P/N 33-308100-003
June 2009

AIR Intelligence™

AIR-Intelligence™ ASD-640 Aspirating Smoke Detection System

Design, Installation, Operation, and Maintenance Manual

FOREWORD

This manual, P/N 33-308100-003, is to be used by qualified and factory-trained personnel, knowledgeable of NFPA standards and any other applicable standards in effect, and is intended to provide guidance to qualified technical professionals for the installation, operation, and maintenance of the AIR-Intelligence™ ASD-640 Air Sampling Detector, referred to in this manual as the "ASD-640" or the "Detector."

Only qualified persons experienced, trained and certified in the installation of this equipment should design, service, maintain, test, install, and configure the ASD-640. They must be familiar and experienced with the wiring diagrams and components, electrical installation, and familiar not only with NEC, relevant NFPA and local codes but also trained and qualified by the manufacturer and/or its associated operating companies. The manufacturer of the components that make up the ASD-640 is not responsible for its configuration or installation of the product.

It is the responsibility of the professional installer (described above) to properly install, configure and test the systems. Under no circumstances will the manufacturer be liable for improper installation, maintenance, servicing, testing or configuration of the systems.

The technical data contained herein is provided for informational purposes only and should not be used as a substitute for professional judgment and training. Although the manufacturer believes this information to be true and correct, it is published and presented without any guarantee or warranty whatsoever. The manufacturer disclaims any liability for any use of the data other than as set out in this manual, foreword included.

Any questions concerning the information presented in this manual should be addressed to:

AIR-Intelligence
400 Main Street
Ashland, MA 01721 USA
Customer Service: (508) 881-2000
Technical Support: (866) 287-2531
Website: *www.air-intelligence.com*

PRODUCT SYMBOLS

This symbol appears on the main board of the unit and indicates that the board contains static sensitive components.

This label is located on the laser chamber at the bottom right of the open Detector and signifies that the unit is a Class 1 Laser product as specified in IEC 60825-1. The unit incorporates a Class 3B embedded laser which must not be removed from the Detector as retinal damage may result if the laser beam enters the eye.

This symbol indicates the Safety Earth studs. These are for grounding cable screens, etc. and should not be connected to 0 volt or signal earth.

AIR-Intelligence has taken every care to ensure that the ASD-640 is as simple to install as possible, but in case of difficulty, please contact Technical Support at (866) 287-2531. Monday through Friday 8AM to 5PM EST.

EXAMPLE

Entries shown as **EXAMPLE** represent function buttons on the front of the Detector. For example: **TEST** represents the **TEST** function button.

TERMS AND ABBREVIATIONS

°C:	°Centigrade
°F:	°Fahrenheit
A:	Ampere
AC:	Alternating Current
ADA:	Americans with Disabilities Act
AH:	Ampere Hour
AHJ:	Authority Having Jurisdiction
ARC:	Automatic Release Circuit
AWG:	American Wire Gauge
CSFM:	California State Fire Marshal
DACT:	Digital Alarm Comm. Transmitter
DC:	Direct Current
DET:	Detector
EOLD:	End of Line Device
EOLR:	End of Line Resistor
FM:	Factory Mutual
ft.:	Feet
HSSD:	High Sensitivity Smoke Detector
Hz:	Hertz (Frequency)
in.:	Inch
LCD:	Liquid Crystal Display
LED:	Light Emitting Diode
MEA:	Materials and Equipment Acceptance Division of the City of New York
NAC:	Notification Appliance Circuit
N.C.:	Normally Closed
NEC:	National Electrical Code
NFPA:	National Fire Protection Association
N.O.:	Normally Open
NYC:	New York City
PCB:	Printed Circuit Board
pF:	Pico-farads
P/N:	Part Number
PSU:	Power Supply Unit
RAM:	Random Access Memory
SLC:	Signaling Line Circuit
TB:	Terminal Block
UL/ULI:	Underwriters Laboratories, Inc.
V:	Volts
Vac:	Volts AC
Vdc:	Volts DC
VRMS:	Volts Root Mean Square

CAUTIONS AND WARNINGS

CAUTION

A caution identifies a procedure, practice, or statement, which, if not strictly followed, could result in programming errors, impairment of equipment operation, or equipment damage.

WARNING

A warning identifies an operating or maintenance procedure, practice, condition or statement, which, if not strictly followed, could result in personal injury or death.

SAFETY SUMMARY

This entire manual must be read and understood before installation.

Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

Several different sources of power can be connected to this High Sensitivity Smoke Detector.

WARNING **Disconnect all sources of power before servicing. Detector and associated equipment may be damaged by servicing while the unit is energized. Do not attempt to install, service, or operate this control unit until this manual is read and understood.**

System Re-acceptance Test after Re-Programming: **To ensure proper system operation, this system must be retested in accordance with NFPA 72 Chapter 10 after any programming change. Re-acceptance testing is also required after any addition or deletion of system components, and after any modification, repair or adjustment to system hardware or wiring, and as required by applicable codes and standards.**

CAUTION **All components, circuits and system operations that could be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified, in accordance with NFPA.**

This system meets FM and UL 268 requirements for operation at 14° to 100.4°F (-10° to 38°C) and at a relative humidity of 90% (non-condensing) @ 90°F (32.2°C). However, the useful life of the system's standby batteries and the electronic components may be adversely effected by continuous operation at these environmental limits. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 60° to 80°F.

This equipment is Class 111 as defined in EN60950 (i.e., this equipment is designed to operate from Safety Extra Low Voltages and does not generate any hazardous voltages).

Like all solid state electronic devices, this system may operate erratically or can be damaged when subjected to lightning induced transients. Although no system is completely immune from lightning transients and interference, proper grounding will reduce susceptibility.

WARNING **The use of overhead or outside aerial wiring is not recommended due to the increased susceptibility to nearby lightning strikes. Consult with the Technical Support Department if any problems are anticipated or encountered.**

Do not install electronic assemblies prior to mounting and attaching conduit for field wiring to the enclosure. Before making modifications, verify that they will not interfere with battery and printed circuit board locations. Do not overtighten screw terminals. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits so that static charges are removed from the body. Use static suppressive packaging to protect electronic assemblies removed from the control unit.

Follow the instructions in this manual. These instructions must be followed to avoid damage to the control unit and associated equipment. System operation and reliability depend upon proper installation.

CAUTION

While installing a fire alarm system may make lower insurance rates possible, it is not a substitute for insurance. An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, notification appliances, and a fire alarm control unit with remote-notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

ASPIRATING SMOKE DETECTION SYSTEM LIMITATIONS

An Aspirating Smoke Detection system—which can be made up of smoke detectors, heat detectors, manual pull stations, notification appliances, and a fire alarm control unit with remote-notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

Any fire alarm system may fail for a variety of reasons. The following are only examples:

- Smoke detectors may not sense fire where smoke cannot reach the detectors, such as in chimneys, in walls, on roofs, or on the other side of closed doors.
- Smoke detectors on one level also may not sense a fire on another level or floor of a building. A second floor detector, for example, may not sense a first floor or basement fire.
- All types of smoke detectors, both ionization and photoelectric, have sensing limitations. No type of smoke detector can sense every kind of fire caused by carelessness and safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.
- Notification appliances, such as bells, may not alert people if these appliances are located on the other side of closed or partly open doors, or are located on another floor of a building.
- A fire alarm system will not operate without electrical power. If AC power fails, the system will operate from standby batteries only for a specified time.
- Rate-of-Rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested by a qualified fire protection specialist as recommended in NFPA 72.
- Auxiliary Equipment used in the system may not be technically compatible with the control unit. It is essential to use only equipment listed for service with your control unit.
- Telephone lines needed to transmit alarm signals from a premise to a central monitoring station may be out of service or temporarily disabled.

The most common cause of fire alarm malfunctions is inadequate maintenance. All devices and system wiring should be tested and maintained by professional fire alarm installers following written procedures supplied with each device. System inspection and testing should be scheduled monthly or as required by national and/or local fire codes and standards. Adequate written records of all inspections should be kept.

GENERAL SAFETY NOTICES

The following general safety notices supplement specific warnings and cautions appearing in the manual. The safety precautions in this section must be understood and applied during operation and maintenance. This manual is to be used by trained distributors/technicians. The entire manual should be read and fully understood prior to installation.

FIRST AID

Any injury, no matter how slight, should never go unattended. Always obtain first aid or medical attention immediately.

GENERAL PRECAUTIONS

The following general safety precautions are to be observed at all times:

1. All electrical components associated with equipment should be installed and grounded in accordance with NEC and local regulatory requirements.
2. Special precautionary measures are essential to prevent applying power to equipment at any time maintenance work is in progress.
3. Before working on electrical equipment, use a voltmeter to ensure that the system is not energized.
4. When working near electricity, do not use metal rulers, flashlights, metallic pencils, or any other objects having exposed conductive material.
5. When connecting a meter to terminals for measurement, use a voltage range higher than expected voltage to be measured.

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CHAPTER 1
PRODUCT AND COMPONENT DESCRIPTIONS

1-1 INTRODUCTION

The AIR-Intelligence™ ASD-640 is a highly sophisticated "next generation" High Sensitivity Aspirating Smoke Detection product that provides all the benefits of air sampling high sensitivity smoke detection, including very early warning. Designed for easy installation and commissioning, the AIR-Intelligence ASD-640 incorporates a patented "artificial intelligence" known as ClassiFire®, which allows the Detector to configure itself to optimum sensitivity, alarm thresholds, and minimum nuisance alarms for various environments.

ClassiFire intelligence also monitors the Detector chamber and dust separator (filter) for contamination, continually adjusting the appropriate operating parameters to counteract the negative effects of any contamination. AIR-Intelligence Detectors are unique in being able to provide a consistent level of protection in a very wide range of environments by continuously making minor adjustments to sensitivity.

The AIR-Intelligence line of Detectors has detected "difficult-to-detect" slow growth electrical overload incipient fires in "difficult" environments.

This manual gives information likely to be needed for most installations, but for more detailed information on subjects such as programming, networking and pipe networks, please refer to the *SenseNET™ Software User's Guide*, *Remote Configuration Software User's Guide* and *PipeCAD™ Design, Installation and Software Manual*.

This equipment is Class 111 as defined in EN60950 (i.e., this equipment is designed to operate from Safety Extra Low Voltages and does not generate any hazardous voltages).

This label is located on the laser chamber and signifies that the unit is a Class 1 Laser product as specified in IEC 60825-1. The unit incorporates a Class 3B embedded laser which must not be removed from the Detector as retinal damage may result if the laser beam enters the eye.

If this equipment is part of a fire detection system, it should be supplied from an approved U.L. power supply designed for fire system use.

1-2 SPECIFICATIONS

CAUTION **This equipment is only to be used in accordance with this specification. Failure to operate the equipment as specified may cause damage to the unit.**

Specification	Value
SELV rating (EN 60950)	Class III
Supply Voltage	21.6 volt - 26.4 volt DC
Size	16.8 in W x 14.6 in. H x 3.7 in. D (427 mm W x 372 mm H x 95 mm D)

Specification	Value
Weight (Detector) (Command Module Detector) (Stand-alone Command Module) (Stand-alone Command Module + batteries)	 11.5 lb. (5.2 kg) 11.6 lb. (5.3 kg) 13.6 lb. (6.2 kg) 22.3 lb. (10.1 kg)
Operating temperature range	14° to 100.4°F (-10° to 38°C) (UL 268 compliance)
Operating humidity range	0 - 90% Non Condensing IEC 61010-1 Pollution degree 1 IEC 61010-1 Installation Cat. II
Sensitivity range (Obs/ft)	Min = 25% Max = 0.03% FSD
Maximum sensitivity resolution	0.00046 %Obs/ft
Detection principle	Laser light scattering mass detection
Particle sensitivity range	0.0003 to 10 microns
Current consumption	400 mA *(Detector)* 450 mA (*Stand-alone Command Module)* 850 mA *(Command Module Detector)*
Relay contact rating	500mA @ 30V
Maximum sampling pipe length	656 ft. (200 m)
Sampling pipe inlets	1/2 to 1 inch
Sampling pipe internal diameter	15-25 mm
Alarm levels	4 (Fire 2, Fire 1, Pre-Alarm and Aux)
Bar graph sensitivity range	0.00046 to 7.62 obs/ft.
Bar graph segments	26
Chamber service intervals	Greater than 8 years (depending on environment)
Dust separator (filter) replacement intervals	Greater than 5 years (depending on environment)
Laser lifetime (MTTF)	Greater than 1000 years
Programming	Front panel or PC via RS232/RS485
Data bus cable	RS485 data cable
Data bus length	3,937 ft. (1,200 m)
IP rating	IP50
Supported languages on internal programmer	Czech, Dutch, English, Estonian, Finnish, French, German, Hungarian, Italian, Norwegian, Spanish, Swedish

1-3 FEATURES

The following is a list of major features of the ASD-640:

- Patented “artificial intelligence” known as ClassiFire
- Laser Dust Discrimination (LDD^{TM})
- 656 feet of pipe length
- Self-adjusting between the range of 0.05% and 2.0% obscuration
- Network compatible

1-4 STANDARD DETECTOR

The Standard Detector may be operated as a stand-alone unit, or may be part of a network of detectors centrally monitored by a Command Module (see Section 1-5). It may be programmed via its front panel, as in the Standard Detector and Command Module versions, shown in Figure 1-1 and Figure 1-3. Alternatively, the Standard Detector can be ordered without a front panel display, as shown in Figure 1-2. The detectors may be programmed remotely via the detector's RS485 terminals using a Command Module, or via the detector's RS232 port using a PC running ClassiFire software. A copy of this software is supplied with each detector.

The Standard Detector without a front panel display is housed in a rugged sheet metal steel enclosure. This detector includes LEDs to indicate alarms, faults, and normal operating conditions. The Standard Detector with display (and Command Module) can also be ordered with the steel enclosure.

Figure 1-1. Standard Detector

Figure 1-2. Standard Detector, without front panel display

1-5 STAND-ALONE COMMAND MODULE/COMMAND MODULE DETECTOR

When multiple Detectors are networked together, a Command Module may be used to tie all the Detectors together and to provide a centralized point for network access and programming, running diagnostics, and PC and fire panel connection.

The Command Module can be mounted either inside a Detector or as a stand-alone unit in its own housing without an aspirator or smoke detection circuitry.

When a Command Module is mounted inside a Detector, the Standard Detector display is replaced with a dedicated Command Module display. The programming buttons and display on the front of the Detector belong to the Command Module.

