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AirSentry® II AMC Monitoring System

OPERATIONS MANUAL

AirSentry® II

AMC Monitoring System

Operations Manual



**PARTICLE
MEASURING
SYSTEMS®**
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Operations Manual
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Quality Statement

The Quality Policy of Particle Measuring Systems is to strive to meet or exceed the needs and expectations of our customers and to align the activities of all employees with the common focus of customer satisfaction through continuous improvement in the quality of our products and services.

Environmental Information

There are no potential means by which asbestos exposure is possible because there are no materials in the design or manufacture of the Air Sentry II® Ion Mobility Spectrometer containing asbestos.



This equipment must be properly disposed of at end-of-life by means of an authorized waste management system. Contact our Customer Response Center at (877) 475-3317 or (303) 443-7100 for dismantling and disposal information.

Patent Information

U.S. and foreign patents for this equipment are pending.

Manual Conventions

This manual uses the following conventions to call the reader's attention to certain text.

WARNING

A warning in the text is used to notify the user of the potential for bodily injury or death.

CAUTION

A caution in the text is used to highlight an item that if not done, or incorrectly done, could damage the instrument and/or any materials or devices affected by the instrument.



— NOTICE —

A notice in the text is an instructional communication regarding requirements or policies issued by Particle Measuring Systems.

NOTE: A note in the text is used to highlight an item that is of operational importance to the user.

It is important that you observe cautions and warnings while performing the procedures described in this manual. Caution and warning labels are located on and inside the instrument to alert you to potentially hazardous conditions. Please familiarize yourself with this information.

CE – Declaration of Conformity

CE - Declaration of Conformity		
Application of Council Directive(s):	2014/30/EU, 2014/35/EU, RoHS 2011/65/EU	
Standard(s) to which Conformity is Declared:	EMC	EN 61326-1:2013
	Safety	EN 61010-1: 2010, 3rd Ed.
Manufacturer's Name:	Particle Measuring Systems, Inc.	
Manufacturer's Address:	5475 Airport Boulevard, Boulder, CO 80301 USA	
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Type of Equipment:	Airborne Molecular Contamination Monitor	
Model No:	AirSentry II AMC Monitoring System	
I, the undersigned, hereby declare that the equipment specified above conforms to the above Directive(s) and Standard(s).		
Signature:	Signature:	
		
Full Name: Scott MacLaughlin	Full Name: Giovanni Scialo	
Position: Director of Engineering	Position: Vice President Life Sciences	
Place: Boulder Date: June 10, 2019	Place: Rome Date: June 10, 2019	

CAUTION

All I/O cables and accessories must meet current factory specifications in order for this unit to remain in compliance with CE marking requirements. Consult the factory for details.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Table of Contents

Quality Statement	ii
Environmental Information	ii
Patent Information	ii
Manual Conventions	iii
CE – Declaration of Conformity	iv
List of Tables	ix
List of Figures	xi
Chapter 1: Introduction	1-1
Physical Dimensions	1-2
Connections and Ports	1-3
Power	1-3
Ethernet	1-3
Vacuum	1-3
Clean Dry Air (CDA)	1-4
Sample	1-4
Other Technical Specifications	1-5
Wipe Test Port	1-5
Radiation Specifications – AirSentry II IMS Cell	1-6
Chapter 2: Installation and Setup	2-1
Unpacking the Unit	2-1
Installing Critical Internal Components	2-1
Power-On Internal System Components	2-3
Calibrate the AirSentry II AMC Monitoring System	2-3
Set Up Network Communications	2-4
Internal Network Topology (Example)	2-5
Connecting to the Corporate Network	2-6
Advanced Setup	2-6
Chapter 3: Software	3-1
iFix	3-2
OPC Data Access Overview	3-3
OPC Setup	3-3
OPC Server & Setup	3-3
Connecting to the Server	3-3
Server Browsing	3-4
Tag List	3-4

Navigating the AirSentry II User Interface	3-5
Components of the AirSentry II Display	3-6
The Sampling Status Display	3-7
MPS Manifold Status	3-8
Color Legend	3-10
Alarm Setup Display	3-10
Analyzer Diagnostics	3-12
The Configuration Display	3-13
Order	3-13
Enable	3-14
Description	3-14
Purge	3-15
Sample	3-15
Verifying and Saving Configuration Changes	3-16
Trend Displays	3-17
Configurable Trends	3-17
Trend Duration	3-18
Arrow Buttons	3-19
Pause/Resume	3-19
Zoom	3-19
Add Pen	3-20
Data Ranges	3-20
Delete Pen	3-21
Change Color	3-21
Multiple Vertical Scales	3-24
Start Date and Time	3-24
Pop-up Trends	3-25
Single Value Pop-up Trends	3-25
Multiple Value Trends	3-27
Alarm Summary	3-28
Viewing Current Alarms	3-28
Acknowledging Alarms	3-28
Alarm History	3-29
The Alm Tab	3-29
The Log Tab	3-30
The Evt Tag	3-30
Reports	3-31
Summary Reports	3-33
Alarm Summary Report	3-34
Access to Existing Reports	3-34
Access to Reports through Excel	3-35
Configuring the AirSentry II	3-36
The AirSentry II Setup Display	3-36
Number of Analyzers	3-36
Valve Act. Type	3-36
COM Port	3-36

Actuator Model -----	3-36
Manual Control -----	3-37
User Security -----	3-40
Preconfigured Users-----	3-40
Logging In and Out -----	3-41
Exit -----	3-42
Exiting the AirSentry II Software-----	3-42
Shutting Down iFIX and Facility Net-----	3-42
Service Software -----	3-44
Chapter 4: Service -----	4-1
Consumables – AirSentry II AMC Monitoring System-----	4-1
Service Parts – AirSentry II AMC Monitoring System -----	4-2
System Fuse Replacement-----	4-2
Chapter 5: IMS Cell and Radiation Safety Information -----	5-1
IMS Cell-----	5-1
IMS Cell Detector Servicing -----	5-2
Six Month Leak Test for the IMS Cell -----	5-2
Radiation Safety and Wipe Test Procedures -----	5-3
IMS Cell Transportation -----	5-4
Appendix A: Pneumatic Diagrams -----	A-1
Troubleshooting the Flow for AirSentry II IMS-----	A-1
Flowrates -----	A-1
Appendix B: International Precautions -----	B-1
Hazard Symbols -----	B-1
Symboles de risque -----	B-1
Warnschilder -----	B-2
Simboli di pericolo -----	B-2
Simbolos de peligro -----	B-2
Appendix C: 有毒或有害的物质和元素-----	C-1

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List of Tables

Chapter 1: Introduction	1-1
Table 1-1 Detection Techniques used in the AirSentry II AMC Monitoring System	1-1
Table 1-2 AirSentry II Radiation Specifications	1-6
Chapter 2: Installation and Setup	2-1
Table 2-1 IP Addresses for Internal Network	2-5
Chapter 3: Software	3-1
Chapter 4: Service	4-1
Table 4-1 Replacements for Consumables	4-1
Table 4-2 Potential Considerations for Spare Parts	4-2
Chapter 5: IMS Cell and Radiation Safety Information	5-1
Appendix A: Pneumatic Diagrams	A-1
Table A-1 Typical Flowrates of Analyzers	A-1
Appendix B: International Precautions	B-1
Appendix C: 有毒或有害的物质和元素	C-1

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List of Figures

Chapter 1: Introduction	1-1
Figure 1-1 Physical Dimensions (in inches)	1-2
Chapter 2: Installation and Setup	2-1
Figure 2-1 Networking Topology	2-5
Chapter 3: Software	3-1
Figure 3-1 iFix general software scheme	3-2
Figure 3-2 AirSentry II System icon on the desktop	3-5
Figure 3-3 AirSentry II Sampling Status display	3-7
Figure 3-4 MPS Manifold Status box when Sample Sequence is stopped	3-8
Figure 3-5 MPS Manifold Status box when Sample Sequence is running	3-8
Figure 3-6 MPS Manifold Status box when Sample Sequence is paused	3-9
Figure 3-7 Legend box showing Analyzer Status colors	3-10
Figure 3-8 Single Value pop-up menu	3-11
Figure 3-9 Alarm Setup dialog box for configuration	3-11
Figure 3-10 Analyzer Status, showing current values for parameters	3-12
Figure 3-11 Configuration display	3-13
Figure 3-12 Position Configuration Description dialog box	3-14
Figure 3-13 New Description dialog box	3-14
Figure 3-14 New Description message when the new description was not saved	3-14
Figure 3-15 Position Configuration (for entering a value for Purge Time)	3-15
Figure 3-16 Position Configuration (for entering a value for Sample Time)	3-15
Figure 3-17 Error message when no Purge Time or Sample Time values have been entered for a position	3-16
Figure 3-18 Error when an enabled position has 0 for its Order number	3-16
Figure 3-19 Error when multiple positions have the same Order number	3-16
Figure 3-20 A Configurable Trend chart	3-18
Figure 3-21 Available Pen tag names in the Data Point pull-down menu	3-20
Figure 3-22 Selected Data Point and the Description associated with it	3-20
Figure 3-23 Chart tab in the Chart Configuration pop-up	3-21
Figure 3-24 Change Color of the Chart and Pens pop-up	3-22
Figure 3-25 Select the portion of the chart to change menu	3-22

Figure 3-26	Select a Pen to change its color menu -----	3-22
Figure 3-27	Select Color pop-up -----	3-23
Figure 3-28	Multiple Values Chart mode -----	3-24
Figure 3-29	Chart Start Date and Time Configuration pop-up -----	3-25
Figure 3-30	Single Value pop-up menu -----	3-25
Figure 3-31	Single Value Trend chart -----	3-26
Figure 3-32	Multiple Value Trend chart -----	3-27
Figure 3-33	Alarm Summary display -----	3-28
Figure 3-34	Alm tab in the Alarm History display -----	3-29
Figure 3-35	Log tab in the Alarm History display -----	3-30
Figure 3-36	Evt tab in the Alarm History display -----	3-30
Figure 3-37	Reports display -----	3-31
Figure 3-38	Select Report to Create pull-down menu in the Reports display --	3-31
Figure 3-39	Reports button in the Reports display -----	3-32
Figure 3-40	Example of a Summary Report in the Reports display -----	3-33
Figure 3-41	Example of an Alarm Summary Report in the Reports display ----	3-34
Figure 3-42	Report selected in Select Report to View in Reports -----	3-34
Figure 3-43	Launch Excel button in the Reports display -----	3-35
Figure 3-44	The AirSentry II Setup dialog box -----	3-36
Figure 3-45	The COM Port Status dialog box -----	3-37
Figure 3-46	Error message when automatic sequence has not been stopped ---	3-37
Figure 3-47	Message when automatic sequence has been stopped -----	3-38
Figure 3-48	Confirmation message that the data will be logged -----	3-38
Figure 3-49	Confirmation the data is logged in Manual Mode at Position 12 ----	3-39
Figure 3-50	Login dialog box for logging in as a different user -----	3-41
Figure 3-51	Login dialog box -----	3-41
Figure 3-52	Proficy iFIX Startup's Shutdown command in the Options menu -	3-42
Figure 3-53	Facility Net window's File menu showing the Close command ----	3-43
Chapter 4:	Service -----	4-1
Chapter 5:	IMS Cell and Radiation Safety Information -----	5-1
Figure 5-1	Wipe Test Port -----	5-3
Figure 5-2	Wipe inside surface of vacuum port -----	5-4
Appendix A:	Pneumatic Diagrams -----	A-1
Appendix B:	International Precautions -----	B-1
Appendix C:	有毒或有害的物质和元素 -----	C-1

Chapter 1

Introduction

The AirSentry® II AMC Monitoring System is designed to monitor airborne molecular contamination (AMC) across a large number of sample points spread out within a cleanroom or facility. The System incorporates a 16 or 30 point valve actuator which rotates to sample one point at a time based upon an automated sampling scheme setup by the user. A single “sample pump” delivers the sample from the monitoring location to the set of analyzers installed within the system, while a second pump, the “fast loop” pump, continuously pulls sample air through the remaining sample points (the points not actively being sampled by the “sample pump”) in order to keep the sample lines from becoming stagnant.

Up to 3 analyzers can be installed within the AirSentry II AMC Monitoring System, utilizing different techniques to monitor different compounds. The following techniques are utilized to monitor the AMC contaminants of concern in clean manufacturing environments.

Table 1-1 Detection Techniques used in the AirSentry II AMC Monitoring System

Detection Technique	Common Name	Compounds Detected
IMS	Ion Mobility Spectrometry	Ammonia (NH ₃)
IMS	Ion Mobility Spectrometry	Amines
IMS	Ion Mobility Spectrometry	Acids Responds to: HCl, Cl ₂ , HBr, Br ₂ , HF, Acetic and Formic Acid
IMS	Ion Mobility Spectrometry	Chlorides (Cl ₂ Calibrated) Responds to HCl & Cl ₂

Physical Dimensions

The physical dimensions of the AirSentry II AMC Monitoring System are identified in **Figure 1-1**.

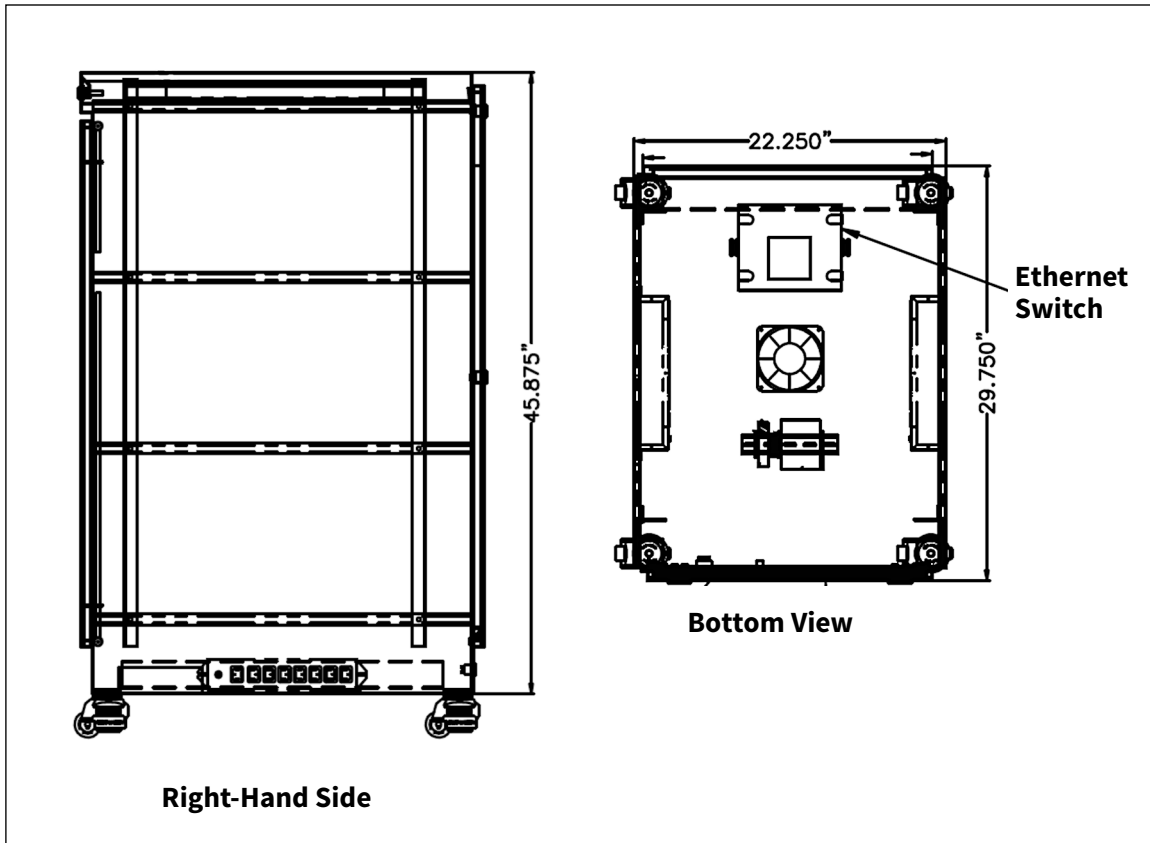


Figure 1-1 Physical Dimensions (in inches)

WARNING

Tipping Hazard: Only 1 drawer should be opened at a time – all other drawers should remain inside the enclosure and secured with their front panel screws.

Only authorized service personnel should service the System, which includes opening the drawers.

Connections and Ports

The AirSentry II AMC Monitoring System has a total of 4 external ports which must be connected prior to operation. These connections are located on the rear of the System, at the bottom of the enclosure. The connections are labeled as:

- **Power**
- **CDA (Clean Dry Air)**
- **Ethernet**
- **Vacuum**

In addition to these connections, each sample point must be connected to the back of the Multi-Point Sampling (MPS) drawer. At the back of the enclosure, there is a large circular cutout allowing for connecting the ¼" (quarter-inch) PFA sample tubing to the MPS drawer.

