	∎	9	DI2 Signal
DI Common	12	∎	∎	11	DI1 Signal
DO8 C	14	∎	∎	13	DO8 NC
DO7 NC	16	∎	∎	15	DO8 NO
DO7 NO	18	∎	∎	17	DO7 C
DO6 C	20	∎	∎	19	DO6 NC
DO5 NC	22	∎	∎	21	DO6 NO
DO5 NO	24	∎	∎	23	DO5 C
DO4 C	26	∎	∎	25	DO4 NC
DO3 NC	28	∎	∎	27	DO4 NO
DO3 NO	30	∎	∎	29	DO3 C
DO2 C	32	∎	∎	31	DO2 NC
DO1 NC	34	∎	∎	33	DO2 NO
DO1 NO	36	∎	∎	35	DO1 C

Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole.

Digital Outputs: Digital Outputs: Floating double-throw contacts, max. contact load rating 30 V/1A

The DOs are rated for 1A resistive load. Inductive loads are different. A DO should not drive an inductive load greater than 0.5A. The typical block and bleed application, which uses two parallel solenoids at 0.4A each, should use separate DOs to drive each solenoid. Each DO connected to a solenoid should have a diode to suppress the solenoid load.

Design: Terminal strips for braided or solid conductors with a maximum diameter of 1.5 mm or 16 AWG.

Table 2-2: I²C DIO Board Connection Diagram -X10 - -X11

I²C Analog and Digital I/O Board (ADIO)

Circuits on the ADIO board are wired as shown in the following table. The table is the view is as seen when looking at the connector while the board is installed.

ADIO I²C Wire Side View					
Lead	**Pin**			**Pin**	**Lead**
AI4 -10V	2	∎	∎	1	AI4 +10V
AI3 -10V	4	∎	∎	3	AI3 +10V
AI2 -10V	6	∎	∎	5	AI2 +10V
AI1 -10V	8	∎	∎	7	AI1 +10V
DI Common	10	∎	∎	9	DI4 Signal
DI Common	12	∎	∎	11	DI3 Signal
DI Common	14	∎	∎	13	DI2 Signal
DI Common	16	∎	∎	15	DI1 Signal
AO_GND	18	∎	∎	17	AO4 Current
AO_GND	20	∎	∎	19	AO3 Current
AO_GND	22	∎	∎	21	AO2 Current
AO_GND	24	∎	∎	23	AO1 Current
DO4 C	26	∎	∎	25	DO4 NC
DO3 NC	28	∎	∎	27	DO4 NO
DO3 NO	30	∎	∎	29	DO3 C
DO2 C	32	∎	∎	31	DO2 NC
DO1 NC	34	∎	∎	33	DO2 NO
DO1 NO	36	∎	∎	35	DO1 C

Analog Inputs: -20 to +20 mA into 50 ohms or -10 to +10V, R_{10}=1 M-ohm, mutually isolated 10 V

Analog Outputs: 0/4-20 mA. Common negative pole, galvanically separated from ground, freely connectable to ground, max. gain vs. local protective ground potential 50B, max. working resistance 750 ohms.

Digital Inputs: Optocoupler with internal 12-24 VDC power supply, switchable with floating contacts; alternative: switchable with external voltage 12-24 VDC, common negative pole.

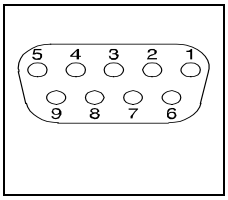
Digital Outputs: Digital Outputs: Floating double-throw contacts, max. contact load rating 30 V/1A

Design: Terminal strips for braided or solid conductors with a maximum diameter of 1.5 mm or 16 AWG.

Table 2-3: I²C ADIO Board Connection Diagram -X10 - -X11

NAU SYSCON Connections, Continued

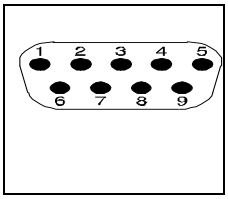
RS-485 Port -X05



2 RTxD–
3 RTxD+
5 GND

Design: 9-pin Sub D female connector

RS-232C Port -X06



2 RxD
3 TxD
5 GND

Design: 9-pin Sub D male connector

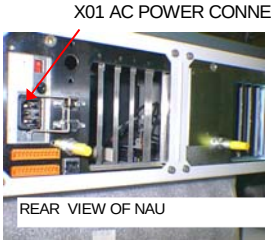
RJ45 Ethernet 10BaseT Port X-08

1 10TT+
2 10TT–
3 10TR+
6 10TR–

Design: 8-pin RJ45 Jack
Using Pairs 2 & 3

NAU SYSCON2 Connections

Description

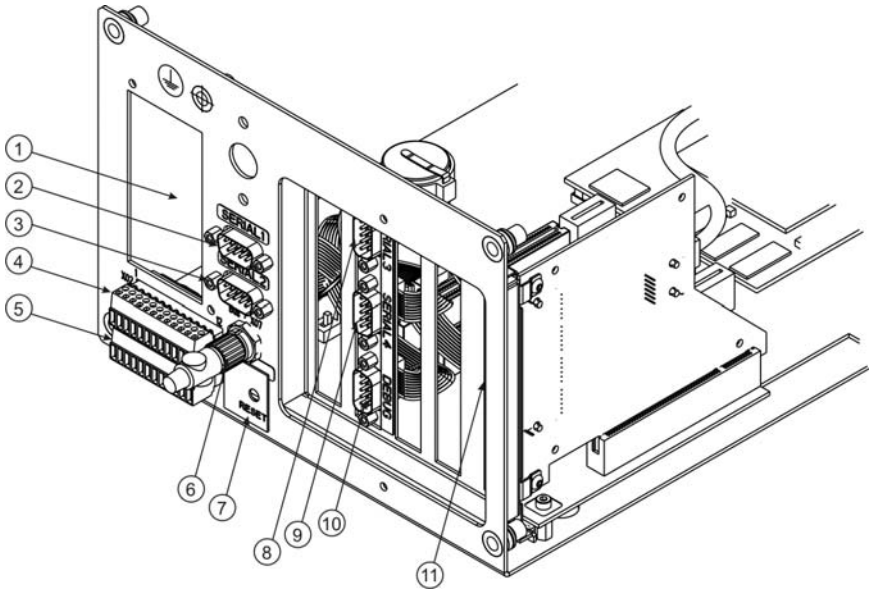


This section shows differences in connections between the NAU System Controller (SYSCON) and version 2 of the System Controller (SYSCON2). Because many of the connections between the two versions of the board are similar, only the differences are described in this section.

The primary difference between original SYSCON and SYSCON2 is that there are more connection options. There are four serial ports on the SYSCON2 compared to two on the original SYSCON. These four ports are each configurable for either RS-232 or RS-485 (compared to one of each for the original SYSCON). In addition, there are four external Ethernet connections in the SYSCON2 compared to one in the original SYSCON.

Figure 2-6: Electronic Module Connections

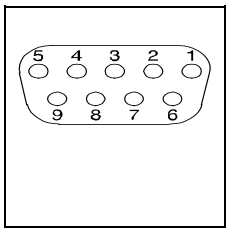
The connections to NAU SYSCON2 are shown below. Applicable I/O connection diagrams are shown on the following pages.



1	115 VAC or 230 VAC power supply
2	Serial Port 1 (Modbus)
3	Serial Port 2 (e.g. Printer)
4	Digital outputs (system controller)
5	Analog outputs and digital inputs (system controller)
6	System bus for add-on CAN Extension Unit
7	SYSCON2 Reset
8	Serial Port 3 (Future)
9	Serial Port 4 (Future)
10	SYSCON2 Debug
11	Ethernet Switch Board (External Ethernet)
Other	Slots 1, 3, 4 (counting from left) Analog and digital I/O boards

RS-485 Port

The only connection that wires differently between the original SYSCON and the SYSCON2 is the RS-485 connection (configurable as any of the serial ports). All serial connectors are male (compared to female for the RS-485 port in the original SYSCON). This connector also has a different pinout than for the original SYSCON. Pinout of the connector when configured as RS-485 is below.



2 5 V Power
3 RTxD+ (RS-485A)
5 GND
8 RTxD– (RS-485B)

Design: 9-pin Sub D male connector

AC Power (Mains) Connections

Description

The NAU power supply requires an input voltage of 115 VAC or 230 VAC.

Specifications

Input Voltage	85-115-140 VAC or 185-230-250 VAC 47-63 Hz
Output Voltage	24VDC + - 5%
Input Current	max. 1.9A at 115 VAC, max. 1.1 at 230 VAC
Power Consumption	approximately 200 VA
Fuse	G fuse element per IED 127 2, 4A rating, slow-blow for both 115 VAC and 230 VAC
Line Power connection	3-pin grounded instrument connector per IEC 320

CAUTION

Follow all applicable national, state and local safety regulations for the installation and operation of the NAU.

Connecting AC Power

It is not necessary for the customer to provide external primary AC power and a circuit breaker for the NAU. Primary AC power can be directly connected to the internal NAU power supply connector from an AC wall outlet in close proximity to the NAU. However, it is recommended that the AC power source be protected by a circuit breaker.

Circuit Breaker

The circuit breaker must be rated for 117 VAC (100 to 130 VAC) and 230 VAC (195 to 260 VAC), 47 to 63 Hz, Single phase, grounded neutral. A 15-amp fuse must be installed in the circuit breaker.

Wall Mounted Unit With Conduit Connection Box

Cables must be run through compression fittings installed in the bottom or side of the Conduit Connection Box. When the compression fitting is tightened, it will secure the cable and prevent it from being pulled out from its SYSCON connector. The compression fitting openings that are drilled into the box must be suitable for the size cables being routed.

Installing AC Power

The following procedures should be followed for connecting primary AC wiring to the NAU.

Procedures

Step	Procedure
1.	Turn off primary AC power to this location.
2.	If unit is equipped with conduit connection box go to step 3. If not perform this step and go to step 5. Remove wiring access plate. Punch holes as required for either conduit or cable gland connectors. Install connectors and replace the plate.
3.	**Wall Mounted Units With Conduit Connection Box**. Remove the Conduit Connection Box cover by loosening the 2 fastening screws. 
4.	**Wall Mounted Units With Conduit Connection Box**. Drill holes in side of box to accommodate conduit or cable gland connectors. If desired, entry can be made from underside of Conduit Connection Box. Simply remove the desired knock out.
5.	Install a 15-Ampere circuit breaker, disconnect switch or a receptacle in the power supply line or a switched receptacle near the NAU unit to make sure the unit can be completely separated from the power source. Label the breaker or receptacle box to make sure that the circuit is clearly identifiable.
6.	Route input power cord, in accordance with pertinent electrical codes and regulations to the NAU power supply.
7.	Loosen upper right corner mounting screw located on the power supply. Connect ground wire to this location. After connecting ground wire, securely tighten mounting screw.

AC Power (Mains) Connections, Continued

Step	Procedure
7.	Set the 115/230 VAC voltage selector switch to be compatible with the primary AC voltage; see Figure 2-1.
8.	Connect the power cord to the power supply receptacle and secure it with the clip; see Figure 2-1.
9.	**Wall Mounted Unit With Conduit Connection Box.** Open the front Conduit Connection Box cover, and ensure that the internal ground strap is securely tightened. **This ground strap grounds the cover to the Box which is then grounded to the NAU. This strap MUST NOT be disconnected.**
10.	Primary AC power can now be applied to the NAU.

Ethernet Connections

Description

This section provides information for connecting Ethernet RJ-45 wiring to the NAU installed SYSCON. Refer to Figure 2-1 for connector location.

External Ethernet Connector

Refer to the appropriate previous section (SYSCON or SYSCON2) for location of the external ethernet connector. To access the wall mounted units, the safety wiring box cover must be removed to see the connector.