Programming at the Command Module is very similar to programming a Detector, the main difference being that the Command Module has extra functions to control all the AIR-Intelligence Detectors connected in the network.

Figure 1-3. Command Module Detector

1-6 STANDARD DETECTOR INTERIOR VIEW

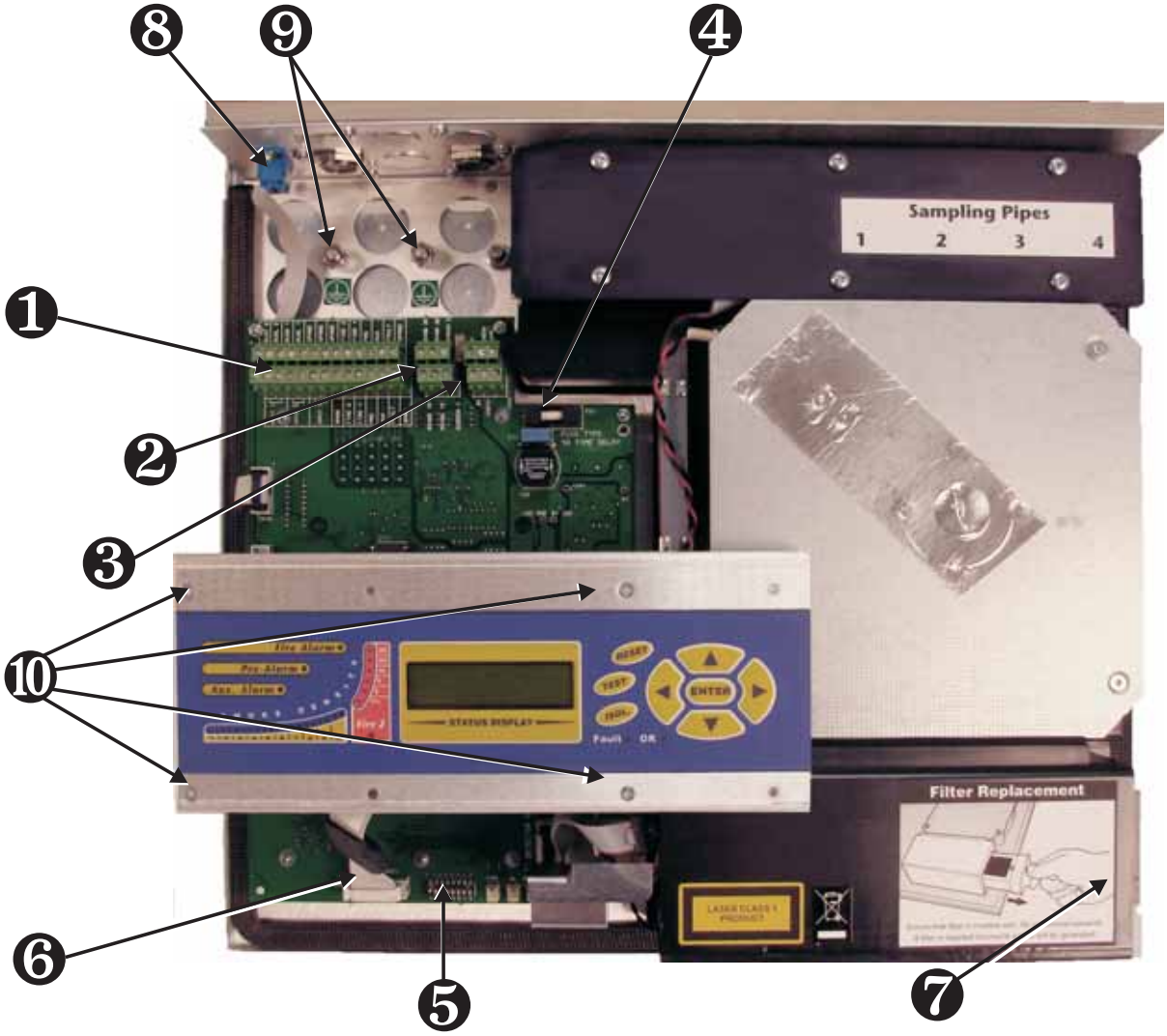

Figure 1-4. Standard Detector Interior View

1. Terminal block connections
2. RS485 terminal connections
3. 24VDC power supply connections
4. 1A 5 x 20mm T-type protection fuse
5. Detector address DIP switch
6. Front panel display connectors
7. Dust separator (filter) removal handle
8. RS232 serial port
9. Safety earth studs
10. Display attachment screws

1-7 STAND-ALONE COMMAND MODULE INTERIOR VIEW

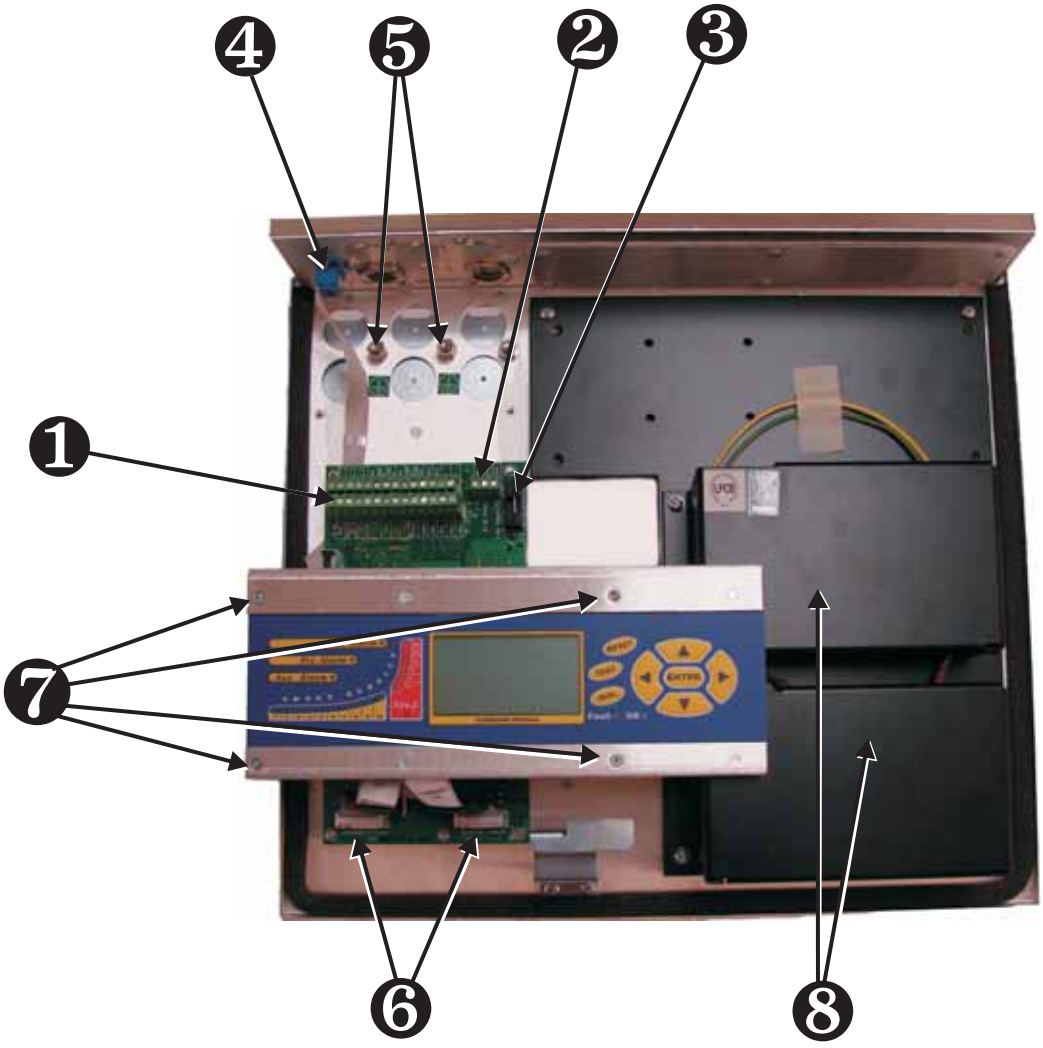

Figure 1-5. Stand-alone Command Module Interior View

1. Terminal block connections
2. 24VDC power supply connections
3. 500mA 5 x 20mm T-type protection fuse
4. RS232 serial port
5. Safety earth studs
6. Front panel display connectors (Command Det and Command CM)
7. Display attachment screws
8. Battery brackets

1-8 COMMAND MODULE DETECTOR INTERIOR VIEW

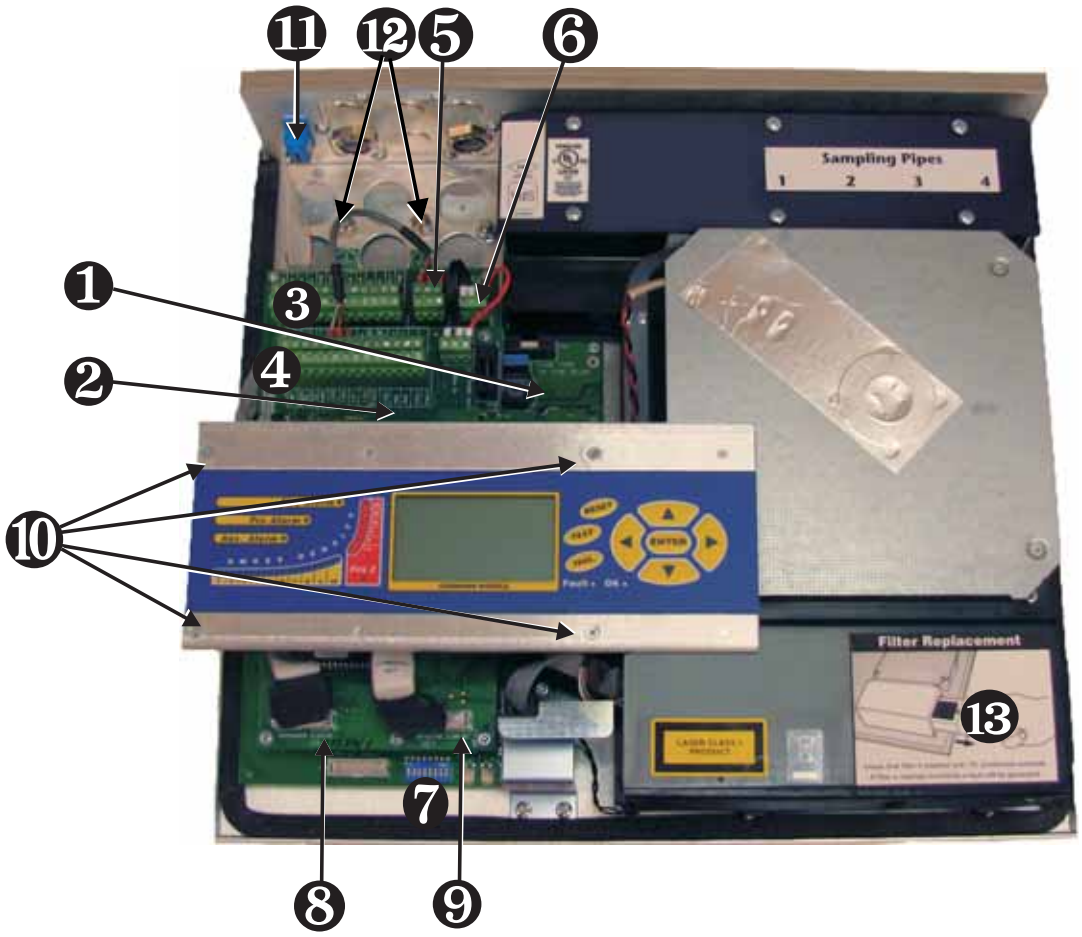

Figure 1-6. Command Module Detector Interior View

1. Detector CPU board
2. Command Module CPU board
3. Detector CPU board - terminal block connections
4. Command Module CPU board - terminal block connections
5. Detector CPU board - RS485 terminal connections
6. Detector CPU board - 24VDC power supply connections
7. Detector address DIP switches
8. Command Module display connection (Display DET)
9. Detector display connection (Command CM)
10. Display attachment screws
11. RS232 serial port
12. Safety earth studs
13. Dust separator (filter) removal handle

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1-9 STANDARD AND COMMAND MODULE DETECTOR CONTROLS AND INDICATORS

The Standard and Command Module controls and indicators are very similar.