Power

The AirSentry II AMC Monitoring System is supplied with power from an external mains power source. 120 VAC / 60 Hz or 230 VAC / 50 Hz should be supplied to the analyzer based on the configuration ordered.

Because there is no power switch for the AC Mains supply on the enclosure, the means of disconnect is the plug on the power supply cord-set. The Mains socket-outlet shall be installed near the equipment and be readily accessible.

Ethernet

An Ethernet port is supplied to allow connection to a corporate network, as well as to transfer data, if desired, to another external software package via OPC.

Vacuum

The AirSentry II AMC Monitoring System uses vacuum for a number of different analyzer requirements within the enclosure. The source must be capable of pulling and sustaining ≤ 33 kPa (absolute) of vacuum. Typical vacuum flow requirement are 500-1000 cc/min per analyzer, so the total vacuum flow will depend upon the configuration ordered. The vacuum inlet supplied with the System accepts ¼" (quarter-inch) female swagelock fittings.

Clean Dry Air (CDA)

The AirSentry II AMC Monitoring System requires a source of CDA to support the transport of the carrier gas to the IMS cell. The CDA inlet supplied with the System accepts ¼" (quarter-inch) female swagelock fittings. CDA specifications must be:

- **-60°C dew point**
- **free of hydrocarbons**
- **40 - 200 psi**
- **no particles ≥ 50 microns**

Sample

Sample is delivered to each analyzer via the MPS drawer as described previously. A maximum of 75 meters of sample tubing should be connected to each sample port. Sample tubing should be comprised of ¼" (quarter-inch) outer diameter thin-walled PFA tubing. However, it is recommended to minimize the length of sample tube used in order to prevent or minimize interference of the sample with the tubing walls.

WARNING

Water must not be allowed to enter the AirSentry II AMC Monitoring System. Do not connect a bubbler or any other device to any sample inlet point which could allow water to enter the system intentionally or unintentionally.

Within the System, a CDA line has been provided which allows for a “zero-check” to be performed if desired during the sample sequence. It is recommended to connect this “zero-check” line to sample point #1 on the back of the MPS drawer, and to program in to the sample sequence program a sufficient amount of time during each cycle to allow the zero check to be performed.

Other Technical Specifications

Electrical Rating	115 VAC, 60 Hz or 230 VAC, 50 Hz
Relative Humidity	10 - 85%, non-condensing
Operating Temperature	59 - 104 °F (15 - 40°C)
Storage Temperature	-40 - 158 °F (-40 - 70 °C)
Transportation Temperature	-40 - 158 °F (-40 - 70 °C)
Maximum Altitude	6562 ft (2000 m)
Weight	300 lb (136 kg) maximum
Installation Requirements	Indoor Use Only Ordinary Protection (Not protected against harmful ingress of moisture) Pollution degree 2 Over voltage category II Class I Equipment (Electrical earth ground from the mains power source to the product input is required for safety.)

Wipe Test Port

The AirSentry II AMC Monitoring System may contain Ion Mobility Spectrometer (IMS) analyzers, which utilize a small Ni⁶³ radioactive source for sample ionization. Many federal, state, or local agencies may require periodic verification of the integrity of the source. For specific instructions, refer to the AirSentry II IMS Operations Manual.

Radiation Specifications – AirSentry II IMS Cell

Table 1-2 AirSentry II Radiation Specifications

Radiation		
Isotope	Nickel-63	
Atomic number	28	
Mass number	63 (35 neutrons)	
Physical form	Nickel-63 (electroplated on one face of a thin nickel ring)	
Physical characteristics	Physical half-life: 96 years Nominal activity: 10 mCi Maximum activity: 15 mCi	
Principal emissions	Beta β , Max E (MeV) 0.066	Beta β , Avg E (MeV) 0.017
External hazard	Maximum Beta range in air:	~ 2.16 in
	Maximum Beta range in water:	~ 0.0023 in
(Occupational limit) Oral ingestion annual limit of intake (ALI)	9 mCi (333 MBq)	
(Occupational limit) Inhalation annual limit of intake (ALI)	3 mCi (111 MBq)	
(Occupational limit) Derived air concentration (DAC)	3×10^{-7} Ci/mL for vapor 1×10^{-6} Ci/mL for oxides, hydroxides, and carbides 7×10^{-7} Ci/mL for all other components	

Chapter 2

Installation and Setup

Unpacking the Unit

To unpack the AirSentry II AMC Monitoring System:

- 1 Verify the contents of the shipment packaging against the enclosed packing list. If there is a discrepancy, contact Particle Measuring Systems Customer Service Center (1-877-475-3317).
- 2 Utilize a hoist with straps or other means of removing the System from the pallet or shipping container.
- 3 Transport the AirSentry II AMC Monitoring System and any accessories to the installation location.
- 4 Install the System into its permanent location, and level the feet to make sure the unit is level across its width and length dimensions.

Installing Critical Internal Components

CAUTION
If a Chlorides analyzer was purchased as part of the AirSentry II AMC Monitoring System, please see Appendix C. The installation of a permeation tube within the Chlorides analyzer is required prior to start-up of the System.

Utility Connections

— — NOTICE — —

To be performed by authorized personnel only.

To unplug appropriate fittings:

- 1 Open the back panel of the AirSentry II AMC monitoring system
 - a. Unlatch the rear-upper panel first by turning the latches to the unlock position using a flat-blade screwdriver. Remove and set aside panel.
 - b. Unlatch the rear-lower panel by turning the latches to the unlock position using a flat-blade screwdriver.
 - c. Remove the rear-lower panel and set it aside.
The rear-lower panel is removed by tipping the panel back slightly and then lifting the panel straight up.
- 2 Remove the plugs from the rear-panel of either the 16 or 30 channel MPS drawer at the sample inlet ports (the number to remove will depend upon the System ordered)
- 3 Remove any plugs from the rear-panel of any analyzer(s) ordered.
- 4 Remove the plugs at the rear-bottom of the enclosure at the CDA and Vacuum fittings.

To connect the AirSentry II AMC Monitoring System to Power, Ethernet, CDA, & Vacuum:

- 1 Connect the CDA source to the CDA inlet fitting at the rear-bottom of the System enclosure. It is recommended to install a means to allow for future shutoff of the CDA source, such as a ball valve upstream of the CDA fitting.
- 2 Connect the Vacuum source to the Vacuum inlet fitting at the rear-bottom of the System enclosure. It is recommended to install a means to allow for future shutoff of the vacuum source, such as a ball valve downstream of the Vacuum inlet fitting.
- 3 Connect one end of an RJ45 twisted-pair ethernet cable to the Ethernet port at the rear-bottom of the system enclosure. The other end of the cable is plugged into a network jack or Ethernet hub connected to the existing corporate network.
- 4 Connect the sample tubing to the appropriate ports at the rear-panel of the MPS drawer. Use the ratcheting socket driver with 3/8-inch adaptor to ensure the sample tubes are secure and do not come out when tugged on.
- 5 Connect power to the rear-bottom of the System enclosure.
- 6 Replace the rear-lower and rear-upper panels of the System enclosure.

Power-On Internal System Components

To turn on the power to the internal components:

- 1 Any AirSentry II IMS analyzers ordered as part of the configured System will be powered on once mains power is connected.
- 2 Open the front door of the AirSentry II AMC Monitoring System.
 - a. For the MPS rack, turn on power using the green power switch at the front of this rack.
- 3 Close the front door of the AirSentry II AMC Monitoring System.

To start system PC:

NOTE: The manifold system is controlled with an Industrial Node PC.

- 1 The Industrial Node PC is automatically powered upon plugging in the system to AC Power.
- 2 The Industrial Node PC is connected to the Drawer Mount Peripheral Monitor / Keyboard and is also automatically powered on upon system plug in to AC Power.
- 3 To interface with the manifold system, open the Peripheral Monitor/Keyboard by pulling and opening the drawer from the front of the system.
- 4 Upon opening the monitor/keyboard the login prompts will be displayed. Use the following username and password:
username: PMSuser
password: pms80301

NOTE: If HASP Keys are needed for software, these are to be inserted into the Industrial PC USB Ports. The externally facing Ethernet connection is to utilize the USB - Ethernet adapter which is added to the Industrial PC via external USB Port hub.

Calibrate the AirSentry II AMC Monitoring System

It is recommended to, at a minimum, perform a calibration procedure as outlined in the AirSentry II IMS Operations Manual.

Set Up Network Communications

The AirSentry II AMC Monitoring System has a network configuration that is designed to allow easy connection into a corporate network environment. The AirSentry II AMC Monitoring System will consist of the following components:

Included Components:

- 1** Industrial Node PC
- 2** Drawer - Mounted Peripheral Monitor / Keyboard
- 3** One (1) Ethernet switch with eight (8) LAN ports
- 4** One (1) Multi-Point Sampling unit comprised of 16 or 30 sample points

Optional installed components (depends upon ordered configuration):

- 5** Up to four (4) AirSentry II IMS Analyzers

Internal Network Topology (Example)

The internal network has been assigned the IP addresses given in Table 2-1 (may vary based on the specific configuration ordered). As an example, a 3-analyzer system containing Acids, Ammonia and Chlorides analyzers is shown below.

Table 2-1 IP Addresses for Internal Network

Device	IP Address
Laptop	11.1.1.2 (Static)
Laptop (2nd NIC)	Dynamic (DHCP)
Acids	11.1.1.3
Ammonia	11.1.1.4
Chlorides	11.1.1.5

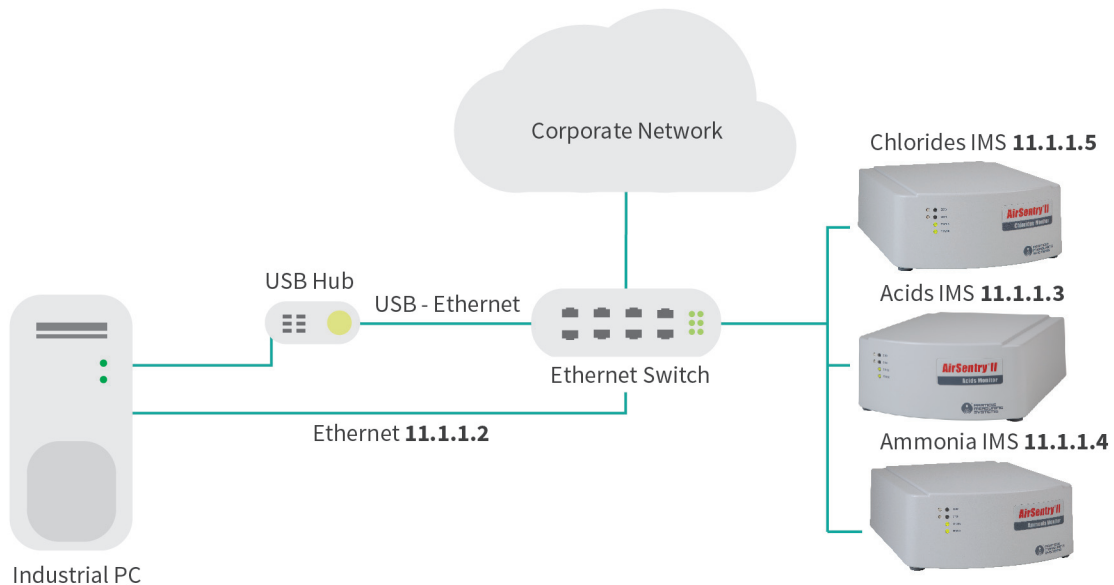


Figure 2-1 Networking Topology

Connecting to the Corporate Network

Connecting the system to the corporate network is relatively simple. After connecting the external Ethernet connector at the rear-bottom of the system enclosure to the corporate network, the laptop's second NIC will automatically be assigned an IP address from the corporate DHCP server. At this point the laptop has access to any resources on the corporate network, and can be joined to the corporate domain. The laptop can initiate any needed connection to the external network.

If however, the end user wants to initiate a connection from the corporate network into the AMC Manifold network, then the WAN IP address must be added as a gateway to the computer making the connection. This can be done either by adding another gateway directly on the computer making the connection, or have the IT department assign any gateways and routings from the main domain server. The WAN gateway must be added to the existing gateways or other network services may stop working.

This gateway address must be available to any computer that makes a remote desktop connection (RDC) or an OPC connection.

Advanced Setup

If necessary, a more advanced setup can be achieved by professional IT personnel. However, all of the analyzers must retain their current IP addresses in most situations. If the end user wishes to use an advanced setup that requires the IP addresses on any of the analyzers to be changed, then a qualified software support employee from Particle Measuring Systems must make, assist, and/or be aware of the change adopted.

Chapter 3 Software

WARNING

The AMC manifold system will become unstable and key software features will become dysfunctional if the PC name is changed or if any Windows operating system updates are loaded. Contact Particle Measuring Systems with any questions.

— NOTICE —

Before continuing, ensure that the PC name has not been changed from its default at the time of the software stack was loaded on to the PC before delivery.

— NOTICE —

Before continuing, ensure that the Windows Update service has been disabled.

iFix

The AirSentry II AMC Monitoring System uses iFix as its central software package and user interface. A general software scheme is identified in **Figure 3-1**.

- The MPS valve(s) which control the active sample port interface with the software serially.
- IMS analyzers utilize a background software program (Facility Net) to communicate with the software

The user interface allows for the automatic or manual control of sample settings, real-time graphing of sample point trends, alarm display and notification, as well as data downloading for report viewing or exporting.

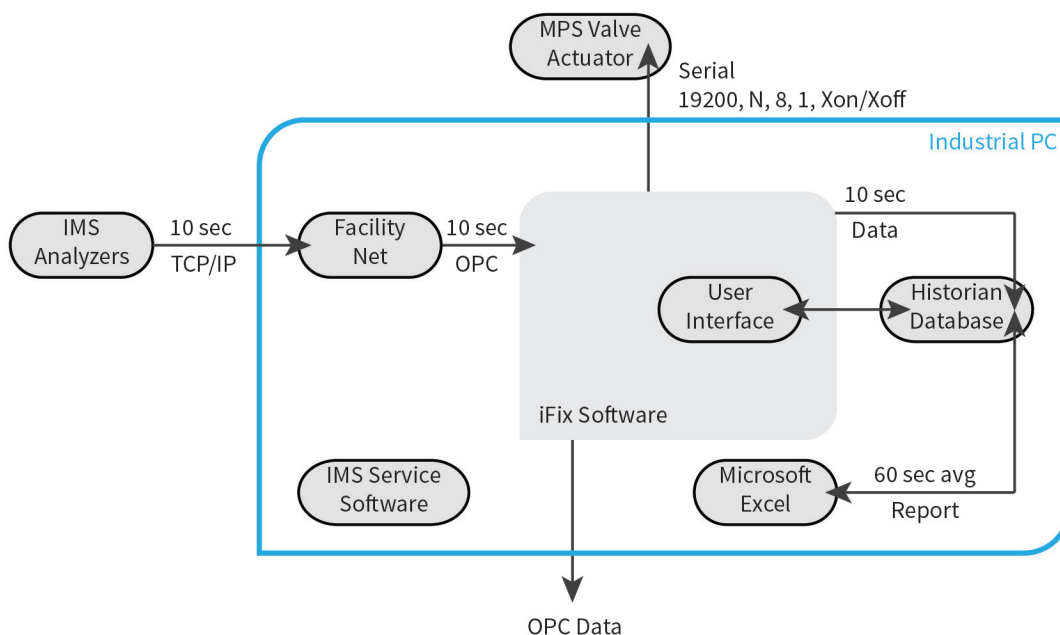


Figure 3-1 iFix general software scheme

OPC Data Access Overview

The AirSentry II AMC Monitoring System provides data via GE Digital's Proficy iFIX OPC Server. The server supports OPC Data Access Custom Interface Standard 2.05a. Information on the OPC specifications and standards can be found at <http://www.opcfoundation.org/>. These specifications and standards are essential for understanding how to use OPC. OPC (OLE for Process Control) is an industry standard created with the collaboration of a number of leading worldwide automation and hardware software suppliers working in cooperation with Microsoft. Based on Microsoft's OLE (Object Linking and Embedding), COM (Component Object Model) and DCOM (Distributed Component Object Model) technologies, OPC consists of a standard set of interfaces, properties, and methods for use in process-control and manufacturing-automation applications. The Active X/COM technologies define how individual software components can interact and share data. OPC provides a common interface for communicating with diverse process-control devices, regardless of the controlling software or devices in the process.

OPC Setup

The OPC data access components need to be installed on any PC prior to connecting to the OPC Server. The data access components are available for download from the OPC Foundation.

For more information on OPC data access, go to www.opcfoundation.org.

OPC Server & Setup

The Proficy iFIX OPC Server provides data that can be accessed by OPC Clients. The Proficy iFIX OPC Server is always available when the AirSentry II AMC Monitoring System is in operation. No configuration of the Server is required to access the data.

Connecting to the Server

Most client applications allow the user to browse for the server based on the IP address. The AirSentry II AMC Monitoring System OPC identifiers are:

OPC Server Program ID: Intellution.OPCiFIX.1

NOTE: Often the “.1” trailing the OPC Server Program ID is omitted.