External Ethernet Data Cable

The external ethernet data cable requires a minimum of two twisted pair. One pair is for transmission and the other pair for receiving. The cable should conform to the following specifications:

Function	Specifications
Data Rate	10Mbits/sec (original SYSCON) 10 or 100 Mbits/sec autonegotiating (SYSCON2)
Maximum Cable Length	Per Ethernet Specifications
Maximum Length to Adapter Concentrator/Hub	328 feet (100 meters)
Cable Type (minimum required)	AT&T D-Inside wire (DIW & PDS, IBM Type 3, Category 3 or 5 Data Grade Cabling)

NOTE

The maximum length of 10BaseT data cable can not exceed 328 feet (100 meters). To increase this distance, the cable must be connected to a hub or other type of repeater/medium converter.

Data Cable Terminator

A 10BaseT male RJ-45 terminator connector is required on the end of the 10BaseT data cable. The following table shows the RJ-45 wiring connections.

Pin No.	Function
1	10TT+
2	10TT-
3	10TR+
4	NC
5	NC
6	10TR-
7	NC
8	NC

Wall Mounted Unit With Conduit Connection Box

Cables must be run through compression fittings installed in the bottom or side of the Conduit Connection Box. When the compression fitting is tightened, it will secure the cable and prevent it from being pulled out from its SYSCON connector. The compression fitting openings that are drilled into the box must be suitable for the size cables being routed.

Cable Installation

The following procedures should be followed when installing Ethernet data cable:

Procedures

Step	Procedure
1.	Before installing cable, turn NAU AC power OFF.

NOTE

Refer to above section, Data Cable Terminator for RJ-45 wiring configuration.

2.	Feed cable through the compression fitting see page 27, leaving sufficient cable length within the Conduit Connection. Leave enough cable to allow connection of cable connector and to remove cable tension; tighten fitting.
3.	Plug connector in correct jack in the SYSCON or SYSCON2 Ethernet Switch.
4.	Turn NAU AC power ON.

RS-232C or RS-485 Serial Connections

Description

This section provides information for making connections to the NAU installed SYSCON RS-232C and RS-485 serial port connectors. Refer to the appropriate previous section (SYSCON or SYSCON2) for connector locations.

Wall Mounted Unit Cable Compression Fittings

Cables must be run through compression fittings installed in the bottom or side of the Conduit Connection Box. When the compression fitting is tightened, it will secure the cable and prevent it from being pulled out from its SYSCON connector. The compression fitting openings that are drilled into the box must be suitable for the size cables being run.

The maximum line length is 3937 feet (1200 meters) for RS-485 and 49 feet (15 meters) for RS-232.

Serial Port Cable Installation

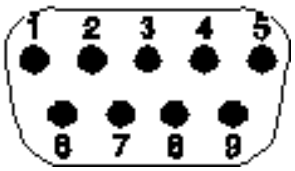
The following procedures should be followed when installing serial port data cable:

Procedures

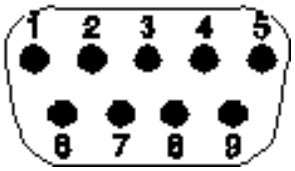
Step	Procedure
1.	Before installing RS-232 and/or RS-485 connector(s), turn NAU AC power OFF.
2.	Feed serial cable through the compression fitting, leaving sufficient cable length within the Conduit Connection Box, leave enough cable to allow connecting of RS-232C and/or RS-485 connector and to remove cable tension; tighten fitting.
5.	Identify which cable is the RS-232C and which is the RS-485.
6.	Plug RS-232-C and/or RS-485 connector in appropriate SYSCON serial port connectors (for SYSCON2, refer to the database to determine which connectors are configured as RS-232 and which are RS-485).
7.	Turn NAU AC power ON.

Cable Connections

Refer to the following Tables for RS-232C and/or RS-485 connector wiring configurations if making a cable.



RS-485 Serial Connections		
Pin No.	**Function (original SYSCON)**	**Function (SYSCON2)**
1	NC	NC
2	RTxD- (RS-485B)	5 V Power
3	RTxD+ (RS-485A)	RTxD+ (RS-485A)
4	NC	NC
5	GND	GND
6	NC	NC
7	NC	NC
8	NC	RTxD- (RS-485B)
9	NC	NC
Connector Type	Female	Male



RS-232 Serial Connections	
Pin No.	**Function**
1	DCD
2	RxD
3	TxD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

I/O Connections

Description

This section is intended for installation personnel and contains instructions for making external connections to the I/O Modules.

CAUTION

Follow local regulations on installing and connecting electrical wiring.

Locate the signal control and interface lines separately from the power supply line.

Route the analog and digital leads separately.

Wall Mount Units. Carefully plan the arrangement of the signal lines in the cables as well as the use of safety box connector openings.

Material Required

Selection of the required wire gauge depends on:

- Line Length
- Planned Current Load

The maximum conductor section is 1.5 mm^2, or 16 AWG.

The matching plug-in field wiring connectors for each I/O board are supplied with the unit. All wiring connections are made to these connectors, which plug into each I/O board.

CE Installations

Required for all CE (Conformite Europeean) installations.

The user must determine if the heavy industrial conducted immunity requirements are pertinent to the installation and application. If the requirements are pertinent then:

- All Digital Output (DO) lines with inductive loads must have transient suppression at the inductive load.

- All Analog Output (AO) lines must be terminated in a load that is CE/EMC certified to meet the heavy industrial conducted immunity requirements. All other CE requirements are met with standard/normal termination.

Wiring Connections

Proceed as follows to connect the signal, control and interface wiring to the NAU installed I/O boards.

Wall Mount Units

Step	Procedure
1.	Before installing cable, turn NAU AC power switch OFF.
2.	Feed cable through the compression fitting, leaving sufficient cable length within the Conduit Connection Box. Leave enough cable to allow connection of cable connector and to remove cable tension; tighten fitting.
3.	Make all wiring connections to the I/O board plug-in field wiring connector in accordance with the applicable wiring diagram; see Chapter 2. Installation, NAU SYSCON Connections, page 15. Ensure that the screw lug for each connection is securely tightened.
4.	Plug the field wiring connector into correct I/O board.
5.	Turn NAU AC power ON

Rack Mount Units

Step	Procedure
1.	Before installing cable, turn NAU AC power OFF.
2.	Make the wiring connections to the I/O board plug-in field wiring connector in accordance with the applicable wiring diagram; see Chapter 2. Installation, NAU SYSCON Connections, page 15. Ensure that the screw lug for each connection is securely tightened.
3.	Plug the field plug-in connector into correct I/O board.
4.	Turn NAU AC power ON.

Removing or Replacing CAN I/O Boards

Description

This section should only be used by maintenance personnel when adding, removing or replacing a CAN I/O module. All factory installed CAN I/O Modules have been pre-configured at the factory. I2C I/O modules auto-configure when they are installed (refer back to switch

IMPORTANT

This procedure configures the analyzer software to recognize the addition, deletion, or change-out of a CAN Module within an analyzer system. It does not assign it to an application. All CAN I/Os must be configured for use within an application from the Advance System Manager software; see Advance System Manager, online Application I/O help file.

Serial Number

A serial number label affixed to each CAN I/O Board. This 14-digit serial number is used in the following procedure when adding or replacing a module. The serial number contains the following information.

002 00000012301

- Module Serial Number
- Module Type
  - 002 Analog I/O Board
  - 003 Digital I/O Board
  - 007 AO8 Board

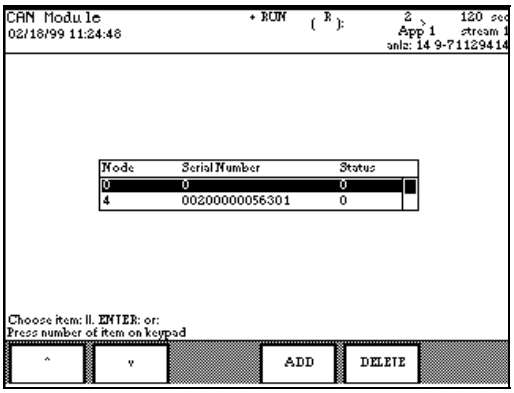
Node Number

A node number is assigned to each CAN I/O Board when it is installed in a Maxum, CAN Extension Unit, or Network Access Unit. Because of the assigned node number, a CAN Module can be placed in any board slot within these units. Node numbers cannot be duplicated within any analyzer system. The node number can be any 1 to 3-digit number but cannot be or start with a ‘0’.

SYSCON Can Module Slots

There are only four slots available on the SYSCON module for CAN cards. The fifth slot does not have a CAN card connector.

Instructions

Step	Description
1.	Ensure that the HMI is connected to the analyzer system to which the CAN Module was added or removed.
2.	Go to the **CAN Module** screen. **Configure Menu →SYSTEM I/O→CAN MODULES** 
3.	Make a selection from the following Table. To……. / THEN…….. ADD a CAN Module / Go To Step 4. Delete a CAN Module / Use ▲ ▼ to select the Module and press DELETE.

Steps 4 through 7 adds a CAN Module to the system.

Step	Description
4.	Release 4.3 or below: Press ADD softkey. The CAN entry dialogue screen will appear. Release 5.0 and above: Select the line corresponding to the desired node number and Press the ADD softkey. The CAN entry dialog line will appear at the bottom of the screen.
5.	Enter the 14-digit Module serial number of the added CAN Module.
6.	Release 4.3 or below: Press **Next Field** softkey to highlight **Node** field and enter a node number for the module. Check Your Node Number You can return to the CAN Module screen and verify that the number you selected is not already in use; simply press BACK softkey.
7.	Press **DONE** softkey (Rel 4.3 or below) or the ACCEPT CHANGE softkey (Rel 5.0 or higher). The CAN Module screen will appear with the added CAN Module. The added CAN I/Os must now be added to an application using the Advance System Manager software; see Advance System Manager, online Application I/O help file.

Removing or Replacing I²C I/O Boards

Description

This section provides the user with information needed to add or replace I²C I/O modules. I²C I/O modules auto-configure in the NAU database when they are installed and powered up, using the ID based on the DIP switch settings.

I²C I/O Board DI Mode Switch

For the I²C I/O boards that contain digital inputs (DIs) switch SW1 located at the top of the board near the front (connector end) controls the mode setting for the on-board DIs. The switch sets the mode for all DI circuits on the board (mixing of modes on a board is not allowed). The available options are Default/Sink and Legacy (see back side of board for diagram of setting). The Legacy option is designed to adjust for a non-standard configuration that may be in use on some systems. The Mode switch should be set to Mode 2 unless instructed differently by Siemens.

I²C I/O Board Status LEDs

Three status LEDs have been included on each I2C I/O board. These LEDs are visible on the top front of the board. The LEDs follow the Maxum standard as follows:

- LED1 (Fault) - When lit, the bottom (red) LED indicates that the board has a fault.
- LED2 (Warn) - When lit, the middle (yellow) LED indicates that there is a warning status for the board.
- LED3 (Norm) - The bottom (green) LED indicates that the board is powered when lit. When this is the only LED illuminated, then the board is operating normally.

I²C Bus Connections on I²C I/O Boards

There are two standard I²C bus connections on the top of each I²C I/O board. Either of these connections may be used as either a bus input or bus extension connection. In this manner the I²C bus can daisy-chain from one board to another or to other I²C devices.