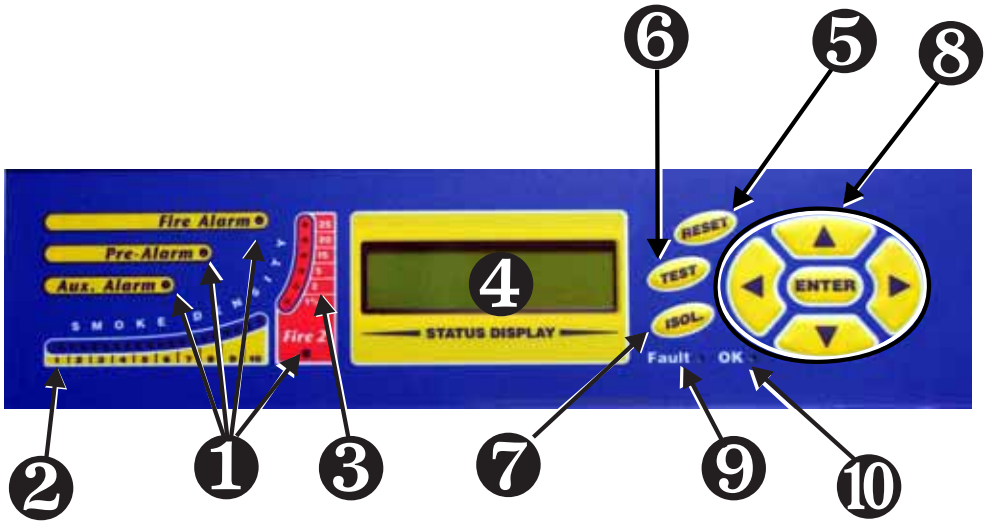


Figure 1-7. Standard Detector

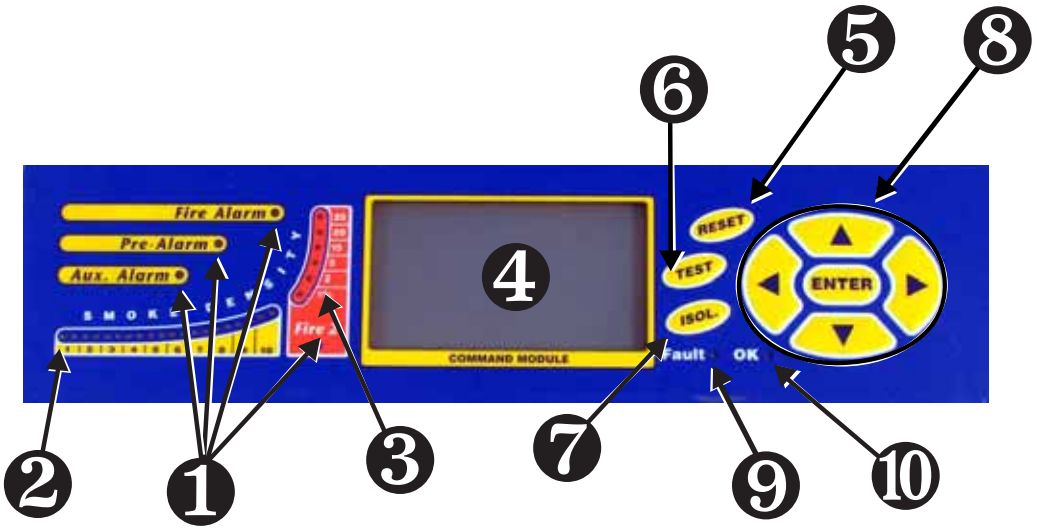


Figure 1-8. Command Module Detector

1. **Aux. Alarm**, **PreAlarm**, **FireAlarm**, and **Fire 2** indicators illuminate when the set alarm level has been reached and the set time delays have expired. On a Command Module, the indicators signify an alarm condition from any Detector on the communications loop.
2. **Smoke Density Indicators** (1 through 10) are the relatively scaled ClassiFire bar graph and changes in steps of half a segment.
3. **Smoke Density Indicators** (scaled smoke levels) display absolutely scaled smoke levels above 0.30% obscuration per foot to a maximum of 7.62% per foot (that is, 1.0 to 25% obscuration per meter). The **Fire 2** activation level is programmed normally somewhere in this range. The bar graph display will show a continually cycling pattern when the unit is in FastLearn™ mode. On the Command Module display, this will occur when any unit on the RS485 communications loop is in FastLearn. Otherwise, the bar graph display on the Command Module mimics the bar graph display on the highest-reading Detector on the loop.
4. **Status Display** (if fitted) shows all events as they happen in real time and is also used to configure the unit. See Chapter 3, Programming the Unit, for more information.
5. The <**RESET>** Button clears any latched alarms or faults and sets the status display back to its normal operation display. To comply with national standards, Detectors are supplied with the **RESET** function disabled as the default.
6. The **<TEST>** Button starts a lamp test which makes the Detector show its nominal operating sensitivity as calculated by the ClassiFire Artificial Intelligence System.
7. The <**ISOL>** Button toggles the unit's isolation state. When isolated, the unit cannot generate any alarms and will signal a fault condition and the text display will show **Panel Isolate**. A Detector is shipped with its <**ISOL**> Button disabled as default. These three buttons can be individually enabled or disabled. The factory default state of the Detector is: **<TEST>** button enabled and <**RESET>** and <**ISOL>** buttons disabled.
8. **MENU** Buttons are used when programming the unit, which is password-protected. See Section 3-4, "Navigating Through the Menus", for more information. Pressing the **UP** or **DOWN** arrow keys when not in Programming Mode (the access code has NOT been entered) scrolls through the Detector's event log. Refer to Section 3-6, "Event Log" for more information.
9. The **Fault Indicator** illuminates when the unit has a fault and a fault signal is being sent to the fire alarm panel. On the Command Module, this also indicates a fault in a Detector on the communications loop, or in the loop itself.
10. The **OK Indicator** illuminates to show normal operation when there are no faults. On the Command Module, this means that the Command Module and all Detectors on the loop are operating normally.

1-10 DISPLAY TYPES

The Standard Detector display is a two-line LCD which allows basic programming of the Detector.

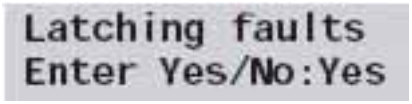


Figure 1-9. Standard Detector Display

The Command Module display contains more information than the Standard Detector display. The Command Module display instructs the user with graphic symbols.

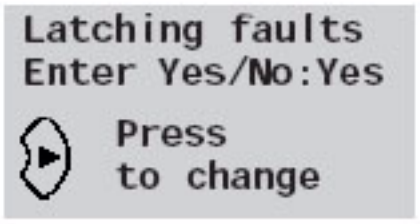


Figure 1-10. Command Module Display

CHAPTER 2
INSTALLATION AND ASSEMBLY DESCRIPTION

2-1 INTRODUCTION

This chapter provides information necessary to install the AIR-Intelligence™ ASD-640 system. Installation consists of the following steps:

1. Unpack the shipping carton. Ensure that the package contains a CD-ROM, two ferrite rings, two keys, two cable glands, and the unit.
2. Determine the optimum location for the Detector.
3. Do not open any unused sampling pipe inlets. Remove the inlet caps from sampling pipe inlets to be used.
4. Remove the knockouts for field wiring and battery connections.
5. Mount the wall-mounting bracket.
6. Mount the Detector to the mounting bracket.
7. Connect the Detector to the sampling pipe network.

At this time, you may install the optional Command Module with APIC, if one is being used.

8. Connect field wiring to the Detector.
9. Power up and program the Detector.

Note: If the Command Module with APIC is being used, it should be programmed first.

Installation should only be done by factory-trained technicians in accordance with applicable installation requirements. These include:

1. NFPA-70 (National Fire Protection Association)
2. NFPA-72
3. Any other local installation requirements.

CAUTION **Power should be turned off during installation.**

2-2 ANTISTATIC PRECAUTIONS

This system contains static-sensitive components. Always ground yourself with a proper wrist strap before handling any circuits.

When handling any electric components or printed circuit boards, antistatic precautions must be followed. Failure to do so may result in component damage.

Static discharge can be reduced by adhering to the following guidelines:

1. Always use conductive or antistatic containers for transportation and storage, if returning any item.
2. Wear a wrist strap while handling devices and ensure that a good ground is maintained throughout the installation process.
3. Never subject a static sensitive device to sliding movement over an ungrounded surface and avoid any direct contact with the pins or connections.
4. Avoid placing sensitive devices onto plastic or vinyl surfaces.

5. Minimize the handling of sensitive devices and Printed Circuit Boards (PCBs).

2-3 GENERAL INSTALLATION GUIDELINES

The following is a brief set of guidelines on installing Detectors:

1. The Detector should normally be mounted at a level where there is easy access to the unit for configuration and programming.
2. Unused sampling pipe inlets must be left closed.
3. The exhaust air from the unit must not be impeded in any way. If the unit is mounted in a different air pressure from where the air is being sampled (for example an air duct), then a pipe must be routed from the exhaust port back to the same air pressure zone as the sampling holes.
4. All wiring shall comply with NEC, NFPA-70, and the requirements of the local AHJ. All signal cables must be suitable for the application.
5. The unit must not be placed in areas where either the temperature or humidity is outside the specified operating range.
6. The unit should not be placed in close proximity to any equipment expected to generate high Radio Frequency levels (such as radio alarms) or units generating high levels of electrical energy (such as large electric motors or generators).
7. Ensure that when the Detector is fitted to the wall there is enough space on the right-hand side to allow removal and replacement of the filter element. (Refer to Section 6-3.8, “Replacing the Dust Separator (Filter)”, for further details.)

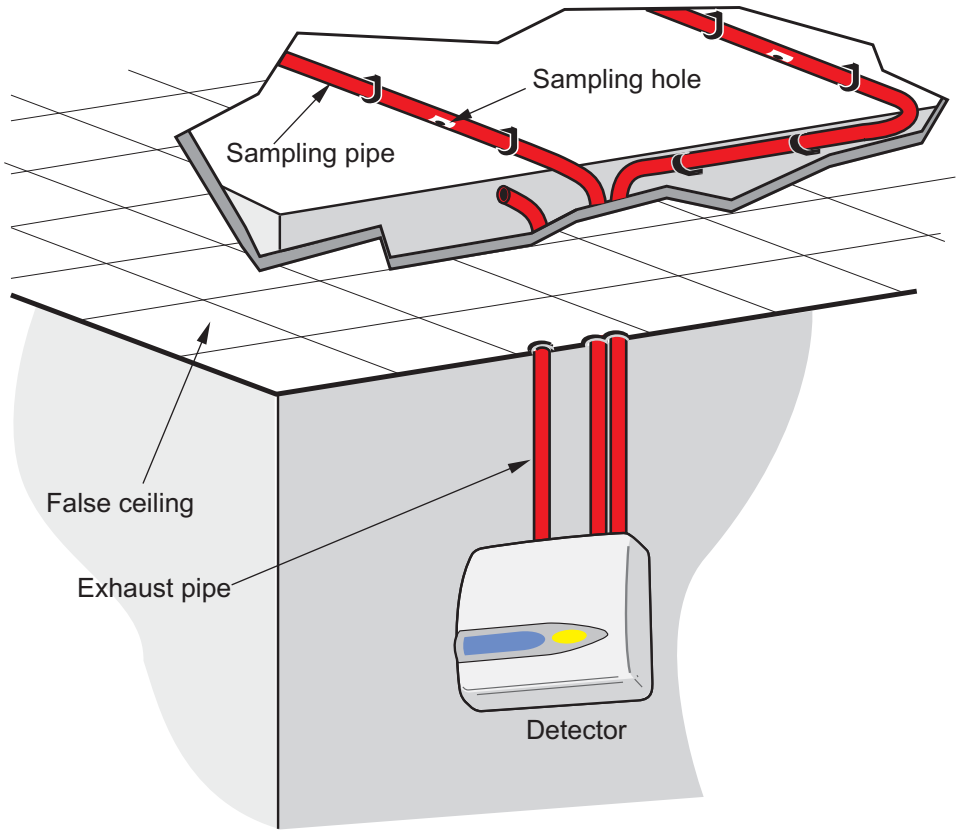


Figure 2-1. Locating the Detector Outside the Protected Area

Table 2-1 contains a list of procedural guidelines for installation of the ASD-640.

Table 2-1. Procedural Guidelines

	Do		Don't
✓	Ensure that the ClassiFire alarm factor is appropriately set.	X	Drop the Detector.
✓	Ensure that the power and signal cables are correctly connected before powering up by use of cable identifiers or electrical continuity checks. Incorrect connection could damage the Detector.	X	Install Detectors in damp or exposed areas.
✓	Ensure that cable of an appropriate approved type is used for interconnection.	X	Remove or connect boards when the Detector is powered up.
✓	Place sampling points so that the Detector will be able to detect smoke at the earliest opportunity.	X	Connect internal 0 volt terminals to local earth.
✓	Ensure that the Detector exhaust is in an area with the same atmospheric pressure as the sample pipes, either by placing the Detector physically in the protected area or by leading a pipe from the Detector exhaust to the protected area.	X	Attempt to re-use dust filter cartridges once removed.
✓	Ensure that the environment of the protected area is within the environmental operating parameters of the Detector (14º to 140ºF or -10º to +60ºC), humidity 0 - 90%, non-condensing.	X	Attempt to adjust or alter Detector settings other than via the user-programmable functions. Any attempts to adjust the laser potentiometer are detectable and will void the warranty on the product.
✓	Close unused pipe inlet ports on the Detector to ensure optimal operation.	X	Place the Detector near high power RF sources.
✓	Set the appropriate ClassiFire alarm factor for the area to be detected.	X	Place the Detector so close to other equipment that there is insufficient room to access and change the dust separator. (See Section 6-3.8, "Replacing the Dust Separator (Filter)").
✓	Set the Detector Address Switches correctly when used in a network.	X	Use sampling pipe of less than 1 inch (27 mm) outside diameter without a suitable 1-inch (27-mm) pipe adapter. It is important that there are no leaks where the pipe connects to the Detector.
		X	Use excessive force when fitting sampling pipes as this may damage the Detector.

2-3.1 Use of PipeCAD Software

PipeCAD™ pipe modeling software must be used when designing a pipe network and verifying its performance. Refer to the *PipeCAD Design, Installation and Software Manual* for complete instructions on how to design and install an air sampling pipe network.

2-4 MECHANICAL INSTALLATION

The Detector body is fitted to a wall-mounting bracket which is attached to the wall via three mounting holes **E** as shown in Figure 2-2. The Detector is then fitted over the mounting stud **D** and secured inside the Detector body with the nut provided for the purpose.

For a more discreet layout, it is possible to allow the sampling pipes and cables to enter the Detector from the rear, with the sample pipes and connection cables channeled into the wall. (Figure 2-1 depicts the Detector with cables channeled into the wall and the sampling pipes not channeled into the wall.) In order to achieve this, sampling holes **A** and **B** need to be opened up to a diameter of 1.25 in. (30 mm) to take the sampling pipes **A** and the exhaust pipe **B**. The holes **C** need to be opened up to 1.0" (25 mm) diameter in order to take a suitable threaded metal cable gland to provide adequate RF screening for the connection cables. These modifications are shown in dotted lines.

The wall will also need to be suitably prepared to allow the mounting plate to sit flush against the wall. The sampling and exhaust pipes must also extend out of the wall sufficiently to tightly engage in the pipe entry points on the rear of the Detector (as shown in Figure 2-2). If the Detector does not fit flush with the mounting bracket, the pipe excess should be trimmed back in small increments until the correct fit is achieved.