Proficy iFIX OPC remains registered even after it shuts down. However, clients can only connect to the Proficy iFIX OPC server when it is already running.

Server Browsing

Proficy iFIX OPC supports IOPCServerList which is a 2.0 interface for browsing the registered OPC servers on a computer. Some clients cannot use this interface. In that case the 1.0 method of browsing which involves searching the registry for OPC entries should be used.

Tag List

The available tags from the AirSentry II AMC Monitoring System with OPC are as follows:

Concentration Tags:

Concentration: PMS.ASII_*[Position]*[*Analyzer*].CONC.F_CV

Analyzer Diagnostic Tags:

IMS Ambient Pressure: PMS.ASII_*[Analyzer]*_AMBPRESS.F_CV

IMS CDA Pressure: PMS.ASII_*[Analyzer]*_CDAPRESS.F_CV

IMS Cell Temp: PMS.ASII_*[Analyzer]*_CELLTEMP.F_CV

IMS Dopant Temp: PMS.ASII_*[Analyzer]*_DOPANTTEMP.F_CV

IMS Vacuum Pressure: PMS.ASII_*[Analyzer]*_VACUUM.F_CV

Sample/Purge Tags:

Sample Active: PMS.ASII_*[Position]*_Sample_Active.F_CV

Purge Active: PMS.ASII_*[Position]*_Purge_Active.F_CV

where

[Position] is a number between either 01 and 16 (for a 16 sample point manifold) or 01 and 30 (for a 30 sample point manifold) for each position of the manifold

[Analyzer] is a letter between A, B, C, D, or E for each analyzer that is connected to the manifold.

When using OPC to collect data, it is recommended to use appropriate logic to capture the correct data. For example, it is recommended to only capture a Concentration tag when the Sample tag is Active.

Navigating the AirSentry II User Interface

To start the software:

- 1 Double-click on the **AirSentry II System** icon on the desktop (see **Figure 3-2**).
- 2 Upon startup, the **AirSentry II Sampling Status** window will appear (see Figure 3-3 on page 3-7).

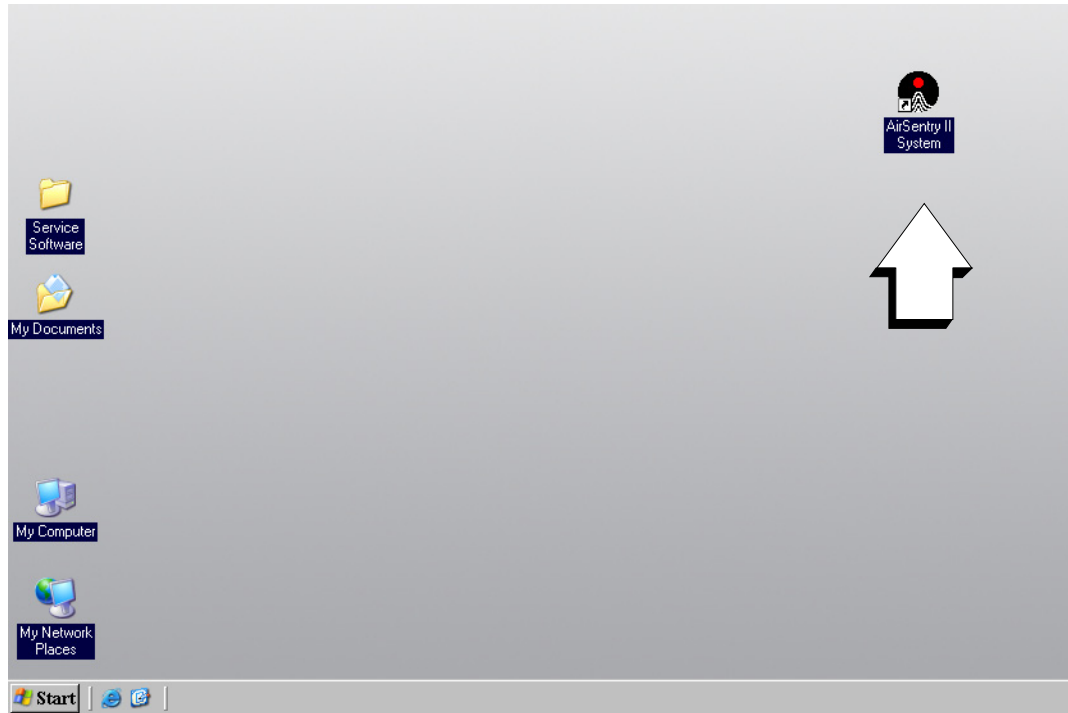







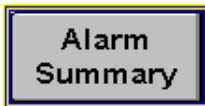


Figure 3-2 AirSentry II System icon on the desktop

Components of the AirSentry II Display

The AirSentry II display includes a *header* (top of screen) and a *navigation bar* (left side of screen) that are common to all AirSentry II graphics. In addition to two navigation push buttons detailed below, the header shows the display title and the current time and date. If an unacknowledged alarm exists anywhere on the system, the title will flash in red until the **Alarm Summary** is called up and the alarm is acknowledged.

The header and navigation bar includes the following navigation push buttons:

Push Button	Icon Name	Description
	Sampling Status	Brings up the Sampling Status display, which shows the current status of all actuator points.
	MPS Config	Brings up the MPS Configuration display, to allow the user to enable/disable sample points, order the sample sequence, provide sample point descriptions, and program the sample & purge times.
	Trend	Brings up the Trend display, which allows users to configure and view historical trends of multiple sample points or diagnostic variables.
	Reports	Brings up the Report display, which allows users to generate and view data summary and alarm reports.
	Setup	Brings up the Air Sentry II Setup window, which is where the user defines the valve actuators themselves and can access manual actuator control.
	Exit	Exits to the desktop. This function is not available at the <i>Operator</i> security level, but can be accessed by the <i>Supervisor</i> and the <i>Administrator</i> .
	User Security	Brings up the Login dialog box to allow users to login and logout of the System. The current user is identified on the header of the display.
	Alarm Summary	Brings up the Alarm Summary display, which lists all current alarms.

The Sampling Status Display

The **AirSentry II Sampling Status** display shows the current status for all sample points and analyzers.

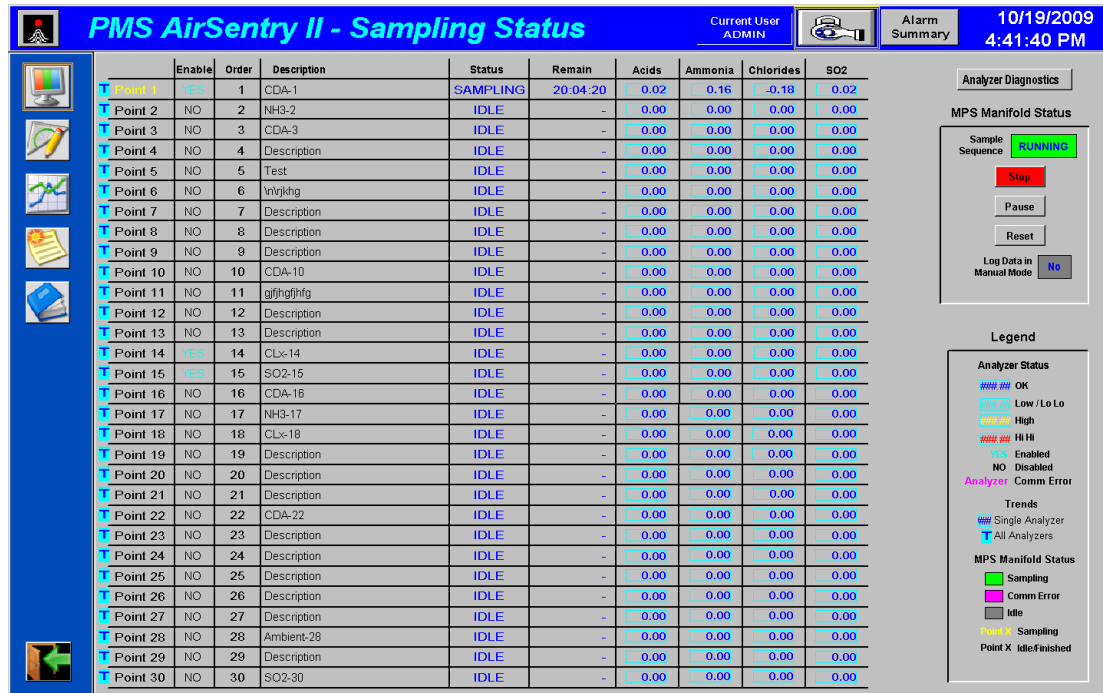


Figure 3-3 AirSentry II Sampling Status display

The **Main Status Screen** indicates for each sample point:

- Active Sampling** If the sample point is currently active (purging or sampling), its point number will appear **Yellow** in color.
- Enabled** If a sample point is enabled, it will sample in the stated order. If a sample point is not enabled, it will be skipped and not sample.
- Order** Describes the order in which the sample point is sampled in the sample sequence. If a sample point is not enabled, it will be skipped in the order sequence.
- Description** A user-defined description of the sample point (ex. Litho Bay C).
- Status** A current status of the sample point. Status can be Idle (not sampling), Purging (Sampling, but not saving data to the database), Sampling (Sampling, and saving data to the database), or Error (Error condition exists).
- Remain** The time in **hh:mm:ss**, remaining in the Purging or Sampling cycle. This field remains blank until the position is purged or sampled for the first time. If a particular position is being sampled in Manual mode, this field remains blank since there is no timer associated with the manual Sampling mode.
- Analyzer** The current or last concentration value (in ppbv) for each analyzer at a given sample point. If the sample point is currently purging or sampling, the value is the real-time concentration detected by each analyzer. If the sample point is not currently sampling (Idle), the value displayed is the last reported concentration measured at that sample point. If an analyzer is in a communication failure, its label will appear **Magenta** in color.

MPS Manifold Status

The MPS Manifold is controlled through the Status display. The MPS Manifold Status box shows the current status of the sample sequence, along with available controls.

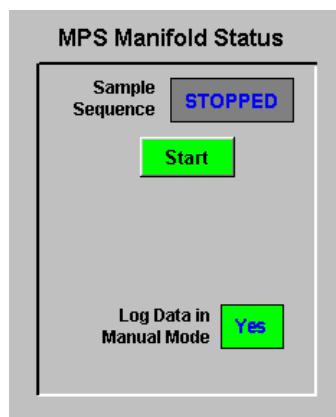


Figure 3-4 MPS Manifold Status box when **Sample Sequence** is stopped

To start the sample sequence, click **Start**. The AirSentry II System will begin the automatic sampling process, using the sampling sequence established for each sample point. It will purge and then sample each of the enabled points/positions, in order. Once started, the MPS Manifold Status box will provide the user with additional controls.

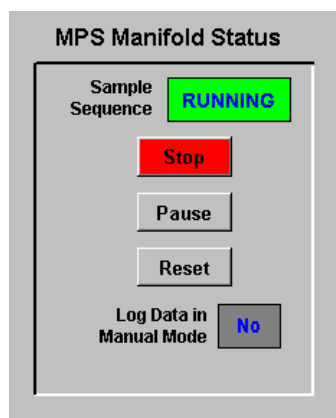


Figure 3-5 MPS Manifold Status box when **Sample Sequence** is running

Stop will stop the automatic sequencing process. If you wish to restart the sequence from the beginning, press **Stop** and then **Start**.

Pause will pause the sample sequence in its current state.

If the sample point is Purging:

- Data will not be collected while in the Pause mode.
- The timer will not advance its countdown.

If the sample point is Sampling:

- Data will continue to be collected and saved in the database for the position that is currently sampling.
- The timer will not advance its countdown.

Resume will resume the sequence from its Pause mode at the point where it was previously paused.

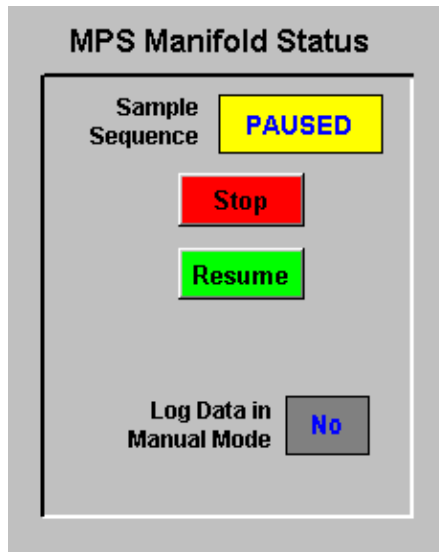


Figure 3-6 MPS Manifold Status box when **Sample Sequence** is paused

Reset will reset the purge or sampling phase of the current point/position. If the point is being purged when **Reset** is pressed, the purge will begin again. If the point is being sampled when **Reset** is pressed, the sample period will begin again (i.e., it will not re-purge the sample point).

NOTE: The controls on this display control the MPS manifold in Automatic mode. The manifold can also be placed into Manual mode and moved to a specific position. Manual mode is accessed through the **MPS Config** screen or the **Setup** screen. **Log Data in Manual Mode** identifies whether the data collected during Manual mode is logged to the historical database, and therefore available for trends and reports. Manual mode control is described in "Manual Control" on page 3-37.

Color Legend

Information on the **Status** display is color coded. The **Color Legend** at the bottom of the display identifies these color conventions.

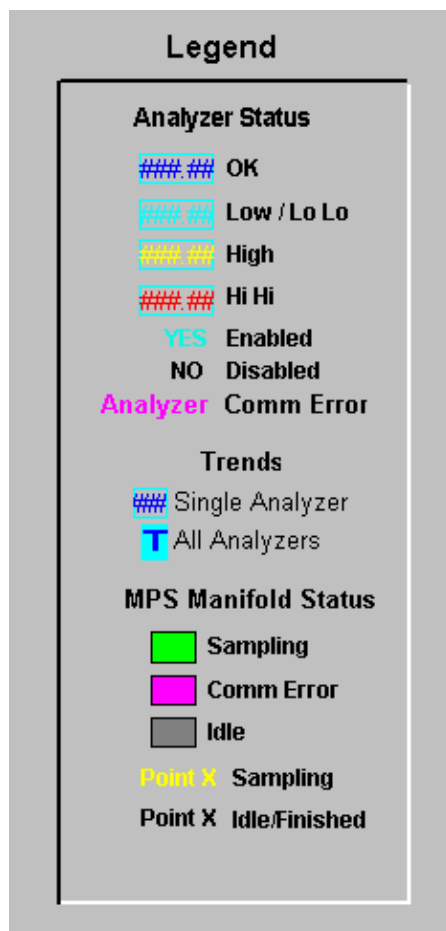


Figure 3-7 Legend box showing **Analyzer Status** colors

Alarm Setup Display

Concentration alarms are configured in the **Sample Status** display screen. Alarms may be set for each analyzer at each sample point.

To access the alarm setup screen:

- 1 Choose the **cyan**-colored rectangle.
- 2 Click on the value and choose **Alarm Setup** from the dropdown menu (see Figure 3-8 on page 3-11).

A detailed **Alarm Setup** dialog box appears for the selected point (see Figure 3-9 on page 3-11).

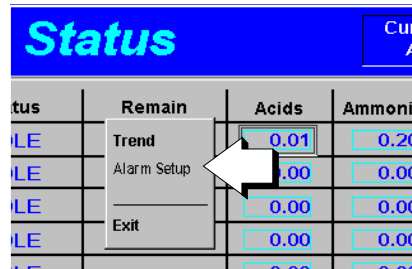


Figure 3-8 Single Value pop-up menu

Figure 3-9 Alarm Setup dialog box for configuration

Figure 3-9 shows the dialog box for configuring parameters, deadband, and delays.

Alarms can be provided for **Low**, **Low-Low**, **High** and **High-High** values.

In addition, alarms can be **enabled** (active) or **not enabled** (off).

NOTE: If the alarm has been configured as **not enabled**, when iFix software is re-opened it will reset to the default **enabled**.

Finally, additional alarm parameters available allow the user to enter an overall alarm deadband and individual delays, in **mm:ss**, for each alarm type. Alarm deadband helps to eliminate nuisance alarms caused by the value wandering above and below the alarm limit. If the deadband is set (deadband is set in units of ppbv), when the value causes the point to go into alarm, the point will not go out of alarm until the point's concentration value exceeds the deadband.

NOTE: The **Alarm Setup** features are available for all values *except* the analyzer concentration values shown on the **Analyzer Diagnostics** display. Analyzer concentrations have individual alarm limits for each point/position, not for the analyzer itself.

Analyzer Diagnostics

To view detailed information about the current status of each analyzer, click

Analyzer Diagnostics

the **Analyzer Diagnostics** button on the **Status** display. This will bring up the **Analyzer Status** pop-up display (see **Figure 3-10**). This display shows the current value of each parameter associated with the analyzer. These diagnostic parameters may be useful for troubleshooting purposes. If the analyzer is in communications failure, question marks (????) will appear in place of a numerical value, indicating that the value is currently unknown.