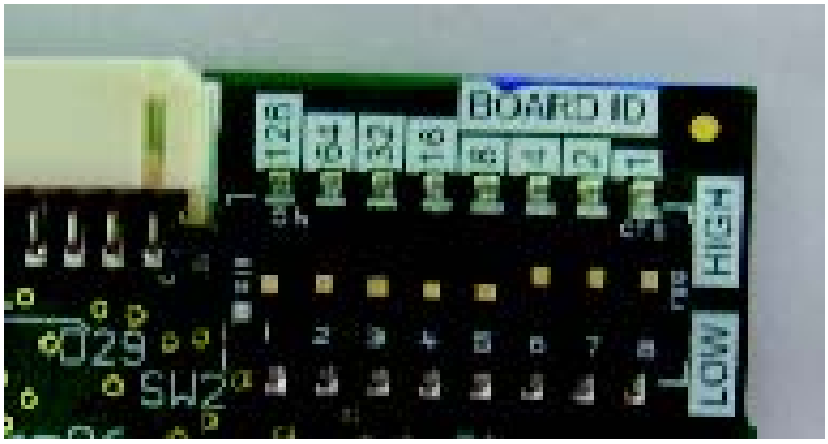
I²C I/O Board Address DIP Switches

The I²C I/O boards use an 8-bit board identification number as an address on the I²C bus. The address is a hex number from 00 to FF, corresponding to a decimal number from 0 to 255. Address numbers from 1 to 254 are used (numbers 0 and 255 are reserved).

DIP switches are used to set the address for the physical board. Older CAN I/O boards require that a user enter a MAC address that programmed onto an individual board. This necessitated the user changing the Maxum database whenever replacing a board. With the I2C I/O boards, a user only needs to set the switches on the new board to match the old board being replaced.

The DIP switches used to set the address are on the top back part of the board and are labeled BOARD ID. Together, the DIP switches correspond to an 8 bit binary number that is set to match the board address. Each switch is labeled for the binary digit it represents, and setting a switch is equivalent to setting that bit to 1. For example, if the switches for 1, 2, and 4 are set, then the board ID would be 1+2+4 = 7.

Figure 2-7: I²C I/O Address Switches



Chapter 3

Troubleshooting

Overview

Description

This Chapter is intended for maintenance personnel.

This Chapter provides troubleshooting procedures for the CAN I/O boards for the Network Analyzer Unit (NAU).

Read This

If a circuit board is found to be faulty and needs to be replaced, refer to Chapter 4 for Siemens return policy.

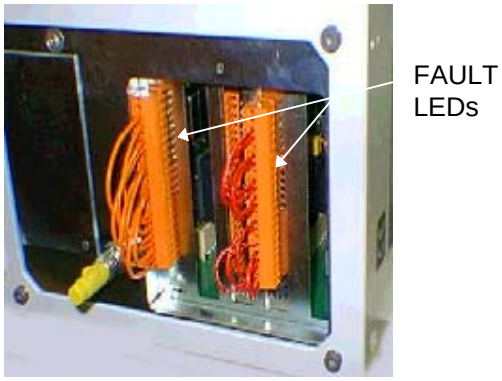
Chapter Highlights

This Chapter covers the following topics:

Location of Fault LEDs

Observing the installed board(s) from rear of NAU, status LEDs are numbered sequentially starting with #1 LED being at the upper edge of board. LED's are located behind installed board field wiring connectors; see Figure 3-1 for LEDs description.

Figure 3-1: NAU LED Status Light Location



AO8 Board

AO8 Board provides 3-LED troubleshooting status lights. The status lights provide information on what functions occur when a status light is illuminated. Status lights illuminate orange, red or green.

A/O Functions

Clear: Analog outputs are reset to 0-m/A during Gas Chromatograph start-up. This also occurs for bus-disruption.

Error Detect: Each output cable carries low micro-amps of minimum current. Two outputs share a common error signal such as AO1 with AO2, AO3 with AO4 etc.

Table 3-1: AO8 Status LEDs

The ON color state of the LED's indicate status of function.

LED Board Position	Light Color	Signal	LED Function
1	Orange	----------	Maintenance Request
2	Red	----------	Failure
3	Green	Power	Power Supply to Microprocessor is Correct

Table 3-2: AO8 Board Terminations

Field Termination connector pin orientation is on the left side when viewing the pins. Pin 1 is at top.

Connector Pin	Signal	Output
1	Not Used	----------
2	Not Used	----------
3	Output, Analog #1 to #4	Common
4	Output, Analog #1	Low Current, + Signal
5	Output, Analog #1 to #4	Common
6	Output, Analog #2	Low Current, + Signal
7	Output, Analog #1 to #4	Common

Table 3-2: AO8 Board Terminations, Continued

Connector Pin	Signal	Output
8	Output, Analog #3	Low Current, + Signal
9	Output, Analog #1 to #4	Common
10	Output, Analog #4	Low Current, + Signal
11	Output, Analog #1 to #4	Common
12	----------	Chassis Ground
13	Output, Analog #5 to #8	Common
14	Output, Analog #5	Low Current, + Signal
15	Output, Analog #5 to #8	Common
16	Output, Analog #6	Low Current, + Signal
17	Output, Analog #5	Common
18	Output, Analog #7	Low Current, + Signal
19	Output, Analog #5 to #8	Common
20	Output, Analog #8	Low Current, + Signal
21	Output, Analog #1 to #8	Common
22	----------	Chassis Ground

Power Supply/CAN (4-Pin Orange Edge Connector)

The following is signal and voltage information for the Power Supply/ CAN.

Connector Pin	Signal
1	CAN High
2	CAN Low
3	Ground
4	+24 VDC

Edge Connector

The following is signal and voltage information pertaining to the Edge Connector.

Connector Pin	Signal
1&2	CAN High
3	CAN Low
4	Reserved
5&6	Common Ground
7&8	+24 VDC
9	Reserved
10	Reserved

DIO Board

Description

DIO Board provides 11 active LED troubleshooting status lights. The status lights provide information on what functions occur when a status light is illuminated. Status lights illuminate orange, red or green.

Optocoupler Inputs

Optocoupler inputs are driven either passive or active. Plus 24 VDC simple or external switches are connected to the inputs. All inputs are isolated and have a ground.

Table 3-3: DIO Status LEDs

The ON color state of the LED's indicate status of function.

LED Board Position	Light Color	Signal	LED Function
1	Orange	----------	Maintenance Request
2	Red	----------	Failure
3	Green	Power	Power Supply to Microprocessor is Correct
4	--------	----------	No Function
5	Orange	Relay Output #1	Relay is Active
6	Orange	Relay Output #1	Relay is Active
7	Orange	Relay Output #1	Relay is Active
8	Orange	Relay Output #1	Relay is Active
9	----------	----------	No Function
10	Orange	Optocoupler Input #1	Input is Active
11	Orange	Optocoupler Input #2	Input is Active
12	Orange	Optocoupler Input #3	Input is Active
13	Orange	Optocoupler Input #4	Input is Active

Table 3-4: Digital I/O Board Terminations

Field Termination connector pin orientation is on the left side when viewing the pins. Pin 1 is at top.

Connector Pin	Signal	Output
1	Reserved	----------
2	Reserved	----------
3	Output Relay #1	Normally Closed
4	Output Relay #1	Common
5	Output Relay #1	Normally Open
6	Output Relay #2	Normally Closed
7	Output Relay, #2	Common
8	Output Relay #2	Normally Open
9	Output Relay #3	Normally Closed
10	Output Relay #3	Common
11	Output Relay #3	Normally Closed
12	Output Relay #4	Normally Open
13	Output Relay #4	Common
14	Output Relay #4	Normally Closed
15	Input, Optocoupler #1	+ Signal
16	Input, Optocoupler	Common

Table 3-4: Digital I/O Board Terminations, Continued

Connector Pin	Signal	Output
17	Input, Optocoupler #2	+ Signal
18	Input, Optocoupler	Common
19	Input, Optocoupler #3	+ Signal
20	Input, Optocoupler	Common
21	Input, Optocoupler #4	+ Signal
22	Input, Optocoupler	Common

Power Supply/CAN Bus Interface (4-Pin Orange Edge Connector)

The following is signal and voltage information pertaining to the Power Supply/CAN.

Connector Pin	Signal
1	CAN High
2	CAN Low
3	Ground
4	+24 VDC

Edge Connector

The following is signal and voltage information pertaining to the Edge Connector.

Connector Pin	Signal
1&2	CAN High
3	CAN Low
4	Reserved
5&6	Common Ground
7&8	+24 VDC
9	Reserved
10	Reserved

Combination Analog/Digital I/O Board

Description

Analog/Digital I/O Board provides 8-LED troubleshooting status lights. The status lights provide maintenance personnel with the information on what functions occur when a status light is illuminated. Status lights illuminate red, green or orange.

Relay Outputs

Each board mounted relay requires 24 VDC @ 1 amp to energize. All relays are isolated against NAU chassis and each other.

Analog Optocoupler Inputs

Optocoupler inputs activate on current flow and become active when current is more that 4-mA's. Inputs contain internal voltage supply so that passive switches can easily be connected. Although Optocoupler inputs have a common ground, they are isolated against NAU chassis.

Table 3-5: Combination Analog/Digital Board I/O LEDs

The ON color state of the LED's indicate status of function.

LED Board Position	Light Color	Signal	LED Function
1	Orange	Maintenance Request	S.U.
2	Red	Failure	S.U.
3	Green	Power	Power Supply to Microprocessor is correct
4	None	----------	Reserved
5	Orange	Relay Output #1	Relay is Active
6	Orange	Relay Output #2	Relay is Active
7	Orange	Optocoupler Input #1	Input is Active
8	Orange	Optocoupler Input #2	Input is Active

Combination Analog/Digital I/O Board, Continued

Table 3-6: Combination Analog/Digital Board Terminations

Field Termination connector pin orientation is on the left side when viewing the pins.

Connector Pin	Signal	Output
1	----------	Not Used
2	----------	Not Used
3	Output Relay #1	Normally Closed
4	Output Relay #1	Ground
5	Output Relay #1	Normally Open
6	Output Relay #2	Normally Closed
7	Output Relay #2	Ground
8	Output Relay #2	Normally Open
9	Input, Optocoupler # 1 DI	+ Signal
10	Input, Optocoupler # 1 and 2	Common Ground
11	Input Optocoupler # 2	+ Signal
12	Input, Optocoupler #1 and #2	Common Ground
13	Input, Analog #1	+ Voltage
14	Input, Analog #1	Current
15	Input, Analog #1	Ground
16	Input, Analog #2	+Voltage
17	Input, Analog #2	Current
18	Input, Analog #2	Ground

Table 3-6: Combination Analog/Digital Board Terminations, Continued

Connector Pin	Signal	Output
19	Output, Analog #1	Current, +Signal
20	Output, Analog #1 and #2	Common Ground
21	Output, Analog #2	Current, +Signal
22	Output, Analog #1 and #2	Common Ground

Power Supply/CAN Bus Interface (4-Pin Orange Edge Connector)

The following table provides signal and voltage information for the Power Supply/CAN connector .

Connector Pin	Signal
1	CAN High
2	CAN Low
3	Ground
4	+24 VDC

Edge Connector

The following table provides signal and voltage information for the edge connector.

Table 3-7: Edge Connector

Connector Pin	Signal
1&2	CAN High
3&4	CAN Low
5&6	Common Ground
7&8	+24 VDC
9&10	Reserved

Chapter 4

Parts Catalog

Introduction

Overview

This chapter is intended for maintenance personnel.

The Chapter provides a list of replaceable parts and assemblies for the Advance Network Access Unit (NAU). Subsequent information includes how to remove and replace the replacement part or assemblies.

How to Place an Order

Parts can be ordered using the contact information at the beginning of this manual:

To ensure an immediate response to your request, you should provide the following:

- Purchase order number. If ordering by phone, a confirming P.O. should be sent.
- Address where the parts are to be shipped.
- Address where the invoice is to be sent.
- Part numbers as listed.
- Quantity needed of each part.
- Equipment Serial number or project number of the system (especially for warranty related orders).
- Preferred method of shipment.

Available Parts

Description

The available NAU assemblies and parts, with their applicable part number are shown below.