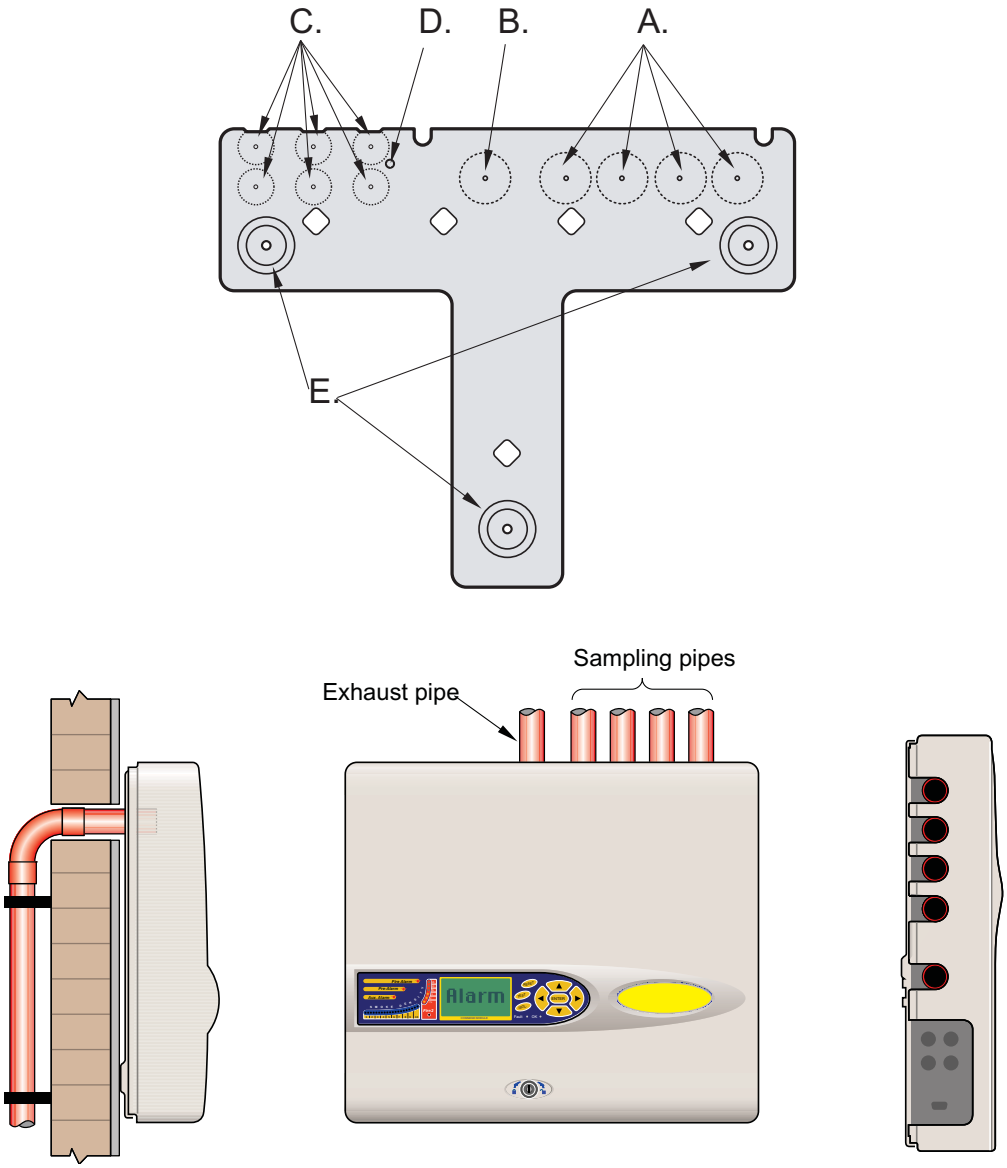


Figure 2-2. Detector Installation Options

2-4.1 Removing and Replacing the Front Cover

To remove the front cover, unlock it using the key provided (turn counter-clockwise). The bottom of the front cover may then be lifted away from the Detector chassis until the top of the cover disengages from the retaining rails at the top of the chassis. The cover may then be removed.

If greater internal access is required, e.g., for software upgrades, it may be necessary to remove the front panel display. To do this, use an anti-static wrist strap to prevent possible static damage to the unit's electronics and proceed with the following steps:

1. Power down the unit
2. Unfasten the four counter-sunk crosshead screws holding the display to the display mounting brackets
3. Lift the display away from the main board.

Note: It is not necessary to remove the remaining four screws .

If the display needs to be completely removed, unplug the display ribbon connectors from the Detector or Command Module main board, taking note of the position of the connectors which are as follows:

- For the Standard Detector, a single ribbon cable connected to the Detector's front panel display connector (see Section 1-4 for details).
- For the Command Module Detector, a twin ribbon cable, one ribbon connected to the Detector's front panel" display connector and marked "DISPLAY DET," and one connected to the Command Module board's Commander Display connector and marked "COMMAND CM" (see Section 1-8 for details).
- For the Stand-Alone Command Module, a twin ribbon cable, one ribbon connected to the detector display connector and marked "COMMAND DET," and one connected to the Commander Display connector and marked "COMMAND CM" (see Section 1-5 for details).

When the display needs to be completely removed, disengage the ribbon connectors from the main Detector or Command Module board and NOT from the display board.

Refitting of the display is the reverse of the above. Ensure that the connectors are refitted as described above. To refit the front cover, hook the recessed lip at the top of the front cover behind the two retaining guard rails at the top of the chassis as shown in Figure 2-3:

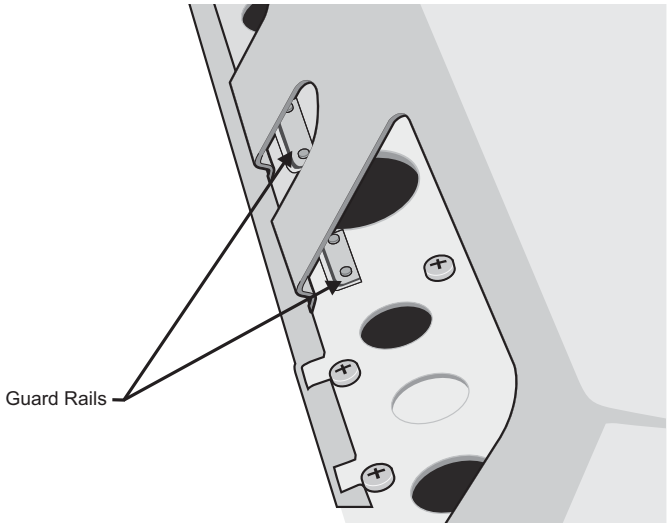


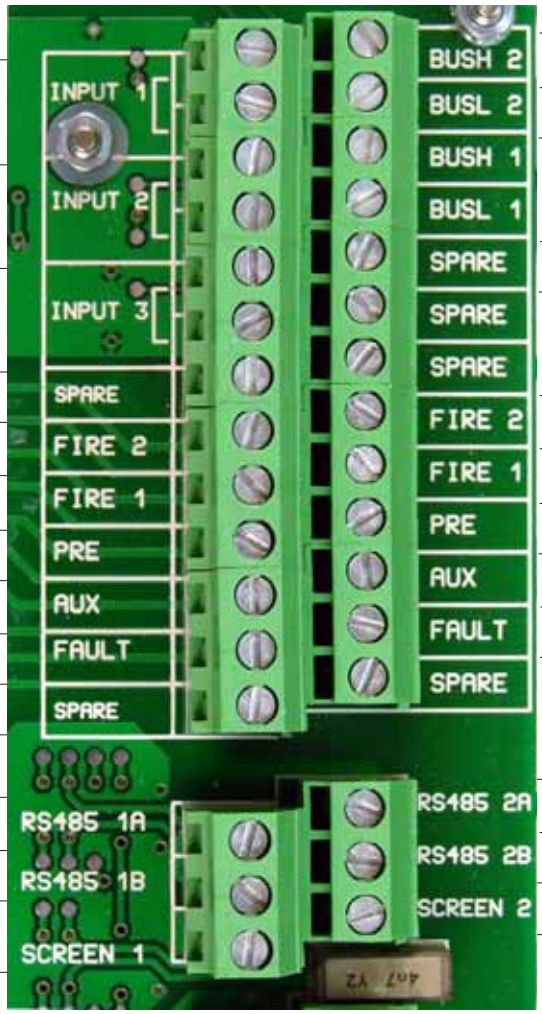
Figure 2-3. Hooking the Recessed Lip at the Top of the Front Cover

2-5 ELECTRICAL INSTALLATION

All electrical (power and signal) connections should be made to the green power terminal block inside the Detector. Power cables should have sufficient current-carrying capacity. Refer to Section 1-2 for current consumption. Signal cable should be 120 volt shielded (screened) twisted pair such as Belden 9841 24AWG. Power and signal cables should enter the Detector via metal cable glands.

2-5.1 Detector Terminal Block Connections

Figure 2-4 shows the terminal block connections for a Standard Detector.



Remote input 1 Short pair to activate[1]
Remote input 2 Short pair to activate[1]
Remote input 3 Short pair to activate[1]
Spare
N/O Fire 2 contacts
N/O Fire 1 contacts
N/O Pre-Alarm contacts
N/O Aux contacts
N/C Fault contacts
Spare

RS485 bus 1 data line A
RS485 bus 1 data line B
RS485 bus 1 screen

Addressable bus 2 high o/p[2]
Addressable bus 2 low o/p[2]
Addressable bus 1 high o/p[2]
Addressable bus 1 high o/p[2]
Spare
Spare
Spare
N/O Fire 2 contacts
N/O Fire 1 contacts
N/O Pre-Alarm contacts
N/O Aux contacts
N/C Fault contacts

RS485 bus 2 data line A
RS485 bus 2 data line B
RS485 bus 2 screen

N/O = Normally Open
N/C = Normally Closed

Figure 2-4. Detector Terminal Block Connections

[1] These connections can be used as the input terminals for main supply and battery fault sensing. When this is the case, the contacts will signal a fault when the contacts are open rather than closed, as fault relays operate in the opposite sense to other relays, i.e., they are open for normal operation. The factory default setting is for supply monitoring on "I/P 1."

[2] These connections are used to connect a Detector to an addressable Fire Panel when a suitable Addressable Protocol Interface card is mounted to the "Addressable Interface" connector on the left-hand edge of the Detector main PCB. (Refer to Section 2-8 for more information on APIC cards.)

2-5.2 Command Module Terminal Block Connections

All electrical (power and signal) connections should be made to the green terminal block inside the Detector. Power cables should be shielded (screened) and of sufficient current-carrying capacity. Signal cable should be 120 volt screened twisted pair such as Belden 9841 24AWG. Power and signal cables should enter the Detector via metal cable glands.

Figure 2-5 shows the terminal block connections for the Command Module.

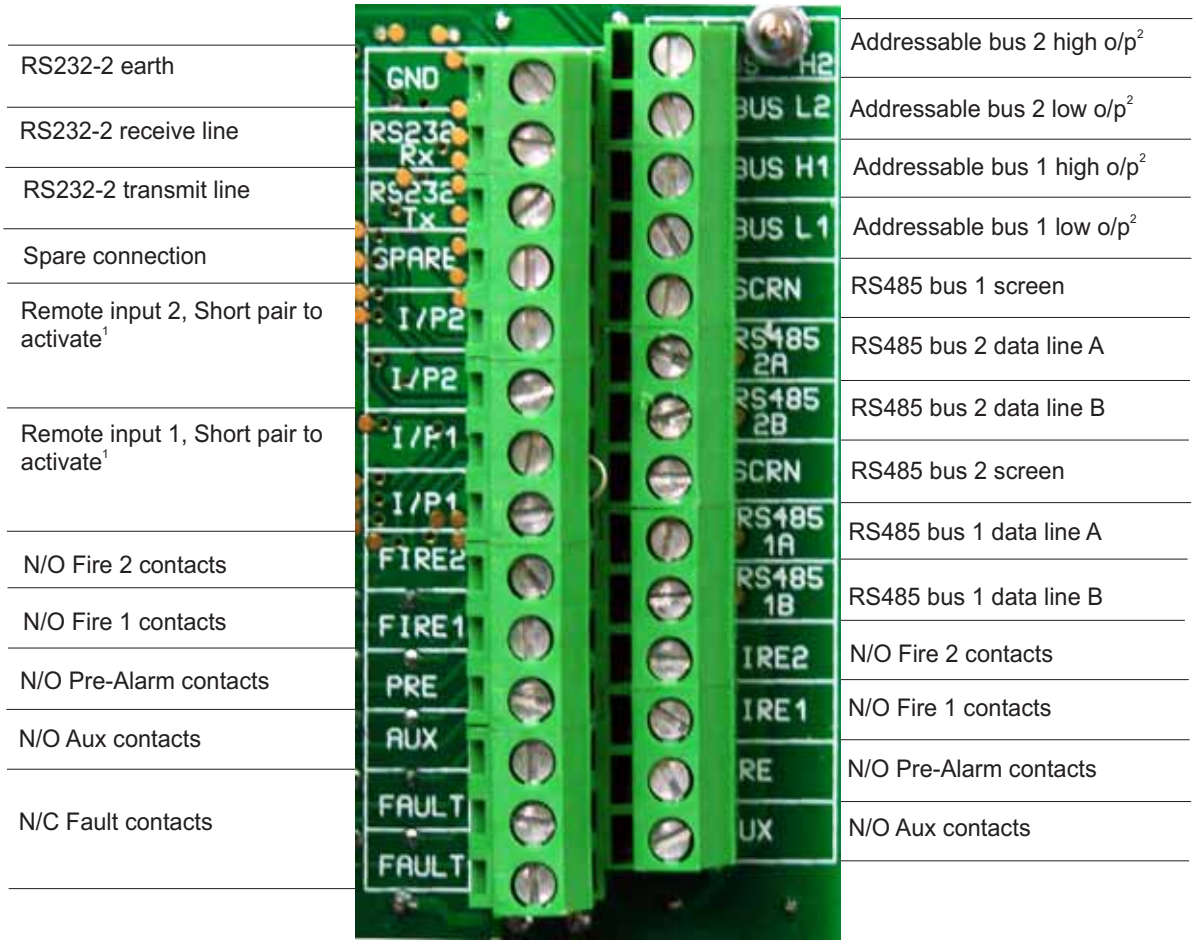


Figure 2-5. Command Module Terminal Block Connections

1 These connections can be used as the input terminals for main supply and battery fault sensing. When this is the case, the contacts will signal a fault when the contacts are open rather than closed, as fault relays operate in the opposite sense to other relays, i.e., they are open for normal operation. The factory default setting is for supply monitoring on "I/P 1."

2 These connections are used to connect a Command Module to an addressable Fire Panel when a suitable Addressable Protocol Interface card is mounted to the "Addressable Interface" connector on the left hand edge of the Command Module main PCB. (Refer to Section 2-8 for more information on APIC cards.)

2-5.3 Connecting Power Cables

The following precautions should be taken only for those applications where the system is required to meet EMC compliance requirements:

- Screened power cable should be used.
- The earth wire of power cables should be connected to the Detector EARTH terminal and this, in turn, connected to a ground stud on the Detector chassis.
- All cables (power and signal) should pass through the screw-in metal cable glands provided. The screen of the power cable should be terminated at the cable gland.
- Power cables need to be fitted with a ferrite ring inside the Detector case (two are provided). The 24V and 0V (-24V) wires should be long enough to form a loop around the ferrite wall.
- Separate wires from the power cables should be kept as short as possible, just enough to provide adequate stress relief.

Figure 2-6 and Figure 2-7 show the proper arrangement of top and rear entry power cables.