Right-clicking on a value within the **Analyzer Diagnostic** screen will provide up to two additional options (**Trend** and **Alarm**). Choosing **Trend** will provide a trend graph of the data point. Choosing **Alarm** will allow for setting alarm limits for the diagnostic data point.

NOTE: Alarm limits for concentration are not set in this screen, but are set in the **Sampling Status** screen.

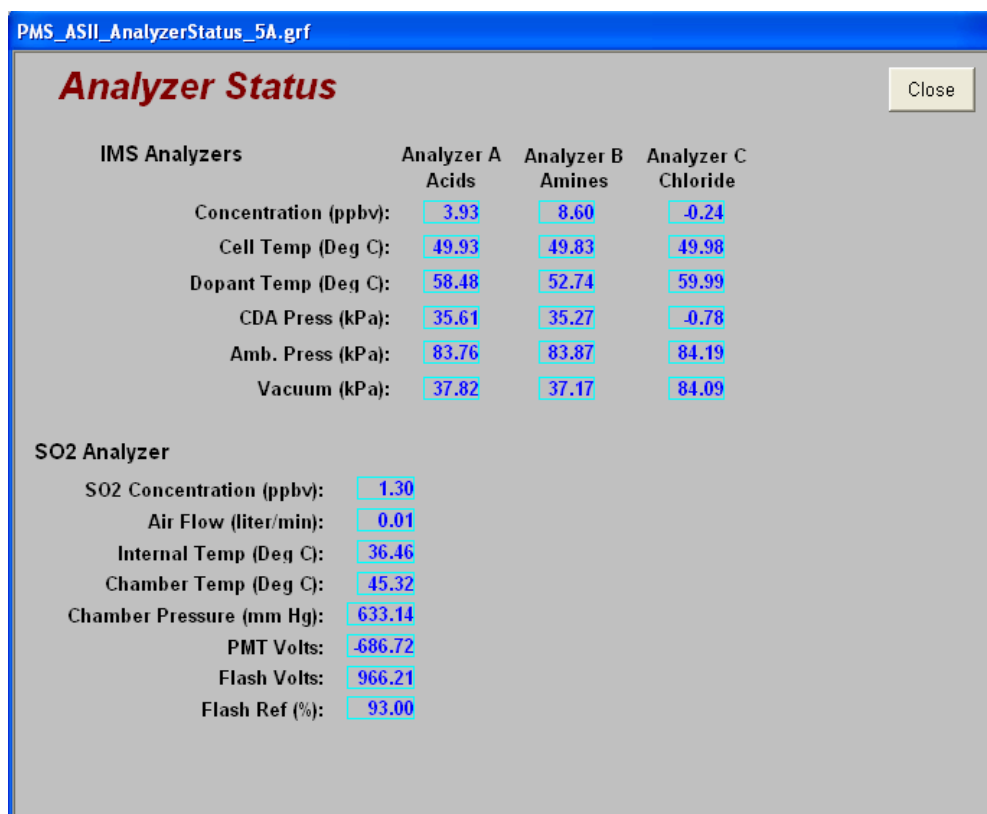


Figure 3-10 Analyzer Status, showing current values for parameters

The Configuration Display

Once all parameters have been entered through the AirSentry II Setup display, the individual points/ports can be configured or modified through the Configuration display. The **Configuration** display shows configuration settings for each of the points/positions (see **Figure 3-11**).

To avoid conflicts in the sampling sequence, the MPS Manifold controls are automatically stopped each time you save configuration changes. When you have completed the desired configuration changes, you must return to the Sampling Status display and restart the sample sequence.

Pos	Order	Enable	Description	Purge	Sample
1	1	Yes	CDA-1	00:00:20	20:15:00
2	2	No	NH3-2	00:00:20	02:15:00
3	3	No	CDA-3	00:01:00	00:01:00
4	4	No	Description	00:00:20	00:01:00
5	5	No	Test	00:00:23	00:00:20
6	6	No	lvkjkhg	00:00:21	00:00:20
7	7	No	Description	00:00:00	00:00:00
8	8	No	Description	00:00:00	00:00:00
9	9	No	Description	00:00:00	00:00:00
10	10	No	CDA-10	00:01:00	00:01:00
11	11	No	ghghghgh	00:00:00	00:00:00
12	12	No	Description	00:00:00	00:00:00
13	13	No	Description	00:00:00	00:00:00
14	14	Yes	CLx-14	00:00:20	02:15:00
15	15	Yes	SO2-15	00:00:20	02:15:00
16	16	No	CDA-16	00:00:00	00:00:00
17	17	No	NH3-17	00:01:00	00:01:00
18	18	No	CLx-18	00:01:00	00:01:00
19	19	No	Description	00:00:00	00:00:00
20	20	No	Description	00:00:00	00:00:00
21	21	No	Description	00:00:00	00:00:00
22	22	No	CDA-22	00:01:00	00:01:00
23	23	No	Description	00:00:00	00:00:00
24	24	No	Description	00:00:00	00:00:00
25	25	No	Description	00:00:00	00:00:00
26	26	No	Description	00:00:00	00:00:00
27	27	No	Description	00:00:00	00:00:00
28	28	No	Ambient-28	00:01:00	00:01:00
29	29	No	Description	00:00:00	00:00:00
30	30	No	SO2-30	00:01:00	00:01:00

Figure 3-11 Configuration display

Each time you change a parameter, its background will appear in *yellow* as a reminder that a change has been made but not yet saved. To restore the display to the original settings, press **Load** and the display will be refreshed with the last saved values.

Order

This entry defines the order in which each point/position is sampled by the AirSentry II. For 16-point valve actuators, select a number between 1 and 16. For 30-point valve actuators, select a number between 1 and 30. An order assignment of "0" is **not** allowed, and all numbers must be used.

Enable

This entry determines whether the position is enabled for sampling. Select **Yes** to sample the position/point when its turn comes in the sequence. Select **No** to skip the position/point.

Description

This is a description of the point. To modify the description, click on it, and you will be asked to enter a new **Position Description** (see **Figure 3-12**).

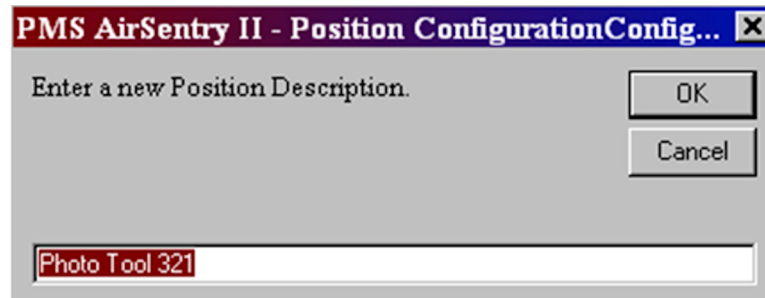


Figure 3-12 Position Configuration Description dialog box

Unlike the other configuration parameters, which are verified and saved as a group, description changes are saved individually. After entering a new description, the new description will appear in *yellow* on the **Configuration** screen, and message shown in **Figure 3-13** appears.

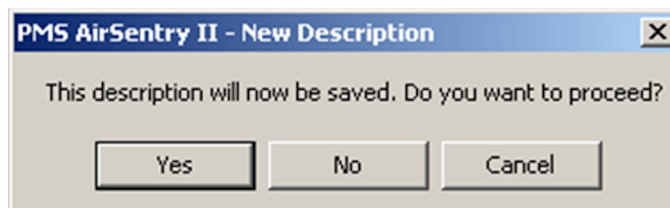


Figure 3-13 New Description dialog box

If you answer **Yes**, the background of the new description will switch from *yellow* to *gray*, indicating it has been successfully saved. If you answer **No**, you will see the message shown in **Figure 3-14**.

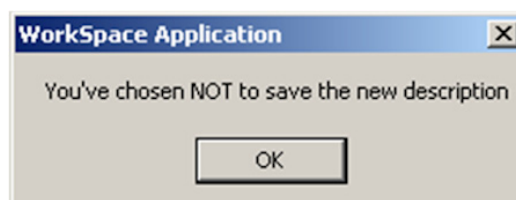


Figure 3-14 New Description message when the new description was not saved

The description will revert to the original description, and its background color will return to *gray*.

Purge

This is the length of time, in **hh:mm:ss**, that the position is purged prior to sampling. To enter a new **Purge Time**, click on it, and the dialog box shown in **Figure 3-15** will appear. Purge Times for enabled points must be 20 seconds or higher.

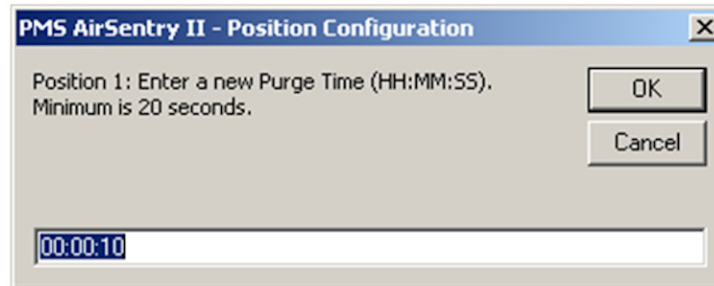


Figure 3-15 Position Configuration (for entering a value for **Purge Time**)

Sample

This is the length of time, in **hh:mm:ss**, that the position is sampled. To enter a new **Sample Time**, click on it, and the dialog box shown in **Figure 3-16** will appear. Sample Times for enabled points must be 20 seconds or higher.

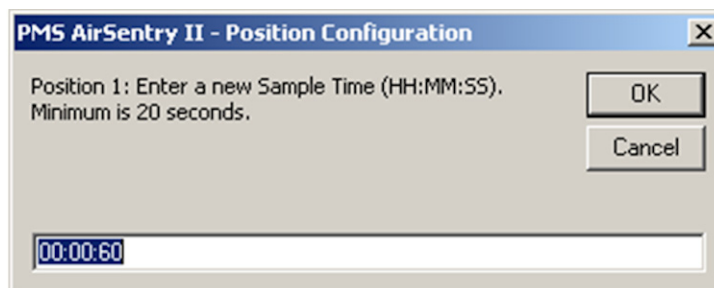



Figure 3-16 Position Configuration (for entering a value for **Sample Time**)

If you enter a purge or sample time less than 20 seconds, you will receive an error message.

Verifying and Saving Configuration Changes

When you are ready to save your configuration changes, click  the **Verify** button. **Verify** checks the actuator position order to make sure that there are no duplicate or zero entries. If no mistakes have been made, verification will be confirmed with an **All parameters are verified** message. If mistakes are found, the error will be identified.

If you have enabled a position, but not entered a **Purge** or **Sample Time**, you will see a message similar to the one shown in **Figure 3-17**.

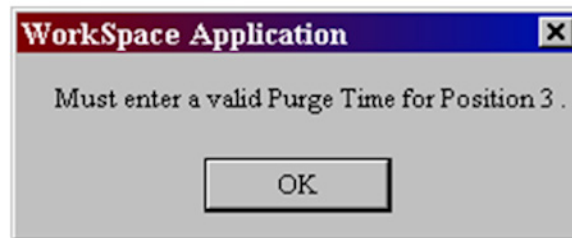


Figure 3-17 Error message when no **Purge Time** or **Sample Time** values have been entered for a position

If you have enabled a position that has an **Order** number of zero, you will see the following message:

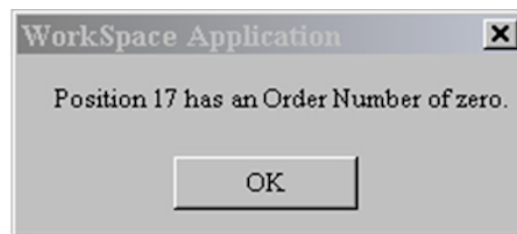


Figure 3-18 Error when an enabled position has **0** for its **Order** number

If you enter duplicate **Order** numbers for two positions, you will see a message similar to the following:

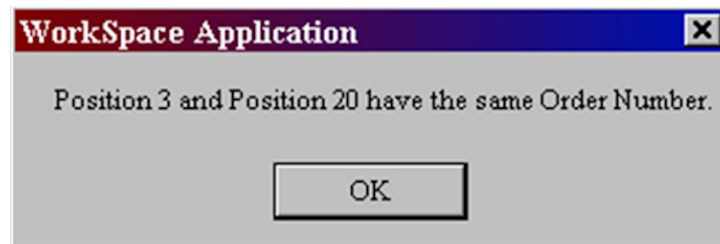

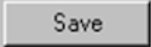
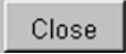



Figure 3-19 Error when multiple positions have the same **Order** number

Correct any mistakes and click  the **Verify** button again. After successful verification, a **Save** button will appear at the top of the screen. Click  the **Save** button to save the new configuration.


Click  the **Close** button to close the **Configuration** display.

Trend Displays

Three types of trends are available:

- 1 A configurable trend, where users can add multiple pens, is available from the **Trend** button on the left-side navigation bar.
- 2 A standardized pop-up trend is available for any value that appears inside a cyan-colored rectangle.
- 3 A trend that includes all analyzer values for the selected point/position is available by clicking on the  that appears to the left of the position number on the **Status** display.

Configurable Trends

Clicking  the **Trend** button brings up the configurable trend window (see **Figure 3-20**).

The trend will show the set of pens/variables that were selected the last time this trend was viewed. You may change the variable(s) to be trended, the trend's start time, color scheme, and whether individual vertical axes are displayed.

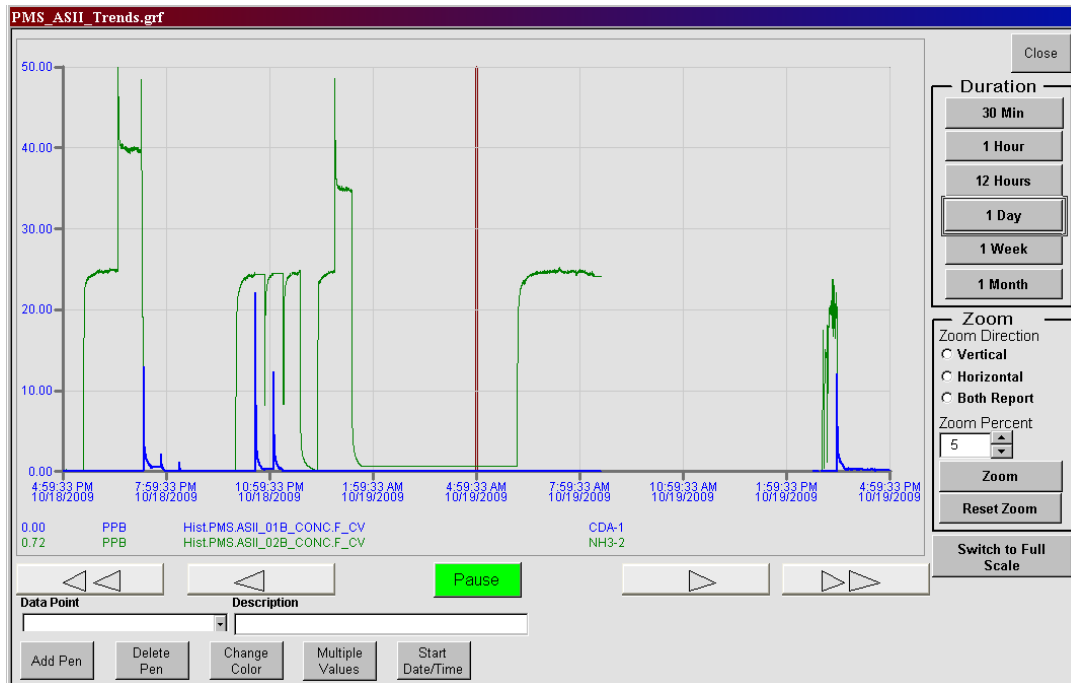


Figure 3-20 A Configurable Trend chart

At the bottom of the trend chart, a description, tag name and value are displayed for each trended variable. This value corresponds to the thick vertical maroon line that appears in the middle of the trend. Use the mouse to move the cursor over the maroon line. Hold the left mouse button down, and the time, date, and value associated with the position of the maroon-colored line will appear in a box over the line. Keep holding the mouse button down and you can move the maroon line as you move the mouse. You can use this method to identify times and values associated with data on the trend.

Trend Duration

The default duration of the trend is 1 hour, but you can select durations of **30 Minutes**, **1 Hour**, **12 Hours**, **1 Day**, **1 Week**, and **1 Month** by clicking on the appropriate button on the right side of the display.

NOTE: Alarm limits for concentration are not set in this screen, but are set in the Sampling Status screen

The maximum number of sample points that can be displayed by a graph is 5,000.

Because data is collected into the database every 10-seconds, 30-minutes, 1-hour, and 12-hour graphs will show the data as it is captured in the database. For graphs of 1 day, 1 week, and 1 month, 10 second data is much larger than the maximum 5,000 data points that can be displayed. Because of this, the graphs for these charts plot the data from the database at different intervals (1 day = 20 second interval, 1 week = 140 second interval, and 1 month = 4200 seconds). Because of this data point limitation, these larger duration graphs may appear to change as the screen is updated or scrolled.