Part Description	Ordering Number
NAU Cable/Connector Kit	2020100-001
Optima Enclosure Hardware Kit	2020101-001
PCBA, NAU Back Plane	2015803-801
NAU SYSCON Board	2020110-001
SYSCON Interface Board (SIB for SYSCON2)	A5E02599488001
Communication and Control Board, version 3 (CAC3 for SYSCON2)	A5E02599492001
Maintenance Panel Kit	2020153-001
Fuse Kit	2020151-001
Power Supply Module	1700490-001
3-COM Ethernet Board	1161000-010
Advance Network Communication Board	2017568-801
Digital I/O Board	1700096-001
Combination CAN I/O (A/D 4)	1700095-001
Analog Output 8 (AO8)	1700605-001
KIT, I2C ADIO BOARD	A5E03660721001
KIT, I2C AIO BOARD	A5E03660722001
KIT, I2C DIO BOARD	A5E03660723001

Appendix 1

Advance Communications System

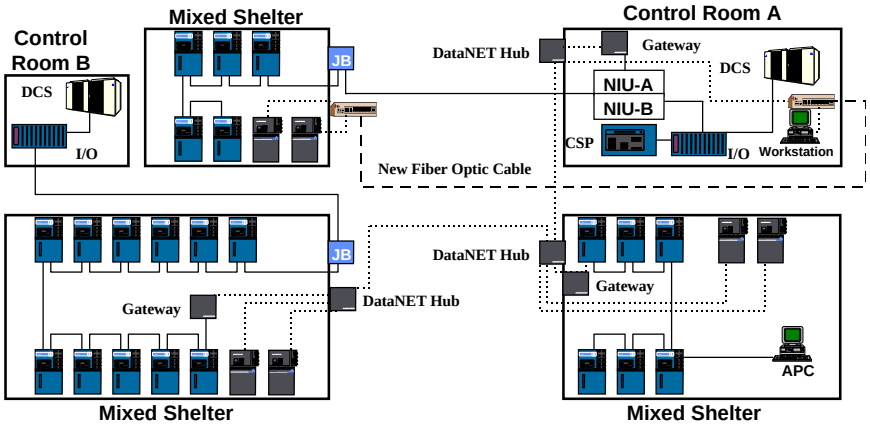
Overview

The Advance Communications System is used to connect a Maxum system to various communication networks including the Advance Data Hiway. This section provides an overview of the ACS and its components.

Network Connectivity

The Advance Communications System (ACS) communication uses industry standard protocols and provides high-speed communication among all devices. The ACS can function alone or may be connected to a Distributed Control System (DCS) or plant-wide Local Area Network (LAN). As with other company systems, the network has complete backward compatibility with all Advance Data Hiway systems.

Figure 1: Typical Network



Advance Data Hiway

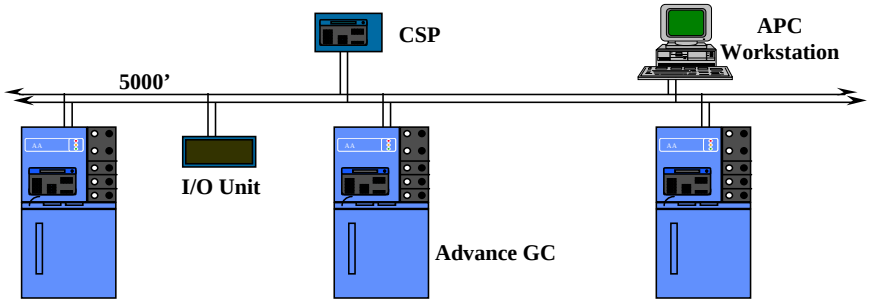
A Maxum GC installed networking board enables the analyzer to tie directly onto any existing Advance Data Hiway. The Maxum GC has a virtual **Loop** and **Unit** number assigned so it can read and write to the Data Hiway and Modbus links.

The Data Hiway provides two way communications between any Data Hiway connected device. Each Data Hiway installed Advance and every Maxum Gas Chromatograph (GC), Service Panel, APC Workstation and I/O device has its own unique address with an assigned specific **UNIT** number and **LOOP** number.

The Data Hiway provides input and output communications from any location on the Data Hiway as well as multiple locations. It provides a direct serial Modbus link to the plant DCS System.

With a Data Hiway network, communication occurs over a pair of twisted shielded pair cables which allows up to 31 devices to be connected into one network loop. This allowed for redundant communications. One cable is for channel A and one for channel B. Each loop can be up to 5,000 feet. Refer to Figure 2.

Figure 2: Typical Example of Advance Data Hiway



More Information

See Appendix 2. Connecting a Maxum to Advance Data Hiway

Ethernet Network

The Maxum GC has an Ethernet connection installed on the Electronic Enclosure rear SYSCON Control Assembly connector bracket. This connection is accessible when the Maxum GC Electronic Enclosure access door is opened. The Maxum GC is compatible with any standard Ethernet system and is fully compatible with Ethernet Hubs, Routers and cabling schemes. These include fiber optics and wireless techniques.

Each installed Maxum GC can be assigned an IP address without restrictions of an artificial numbering structure.

DataNET Network

The DataNET is based on Ethernet TCP/IP software protocol. It is fully redundant with dual cable paths and with Communication Hub dual power supplies. DataNET electronics is certified for use in NEC Division II and IEC (Cenelec) Zone 2 hazardous locations.

DataNET Hubs provide eight connection ports with an additional Ethernet port for interconnecting of DataNET and Ethernet segments. When using DataNET, for Maxum GC’s, it can use any interconnecting cable including the Data Hiway.

What is Gateway

The Advance Network Gateway Unit (ANG) provides the connection point between existing Advance Data Hiway and the Maxum GC Ethernet and DataNET networks. The unit is a translator for converting signal and communication protocols. This conversion allows Maxum GC's and Advance GC's to communicate with each other in addition to using each other's Distributed Control System (DCS) I/O links.

Advance Optichrom Service Panels and older APC workstations can display GC information over the Gateway link. They are, however, limited to only accessing and changing basic operational status. This data includes alarms, run/hold/calibrate, view, analysis results etc.

What is

The Network Access Unit (NAU) has the capability for controlling Advance and Maxum GC's from its HMI and to provide CAN I/O board expansion slots. The unit serves as the controller to receive messages on the Ethernet or DataNET and perform the following functions.

- Convert information to the appropriate messages for the local I/O boards on the CAN bus and
- Convey the information to the installed I/O boards over the CAN Bus.

Typical NAU Configuration

The two typical NAU configurations are as follows:

Complete Conversion to Ethernet with the installed Advance Plus Door and uses the NAU as the Link to the DCS System.

Complete Conversion to DataNET with the installed Advance Installation Plus Door and uses the NAU as the Link to the DCS System

Existing Configuration

Advance GC's in an Analyzer Shelter Communicating to Control Room DCS System.

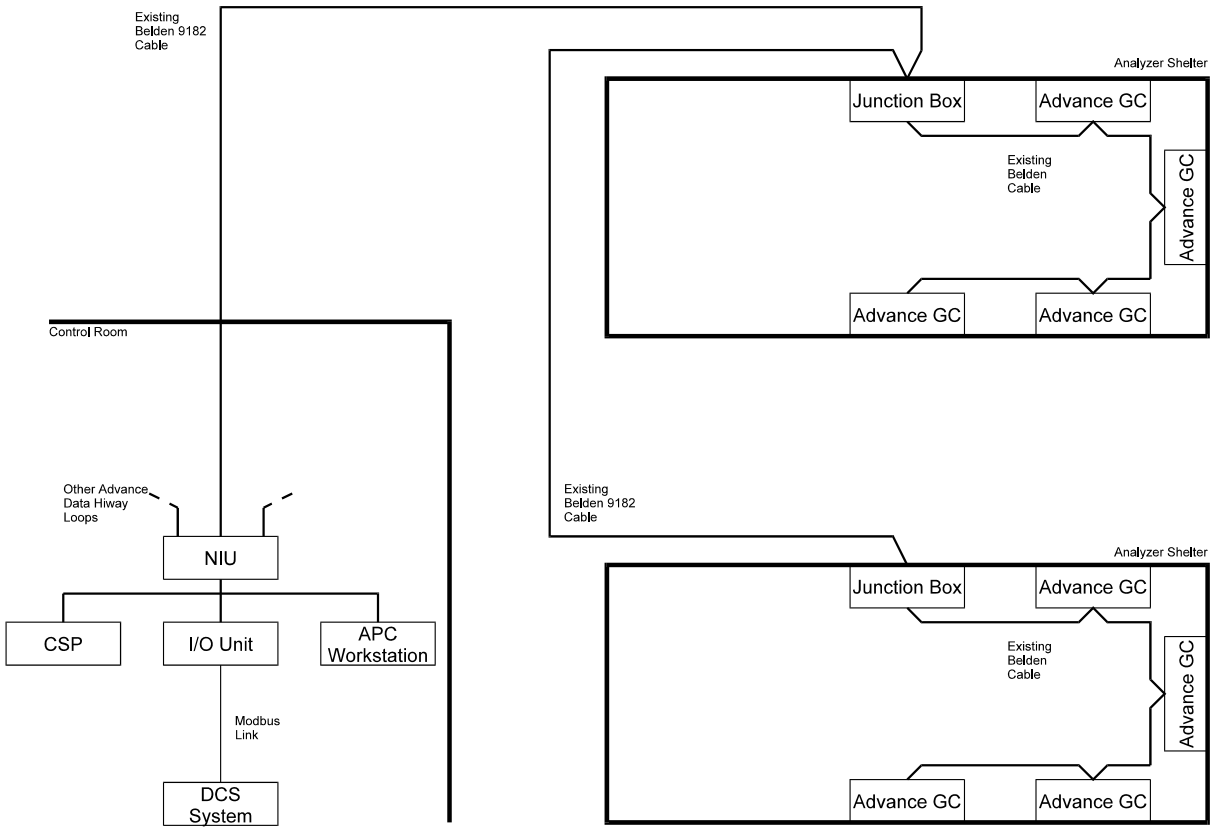
This is a basic Analyzer Shelter Advance GC installation. All Advance GC's are daisy-chained together using standard existing Advance Data Hiway Belden cable and Junction Box. Refer to Figure 2.

The terminating cable from the last Advance GC is terminated in the Junction Box. If additional Analyzer Shelters are installed, they are parallel connected to the last Analyzer Shelter Junction Box using standard Belden cable.

Analyzer Shelters are connected to the Control Room using standard existing Belden cable. The Control Room installed NIU connects the Advance GC's information to the I/O Unit and to the DCS System via the Modbus Link.

This configuration **does not** use DataNET or Ethernet Hubs.

Figure 3: Existing Installation



Advance GC's in Analyzer Shelter Communicating to DCS System in Control Room

Appendix 2

Connecting a Maxum to Advance Data Hiway

Overview

The Advance Communications System (ACS) is used to connect the Maxum system to various communication networks including the Advance Data Hiway. This section provides users with information on various ways to connect a Maxum to their existing Data Hiway installation. The Maxum Communication System provides the user with "*backward*" compatibility.