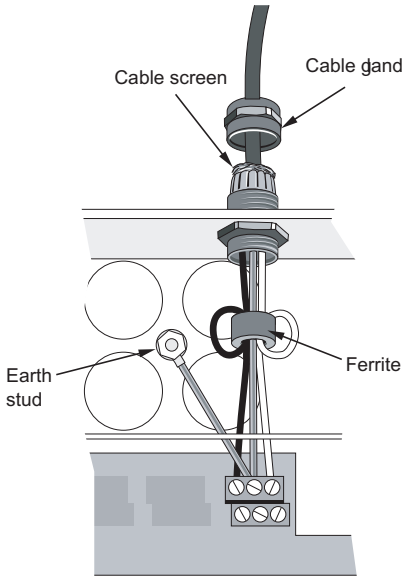


Figure 2-6. Top Power Cable Arrangement

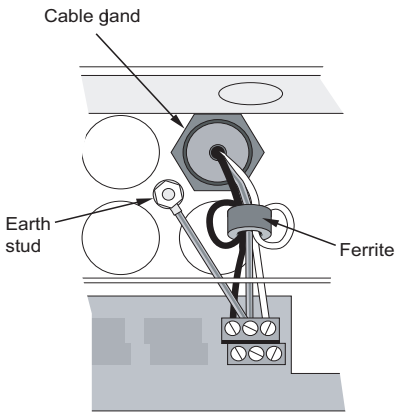


Figure 2-7. Rear Power Cable Arrangement

2-6 POWER SUPPLY CONNECTIONS

The Detector shall be powered by a UL 1481 listed 24 VDC power supply of sufficient capacity (as shown in Figure 2-8).

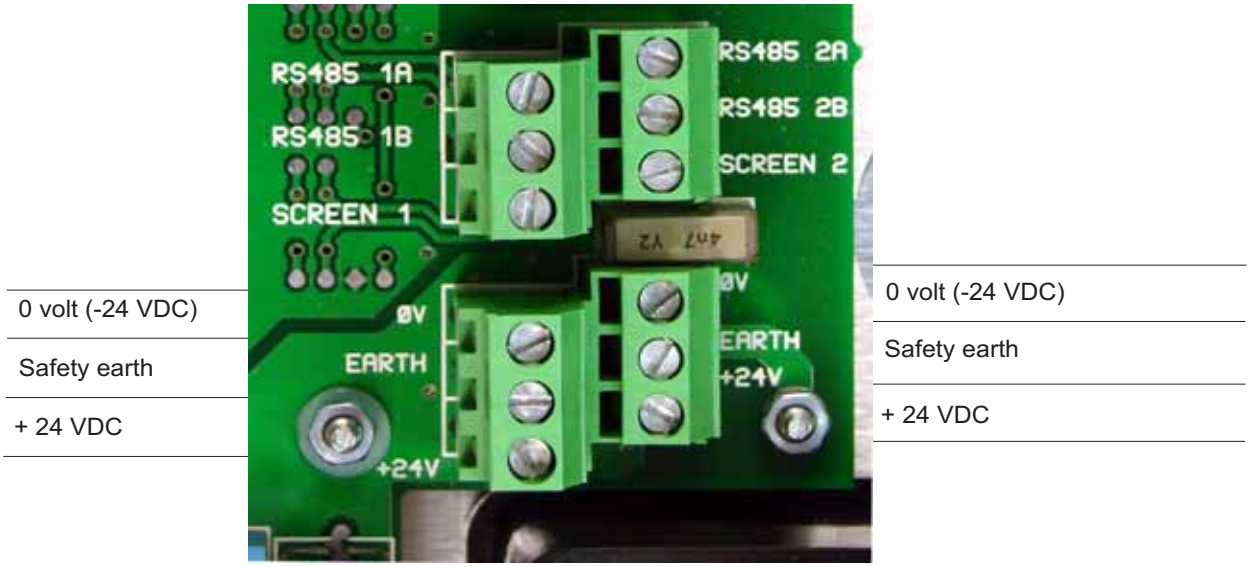


Figure 2-8. Detector Power Supply Connections

Figure 2-9. Command Module Power Supply Connections

Note: The safety earth connection must be separate and not connected to the GND (ØV) connection.

2-6.1 Power Supply Monitoring

The Command Module can be monitored using the “Normally Closed” fault contacts on the power supply. Connect the NC and COM terminals on the power supply to the I/P1 or I/P2

terminals on the Command Module. Power supply monitoring can be turned on through the keypad or via the remote software.

2-7 DEMONSTRATION MODE (DURING COMMISSIONING AND CHECKOUT)

In normal use, the Detector remains in a reduced sensitivity mode for 24 hours while it gathers information about its environment. For purposes of demonstration, for example, to verify a new installation, this may be disabled by putting the Detector into "Demonstration Mode." This special operating mode bypasses the 24-hour learning process and allows the Detector to operate at a high sensitivity after only 15 minutes learn time.

To enter Demonstration Mode, the Detector must be in FastLearn™ mode. While FastLearn is running, hold down the front panel **<RESET>** button and while holding this, simultaneously press the **<TEST>** and **<ISOL>** buttons. The **<RESET>** and **<ISOL>** buttons do not need to be enabled for this function.

When entering Demonstration Mode, the Detector front panel LCD display will show the legend **Demo mode** and the time and date on which this was invoked.

Note: Demonstration Mode should only be used for demonstrations. It should not be used as a substitute for normal operation, as the alarm settings in this mode are based solely on the sparse data gained during the 15-minute FastLearn period. Over time, this would lead to nuisance alarms due to normal variation in the Detector's environment. To cancel Demonstration Mode, invoke a new FastLearn (see Section 3-5.8 for details).

2-8 INTERFACING WITH FIRE ALARM PANELS

The ASD-640 Detector provides the following methods of interfacing with fire alarm panels:

- To conventional or addressable fire alarm panels using the Detectors' Fire 1, Fire 2, Pre-Alarm, and Fault relay contacts as input
- To addressable fire alarm panels via Addressable Protocol Interface Cards (APICs)

APICs, which can be either mounted in a stand-alone Command Module or in a Detector, simplify installation when connecting to addressable signaling line circuits (SLC). The APIC used is completely dependent on the SLC protocol and therefore the make and model of the fire alarm panel. Consult the factory for details on listed/approved APICs.

WARNING **Incompatible APIC-panel combinations may result in a non-operational system which may fail to perform during an event, with resultant loss of life and/or property.**

APICs plug into a connector on the main PCB via a ribbon cable. Once plugged in, the SLC in and out are connected to the main PCB addressable bus terminals and the address DIP switches are set to the SLC address. APICs have two modes of operation: single address and multi-address.

When the interface is set to single address mode, the card appears at a single address on the SLC and the Detector status is read from that address.

Multi-address mode is used when monitoring the status of multiple Detectors with consecutive addresses from a single SLC. Multi-address mode is normally only used in the Command Module.

2-8.1 Setting the Detector Address

In order to identify itself to the Command Module or fire panel, each Detector needs to have a unique address ranging from 1 to 127. The Detector address is simply set on the DIP switch located at the lower left of the opened Detector on the bottom of the main circuit board. The switch settings are up for 1 and down for 0, and the Detector address is set as a 7-bit binary code (switch 8 equates to a value of 128 and so is outside the usable address range).

Figure 2-10 shows an example where the address equates to “01100011” in binary, or:

(1 x 1) + (1 x 2) + (0 x 4) + (0 x 8) + (0x 16) + (1 x 32) + (1 x 64) + (0 x 128) = 99

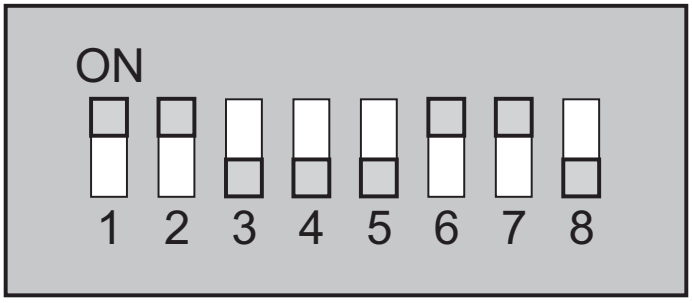


Figure 2-10. Sample Dip Switch Settings

The full range of available addresses and their relevant switch settings are provided in Table 2-2 for reference.

Note: Addresses chosen for Detectors do not have to be consecutive or in a given order as long as they are all different.

Table 2-2. Address Table

Address	1	2	3	4	5	6	7	8
1	1	0	0	0	0	0	0	0
2	0	1	0	0	0	0	0	0
3	1	1	0	0	0	0	0	0
4	0	0	1	0	0	0	0	0
5	1	0	1	0	0	0	0	0
6	0	1	1	0	0	0	0	0
7	1	1	1	0	0	0	0	0
8	0	0	0	1	0	0	0	0
9	1	0	0	1	0	0	0	0
10	0	1	0	1	0	0	0	0
11	1	1	0	1	0	0	0	0
12	0	0	1	1	0	0	0	0
13	1	0	1	1	0	0	0	0
14	0	1	1	1	0	0	0	0
15	1	1	1	1	0	0	0	0
16	0	0	0	0	1	0	0	0
17	1	0	0	0	1	0	0	0
18	0	1	0	0	1	0	0	0
19	1	1	0	0	1	0	0	0
20	0	0	1	0	1	0	0	0
21	1	0	1	0	1	0	0	0
22	0	1	1	0	1	0	0	0
23	1	1	1	0	1	0	0	0
24	0	0	0	1	1	0	0	0
25	1	0	0	1	1	0	0	0
26	0	1	0	1	1	0	0	0
27	1	1	0	1	1	0	0	0
28	0	0	1	1	1	0	0	0
29	1	0	1	1	1	0	0	0
30	0	1	1	1	1	0	0	0
31	1	1	1	1	1	0	0	0
32	0	0	0	0	0	1	0	0
33	1	0	0	0	0	1	0	0
34	0	1	0	0	0	1	0	0
35	1	1	0	0	0	1	0	0
36	0	0	1	0	0	1	0	0
37	1	0	1	0	0	1	0	0
38	0	1	1	0	0	1	0	0
39	1	1	1	0	0	1	0	0
40	0	0	0	1	0	1	0	0
41	1	0	0	1	0	1	0	0
42	0	1	0	1	0	1	0	0
43	1	1	0	1	0	1	0	0
44	0	0	1	1	0	1	0	0

Table 2-2. Address Table

Address	1	2	3	4	5	6	7	8
45	1	0	1	1	0	1	0	0
46	0	1	1	1	0	1	0	0
47	1	1	1	1	0	1	0	0
48	0	0	0	0	1	1	0	0
49	1	0	0	0	1	1	0	0
50	0	1	0	0	1	1	0	0
51	1	1	0	0	1	1	0	0
52	0	0	1	0	1	1	0	0
53	1	0	1	0	1	1	0	0
54	0	1	1	0	1	1	0	0
55	1	1	1	0	1	1	0	0
56	0	0	0	1	1	1	0	0
57	1	0	0	1	1	1	0	0
58	0	1	0	1	1	1	0	0
59	1	1	0	1	1	1	0	0
60	0	0	1	1	1	1	0	0
61	1	0	1	1	1	1	0	0
62	0	1	1	1	1	1	0	0
63	1	1	1	1	1	1	0	0
64	0	0	0	0	0	0	1	0
65	1	0	0	0	0	0	1	0
66	0	1	0	0	0	0	1	0
67	1	1	0	0	0	0	1	0
68	0	0	1	0	0	0	1	0
69	1	0	1	0	0	0	1	0
70	0	1	1	0	0	0	1	0
71	1	1	1	0	0	0	1	0
72	0	0	0	1	0	0	1	0
73	1	0	0	1	0	0	1	0
74	0	1	0	1	0	0	1	0
75	1	1	0	1	0	0	1	0
76	0	0	1	1	0	0	1	0
77	1	0	1	1	0	0	1	0
78	0	1	1	1	0	0	1	0
79	1	1	1	1	0	0	1	0
80	0	0	0	0	1	0	1	0
81	1	0	0	0	1	0	1	0
82	0	1	0	0	1	0	1	0
83	1	1	0	0	1	0	1	0
84	0	0	1	0	1	0	1	0
85	1	0	1	0	1	0	1	0
86	0	1	1	0	1	0	1	0
87	1	1	1	0	1	0	1	0
88	0	0	0	1	1	0	1	0
89	1	0	0	1	1	0	1	0

Table 2-2. Address Table

Address	1	2	3	4	5	6	7	8
90	0	1	0	1	1	0	1	0
91	1	1	0	1	1	0	1	0
92	0	0	1	1	1	0	1	0
93	1	0	1	1	1	0	1	0
94	0	1	1	1	1	0	1	0
95	1	1	1	1	1	0	1	0
96	0	0	0	0	0	1	1	0
97	1	0	0	0	0	1	1	0
98	0	1	0	0	0	1	1	0
99	1	1	0	0	0	1	1	0
100	0	0	1	0	0	1	1	0
101	1	0	1	0	0	1	1	0
102	0	1	1	0	0	1	1	0
103	1	1	1	0	0	1	1	0
104	0	0	0	1	0	1	1	0
105	1	0	0	1	0	1	1	0
106	0	1	0	1	0	1	1	0
107	1	1	0	1	0	1	1	0
108	0	0	1	1	0	1	1	0
109	1	0	1	1	0	1	1	0
110	0	1	1	1	0	1	1	0
111	1	1	1	1	0	1	1	0
112	0	0	0	0	1	1	1	0
113	1	0	0	0	1	1	1	0
114	0	1	0	0	1	1	1	0
115	1	1	0	0	1	1	1	0
116	0	0	1	0	1	1	1	0
117	1	0	1	0	1	1	1	0
118	0	1	1	0	1	1	1	0
119	1	1	1	0	1	1	1	0
120	0	0	0	1	1	1	1	0
121	1	0	0	1	1	1	1	0
122	0	1	0	1	1	1	1	0
123	1	1	0	1	1	1	1	0
124	0	0	1	1	1	1	1	0
125	1	0	1	1	1	1	1	0
126	0	1	1	1	1	1	1	0
127	1	1	1	1	1	1	1	0

2-8.2 Connecting a Detector Network to a Command Module

The RS485 wire needs to be fitted with a ferrite ring inside each Detector. Up to 127 Detectors may be linked in a single SenseNET bus, supporting a total length of wire between adjacent Detectors of up to 3/4 mile (1.2 km). Refer to Section 2-5.3 for further information.