Arrow Buttons

Use the arrow buttons at the bottom of the display to move backward and forward in time. Pressing the single arrow buttons (< or >) will move the trend by one-fourth of the trend duration (e.g., 3 hours for a 12 hour trend). Pressing the double arrow buttons (<< or >>) will move the trend by one-half of the trend duration (e.g., 6 hours for a 12 hour trend).

Pause/Resume

The trend defaults to continually update with new data. To freeze the data on the trend, press the **Pause** button at the bottom of the graph. When paused, this pushbutton will toggle to **Resume**. Press **Resume** to resume trend data updates.

Zoom

You can use the **Zoom** parameters on the right side of the screen to take a closer look at the data. Click on a **Zoom Direction** of **Vertical**, **Horizontal**, or **Both** and enter a **Zoom Percent**, either by using the up and down arrow keys or by entering a numerical value. Click the **Zoom** button to see the new trend. To restore the trend to its original axes, click **Reset Zoom**.

There is also another option for zooming in on data. If you want to look at a portion of the displayed data with a greater resolution, use the cursor to “box” that section of the trend line. To do this, move the cursor to the upper left corner of the area of the trend that you want to look at. Hold the left mouse button down and move the cursor to the lower right corner of the area of interest. As soon as you begin to move the cursor, a box will appear around the selected data. When the box includes all of the trend area that interests you, release the left mouse button, and the trend display will be redrawn so that the boxed section fills the entire display. The box will only zoom in based on what is chosen in Zoom Direction for the selection of Vertical, Horizontal, or Both zooming.

Add Pen

An indefinite number of pens can be added to the trend, although only the first eight will be saved when the trend graph is eventually closed. To add a pen, review the available tag names under the **Data Point** pull-down menu.

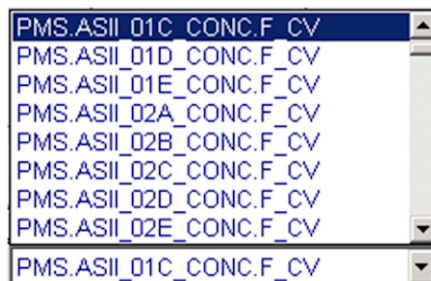



Figure 3-21 Available **Pen** tag names in the **Data Point** pull-down menu

Select a data point, and its description will appear as well in the **Description** box.




Figure 3-22 Selected **Data Point** and the **Description** associated with it

To add this point to the trend, click  the **Add Pen** button beneath the trend.

Data Ranges

When you add a concentration tag to the trend, its range will default to the concentration trend limit set up during system configuration. This range will often be much narrower (e.g., 0-50 ppb) than the full range that is entered in the database (e.g., 0-100 ppb). This allows you to view the trend data with greater precision. A single concentration trend limit applies to all concentration tags. All other trend tags, including analyzer temperatures and pressures, do not have a default trend limit. The y-axis range for these tags will be between the low and high engineering unit limits, as defined in the tag database.

To switch from the default trend limit to the full scale limit, click  the **Switch to Full Scale** button. This button will toggle to **Switch to Default** to allow you to switch back to the default trend limits as desired.

You may also define a specific y-axis range for a trend tag by moving the cursor into the chart area and double-clicking the left mouse button. Select the **Chart** tab from the **Chart Configuration** dialog box that appears (see Figure 3-23 on page 3-21).

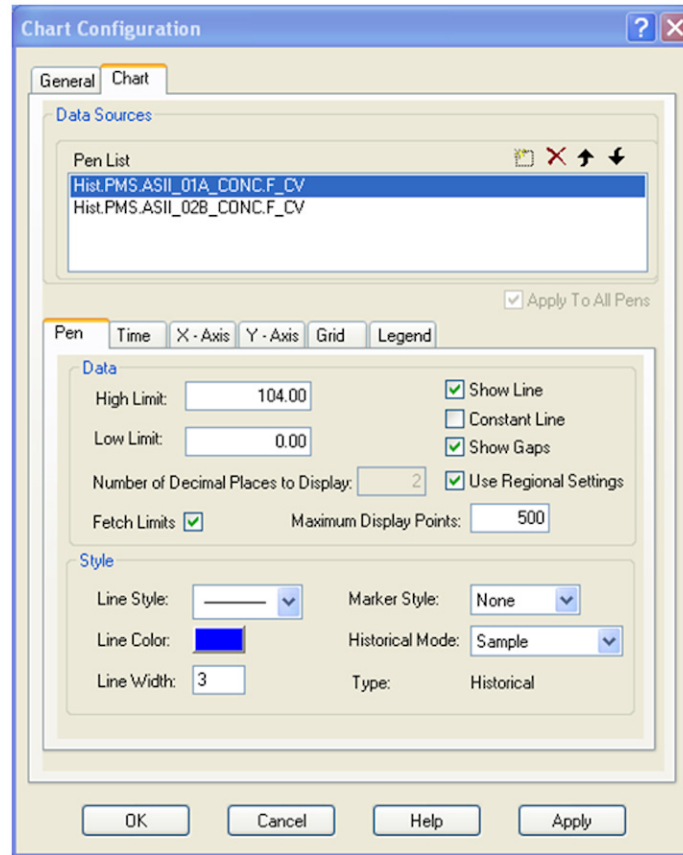

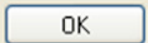



Figure 3-23 Chart tab in the Chart Configuration pop-up


To change a range, highlight the tag/pen on the **Pen List**, and then enter new values in the **High Limit** and/or **Low Limit** fields.

To view the results of your changes, click  the **Apply** button. To save your changes, click  the **OK** button. These changes will remain in effect until the pen is deleted from the trend.

Delete Pen

To remove a pen from the trend, click on its line of tag name information beneath the chart, and then click  the **Delete Pen** button.

Change Color

Default color options are assigned for the trend chart itself, as well as for individual pen colors. To change any of these colors, click  the **Change Color** button.

The **Change Color of the Chart and Pens** pop-up appears (see Figure 3-24 on page 3-22).

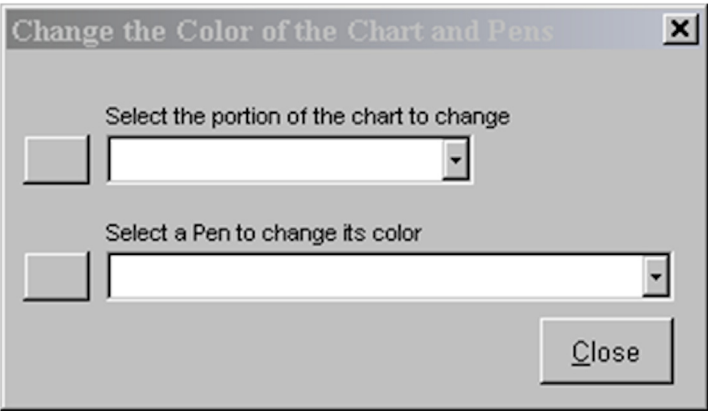


Figure 3-24 Change Color of the Chart and Pens pop-up

The pulldown menu under **Select the portion of the chart to change** lists all of the chart features that may be changed (see **Figure 3-25**).

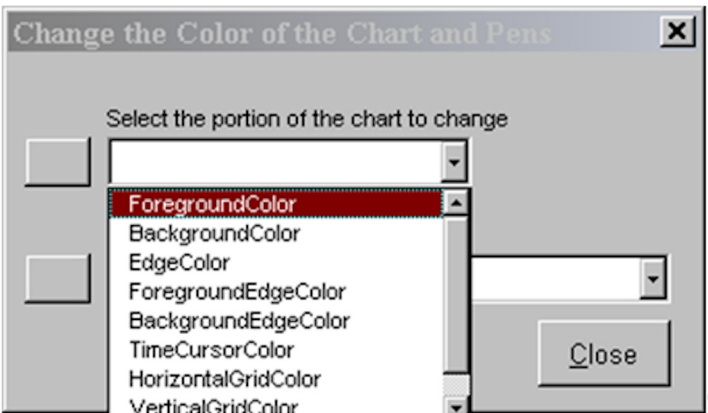


Figure 3-25 Select the portion of the chart to change menu

Figure 3-25 displays the **Change Color of the Chart and Pens** pop-up window.

The pulldown menu under **Select a Pen to change its color** lists all of the tag names currently included on the trend (see **Figure 3-26**).

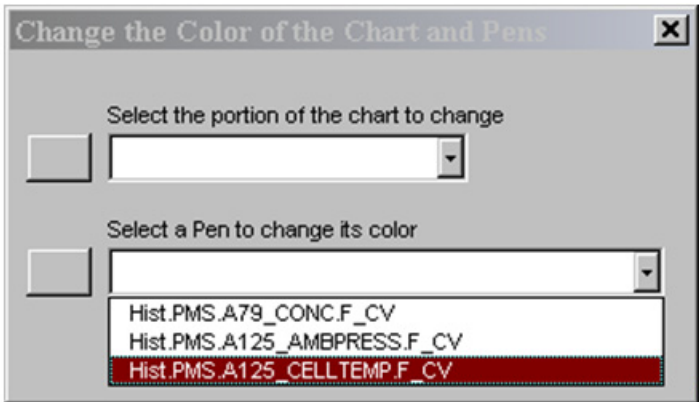



Figure 3-26 Select a Pen to change its color menu

Figure 3-26 displays the **Change Color of the Chart and Pens** pop-up window.

Make a selection from either of these menus and click  the corresponding left-side button. The **Select Color** pop-up appears with palette of available colors (see **Figure 3-27**).

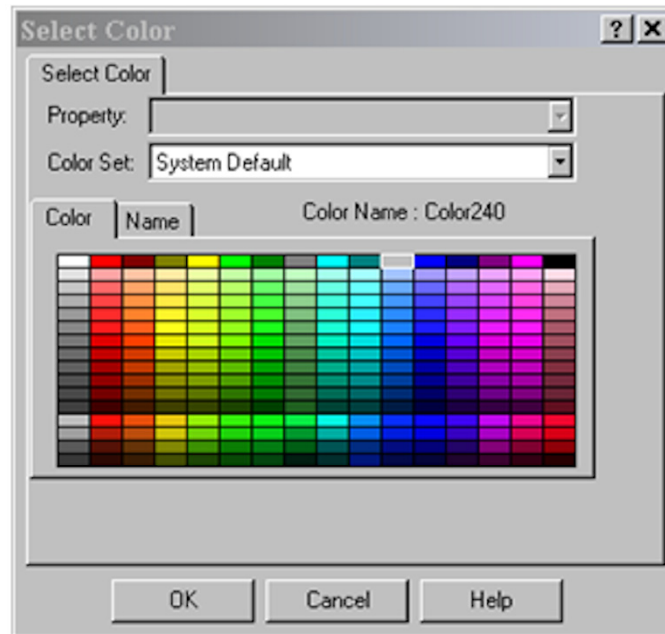
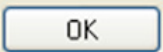
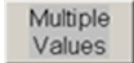


Figure 3-27 Select Color pop-up

Click on the desired color, then click  the **OK** button. The chart will be redrawn with the new color scheme.

Multiple Vertical Scales

By default, a single vertical scale is included on the chart, regardless of the number of pens. You can switch the vertical scales by clicking on the pen descriptions below the graph. The color of the y-axis corresponds to the pen that is chosen. The vertical axis is scaled to encompass the ranges of all the trended variables. If the individual variables have widely divergent ranges, this can result in a loss of resolution in one or more of the trend lines.

As an alternative, each pen can be trended against its own range. Click  the

Multiple Values button and individual scales will appear on the vertical axis. Each scale will be color-coded to match its corresponding pen. An example is shown in **Figure 3-28**.

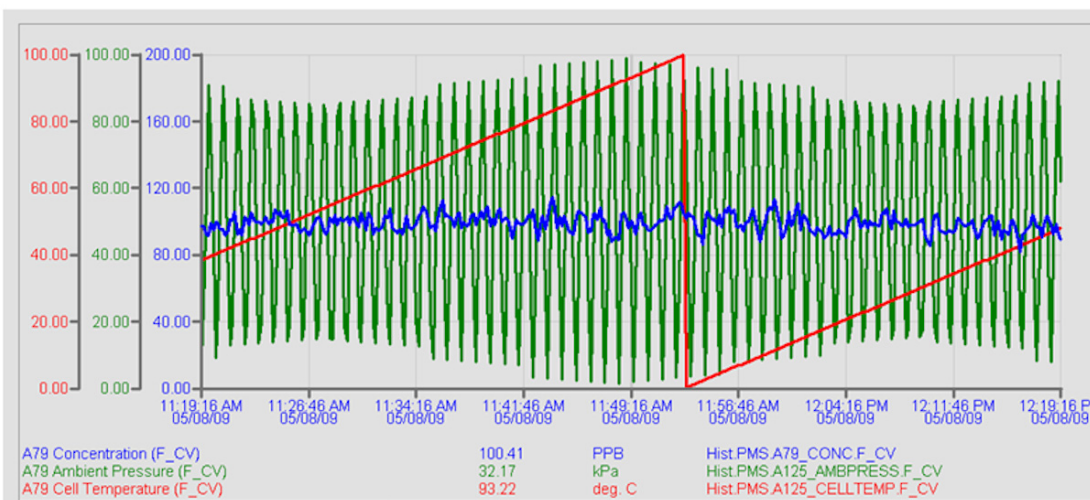
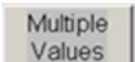


Figure 3-28 Multiple Values Chart mode

To return to a single y-axis scale, click  the **Multiple Values** button again.

Start Date and Time

By default, the trend shows the most recent data. Earlier time periods can be trended by pressing the < and << buttons to move back in time. You can also view a specific

time frame by clicking  the **Start Date/Time** button to display the **Chart**

Start Date and Time Configuration pop-up (see **Figure 3-29**).

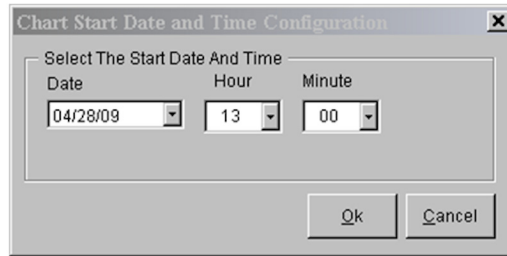
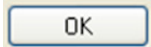


Figure 3-29 Chart Start Date and Time Configuration pop-up

Select the desired **Start Date**, **Hour**, and **Minute**, and click  the **OK** button. The chart will be redrawn to reflect the new start time.

Pop-up Trends

Single Value Pop-up Trends

Pop-up trends are available for any value that appears inside a *cyan*-colored rectangle. To bring up a standardized pop-up trend, click on the value and choose **Trend** from the dropdown menu.

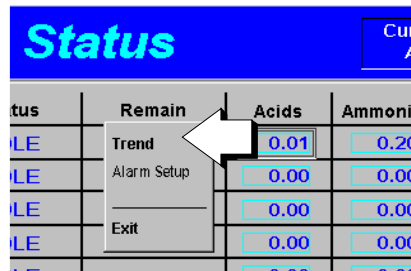


Figure 3-30 Single Value pop-up menu

A trend similar to the one in **Figure 3-31** appears.

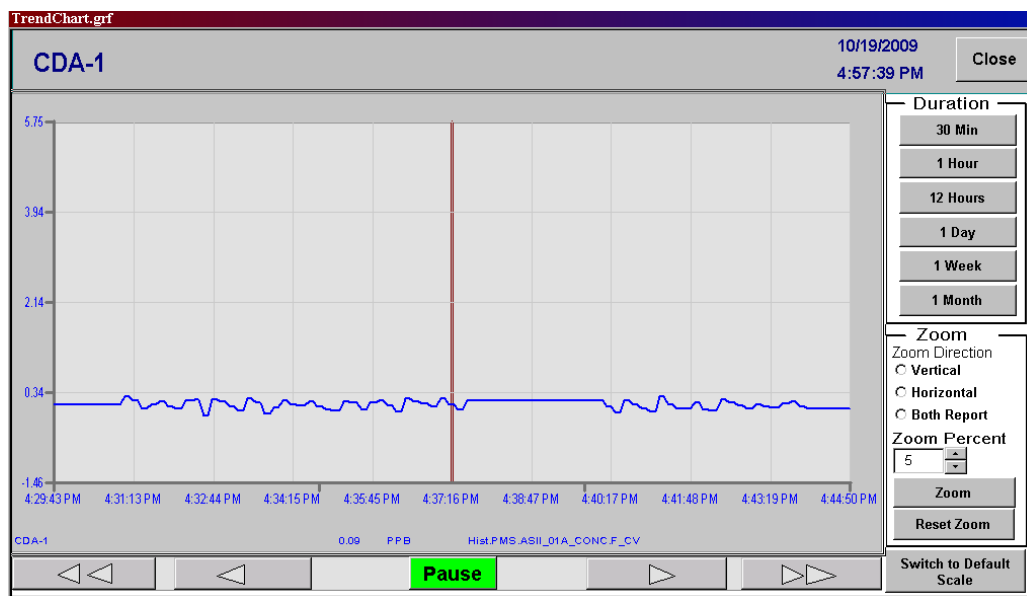


Figure 3-31 Single Value Trend chart

Most, but not all, trend navigation options are available as described in the “Configurable Trends” on page 3-17 section. For example, multiple pens are not allowed as this graph is primarily intended to only display concentration data for one analyzer at one sample point.