Configuration Options

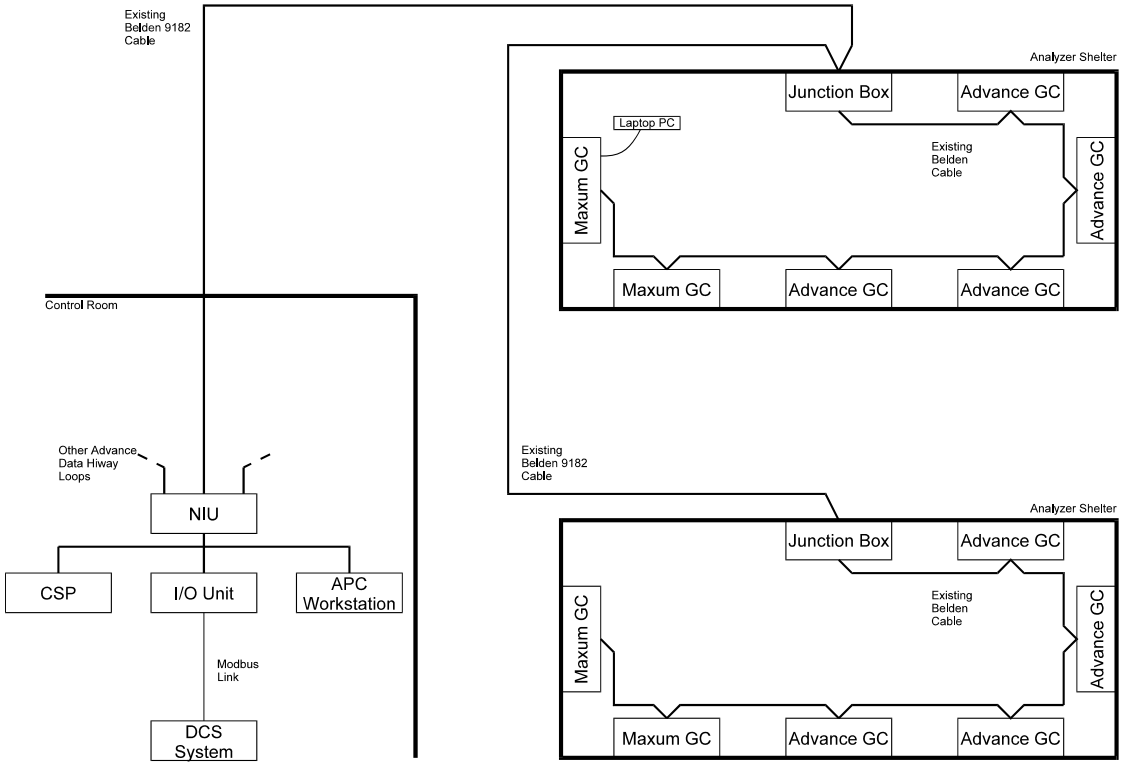
When evaluating each configuration, consider the following:

- Size of present system.
- Preference for keeping present wiring configuration and
- Future expansion requirements for interconnecting the entire
- Gas Chromatograph system into plant LAN and DCS Systems

Option	Function
1	Connect New Maxum GC's Directly to Existing ADH Using Installed ADH Card.
2	Two Separate Parallel Networks Merged in the Control Room via Installed Gateway.
3	Merge Existing Advance GC's into DataNET Inside Shelters and Use Existing Belden Cable to Control Room.
4	Conversion to DataNET with Advance Plus Door using existing link to DCS.
5	Conversion to Ethernet with Advance Plus Door using existing link to DCS.
6	Complete conversion to Ethernet with Advance Plus Door using NAU to link to DCS.
7	Complete conversion to DataNET with Advance Plus Door using NAU to link to DCS.
8	Blended system with the old Advance Data Hiway (via NIU) as well as both DataNET and Ethernet.

Option 1	**Connect New Maxum GC's Directly to Existing ADH Using Installed ADH Card**
Advantages	This is the simplest means for connecting a Maxum to the Advance Data Hiway (ADH). To use this option, the Maxum must have an ADH card installed in the SYSCON motherboard. Refer to Figure 1. Maxum Analyzers are wired exactly like Advance and can transmit analysis results over the existing link to the facilities DCS. Other devices on the network, such as CSPs and APCs are able to observe installed Maxum analyzers. This enables the user to view analysis results, start and stop analyzer functions and initiate calibration. The user can view and acknowledge Maxum alarms over the Data Hiway.
Limitations	The Maxum uses a different software format for program application development, chromatogram processing and viewing. This inhibits information from being transmitted over the Data Hiway. To make any application changes, the user must connect a laptop PC with Maxum workstation software loaded. To make backup copies of the Maxum software, the laptop PC must be connected. Chromatograms from remote locations can not be seen.

Figure 1: Option 1 Configuration



Connect New Maxums Directly to Existing ADH Using Installed ADH Card

Option 2

Two Separate Parallel Networks Merged in the Control Room via Installed Gateway

This is for adding a new Maxum to existing installed Advance GC's. With this option, the existing Data Hiway is retained. A parallel Maxum network based on an Ethernet network link, is routed back to the Control Room. Refer to Figure 2.

In the Control Room, the Ethernet network is connected to existing Data Hiway via the Gateway. This provides the Maxum with full access to devices installed on the Data Hiway. This can be an existing link to the DCS that is able to communicate with the installed Maxum the same way it talks to installed Advance GC's.

To provide a Maxum with communication access, an Ethernet network is established by adding an Ethernet Hub in the analyzer shelter. 10BaseT wiring is used to interface the installed Maxum to the Ethernet Hub.

Fiber optic wiring can be used to connect the analyzer shelter installed Ethernet Hub to the Control Room. This wiring can be run long distances and is immune to generated electronic noise.

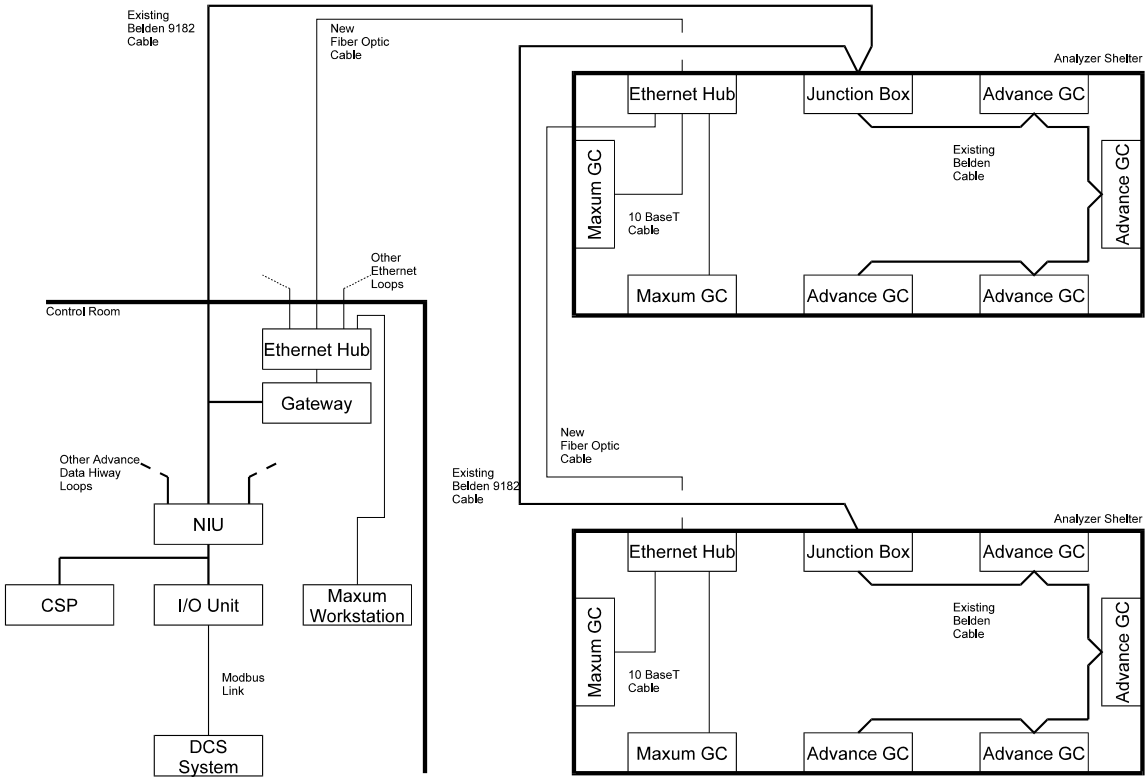
Fiber optic cable, from the analyzer shelter, must be terminated in a control room installed Ethernet Hub. This Ethernet Hub connects all Ethernet loops together and provides access to the installed Gateway. The Gateway allows a Maxum to communicate with the DCS over the existing Modbus link.

To the DCS, a Maxum appears identical to the Advance GC's to which are already communicating.

The APC Workstation can be upgraded to the Maxum workstation. The Maxum workstation provides real-time chromatogram displays of all installed Maxum GC's as well as EZChrom Methods Development software.

Older APC functions are integrated into the Maxum workstation and all previous APC functions are retained. This allows Maxum workstation to communicate with older Advance GC's via the Gateway. In addition, it provides PSP Emulation, Chromatogram displays and Table Editing etc.

Figure 2: Option 2 Configuration



Two Separate Parallel Networks Merged in the Control Room via Installed Gateway

Option 3

Merge Existing Advance GC's into DataNET Inside Shelters and use Existing Belden Cable to Control Room

This option allows DataNET to be used in place of Ethernet for connecting all installed Maxum and Advance GC's. This provided a higher speed network and minimizes installation of new field wiring. Refer to Figure
3.

The DataNET can use any cable type. This includes the Belden cable used by Advance GC's. To interface Maxum GC's to the control room, a DataNET Hub must be installed in each analyzer shelter. Communication between analyzer shelter(s) and the control room is via existing Belden cable. To achieve communication, a DataNET Hub must also be installed in the control room.

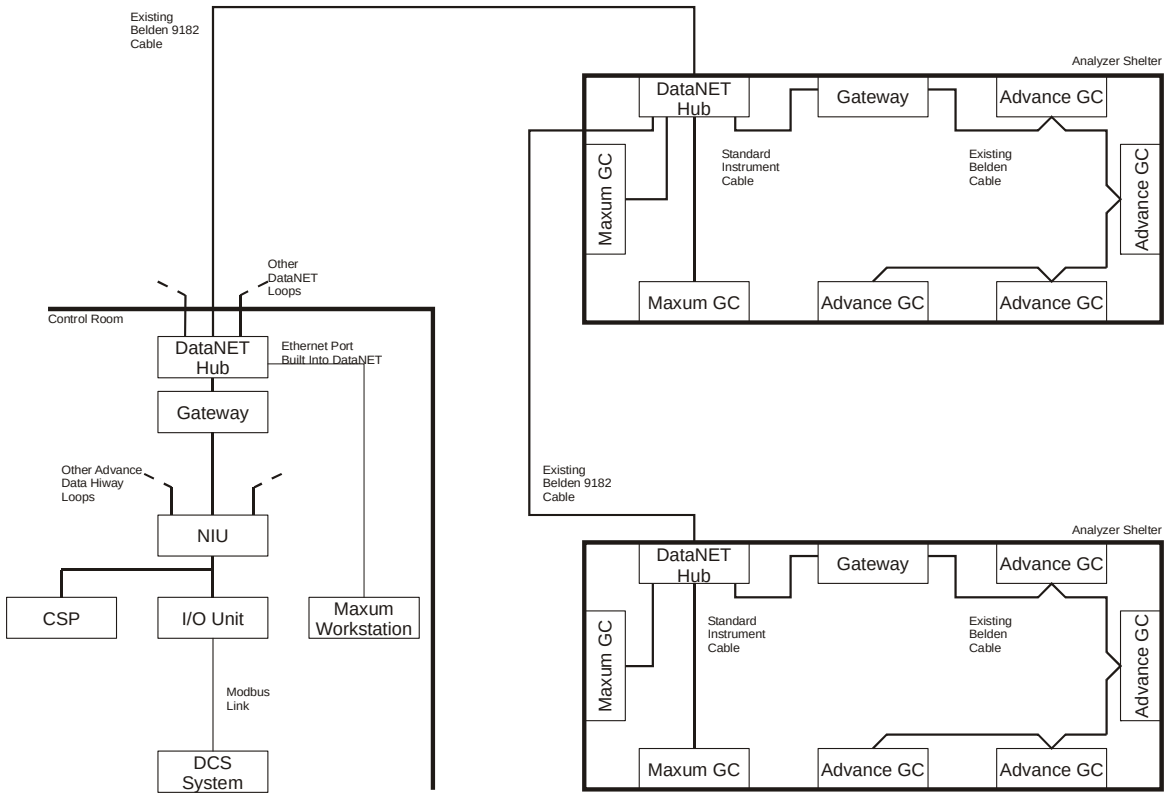
To integrate Advance GC's into this option and prevent them from being isolated from the control room, a Gateway device is installed within each analyzer shelter. The Gateway takes the "mini Data Hiway" used by the analyzer shelter installed Advance GC's and coverts the signals into the DataNET Hub. The Gateway output is tied into the DataNET Hub used by installed Advance GC's.