2-8.3 Fault-Tolerant Detector Loop Configuration (CLASS-A Network Wiring)

The Detectors are connected using the RS485 connections on the terminal block (refer to Section 2-5.1 and Section 2-5.2 for details). RS485 1A and 1B are the signal connections for bus 1 and RS485 2A and 2B are the signal connections for bus 2. SCREEN 1 and 2 are the screen connections for buses 1 and 2, respectively.

For the Command Module, the RS485 1A and 1B connections may be thought of as the 'Send' lines, and 2A and 2B the 'Return' lines. For each Detector on the loop, the 1A and 1B connections may be thought of as the lines from the previous Detector on the loop and the 2A and 2B connections the lines to the next Detector in the loop.

Figure 2-10 shows the configuration for a fault-tolerant network.

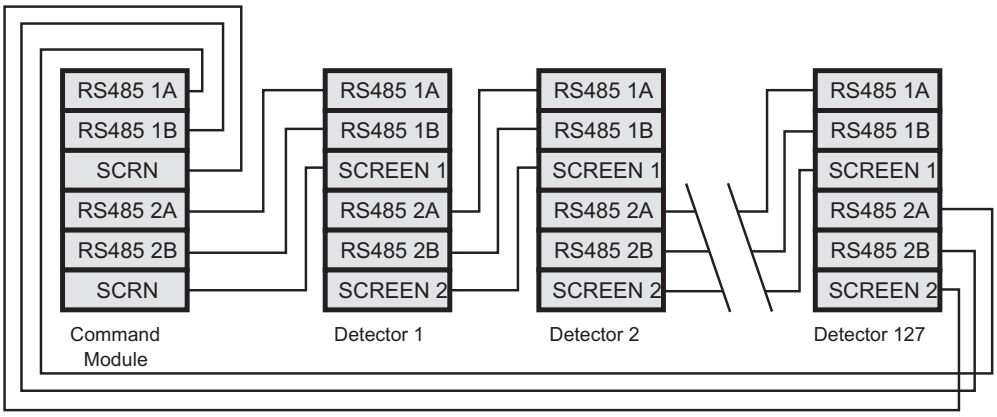


Figure 2-11. Fault Tolerant Detector Loop Configuration

2-8.4 NonFault-Tolerant Serial Configuration (CLASS-B Network Wiring)

It should be pointed out that loop connections such as in Section 2-8.3 are only needed for a fully fault-tolerant network where full isolation is required between Detectors. If all Detectors are operating within the same zone, a series connection can be used where the output from the Command Module is taken from the Bus 2 terminals and the last Detector in the loop does not require to be connected back to the Command Module as shown below. In this example, the Command Module will not be able to monitor the network for communications problems, but less wiring is required.

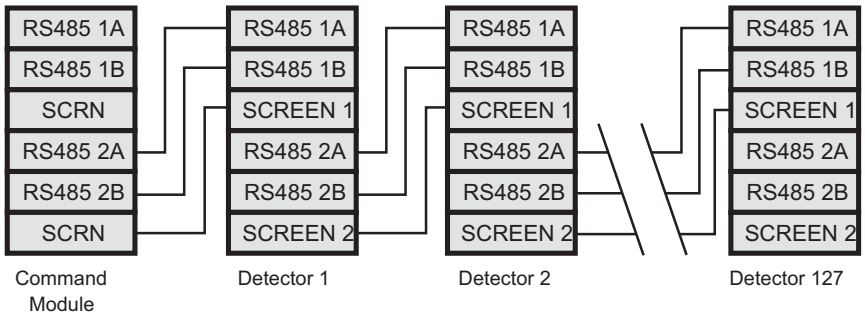


Figure 2-12. Non-Fault-Tolerant Serial Configuration

2-9 CONNECTING A COMMAND MODULE TO AN ADDRESSABLE FIRE PANEL

When a Command Module is being used to manage one or more Detectors (the maximum limit is 127) an Addressable Protocol Interface Card (APIC) is required to decode Detector status information in the Command Module and convey to the Fire Panel via the Addressable Bus 1 and Bus 2 terminal block connections (see Section 2-5.2 for details). In this configuration only one interface is required and all Detector information is available through this interface, one address per device.

Note: Some addressable protocols may limit the maximum number of device addresses to less than 127. The Detector address on the SenseNET™ loop and the Fire Panel addressable protocol address are the same, i.e., no address translation is performed. Some protocols may not support all of the available alarm levels, and fault reporting is usually a general fault with no detailed fault information.

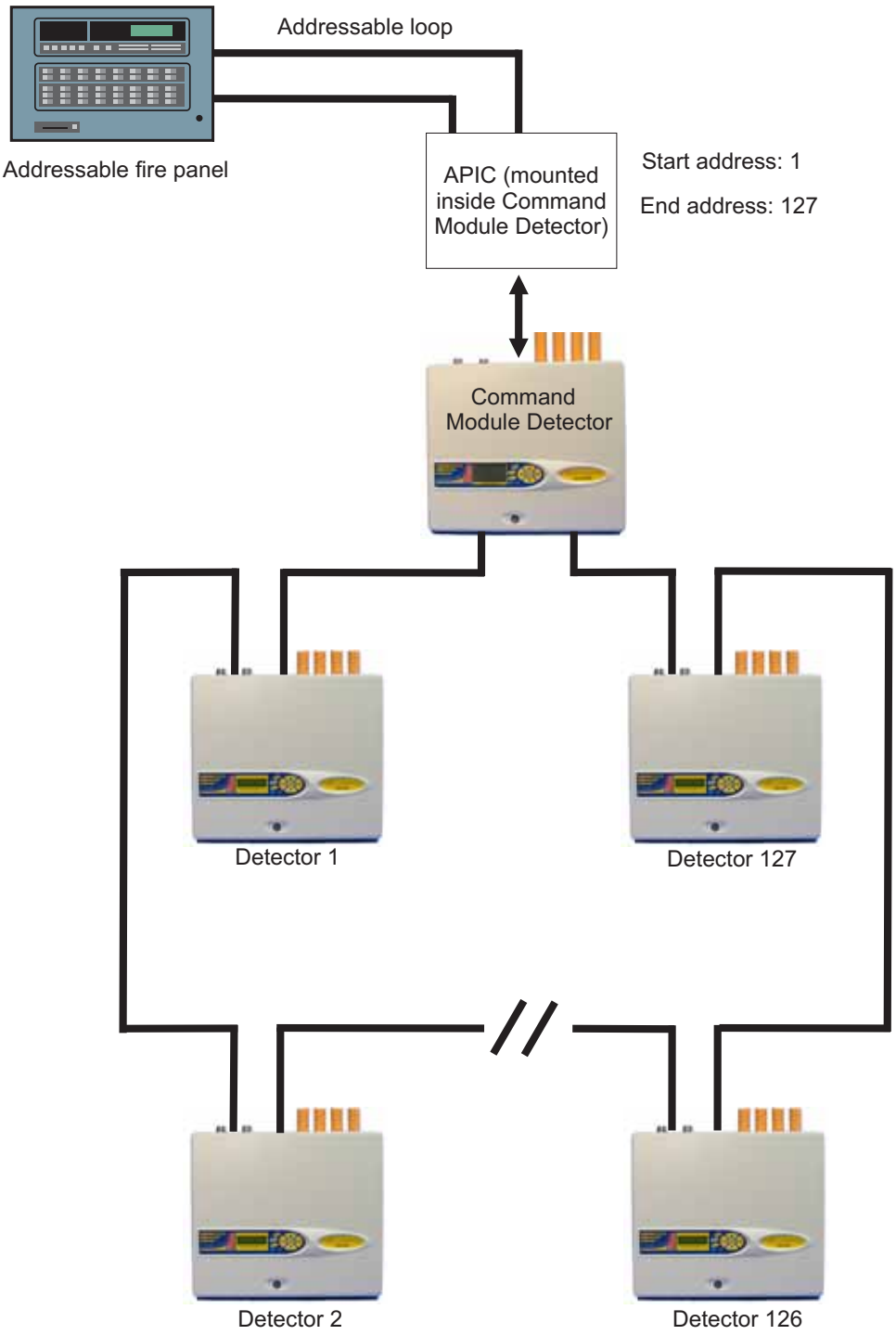


Figure 2-13. Addressable Fire Panel Configuration

Note: In networks of less than 127 Detectors, in order to avoid unused addresses from reporting a “Detector not Present” fault, it is required that a continuous unbroken range of Detector addresses is set on the APIC.

2-10 CONNECTING A SINGLE ASD-640 TO AN ADDRESSABLE FIRE PANEL

An APIC may be used to decode Detector status information and convey this to the Fire Panel via the Addressable Bus 1 and Bus 2 terminal block connections.

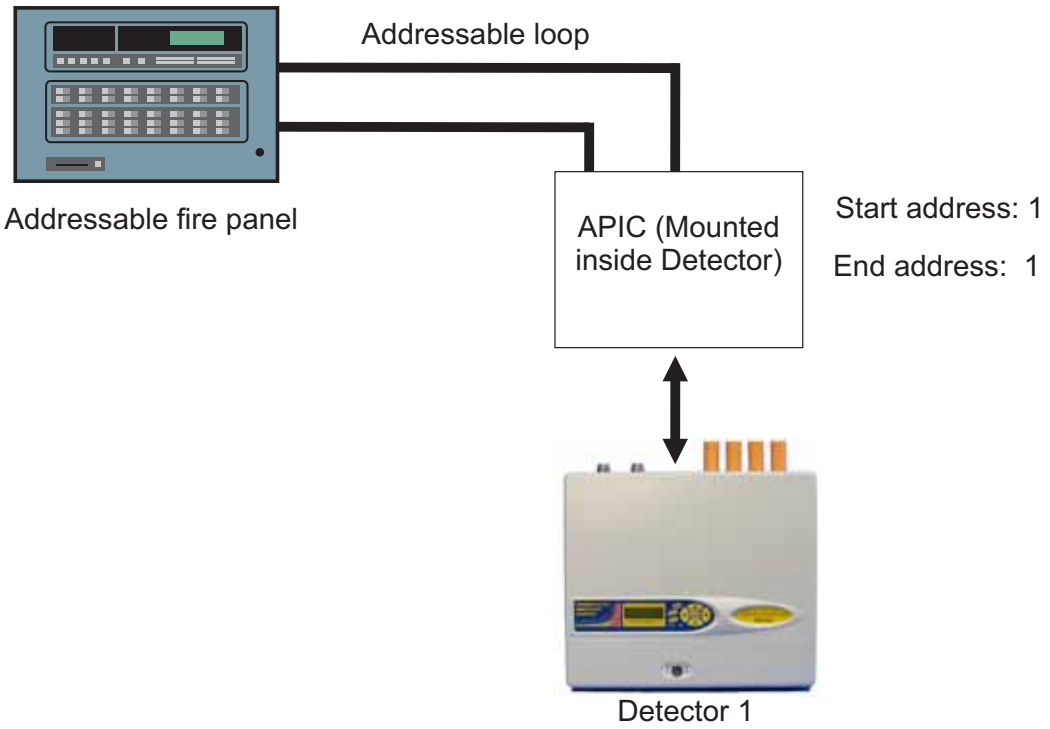


Figure 2-14. Connecting a Single ASD-640 to an Addressable Fire Panel

Note: The Detector address on the RS485 communications loop and the Fire Panel addressable protocol address are the same, which means that no address translation is performed. Some protocols may not support all of the available alarm levels, and fault reporting is usually a general fault with no detailed fault information.

2-11 CONNECTING TO A PC

To connect a single stand-alone Detector to a PC, connect the PC‘s serial port directly to the Detector‘s 9-way RS232 port. Connections for this cable are shown in Figure 2-15.

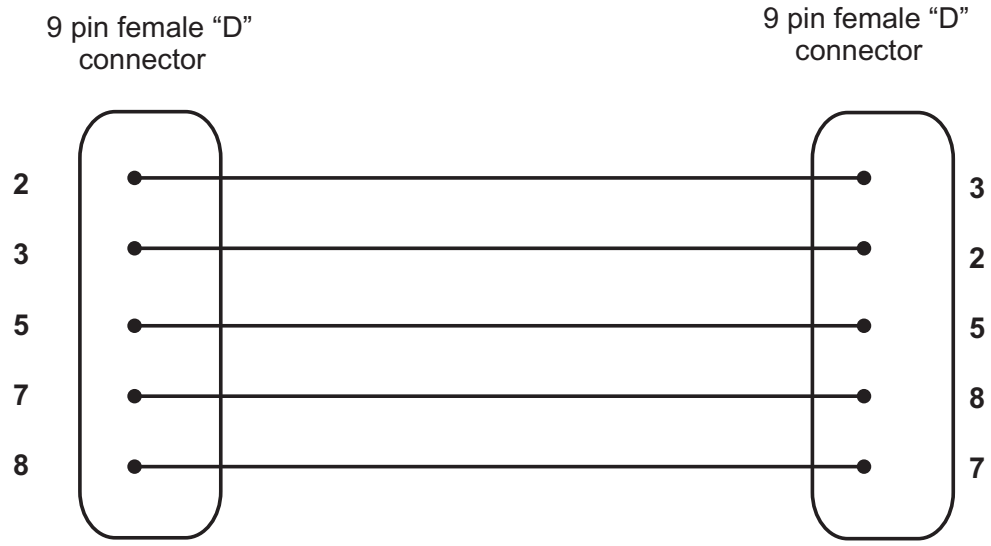


Figure 2-15. Cable Connections for Connecting to a PC

When multiple Detectors are networked together and a Command Module is being used, the PC connects to the Command Module‘s 9-pin RS232 port. The cable connections are the same as the Standard Detector cable connections.

Figure 2-16. Connecting a PC to the Command Module’s RS232 Port

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CHAPTER 3
PROGRAMMING THE UNIT

3-1 INTRODUCTION

The AIR-Intelligence™ ASD-640 can be configured and programmed with the use of the front panel controls or interface to a PC.

3-2 ENTERING PROGRAMMING MODE/ INSTALLER ACCESS CODE

You must enter a valid Installer Access Code to program Detector parameters. The access code is only required when in Programming Mode.

You must re-enter the access code if you:

- Exit Programming Mode
- Power down the Detector
- Press the <**RESET**> key

To enter Programming Mode, press one of the following keys:

- **<Menu>**
- **Right** or **Left Arrow**
- **<Enter>**

The Detector responds by prompting the user for the Installer Access Code as follows:

Access code: 0000

Note: The factory default access code is 0102.