Multiple Value Trends

You may also view a trend of all analyzers associated with a position. These trends are available from the Status Display. Click on the **T** next to the position/point you wish to trend. A trend similar to the one shown in **Figure 3-32** will appear. Each analyzer is assigned its own pen color.

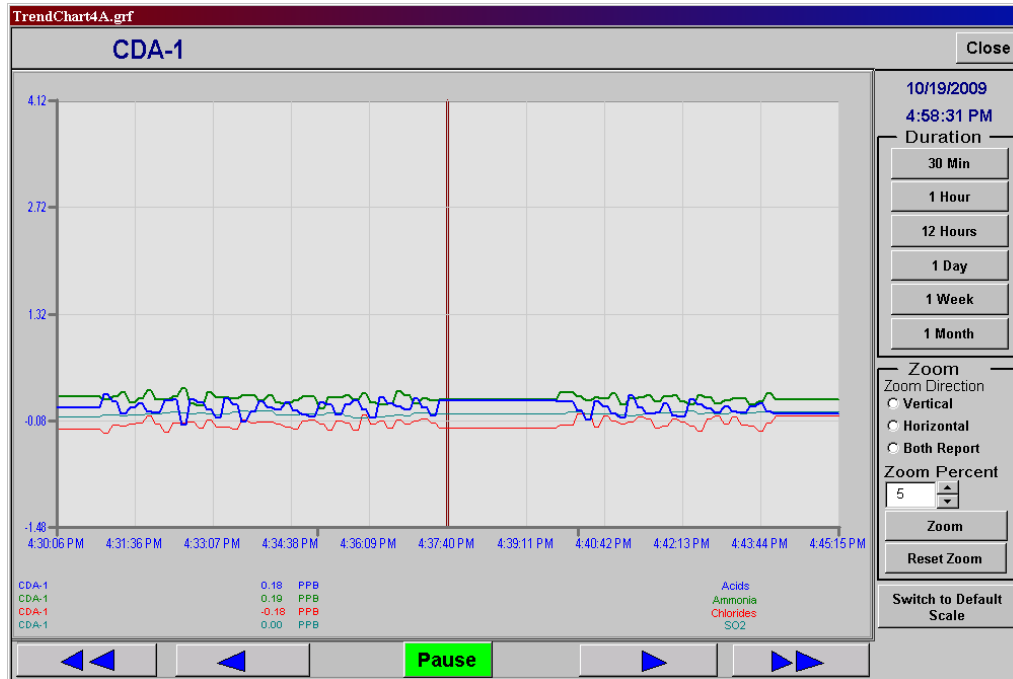



Figure 3-32 Multiple Value Trend chart

All controls operate as they do for the single value pop-up trend as discussed above.

Alarm Summary

Viewing Current Alarms

When a new alarm comes in, the display title at the top of each page begins flashing in red. To view the new alarm, click  the **Alarm Summary** button in the title bar. This brings up the **Alarm Summary** display that lists all of the alarms that are currently active in the system (see **Figure 3-33**).

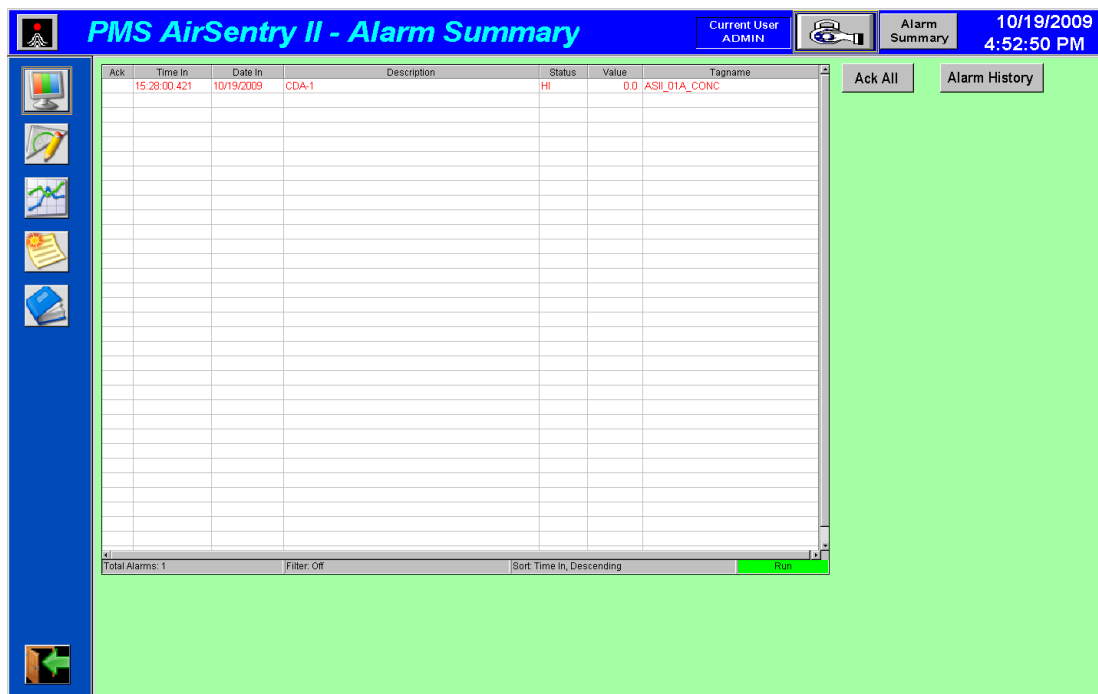


Figure 3-33 Alarm Summary display

The most recent alarm appears on the first line of the display, and the others follow in the order in which they were received. The scroll bars on the right can be used to view additional alarms, if necessary.

Alarms that have not yet been acknowledged will appear in flashing red text. If the alarm has already been acknowledged, a check mark will appear to the left of the alarm, which now appears in solid black text.

If the alarm condition no longer exists AND the alarm has already been acknowledged, it will be removed from the **Current Alarm Summary**.

Acknowledging Alarms

To acknowledge a single alarm, click within the left-hand field (the **Alarm Acknowledgement** field) of the alarm entry. To acknowledge all alarms, click

Ack All the **Ack All** button.

Once there are no unacknowledged alarms, the title bar will stop flashing.

Alarm History

Clicking **Alarm History** the **Alarm Summary** button in the **Current Alarm Summary** display will bring up the **Alarm**, **Log**, and **Event** histories.

The Alm Tab

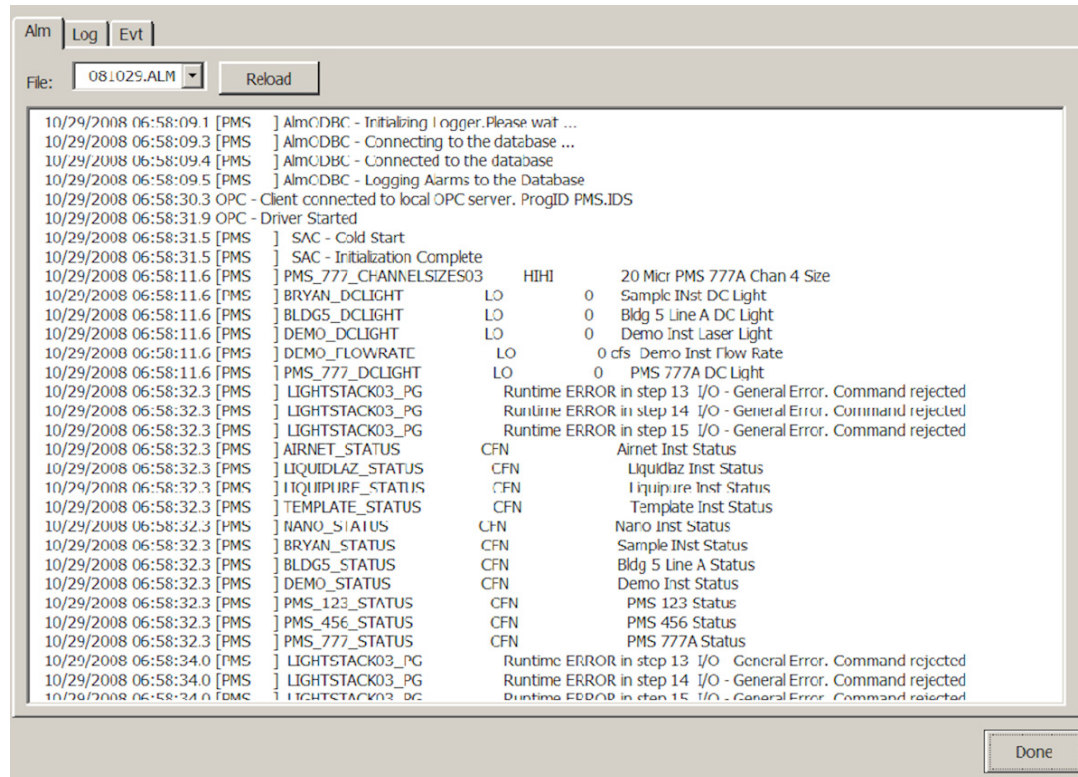


Figure 3-34 Alm tab in the Alarm History display

The **Alm** tab displays information about all alarms and events, alarm acknowledgements, and user actions for the chosen day. The day is selected through the dropdown menu labeled **File**. Each day has its own file that follows the naming convention **yyymmdd.alm** (e.g., 090616.alm).

The Log Tab

The **Log** tab displays log in and log out records for the chosen day. The day is selected through the dropdown menu labeled **File**. Each day has its own file that follows the naming convention **yymmdd.log** (e.g., 0090616.log).



Figure 3-35 Log tab in the **Alarm History** display

The Evt Tag

The **Evt** tab brings up a record of iFIX level events, such as restarts, for the selected day.

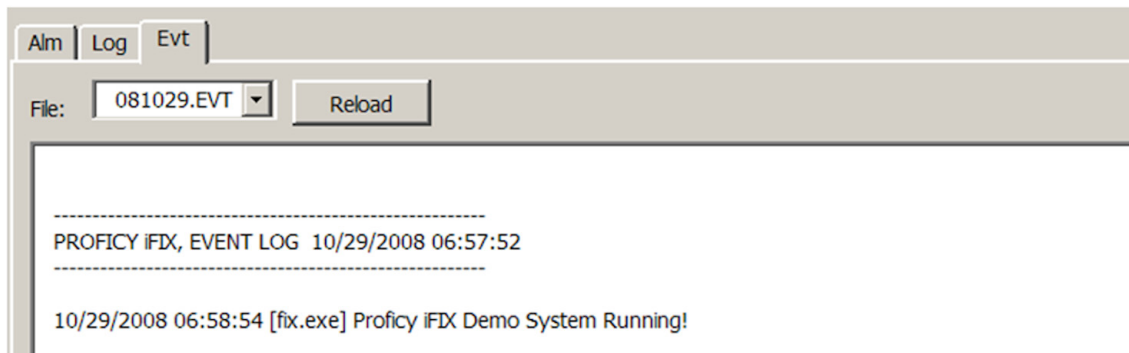


Figure 3-36 Evt tab in the **Alarm History** display


Reports

Reports of sample data and alarms can be viewed or exported for any valid time period. A valid time period is anytime after the first sample point was recorded.

NOTE: Do not enter a start time that is earlier than the first known sample point value.

Reports can take a long time to generate. It is recommended to keep report intervals to less than 7 days of data.

Generating reports will also take priority over data storage; when reports are generated, the current sample data is not saved during the time the report is being generated.

The  **Reports** button on the side of each display brings up the **Report** display (see **Figure 3-37**).

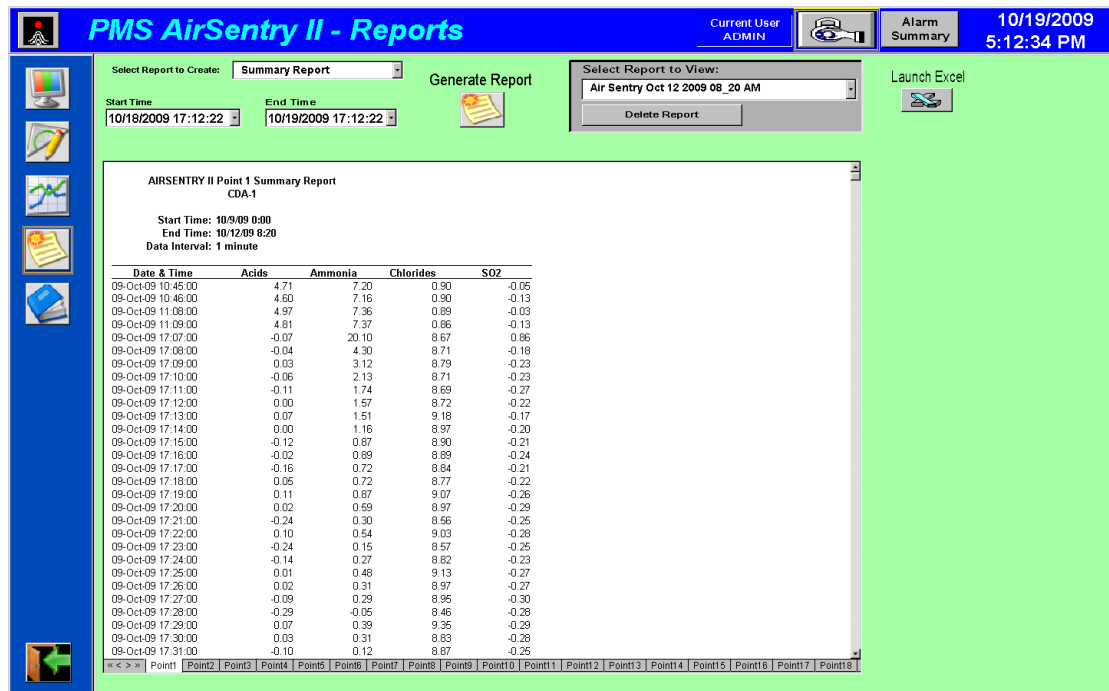


Figure 3-37 Reports display

The initial display defaults to the **Summary Report** selection.

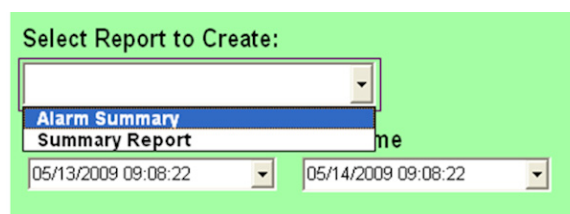


Figure 3-38 Select Report to Create pull-down menu in the Reports display

Enter the desired time period by selecting a **Start Time** and an **End Time**. **Summary Reports** include 1-minute interval data for each position/point for the selected time period.

NOTE: For more information on Alarm Summary Reports, refer to “Alarm History” on page 3-29. Alarm information may be exported by using cut (Ctrl+C) and paste (Ctrl+V) into the word processor or database program of your choice.

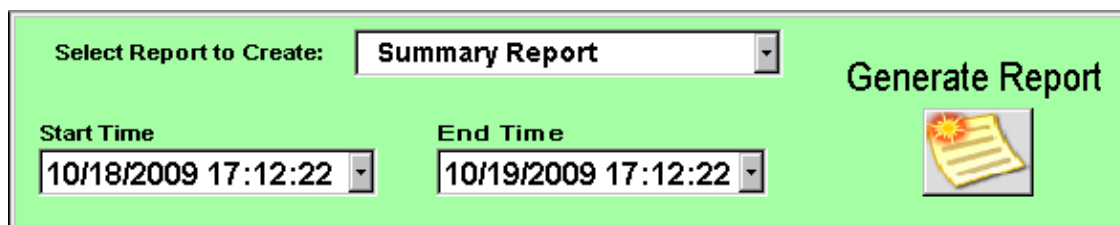
The screenshot shows a software interface for generating reports. It has a light green background. At the top left, there is a label 'Select Report to Create:' followed by a dropdown menu currently showing 'Summary Report'. To the right of this is a large button labeled 'Generate Report' with a yellow document icon featuring a red starburst. Below the dropdown menu, there are two more dropdown menus labeled 'Start Time' and 'End Time'. The 'Start Time' dropdown shows '10/18/2009 17:12:22' and the 'End Time' dropdown shows '10/19/2009 17:12:22'.

Figure 3-39 Reports button in the **Reports** display

To generate the report, click on the indicated **Generate Report** button.

While the report is being generated, the message “*Creating Report Please Wait...*” appears on the screen. Depending on the length of the report period, this may take a number of minutes. When the report has been created, it will appear at the bottom of the display.

Summary Reports

Summary Reports list one-minute sampling data for each port/point. The one-minute data is an average of the preceding six (6) 10-second sample interval data taken while the sample point is in the Sampling Mode.