The control room installed DataNET Hub also requires a Gateway be installed. The Gateway connects the DataNET to the I/O Unit to maintain the link to the DCS.

Because the DataNET uses different signal electronics, it is not directly compatible with the Ethernet. To compensate for this, each DataNET Hub provides a pure Ethernet port. This enables DataNET systems to be connected to Ethernet devices, such as Maxum workstations.

The DataNET Ethernet port can be used to connect in-plant LAN networks and provide direct Ethernet connection to DCS that support this capability. To maintain installed Maxum and Advance GC's outputs, connected to the Gateway, new Maxum workstation software is upgraded.

Figure 3: Option 3 Configuration



Merge Existing Advance GC's into DataNET Inside Shelters and Use Existing Belden Cable to Control Room

Option 4

Conversion to DataNET with Advance Plus Door Using Existing Link to the DCS System

To integrate existing Advance GC's into the DataNET network, each Advance GC is upgraded with Maxum GC electronics. This is achieved by Advance GC installation of Advance Plus Door. Refer to Figure 4.

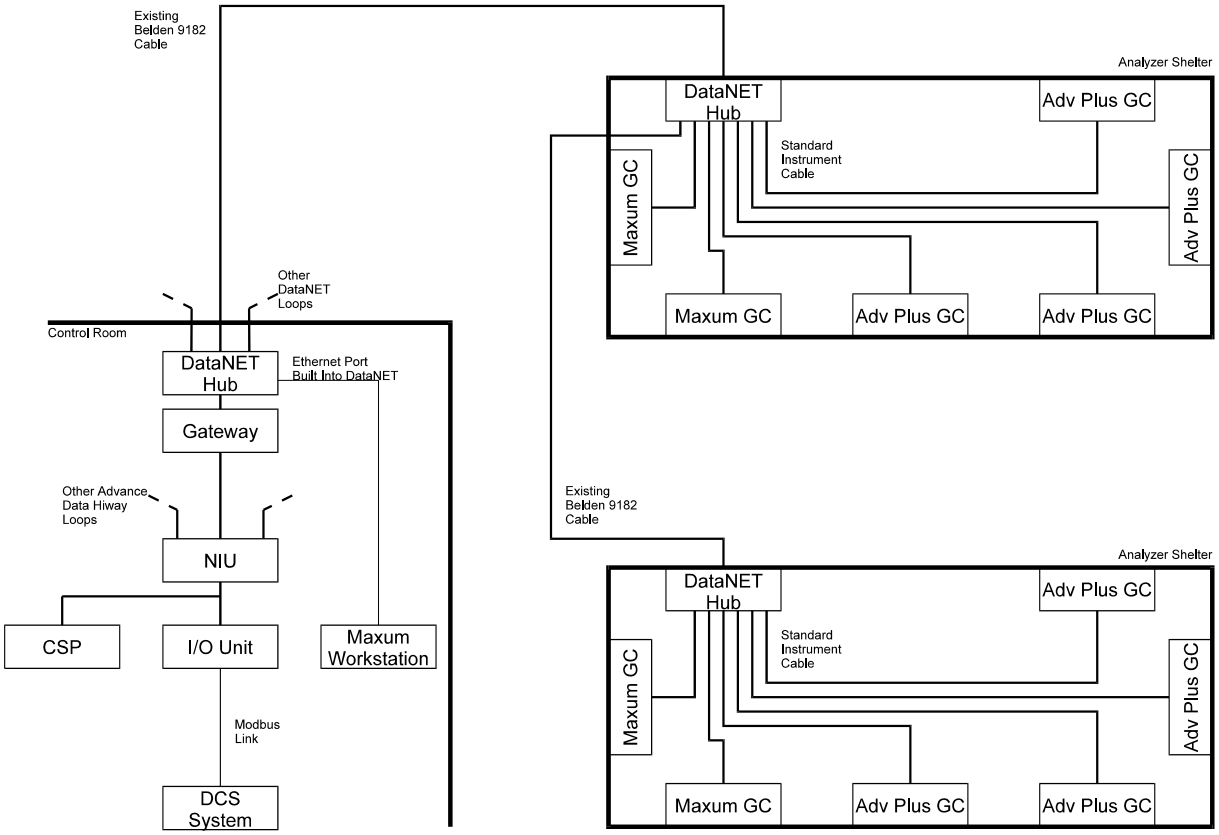
If there are only a few Advance and Maxum Gas Chromatographs installed in the analyzer shelter, this option is the most workable method for merging them together.

The Advance Plus Door conversion provides the installed Advance GC's electronics and software, with the capabilities of the Maxum. A DataNET Hub must be installed in both the Analyzer Shelter and the control room. The output from the control room DataNET Hub is connected to the Gateway. Both Advance and Maxum GC's are individually connected to the analyzer shelter installed DataNET Hub.

The Advance Plus Door electronics provides upgraded Advance GC's with the following functions:

- Real-time chromatograms anywhere on the network.
- EZChrom method development
- More powerful calculations and
- Data storage capability

Figure 4: Option 4 Configuration



Conversion to DataNET with Advance Plus Door Using Existing Link to DCS System

Option 5

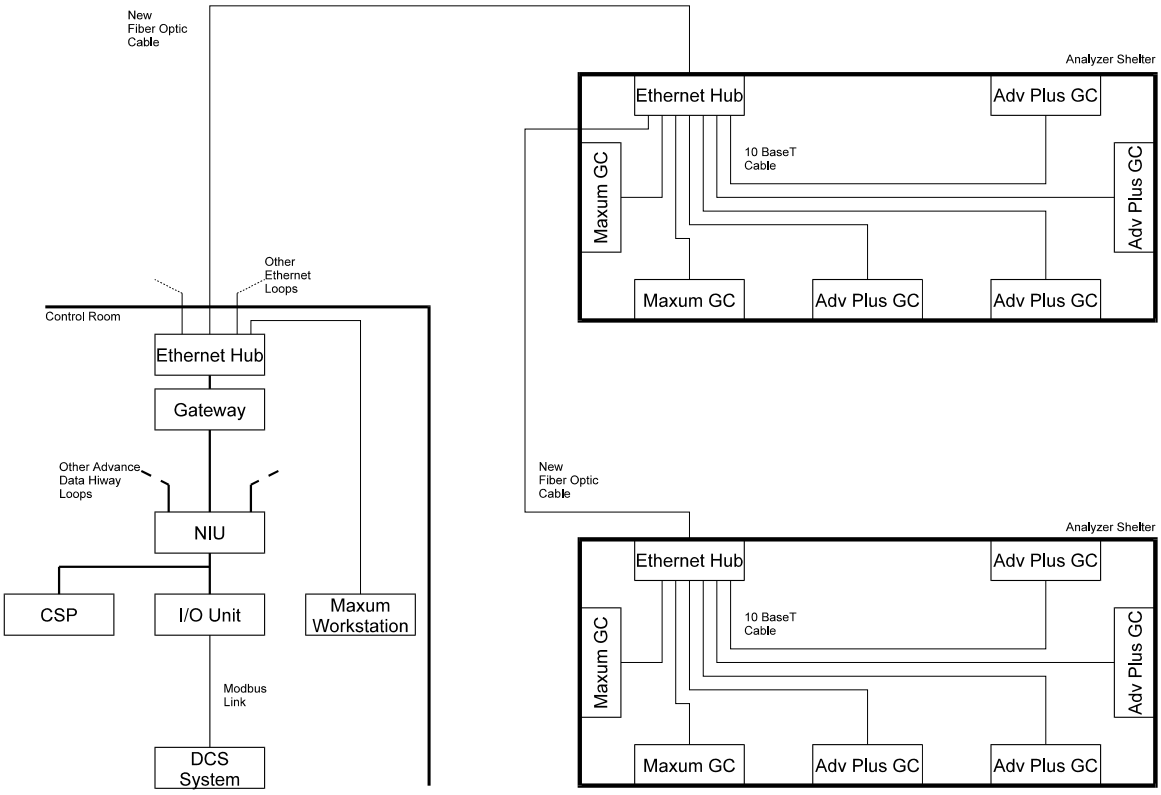
Conversion to Ethernet with Advance Plus Door Using Existing Link to DCS System

When the Advance Plus Door conversion is installed, it is compatible with Maxum GC Ethernet and DataNET networks. This enables the user to upgrade an installed Advance GC to Maxum electronics using the Advance Plus Door. The user can select the Ethernet connection. Refer to Figure 5.

This option requires an Ethernet Hub be installed in both the Analyzer Shelter and Control Room. Each Advance Plus GC and Maxum GC are individually connected to the analyzer shelter installed Ethernet Hub via 10BaseT Ethernet cables. The output from the control room installed DataNET Hub is then connected to the Gateway.

Interconnecting of analyzer shelter(s) to control room for transfer of data is via fiber optic cabling and pre-installed LAN systems.

Figure 5: Option 5 Configuration



Conversion to Ethernet with Advance Plus Door Using Existing Link to DCS System

Option 6 and

Complete Conversion to Ethernet with the Advance Plus Door Using *NAU* to Link to the DCS System

Option 7

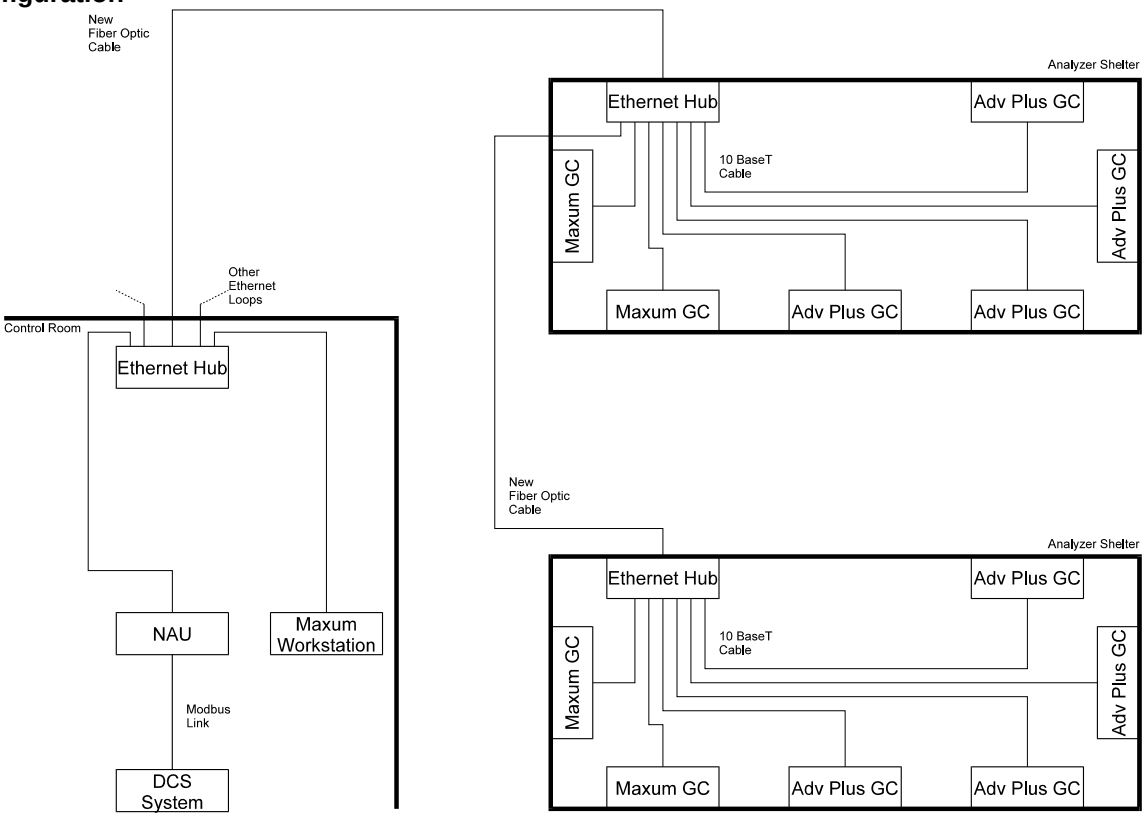
Complete Conversion to DataNET with the Advance Plus Door Using *NAU* to Link to the DCS System

Both these Options are similar to Options 4 and 5 except that these latter options use the existing link to the DCS. With Options 6 and 7, the Input/ Output Unit (I/OU) and Modbus link network use the Advance Network Access Unit (NAU). These two options allow the user to upgrade the Advance GC systems to a Maxum GC using the NAU. Refer to Figures 6 and 7.