To enter the default access code, enter the following sequence:

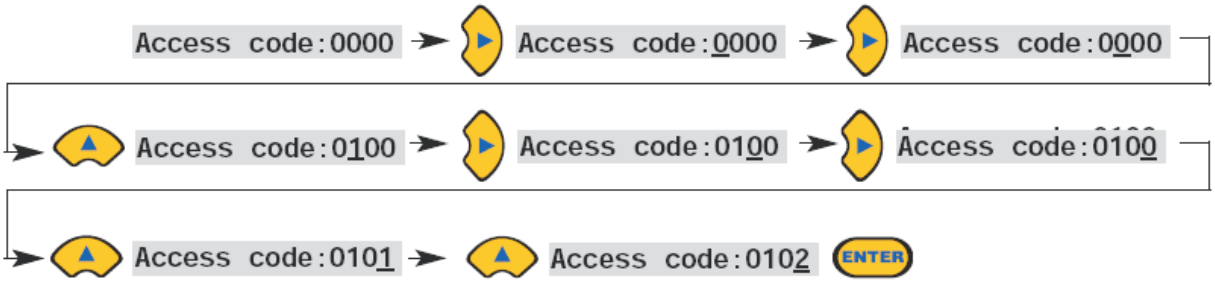

Figure 3-1. Setting the Access Code

Note: Pressing the **Up** or **Down Arrow** key has no effect until you press the **Right Arrow** key to place the cursor under the first digit.

All programmable functions work in a similar manner:

- **Right** and **Left Arrow** keys: Move the cursor position through the user-settable digits.
- **Up** and **Down Arrow** keys: Step through the available values for the currently-selected digit.
- **<Enter>** key: Enters the displayed figure.

Valid ranges for all programmable parameter values are displayed in parentheses below/beside the parameter legend in Figure 3-3 and Table 3-1.

Note: You cannot save an illegal value. For example, the maximum valid input for the **Fire 1 level** is 10. If you enter 99, the programmer displays the **Bad value** error message and prompts you for a new value.

After you enter the required value, press the **<Enter>** key to select the amended setting. Pressing the **Right Arrow** key when the cursor is on the right-most digit has the same effect. If no programming activity is detected for 5 minutes, the Detector displays the legend **Access timeout** and exits Programming Mode.

3-3 MAIN MENU

When the correct access code is entered, the display shows the main menu. The current selection is always shown with an arrow after it. Press the **<Enter>** key or the **Left Arrow** key to activate the selection.

The choices available in the main menu are, in order:

- **Setup Menu**: Contains all the user-programmable functions.
- **Log Menu**: Displays historical information such as the event log (time and date of various events such as alarm or fault conditions).
- **Diagnostic Menu**: Contains Detector self-tests.
- **Reset**: Clears any latched fault readings or exits from a menu item to its parent menu. This has the same effect as pressing the **<RESET>** button.
- **Isolate**: Isolates the Detector. This has the same effect as isolating with the **<ISOL>** button.
- **Exit**: Exits Programming Mode

Note: When you press the **Up Arrow** key in the **Setup Menu**, the main menu wraps around and brings up **Exit**, etc.

3-4 NAVIGATING THROUGH THE MENUS

Press the **Up** and **Down Arrow** keys to navigate through the main menu options. The currently selected item appears at the top of the screen and is identified by an arrow or a trailing dot.

Figure 3-2 shows how pressing the **Down Arrow** key scrolls the screen from the **Setup** menu (the current selection), to the **Log** menu. Alternatively, pressing the **Up Arrow** retreats to the **Exit** command.

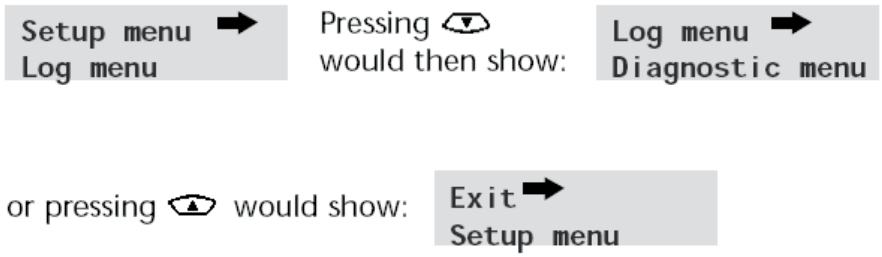

Figure 3-2. Using the Arrow Keys to Navigate

When the menu item appears with the arrow next to it, press the **<Enter>** key to scroll through the list of items available for that menu.

For example, Figure 3-3 shows the sequence of actions necessary to program the **Fire 1 level**. Having entered the **Fire 1 level**, the selected item indicator steps along to the item below it in the **Alarm levels** sub-menu. (For Alarm level setting information, see Section 3-5.2.) You can edit the **Fire 1 level** as shown, or use the **Up** and **Down Arrow** keys to move to the next choice.

Once you reach the last entry in the sub-menu, press the **<RESET>** button to move back up to the **Setup menu**. Pressing the **<RESET>** button at any time exits Programming Mode, assuming the **<RESET>** button is enabled.

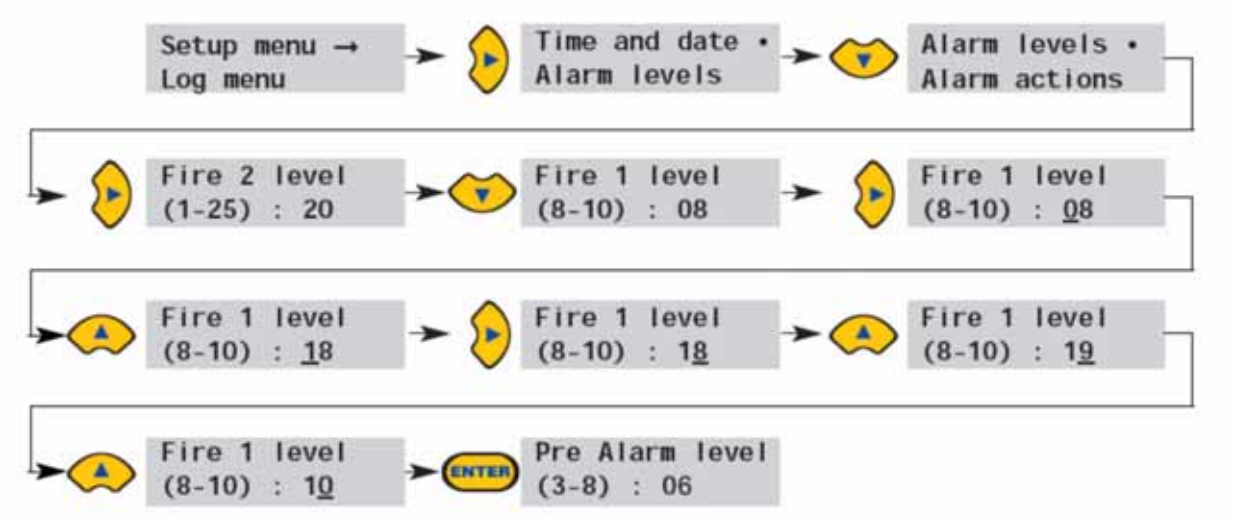

Figure 3-3. Navigating to the Pre-Alarm Level Item

Table 3-1 shows the full menu map for the ASD-640, showing the choices available within each menu and sub-menu.

The **Up** and **Down Arrow** keys move the menu pointer progressively towards the left or right of the map as appropriate, and the **Right** and **Left Arrow** keys move the pointer to the choices in the currently-selected menu or sub-menu.

Items within sub-menus are sequentially accessed with the **Down Arrow** key, followed by the **Right Arrow** key. Values are edited by pressing the **Right Arrow** key, followed by the **Up** and **Down Arrow** keys.

3-5 ASD-640 FUNCTIONS

A list of all programmable functions follows with an explanation of their usage and the menu and sub-menu in which they can be found. A menu map with the location of each sub-menu and function within the main menu is shown in Table 3-1. The valid input range for programming parameters is also provided.

Each function listed in Table 3-1 gives the following information:

- Function name and description
- Type of function. There are five types of functions:
  - Yes/No
  - Numeric
  - Alpha
  - Display
  - Test
- The menu and sub-menu within which the function can be found.
- Applicability
  - The legend "**CM only**" means that the function applies only to the Command Module and is not available for the Standard Detector.
  - The legend "Address 000-127" means that the function may apply to the Command Module and the Standard Detector (allowable addresses from 000 to 127). **Time and date** and **Relay test** are examples of these.
  - All other functions are present in both the Standard Detector and Command Module function lists and are used to program the Detectors. They can either be remotely set on the Command Module, or set locally on the Detector front panel. These are annotated "**Address 001-127**" since they do not apply to the Command Module itself.

Where a programmable function on the Command Module applies to a Standard Detector, the Command module will scan the loop and, if more than one Detector is present, will prompt the user for the address of the Detector to be programmed.

If the function applies to the Command Module, the address "000" should be entered. For other Detectors on the loop (including the Detector element of a Command Module Detector), the value is the same as the address set on the Detector's internal DIP switch.

If a user enters an address which does not appear on the loop, the error message, "**Bad Detector"** appears. This message only appears if the Command Module address "000" is entered into a function which only applies to Detectors (that is, anything except "**CM only**" and "**Address 000-127**" functions).

Table 3-1 shows a map of the programmable functions by menu and sub-menu with references by chapter section.

Table 3-1. Menu Reference Table

Menu	Sub-menu	Programmable Function	Section
Setup Menu	**Time and Date**	Time HH:MM	Section 3-5.1
		Date DD:MM:YYYY	
	Alarm Levels	Fire 2 level (1-25)	Section 3-5.2
		Fire 1 level (8-10)	
		Pre-Alarm level (3-8)	
		Aux level (2-10)	
		Fire 2 delay (0-90)	Section 3-5.3
		Fire 1 delay (0-90)	
		Pre-Alarm delay (0-90)	
		Aux delay (0-90)	
		Class. override (0-199)	Section 3-5.4
		Alarm factor (0-17)	Section 3-5.5
		Day start (0-23)	Section 3-5.6
		Night start (0-23)	
		LDD™ enable (Yes/No)	Section 3-5.7
		FastLearn™ On (Yes/No)	Section 3-5.8
		Auto FastLearn (Yes/No)	Section 3-5.9
	Alarm Actions	Delay override (Yes/No)	Section 3-5.10
		Cascading alarms (Yes/No)	Section 3-5.11
		Latching alarms (Yes/No)	Section 3-5.12
		Latching faults (Yes/No)	Section 3-5.13
		Remote day/night (Yes/No)	Section 3-5.14
		Remote reset (Yes/No)	Section 3-5.15
		Remote isolate (Yes/No)	Section 3-5.16
		Prog. Isolate On (Yes/No)	Section 3-5.17
	Detector	Detector address	Section 3-5.18
		Device text	Section 3-5.19
	Reference	Reference enable (Yes/No)	Section 3-5.20
		Reference device (1-127)	Section 3-5.21
		Level (0-99)	Section 3-5.22
		Back off (0-99)	Section 3-5.23
	Front Panel	ISOLATE enable (Yes/No)	Section 3-5.24
		TEST enable (Yes/No)	Section 3-5.24
		RESET enable (Yes/No)	Section 3-5.24

Table 3-1. Menu Reference Table (Continued)

Menu	Sub-menu	Programmable Function	Section
Setup Menu	**Power Checks**	Power save (Yes/No)	Section 3-5.25
		Battery check enable (Yes/No)	Section 3-5.26
		Mains check enable (Yes/No)	Section 3-5.27
	Air Flow	Aspirator speed (1-16)	Section 3-5.28
		Flow setup (Yes/No)	Section 3-5.29
		Sensor 1 enable (Yes/No)	Section 3-5.30
		Sensor 2 enable (Yes/No)	Section 3-5.30
		Flow pipe 1 - 4	Section 3-5.30
		Flow low 1 - 4 (0-99)	Section 3-5.30
		Flow high 1 - 4 (0-99)	Section 3-5.30
		Sensor 3 enable (Yes/No)	Section 3-5.30
		Sensor 4 enable (Yes/No)	Section 3-5.30
	Miscellaneous	Chart rate (0-19)	Section 3-5.31
		Access code (0-9999)	Section 3-5.32
		BMS protocol (0-2) (Command Module only)	Section 3-5.33
		Factory default (Yes/No)	Section 3-5.34
	Bus Setup (CM only)	Scan for devices (Yes/No)	Section 3-5.35
		Numbers and addresses of detectors	Section 3-5.35
		Looped bus (Yes/No)	Section 3-5.36
		Poll timeout (30-255)	Section 3-5.37
	Pager (CM only)	Call center	3-5.38
		Password	3-5.39
		Pager	3-5.40
		Page on fault (Yes/No)	3-5.41
		Page on alarm (Yes/No)	3-5.42
Log Menu	**View event log**	200 Events (000-127)	3-5.43
Diagnostic Menu	**Diagnostics**	Self-Test Mode (1-127)	3-5.44
	Detector read	Detector Read (1-127)	3-5.45
	Loop errors	Loop Errors (Port 1 and Port 2)	3-5.46
	Dust separators	0 - 100% (1-127)	3-5.47
	Relay test	Aux	3-5.48
		Pre-Alarm + Fault	3-5.48
		Fire 1 + Fault	3-5.48
		Fire 2 + Fault	3-5.48
		Fault	3-5.48
	Watchdog count	Number of interruptions	3-5.49
Reset			3-3
Exit			3-3

3-5.1 Time and Date (Numeric - Address 000-127)

It is important that the time and date be set up correctly on the controller's internal calendar/ clock because it uses this information to store events in the event log. Refer to Section 3-6, "Event log" for more details. Units are supplied with the correct setting for UK time. This is backed up with a rechargeable battery.

3-5.2 Alarm Levels (Numeric - Address 001-127)

The value set in the **Pre-Alarm level** , **Fire 1 level** and **Aux level** functions in the **Alarm levels** sub-menu is the relatively-scaled bar graph level at which the appropriate alarm is initiated on the Detector. The **Fire 2 level** function assigns an **absolutely-scaled** alarm level in % obs/ft or % obs/m (as selected in configuration) to the Fire 2 alarm. The **Aux level** is set by factory default at level 10, which means that this alarm will occur after the Fire 1 alarm.

3-5.3 Alarm Delays (Numeric - Address 001-127)

The alarm delay is the number of seconds that an alarm level has to be continuously sensed before the alarm is initiated. Each alarm level has a programmable delay of between 0 and 90 seconds.

3-5.4 ClassiFire Override (Numeric - Address 001-127)

When this function is set to a value other than zero, the shorting together of one of the "Input 3" contacts on the Detector main circuit board by means of potential-free dry contacts will desensitize the Detector by moving the alarm levels out by the specified percentage.