AIRSENTRY II Point 1 Summary Report CDA-1				
Start Time: 10/9/09 0:00				
End Time: 10/12/09 8:20				
Data Interval: 1 minute				
Date & Time	Acids	Ammonia	Chlorides	SO2
09-Oct-09 10:45:00	4.71	7.20	0.90	-0.05
09-Oct-09 10:46:00	4.60	7.16	0.90	-0.13
09-Oct-09 11:08:00	4.97	7.36	0.89	-0.03
09-Oct-09 11:09:00	4.81	7.37	0.86	-0.13
09-Oct-09 17:07:00	-0.07	20.10	8.67	0.86
09-Oct-09 17:08:00	-0.04	4.30	8.71	-0.18
09-Oct-09 17:09:00	0.03	3.12	8.79	-0.23
09-Oct-09 17:10:00	-0.06	2.13	8.71	-0.23
09-Oct-09 17:11:00	-0.11	1.74	8.69	-0.27
09-Oct-09 17:12:00	0.00	1.57	8.72	-0.22
09-Oct-09 17:13:00	0.07	1.51	9.18	-0.17
09-Oct-09 17:14:00	0.00	1.16	8.97	-0.20
09-Oct-09 17:15:00	-0.12	0.87	8.90	-0.21
09-Oct-09 17:16:00	-0.02	0.89	8.89	-0.24
09-Oct-09 17:17:00	-0.16	0.72	8.84	-0.21
09-Oct-09 17:18:00	0.05	0.72	8.77	-0.22
09-Oct-09 17:19:00	0.11	0.87	9.07	-0.26
09-Oct-09 17:20:00	0.02	0.59	8.97	-0.29
09-Oct-09 17:21:00	-0.24	0.30	8.56	-0.25
09-Oct-09 17:22:00	0.10	0.54	9.03	-0.28
09-Oct-09 17:23:00	-0.24	0.15	8.57	-0.25
09-Oct-09 17:24:00	-0.14	0.27	8.82	-0.23
09-Oct-09 17:25:00	0.01	0.48	9.13	-0.27
09-Oct-09 17:26:00	0.02	0.31	8.97	-0.27
09-Oct-09 17:27:00	-0.09	0.29	8.95	-0.30
09-Oct-09 17:28:00	-0.29	-0.05	8.46	-0.28
09-Oct-09 17:29:00	0.07	0.39	9.35	-0.29
09-Oct-09 17:30:00	0.03	0.31	8.83	-0.28
09-Oct-09 17:31:00	-0.10	0.12	8.87	-0.25

Figure 3-40 Example of a **Summary Report** in the **Reports** display

Each sample/point has its own tab at the bottom of the report.

- Click on the tab for the point you wish to view.

NOTE: Data is only reported for periods when the point is being sampled, whether in Automatic or Manual mode. Periods when the point is idle or purging are not included on the report. Since only one point is sampled at a time, individual report tabs for each point will reflect different time periods.

Alarm Summary Report

The **Alarm Summary Report** lists current alarms, including the time alarm was recorded, alarm tag name and description, and the alarm value and status, for the selected time period. A sample **Alarm Summary** report is shown in **Figure 3-41**.

PMS Airsentry II ALARM SUMMARY				
Start Date:		5/2/2009	End Date: 5/14/2009	
Date & Time	Description	Tagname	Value	Alarm Status
8:54:36	ASII_01B_CONC	Photo Tool 321	13.00	HI
15:16:36	ASII_04B_CONC	CMP Bay XYZ	14.00	HI

Figure 3-41 Example of an **Alarm Summary Report** in the **Reports** display

NOTE: For more information on Alarm Summary Reports, refer to “Alarm History” on page 3-29. Alarm information may be exported by using cut (Ctrl+C) and paste (Ctrl+V) into the word processor or database program of your choice.

Access to Existing Reports

Previously generated reports can be viewed as well. A dropdown list under **Select Report to View** lists all saved reports. Click on the desired report. **Summary Reports**, which vary widely in length include the end date and time in the report name, in the format **Air Sentry 09 May 2009 3_33 PM**. Alarm Summaries span only a single day, and their report names are formatted as **Alarm Summary 09 May 2009 3_33 PM**.

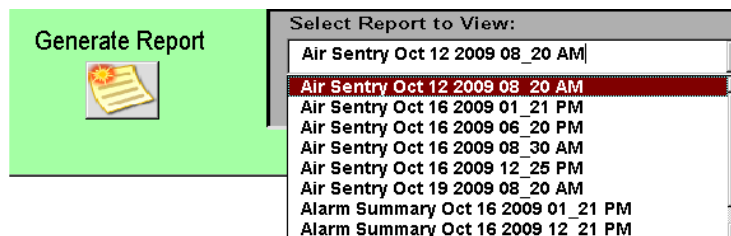



Figure 3-42 Report selected in **Select Report to View** in **Reports**

These reports can be deleted from the system clicking  the **Delete Report** button when the report is currently displayed. Only the report itself is deleted; the historical data and alarm logs cannot be deleted.

NOTE: Report files are quite large, and it is important for the Supervisor to occasionally delete reports that are no longer needed.

Access to Reports through Excel

Reports can also be accessed directly through Excel. To launch Excel from the **Report** display, click on the icon shown in **Figure 3-43**.



Figure 3-43 Launch Excel button in the **Reports** display

From Excel, you may open any of the saved reports. Choose to open a file, then select the report. Report file names match the names under **Select a report to view**.

You are limited in the changes you can make. You cannot change any of the historical data in the cells, although you can change the appearance of the cells. You can manually enter data in additional columns or rows.

Excel should automatically be set to open to the default file path where reports are found. This default file path is:

C:\Program Files(x86)\Proficy\ProficyiFix\APP\Reports

Configuring the AirSentry II

The AirSentry II Setup Display

The **Setup** display is a pop-up graphic that is used to define the instrument parameters. **Generally this information is set at the factory and should never be changed or deleted without factory consultation.** Access to this screen is available only to the Supervisor and Administrator security level. It is not available to Operators.

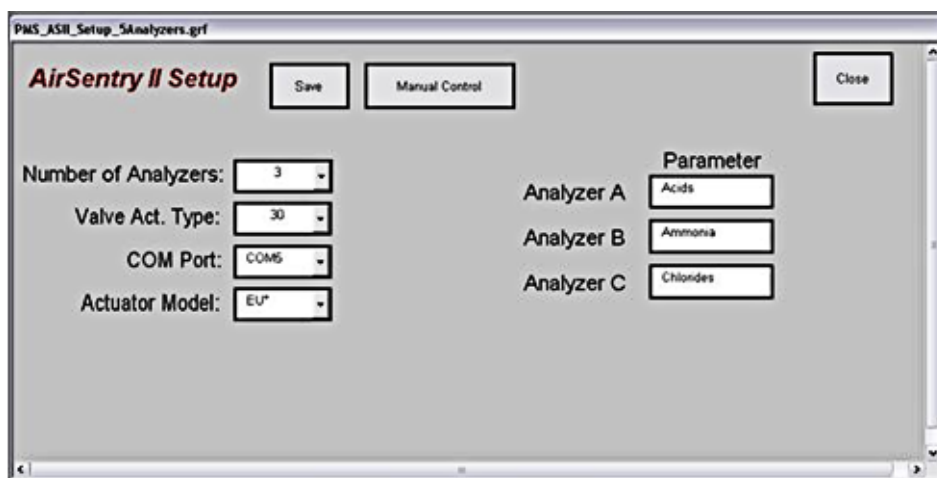


Figure 3-44 The **AirSentry II Setup** dialog box

Number of Analyzers


The AirSentry II can have from one to five analyzers. A user-defined label can be assigned to each analyzer.

Valve Act. Type

The AirSentry II valve actuator can have either 16 or 30 points. These are also referred to as ports or positions.

COM Port

This identifies the PC COM Port that is linked to the AirSentry II MPS drawer. COM1 is the default port used for MPS Valve communication.

Pull-down menus will provide a list of permissible choices. When you make a change, it will appear with a *yellow* background. This serves as a reminder that changes have been made but not yet saved. Click  the **Save** button to save the setup.

Actuator Model

For systems shipped in 2011 or later, this should always be set to EU*.

Manual Control

The **Setup** display can also be used to access manual control of the valve actuator. Click the **Manual Control** button to display the **COM Port Status** dialog box (see **Figure 3-45**).

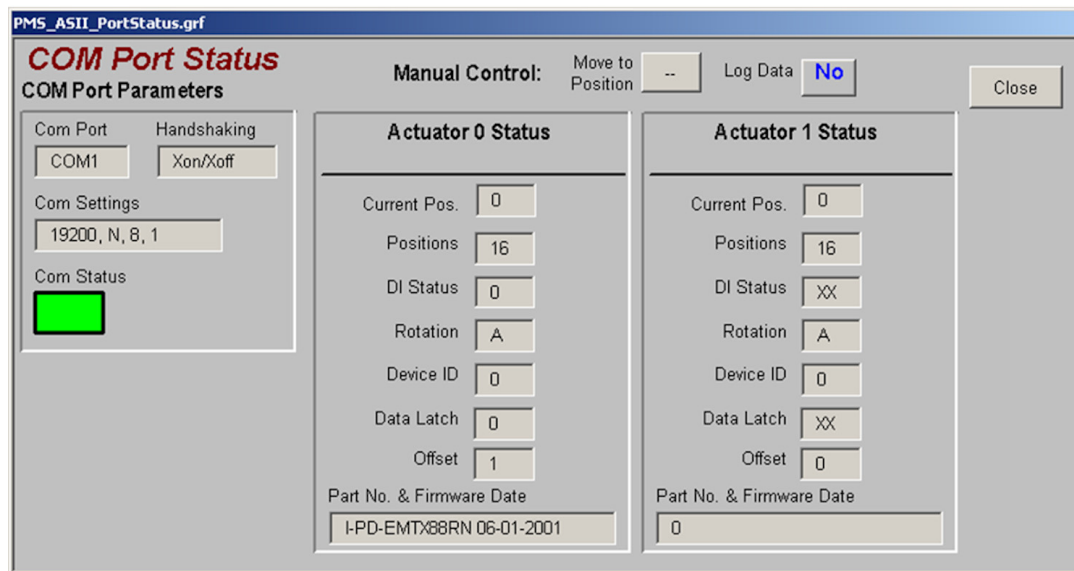


Figure 3-45 The **COM Port Status** dialog box

The left side of the **COM Port Status** dialog box shows data communications information about the COM port. Detailed information about each of the two actuators (**Actuator 0** and **Actuator 1**), appears in the middle columns. For single-actuator, 16-point systems, only **Actuator 0** will appear.

Before you can command the actuator(s) to move to a specific position, you must first stop the automatic sample sequence. To do that, use the **MPS Manifold** controls on the **Sampling Status** display. If you neglect to do this, and attempt to enter a value under **Move to Position**, the message shown in **Figure 3-46** appears.

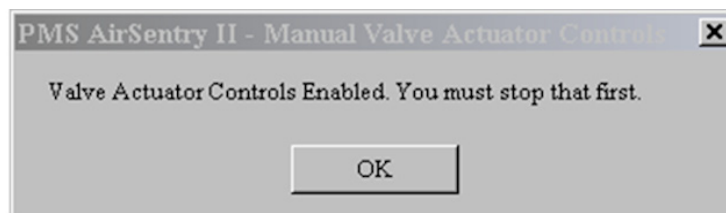


Figure 3-46 Error message when automatic sequence has not been stopped

Once the automatic sample sequence has been stopped, click on **Move to Position**. The message shown in **Figure 3-47** appears.

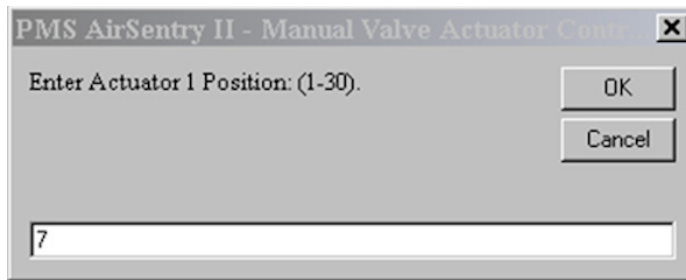


Figure 3-47 Message when automatic sequence has been stopped

The valve actuator(s) will move to the selected position and begin sampling. It will remain there until you choose a new position or restart the automatic Sample Sequence.

The current position of each actuator will appear under **Actuator Status**.

- For positions 1 through 15 on dual actuator systems, **Actuator 0** will move to the selected position number, and **Actuator 1** will move to the neutral position (Position 16).
- For positions 16 through 30, **Actuator 0** will move to the neutral position (Position 16), and **Actuator 1** will move to the desired position. Its **Current Position** will appear as a number from 1 to 15, rather than 16 through 30. For example, if the user moves to Position 20, **Actuator 0** will move to Position 16 and **Actuator 1** will move to Position 5.

You may choose whether you wish to log data collected during manual operation.

Toggle the **Log Data** button between **Yes** and **No** to change this setting.

When you toggle the **Log Data** button to **Yes**, the message shown in **Figure 3-48** appears.

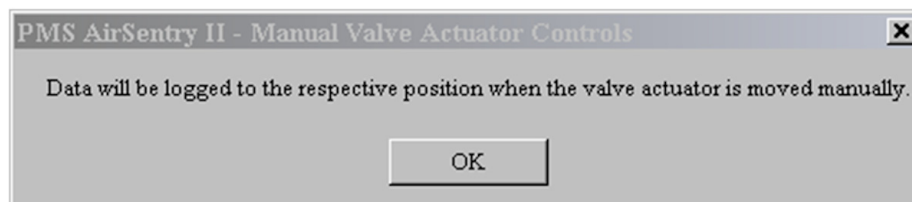


Figure 3-48 Confirmation message that the data will be logged

Data will now be logged to the historical database for the selected position. When you toggle the **Log Data** button to **No**, a message appears telling you that data will not be logged.

When using the **Manual Control** feature, the **Manual Mode Position** will be identified under the **MPS Manifold Status** on the **Sampling Status** screen (see **Figure 3-49**).

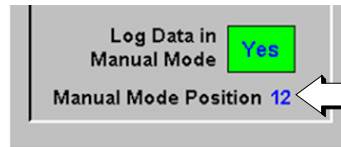


Figure 3-49 Confirmation the data is logged in Manual Mode at Position 12

Also on the **Sampling Status** screen, the position number will appear in *yellow* and its status will switch from **Idle** to **Sampling**. Because the position is being manually sampled under user control, it does not have a sample time associated with it and the time remaining (**Remain**) is blank.

User Security

Preconfigured Users


The Air Sentry II User Interface is preconfigured with two users, with increasing privileges. These users are listed in the table below:

User	Name	Password	Privileges
Operator	OPER	OPER	Allows access to: <ul style="list-style-type: none">• start/stop sampling sequence• trend points• acknowledge alarms• create reports
Administrator	Admin	S@nit@s	All Operator functions, with additional access to: <ul style="list-style-type: none">• exit the software• configure the MPS sequence• perform manual control of the MPS• change alarm settings• delete reports• use the Windows key to access the Start menu button or other programs

Upon startup, the default user is **Operator**.

Logging In and Out

To log in as another user:

- 1 Click  the **User Security** icon on the display header.
The logout version of the **Login** dialog box will appear (see **Figure 3-50**).

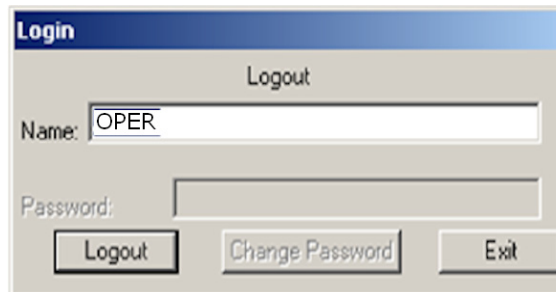



Figure 3-50 Login dialog box for logging in as a different user

- 2 Click  the **Logout** button in the **Login** dialog box.
The **Login** dialog box changes to allow you to enter your username (e.g., OPER or Admin) and password (see **Figure 3-51**).

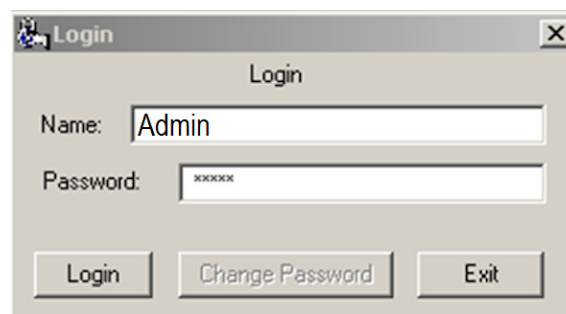
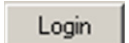


Figure 3-51 Login dialog box

- 3 In the **Name** field of the **Login** dialog box, enter your user name.
- 4 In the **Password** field, enter your password.
Names and passwords are not case sensitive.
- 5 Click  the **Login** button in the **Login** dialog box.
The user name on the display header will update.

Exit

Exiting the AirSentry II Software

To exit the AirSentry II software:

- Press  the **Exit** button.