The NAU is the Maxum GC equivalent of the Advance GC Central Service Panel (CSP) and I/OU. With the NAU installed in the Control Room it creates a new custom link. The NAU built-in RS-232 serial port provides the same Modbus output as the Advance GC system. The NAU has a built-in LCD display that is used by Maxum GC's. This presents the user with access to the same maintenance functions and provides real-time chromatograms.

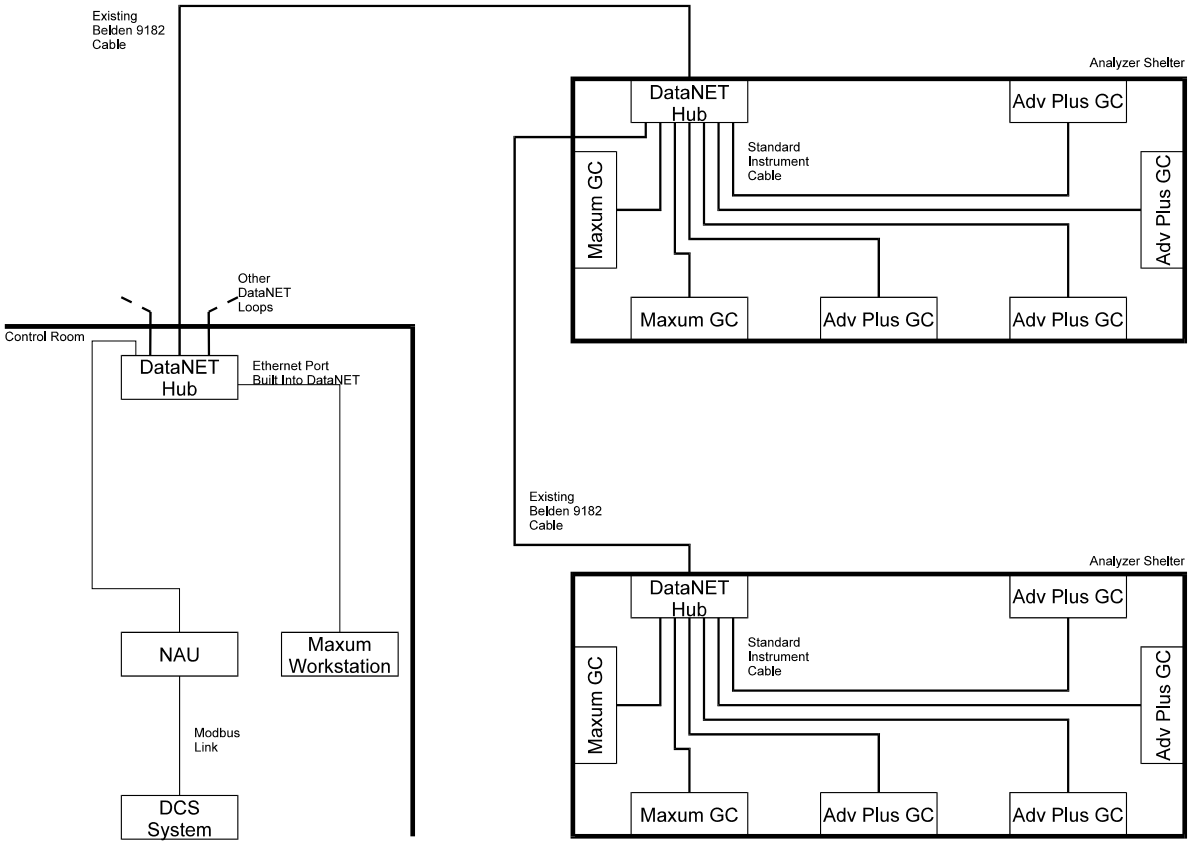
For Option 6, each analyzer shelter installed Advance GC and Maxum GC is individually connected to the installed Ethernet Hub using 10BaseT cable. For Option 7, each analyzer shelter installed Advance GC and Maxum GC is individually connected to the installed DataNET Hub using standard instrument cable.

Figure 6: Option 6 Configuration



Complete Conversion to Ethernet with Advance Plus Door Using NAU to Link to DCS System

Figure 7: Option 7 Configuration



Complete Conversion to DataNET with Advance Plus Door Using NAU to Link to DCS System

Option 8

Blended System with the Old Advance Data Hiway (via NAU) as well as Both DataNET and Ethernet

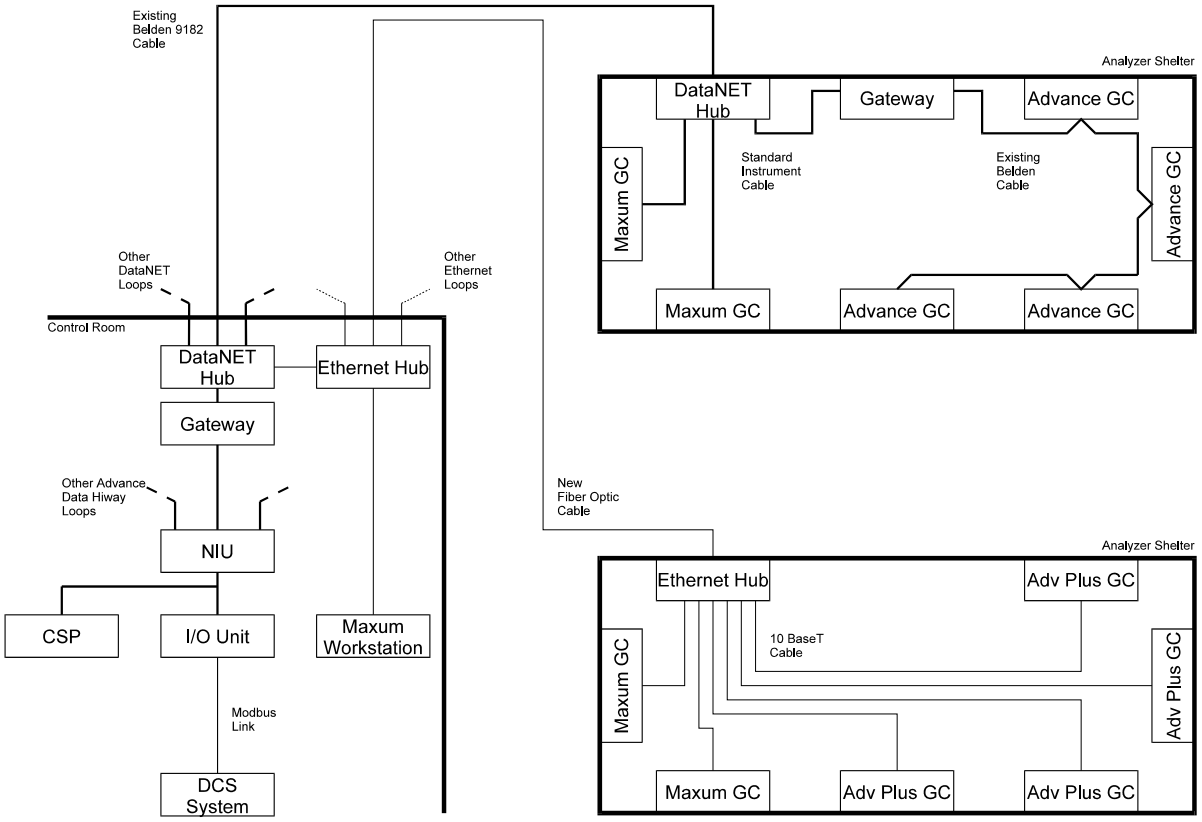
Enables an Advance GC system not to be locked into selecting one option over another. When connected simultaneously, the Maxum GC network is compatible with all of the previously described options. Refer to Figure 8.

If other techniques are to be used for merging Advance GC's to Maxum GC's connected together, existing Belden interconnecting cable and a DataNET Hub can be used. For this configuration, the Analyzer shelter and Control Room must have DataNET Hubs installed. Analyzer shelter installed Advance GC's are daisy chained together and connected to DataNET Hub via standard instrument cable. Maxum GC's are individually connected to the DataNET Hub using standard instrument cable.

If Advance Plus GC's and Maxum GC's are installed in an additional analyzer shelter, fiber optic cable and Ethernet Hub network can be used to connect them to the control room. Analyzer shelter Advance and Maxum GC outputs are connected to the control room via their respective DataNET and Ethernet Hubs. Connectivity to the DataNET Hub is via the built-in Ethernet port.

Advance GC's can be left as is and continue to be connected to the DCS via the control room DataNET Hub and Gateway.

Figure 8: Option 8 Configuration



Blended System with the Old Advance Data Hiway (via NAU) as well as Both DataNET and Ethernet

Appendix 3

CEMS Option

Overview

Description

The NAU Continuous Emission Monitoring System (CEMS) software option provides sample system control and general data acquisition for up to four Siemens continuous analyzers or most other analyzers or devices. When connected via our Advance Communications System (ACS) the NAU can be remotely accessed from the Maxum workstation.

I/O Summary

2 combination I/O boards
4 digital I/O boards

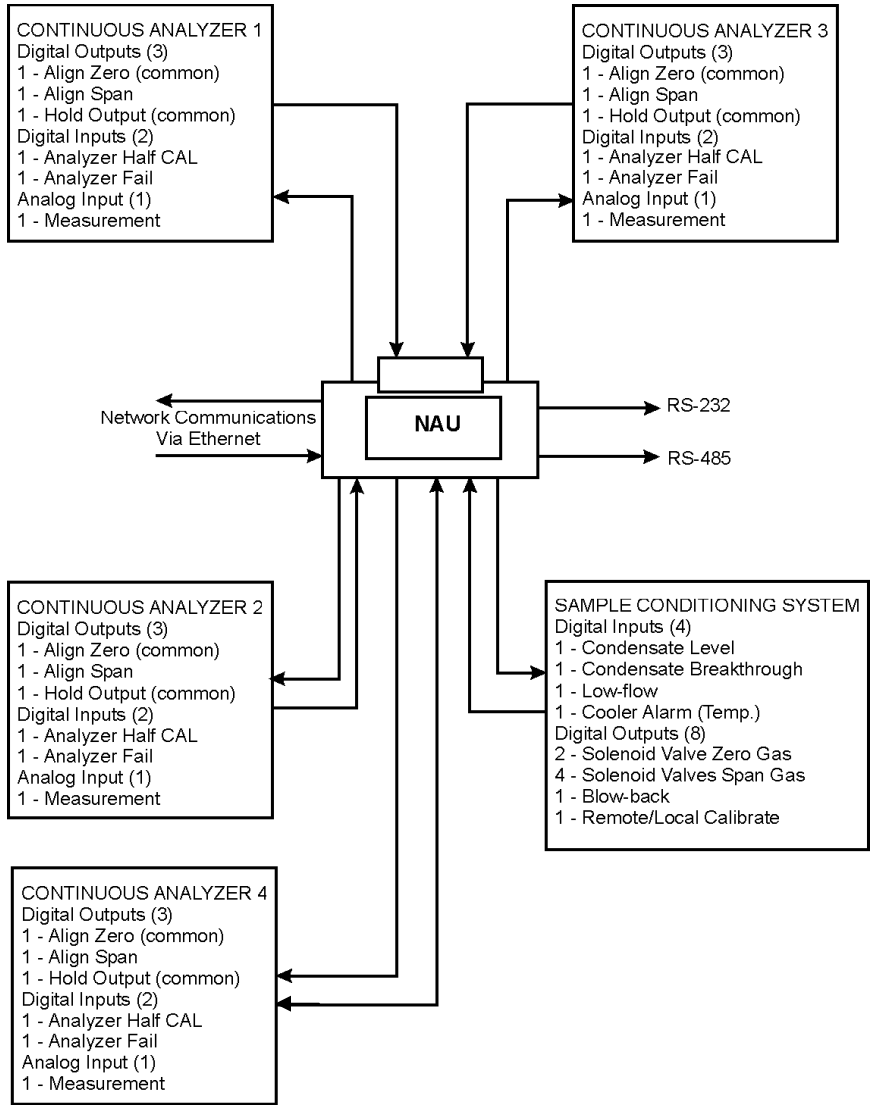
DO channels	20
DI channels	12
	8 spares
AO channels	4 spares
AI channels	4

Built-in Standard

DO channels	4 spares
CI channels	4 spares
AO channels	2 spares

RS-232 serial channel 1 (up to 4 configurable with SYSCON2)
RS-485 serial channel 1 (up to 4 configurable with SYSCON2)

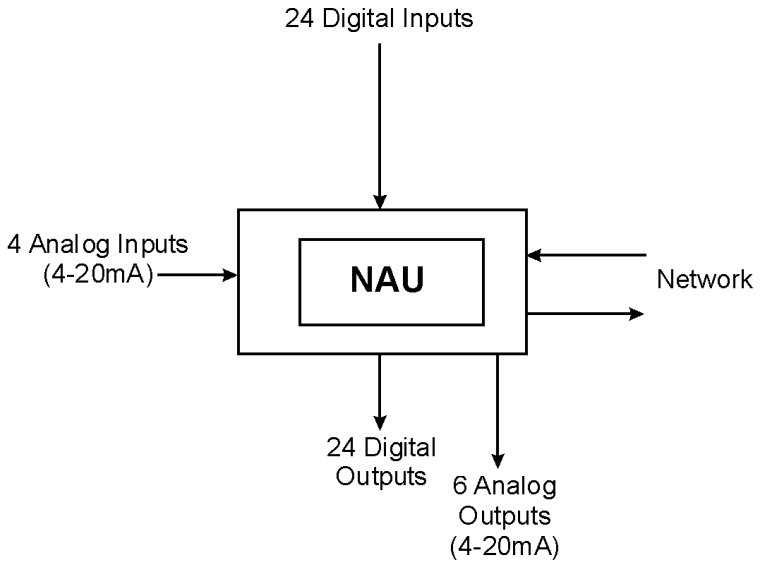
Figure 1: NAU – Three-Analyzer CEMS Application



Monitoring and Control

The digital I/O's can be used for monitoring and control of such parameters as condensate level, cooler alarm, remote, and local calibration; reference Figures 1 and 2.

Figure 2: Input/Output Capability



CEM Data Logging

It scans each of the monitored component concentrations 6 times per minute. The NAU averages the 6 values to yield a 1-minute average for each component. The NAU stores 1-minute averages and computes 1-hour averages for each component.

Storing Data

The NAU can store up to 3 days of 1-minute data averages. If the data-logging computer fails, the NAU can upload up to 3 days of 1 minute averages after the communications is restored. When uploading, the NAU can transfer all data within 60 seconds via Ethernet or about 2.5 hours via RS-232 or RS-485 at 19.2 Baud. This balances the load on the highway by sending 8 hours of stored data every 15 minutes.

NAU CEMS Programming

Introduction

Each NAU unit is programmed with a standard database unless a custom application was purchased. This database provides pre-defined tables and programs that handle the requirements of a basic single process Continuous Emission Monitoring (CEM) application. Two (2) zero gas stream and four (4) span gas streams are designed into the NAUs standard Table Set. As with our Maxum Chromatographs, the standard application can be configured to meet individual customer requirements; see your custom documentation that was shipped with the equipment if a custom application was purchased.

Standard Applications

- Blow back
- Calibration Control
- Data Averaging
- Data Collection
- Data Storage
- Data Transmission
- Sample Control

Learning Hint

The NAU performs functions in real-time. These functions are called events; refer to Application Documentation.

Blow Back

The software provides sample probe blow back control and is designed for maximum flexibility. Three factor entries allow you to easily modify the number of pulses and the width of each pulse. The blowback is typically scheduled once per day, but can be initiated on demand through a local or remote user provided interface.

Calibration Control

Software provides necessary timing and logic to initiate an external calibration of a Continuous Analyzer. This event is typically scheduled once per day, but can be initiated on demand through a local or remote user provided interface. The amount of time allowed to purge the sample line when switching between processes and calibrate gases is easily customized by modifying the appropriate factor.

The Continuous Analyzer is notified via a relay output when to self-calibrate for zero or span. Percent drift is calculated and stored in the NAU along with the calibration values. A calibration alarm is initiated if the drift is outside of acceptable limits.

Data Averaging

Data averaging occurs at 1 minute, 15 minute, hourly and daily intervals. The 1-minute averages are automatically status, time, and date stamped as they are written to the data table. A circular queue is used for storage of all the 1-minute averages taken in the last 3 days. The status is stored in the database prior to writing a value in the data table.

Averages	Description
1-Minute	Six measurements are taken each minute for the analog inputs and are averaged together for a 1-minute average.
15-Minute	15-minute averages are generated and stored for verification of the hourly averages in the daily log.
Hourly	Hourly averages are generated and stored for use in the daily log.
Daily	Daily averages are generated and stored for use in the monthly log.

Data Collection

Both Analog and digital inputs are scanned every 10 seconds.

Analog Values

Analog inputs are scanned every 10 seconds. Values are added to each scan and the counters are incremented which are used by the averaging events. Continuous Analyzer status, at the time of the scan, is checked and the highest priority status is stored.

Digital Status

Event 4 scans the digital inputs. The digital input information is used for status and alarm generating purposes. The information is also evaluated based on the priority list shown below along with the Continuous Analyzer status; the highest priority status is stored for stamping 1-minute averages.

Status Number	Description
250	Calibrate in progress
249	Blow Back in Progress
248	Continues Analyzer Failure
247	Condensate Alarm
246	Low Flow Alarm
245	Cooler Temperature Alarm
244	Sample Line/Probe Temperature Alarm
120	Half-Cal Alarm

Highest priority = 255
Status = 0 means Continuous Analyzer running normally with no alarm
Status above 127 indicates a Fault problem.

Data Storage

The data averages are stored in SYSCON memory in the data table as shown below.

Data	Quantity Stored
1 Minute Averages	Last 3 days
15 Minute Averages	Current days information since midnight
Hourly Averages	Current days information since midnight
Daily Averages	Current months information since start of month

Data Transmissions

The workstation provides for three forms of Data Transmission via a printer, Maxum Data Logger or Host Computer or via Ethernet.

Printer

Three printout Logs are available. All can be scheduled to print automatically or on request.

Hourly Log	Prints a log of the 1-minute averages taken during the current hour.
Daily	Prints a log of the 1- hour averages taken during the current day. The 15 minutes averages are also printed in order to validate the hourly averages.
Monthly	Prints a log of the daily averages taken during the current month.

Sample Control

Sample Control is provided by stream switching between process, zero calibration gas and span calibration gas as well as blow back control.

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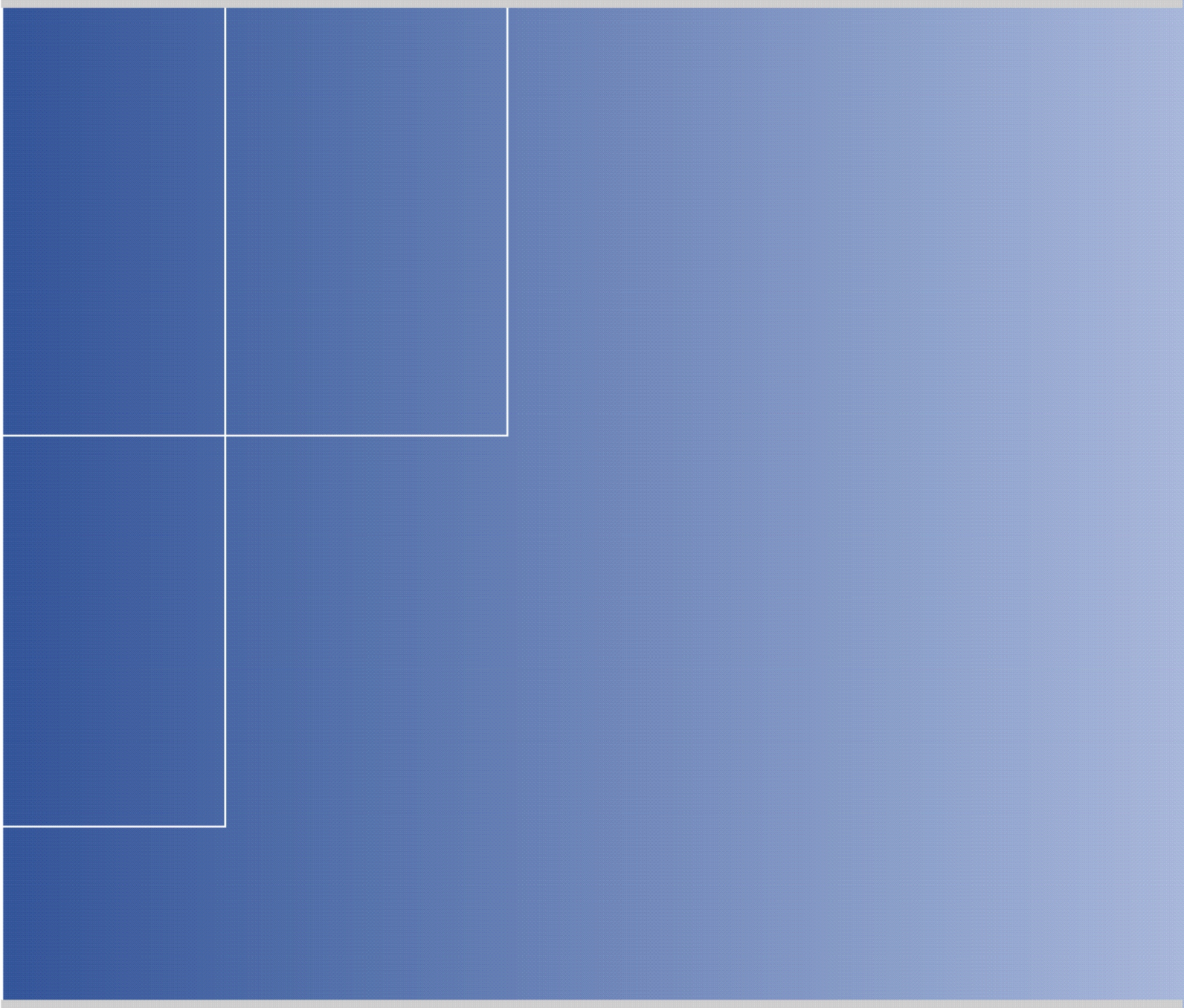

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