Shutting Down iFIX and Facility Net

The **Exit** button in the AirSentry II software only exits out of the AirSentry II user interface workspace. To completely exit the software, both iFIX and Facility Net must be shutdown in a specific sequence.

- 1 First, shut down iFIX by choosing the **Proficy iFIX Startup** folder on the taskbar.
The **Proficy iFIX Startup** window appears.
- 2 From the **Options** menu, select **Shutdown iFIX** (see Figure 3-52 on page 3-42).
Shutting down iFIX takes approximately 15-20 seconds.

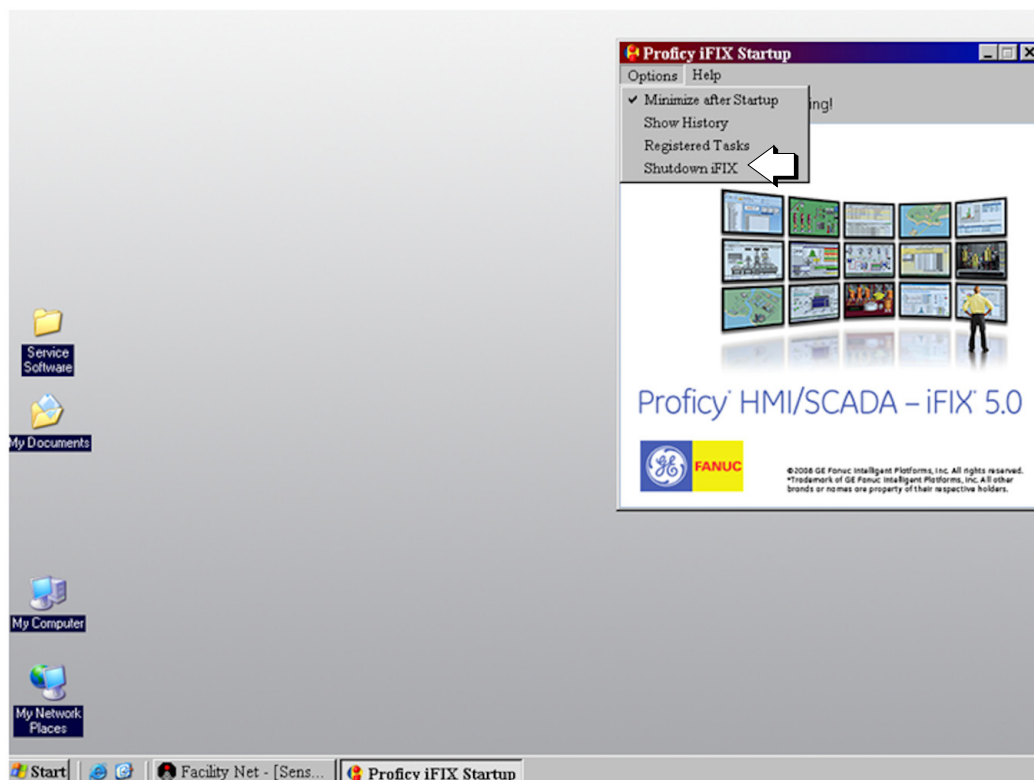


Figure 3-52 Proficy iFIX Startup's Shutdown command in the Options menu

When iFIX has shutdown, Facility Net can then be shutdown.

- 3 To shut down Facility Net, choose the **Facility Net** folder on the taskbar.

The **Facility Net** window displays on the Desktop.

- 4 From the **Facility Net** window's **File** menu, select **Close** (see **Figure 3-53**).

The software has now been completely shutdown.

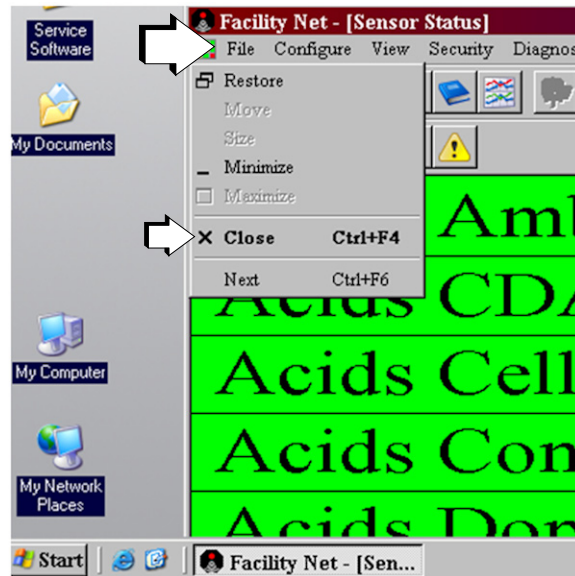


Figure 3-53 Facility Net window's **File** menu showing the **Close** command

Service Software

On the desktop of the laptop computer, there is a folder entitled “Service Software” which contains software to communicate with individual analyzers. Potential service software that may be installed on the System (depending upon configuration ordered) may include:

- AirSentry II Service Software – to communicate directly with IMS analyzers which provides advanced diagnostic capabilities
- Hyperterminal shortcut to allow communication directly with the MPS Values

Instructions for the use of this service software can be found in the instruction manual for the analyzer/software product, which is included in the same service software folder.

Chapter 4

Service

Some components within the AirSentry II AMC Monitoring System will require periodic maintenance in order to maximize the useful lifetime of the equipment.

Consumables – AirSentry II AMC Monitoring System

A list of consumable items and their recommended replacement intervals is noted in Table 4-1 for each major sub-component of the System (MPS drawer, IMS analyzers).

Table 4-1 Replacements for Consumables

Description	Replacement Interval	PMS Part #
MPS Drawer		
Sample and Fast-Loop Pump Diaphragm Replacement Kit	6 months	1000014751
NOTE: Contains diaphragm and head plates for both sample and Fast-Loop pumps.		
AirSentry II Ammonia Analyzer		
Dopant Module	15 years	1000011800
AirSentry II Amines Analyzer		
Dopant Module	15 years	1000011800
AirSentry II Acids Analyzer		
Dopant Module	4 years	1000011840
AirSentry II Chlorides Analyzer		
Dopant Perm Tube	3 years	1000006768
Miscellaneous		
AirSentry II IMS Analyzer Leak Test Kit	Per federal, state, or local regulations	1000008364

Service Parts – AirSentry II AMC Monitoring System

A list of service items and their part numbers is noted in Table 4-2 for each major sub-component of the System (MPS drawer, IMS analyzers). These are not intended to be kept on hand, and replacement would only be necessary in the event of a hard failure.

Table 4-2 Potential Considerations for Spare Parts

Description	PMS Part #
MPS Drawer	
Vici Rotary Valve (16 port)	1000016182
System	
Fuse, 1A, 500V, Time Delay	1000014410
Not all parts included in this table. Other service parts may be found in the Thermo 43i-TLE instruction manual.	

System Fuse Replacement

WARNING

Disconnect the power cord from its power source.

The fuse block is in the cabinet base.

To replace a fuse:

- 1 Unplug the power cord from rear panel of the unit.
- 2 Lift the tab of the fuse block.
- 3 Choose the proper fuse according to the table above and replace fuse.
- 4 Press down on the tab of the fuse block to secure fuse.

Chapter 5

IMS Cell and Radiation Safety Information

IMS Cell

The heart of the analyzer is the IMS cell, the component used for detection and speciation of sampled gases. The IMS cell contains a radioactive source, which is a small brass ring electroplated with the radioactive isotope, Ni^{63} . The cell housing is approximately 96 mm long. The low-energy beta particle radiation (β) emitted from the electroplated Ni^{63} causes ionization of the sampled gas.

The source is permanently secured in the IMS cell. The IMS cell housing is aluminum, with machined cavities and ports allowing the entry and exit of gases, and placement of internal detector components, including the Ni^{63} source. The radioactivity content of the Ni^{63} source is nominally 10 millicuries (a millicurie is a unit of measure of the number of Ni^{63} atoms “disintegrating” or giving off a beta particle over time). During normal use in typical environments where the Analyzer is designed to be used, the Ni^{63} source remains contained inside the IMS cell.

Because of the low-energy of the Ni^{63} beta radiation, there is no measurable radiation at the outside surface of the IMS cell. In fact, the Ni^{63} beta radiation energy is so low that it is stopped by normal clothing. While Ni^{63} is not a hazard external to the body, it could result in radiation exposure if inhaled or ingested in significant quantities. It is important to follow these instructions to prevent this hazard, even though the radiation hazard from small amounts of inhaled or ingested Ni^{63} is low.

The design and radiation hazard for IMS cells has been reviewed by government agencies that authorize and license the distribution and use of these devices in the United States. The IMS cells have been determined to meet the radiation safety standards applicable to these devices.

The primary radiation protection policy is to use procedures and engineering controls based on practical, sound principles to achieve radiation doses to occupational workers and the public that are As Low As Reasonably Achievable (ALARA). The IMS cell design employs controls to prevent access to the Ni^{63} source. These safety instructions are the procedures that also help meet the ALARA policy. They are simple to follow and to implement and they are intended to greatly minimize the possibility of unnecessary exposure to radiation.

See the AirSentry II IMS Operations Manual for more information.

WARNING

Do not tamper with or attempt to modify the IMS cell. There are no serviceable parts inside the cell. Do not disassemble.

Water must not be allowed to enter the IMS cell. Do not connect a bubbler or any other device to the sample inlet, which could allow water to enter the cell intentionally or unintentionally.

IMS Cell Detector Servicing

If the IMS cell should ever need servicing, repair, or replacement, call the Instrument Service and Support department at Particle Measuring Systems Headquarters at 1-800-557-6363.

Six Month Leak Test for the IMS Cell

U.S. regulations require a leak test every six (6) months to insure that IMS Cells are not releasing radioactive contamination. Other countries may have different leak test frequencies or may not require leak tests. We recommend the six month leak test, if none is otherwise required.

The test is conducted by wiping the cell body and the exhaust port of the analyzer and analyzing the leak test for Ni^{63} contamination. Contamination must not exceed 0.005 microcuries (1/1000th of a millicurie).

NOTE: The IMS cell's nominal radioactivity is 10 millicuries.

0.005 microcuries can also be expressed as 11,000 disintegrations per minute (dpm). A Leak Test kit and analysis is available from Particle Measuring Systems. Other testing laboratories may be capable of providing leak testing. You must determine if such testing facilities will be able to detect 0.005 microcuries on the Leak Test sample.

A Leak Test Kit can be provided by Particle Measuring Systems which contains a reporting form, a return envelope, disposable gloves, re-sealable plastic pouches, and cotton swabs. This kit is designed for leak testing IMS cells containing Ni^{63} sources manufactured by Particle Measuring Systems. Always read and follow the instruction manual Radiation Safety Instructions. Contact Particle Measuring Systems customer service to obtain the kit.

Radiation Safety and Wipe Test Procedures

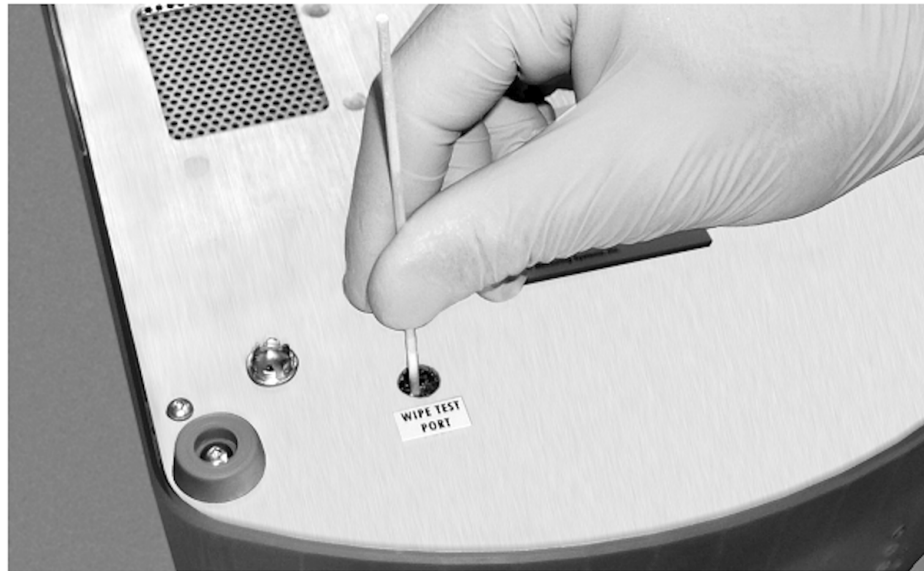


Figure 5-1 Wipe Test Port

To perform a wipe test:

- 1** Visually inspect the analyzer for damage. If the analyzer appears damaged, STOP and contact Particle Measuring Systems. Otherwise, go to step 2.
- 2** Using a small screwdriver or similar tool, remove the wipe port plug (located on the bottom of the analyzer) (see Figure 5-1).
- 3** Insert a swab approximately 1-inch into the hole until it contacts the cell. Wipe the accessible area of the cell with the swab.
- 4** Remove the swab and break off the excess swab shaft.
- 5** Place and seal the swab in the plastic pouch labeled "Cell Surface Wipe."
- 6** Shut off and disconnect the vacuum tube from the rear of the analyzer.



Figure 5-2 Wipe inside surface of vacuum port

- 7 Using a new swab, wipe the inside surface of the vacuum port (see Figure 5-2).
- 8 Remove the swab and break off the excess swab shaft.
- 9 Place and seal the swab in a new plastic pouch labeled “Cell Surface Wipe.”
- 10 Reinstall the plug and reconnect the vacuum tube.
- 11 Turn on the vacuum.
- 12 Place both pouches in an envelope along with the completed documentation (supplied in the wipe test package), and return to Particle Measuring Systems.

IMS Cell Transportation

Radioactive material (10 mCi Ni^{63}) in IMS cells is considered a hazardous material for shipping and transportation purposes by the U.S. Department of Transportation. IMS cells mounted in instruments meet the requirements for shipment as “Radioactive Material, Excepted Package - Instrument or Articles.” See 49 CFR 173.421 for specific shipping requirements for packaging and 49 CFR Parts 172 and 173 for additional requirements for shippers of radioactive material (or applicable hazardous materials or Dangerous Goods regulations for your country).

Appendix A

Pneumatic Diagrams

Troubleshooting the Flow for AirSentry II IMS

A pneumatic diagram of the AirSentry II IMS is included in the *AirSentry II Ion Mobility Spectrometer Operations Manual* (P/N 1000014471). However, it is highly unlikely that you will need to remove the lid of the AirSentry II IMS for troubleshooting purposes.

Flowrates

Typical flowrates for the AirSentry II IMS's various analyzers are given in Table A-1.

Table A-1 Typical Flowrates of Analyzers

Flow Type	How to Measure	Ammonia and Amines (cc/min)	Acids (cc/min)	Chlorides (cc/min)
Carrier Flow	Disconnect and plug (cap) vacuum line. Disconnect sample line and measure positive flow at sample fitting	80 - 120	345 - 475	87 - 110
Vacuum Flow	Disconnect and plug (cap) CDA line. Disconnect sample line and measure vacuum flow at sample fitting.	405 - 565	525 - 685	285 - 365




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Appendix B

International Precautions




Hazard Symbols

The meaning of hazard symbols appearing on the equipment is as follows:

Symbol	Nature of Hazard
	Attention, consult accompanying documents.
	Dangerous High Voltage
	Caution Radioactive Material




Symboles de risque

Des symboles représentant les risques sont placés sur l'appareil. Leur signification est la suivante:

Symbole	Nature du risque
	Attention, consulter les documents d'accompagnement
	Danger Electricite
	Attention - Produit radioactif




Warnschilder

Die, an dem Gerät angebrachten Warnschilder haben folgende Bedeutungen:

Symbol	Gefahrenart
	Achtung! In den beiliegenden Unterlagen nachschlagen
	Achtung Hochspannung
	Vorsicht: Radioaktives Material




Simboli di pericolo

Il significato dei simboli di pericolo che appaiono sugli strumenti il seguente:

Simbolo	Natura del pericolo
	Attenzione. Consultare i documenti allegati
	Tensione Pericolosa
	Attenzione: Materiale Radioattivo

Simbolos de peligro

Los simbolos de peligro que aparecen en el equipo significan:

Simbolo	Naturaleza del Peligro
	Atención, consultar los documentos adjuntos.
	Tensione Pericolosa
	Precaución: Materiales Radiactivos

Appendix C

有毒或有害的物质和元素

Part Name 部件名称	有毒或有害的物质和元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴联苯醚 (PBDE)
电源供应	X	O	X	O	O	O
印刷电路装配	X	O	X	O	O	O
机械部件	X	O	X	O	O	O
电缆	X	O	X	O	O	O
机电	X	O	X	O	O	O
显示器	X	X	X	O	O	O
电池	X	O	X	O	O	O
<p>O: 表示用于部件的所有同族物质中所含的有毒或有害物质低于SJ/T11363-2006规定的限度要求。</p> <p>X: 表示用于部件的至少一种同族物质中所含的有毒或有害物质高于SJ/T11363-2006规定的限度要求。</p>						

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