3-5.5 ClassiFire Alarm Factor (0-8 - Address 001-127)

The Detector sensitivity is set with this entry, which will also affect the probability of nuisance alarms. 0 = high sensitivity, higher probability; 8 = low sensitivity, lower probability.

Note: The highest sensitivity setting is suitable for clean, environmentally controlled environments, e.g., semiconductor manufacturing clean rooms where airborne pollutants are kept to an absolute minimum and the least contamination is cause for alarm. Use of this setting in a busy machine shop would lead to relatively frequent nuisance alarms due to the normal variation of atmospheric contamination, and a lower sensitivity setting is recommended. ***It is therefore important that the alarm factor chosen is suitable for the area to be protected***. When the appropriate alarm factor for the protected area has been set, nuisance alarms will be reduced to an absolute minimum.

Table 3-2. Suggested Settings for ClassiFire Alarms

Alarm Factor	Sensitivity	Probability of Nuisance Alarm	Suggested Protected Area
0	Extremely High	Once per year	Semiconductor manufacturing clean room
1	High	Once per 5 years	Computer room
2	High	Once per 10 years	Non-smoking office
3	High	Once per 50 years	Clean factory
4	Medium	Once per 1,000 years	Warehouse
5	Medium	Once per 5,000 years	Warehouse with diesel trucks operating
6	Medium	Once per 10,000 years	Warehouse with diesel trucks operating
7	Low	Once per 20,000 years	Warehouse with diesel trucks operating
8	Low	Once per 100,000 years	Warehouse with diesel trucks operating

3-5.6 Hour Start of Day and Night Operation (0-23 - Address 001-127)

Note: This information is provided as general guidance only. The installer is responsible for assessing the environment and determining the appropriate sensitivity of the ClassiFire alarm.

These values are the times to the nearest hour at which the day/night switching is desired to take place on the Detector. Entries are made in 24-hour format, e.g., **19:00** for 7pm. If no day/night switching is required, then both entries should be set to **00:00**. Day and night switching is intended so that the Detector may automatically select a different sensitivity when the protected area is unoccupied and fewer contaminants are being produced. ClassiFire automatically detects the change in smoke level after the protected area is left, and if the time at which this happens is within +/– 70 minutes of the programmed switchover time, it selects the nighttime histogram.

Note: If the environment actually becomes more contaminated during the night period, then ClassiFire will adapt to that too, reducing the nighttime sensitivity. The system will automatically compensate for 1 hour seasonal time changes.

3-5.7 LDD™ Enable (Yes/No - Address 001-127)

When this function is set to **Yes** , Laser Dust Discrimination (LDD) increases the response time of the Detector slightly, while greatly reducing the likelihood of nuisance alarms due to dust ingress. LDD may be disabled in very clean rooms for a slightly faster response to smoke by setting this function to **No**. Disabling LDD is not recommended for areas other than manufacturing clean rooms, due to the increased probability of nuisance alarms in most other operating environments.

3-5.8 FastLearn ON (Yes/No - Address 001-127)

Setting this function to **Yes** will start a FastLearn at any time. The bar graph display on the front of the Detector will show a rolling segment display on the front panel for the 15 minutes that it takes to complete.

Note: If the Detector is in FastLearn Mode, do not set this function to “No.” If you set this function to “No”, the FastLearn process will stop. AIR-Intelligence does not recommend or support the deactivation of the FastLearn function.

The text display will initially display the legend **FastLearn 15** and will then count down each minute until the FastLearn is complete.

Note: It will take a further 24 hours after the FastLearn for full sensitivity to be reached, unless Demonstration Mode has been initiated. It is essential for proper functioning that the Detector not be left in Demonstration Mode, and that it be allowed to complete the 24-hour learning period. To cancel Demonstration Mode, set this function to **Yes** or power down and restart the Detector to initiate FastLearn Mode.

3-5.9 Auto FastLearn (Yes/No - Address 001-127)

As default, this function is set to **Yes**. This ensures that if the Detector is powered down for any reason (e.g., for maintenance or to be moved to a new area), FastLearn begins automatically on power-up. There may be occasions when it is desirable to power down the Detector for short periods of time, and it is highly likely that ambient contaminant levels will be the same on power-up. Under these circumstances, it may not be necessary to perform a FastLearn process again. In this case, this function can be set to **No** before power-down, allowing the Detector to return to its original settings on power-up.

3-5.10 Time Delay Override (Yes/No - Address 001-127)

If this function is set to **Yes** , then the Detector will ignore any pre-set time delays in the event of an unacceptably rapid increase in smoke density, thereby minimizing response time to “rapid growth” fires. This function would normally only be used where there were long time delays programmed on the alarm levels.

3-5.11 Cascading Alarms (Yes/No - Address 001-127)

Setting this function to **Yes** means that the controller starts counting down the main Fire delay only when the Detector’s controller is in Pre-Alarm state (which means that time delays on Pre-Alarm and Fire 1 are cumulative). The Aux alarm is not included in the cumulative delay since it may be set to a higher level than either the Pre-Alarm or Fire 1 levels.

3-5.12 Latching Alarms (Yes/No - Address 000-127)

When this function is set to **Yes** it requires a reset on the front panel or a remote reset to clear an alarm condition. It may be applied to the Command Module or a Standard Detector.

3-5.13 Latching Faults (Yes/No - Address 000-127)

When this function is set to **Yes** it requires a reset from the front panel or a remote reset to clear fault indications. This is the factory default setting. It may be applied to the Command Module or a Standard Detector.

3-5.14 Remote Day/Night (Yes/No - Address 001-127)

Setting this function to **Yes** allows the Detector to be manually switched between day and night mode using a remote input.

3-5.15 Remote Reset Enable (Yes/No - Address 000-127)

If remote resetting of the Detector or Command Module is required from the host Fire Alarm controller or other external source, this option must be set to **Yes**.

3-5.16 Remote Isolate Enable (Yes/No - Address 000-127)

When this function is set to **Yes**, a remote switch may be used to isolate the Detector or Command Module.

3-5.17 Programmed Isolate (Yes/No - Address 000-127)

When this function is set to **Yes**, the controller will not generate alarms and will not indicate a fault condition on any fire panel which is connected, e.g., for use during Detector maintenance. The "Fault" light will be illuminated on the Detector or Command Module front panel. The isolated condition will be disabled automatically after 7 days if not manually disabled.

3-5.18 Detector Address / Number of Detectors (Display - Address 000-127)

In the case of the Standard Detector, this function displays the current address of the Detector as set by the internal DIP switch. On the Command Module, it shows the number of Detectors found on the communications loop. This function appears immediately on entering the **Detector** sub-menu. The Command Module is always at address '000'. When the Command Module unit is fitted in a Detector, the Detector must have a separate address.

3-5.19 Device Text (Alpha - Address 000-127)

This is the default text string displayed on the Standard Detector or Command Module LCD display. If desired, this can be altered to any 16-character alphanumeric identification. For example, the name of the area being protected, or the name of the person responsible for fire safety could be entered. The default device text is "ASD-640" and the firmware revision level for the Standard Detector, and "Command Module" and the firmware revision level for the Command Module.

3-5.20 Reference Enable (Yes/No - Address 001-127)

Setting this function to **Yes** enables the reference for the Detector, if one has previously been allocated in **Reference Device (1-127)** (see Section 3-5.20 for details).

3-5.21 Reference Device (Numeric - Address 001-127)

Any Detector on the loop may use another Detector as a fresh air reference. When entering the **Reference** sub-menu, the user is prompted to first select the address of the Detector which will be using the reference, and is then forwarded to this option. To set a Detector as a reference Detector, enter its address as set by its internal DIP switch into this function.

3-5.22 Reference Level (0-99 - Address 001-127)

The value set with this function is the percentage reference signal subtracted from the Detector's signal, if a reference device has been allocated.

3-5.23 Back Off (0-99 - Address 001-127)

This value is the delay time (in seconds) between a build up of pollution being seen by the reference (if used) and the pollution being seen by the Detector.

3-5.24 Reset, Test & Isolate Button Enable (Yes/No - Detectors 000-127)

The front panel buttons may be enabled or disabled individually for the Command Module or Standard Detectors by setting these functions to **Yes** or **No**.

3-5.25 Power Save (Yes/No - Address 001-127)

This function allows the Detector to minimize electrical power consumption when operating from stand-by batteries. If enabled, upon main supply failure the aspirator (fan) will reduce speed to minimum, regardless of the user-defined value. (See Section 3-5.28 for details.)

This function has no effect on the Command Module. **Note:** When in this condition, any smoke reading above 3 bar graph segments on the Detector will automatically remove this condition.

3-5.26 Battery Check Enable (Yes/No - Address 000-127)

If no battery back-up is required, this function should be set to **No** to avoid **Battery fault** being displayed on the front panel. If a back-up battery is used, it is recommended that the battery check be enabled. When this is done the user will be prompted for an input terminal to use. The battery fault will be displayed when this contact is open. The default setting is battery fault enabled on "I/P 1". Section 2-5.1 and Section 2-5.2 of this manual show the input terminal connections for the Standard Detector and Command Module, respectively.

3-5.27 Mains Check Enable (Yes/No - Address 000-127)

The ASD-640 Detector and Command Module are capable of signaling power supply faults from the power supply equipped with a fault relay. The mains check is disabled by default. If the feature is set to "Yes", the user will be prompted with an unassigned input terminal to use (this will normally be "I/P 2" if battery check is already enabled on "I/P 1" (see Section 3-5.26 for details). The mains fault will be displayed when this contact is open.

3-5.28 Aspirator Speed (1-16 - Address 001-127)

The value entered here sets the Detector aspirator speed to a range of 1 through 16 predetermined speeds. The lower the value of the number entered, the lower the airflow rate and, therefore, the less the power consumption will be.

3-5.29 Flow Setup (Yes/No - Address 001-127)

Setting this function to **Yes** puts the Detector into automatic flow limit setup mode. This takes a few minutes to set the flow fault thresholds based on the current flow rates.

3-5.30 Airflow Monitoring (Display / Numeric - Address 001-127)

There are separate **Sensor pipe** , **Flow low** , **Flow high** and **Flow pipe** parameters for each pipe 1 to 4 on the Detector.

For example, **Flow pipe 1** indicates the current airflow rate for pipe 1.

Sensor pipe 1 to **Sensor pipe 4** are used to enable or disable flow sensing on the specified pipe inlet of the Detector. If any pipe inlets are unused, set the relevant flow sensor function for the pipe inlet to **No** to avoid unwanted flow faults.

Flow low is the level below which airflow needs to be reduced to trigger a fault reading (which may indicate a blocked pipe).

Flow high is the level above which airflow needs to increase to trigger a fault indication (which may indicate a loose or damaged pipe).

Flow low and **Flow high** parameters are automatically set up on initial power-up or when **Flow setup** is selected (See Section 3-5.29 for details.)

The airflow rates **Flow pipe 1** to **Flow pipe 4** are for display purposes only and cannot be changed.

3-5.31 Chart Log Recording Rate (0-19 - Address 000-127)

This function controls how frequently the Detector and alarm level or flow rates are stored in the Standard Detector or Command Module internal chart recorder log.

Table 3-3 shows the chart log recording rates.

Table 3-3. Chart Log Recording Rates

Setting	Type	Storage Interval	Time per Division on Chart Log
0	Detector Level & Alarm Level	1 second	10 seconds
1	Detector Level & Alarm Level	5 seconds	50 seconds
2	Detector Level & Alarm Level	12 seconds	2 minutes
3	Detector Level & Alarm Level	30 seconds	5 minutes
4	Detector Level & Alarm Level	1 minute	10 minutes
5	Detector Level & Alarm Level	2 minutes	20 minutes
6	Detector Level & Alarm Level	5 minutes	50 minutes
7	Detector Level & Alarm Level	10 minutes	100 minutes
8	Detector Level & Alarm Level	20 minutes	200 minutes
9	Detector Level & Alarm Level	50 minutes	500 minutes
10	Detector Level & Airflow	1 second	10 seconds
11	Detector Level & Airflow	5 seconds	50 seconds
12	Detector Level & Airflow	12 seconds	2 minutes
13	Detector Level & Airflow	30 seconds	5 minutes
14	Detector Level & Airflow	1 minute	10 minutes
15	Detector Level & Airflow	2 minutes	20 minutes
16	Detector Level & Airflow	5 minutes	50 minutes
17	Detector Level & Airflow	10 minutes	100 minutes
18	Detector Level & Airflow	20 minutes	200 minutes
19	Detector Level & Airflow	50 minutes	500 minutes

In the above table, the greyed section indicates flow rate recording while the white section indicates Detector and alarm level recording.

The factory default setting is 8. At the slowest recording rate, one month of data can be recorded. A PC must be connected via the RS232 port with appropriate software to view the chart event log. (See Section 2-11 for details on how to connect to a PC.)

3-5.32 User Defined Access Code (0-9999 - Address 000-127)

This function sets the access code that the user has to input in order to modify any of the function values. The default setting is "0102" but for added security it can be changed to any four-digit number desired by the user.

3-5.33 BMS Protocol (0-2 - CM only)

This function sets the communications protocol for connection to a Building Management System (BMS). (See Appendix A for details on how to set up external communications.)

3-5.34 Factory Default (Yes/No - Address 000 - 127)

On the Standard Detector, this function has two purposes. If the user has changed any of the Detector's functions, this function will display **No** , indicating that the Detector is not at factory default. Setting the function to **Yes** will restore the Detector to the factory default settings. On the Command Module, this setting returns all Detectors on the communications loop to their default settings. To default an individual Detector in the loop, it is necessary to use the Detector's own front panel.

3-5.35 Auto-Learn Scan Devices (Yes/No - CM only)

Setting this function to **Yes** causes the Command Module to scan the RS485 data bus for connected Detectors. While scanning, the display will show **Scanning loop** and display a progress bar. When finished, the display will show the number of devices found and the Detector addresses in the form. The list "wraps around," so that pressing **Up Arrow** when viewing Address 001 brings up Detector number 127. Pressing **Right Arrow** allows the user to remove a Detector address from the loop (by changing "Y" to "N"), or to re-instate a previously removed Detector (by changing "N" to "Y"). This is different from the Isolate function in that a fault is still generated on the Command Module. However, this may need to be done if replacing a Detector on the loop so that the Detector's address becomes available to the replacement. After replacing the Detector, the address may be re-enabled.

3-5.36 Looped Bus (Class A) Network Wiring Connection (Yes/No - CM only)

This function is set to **Yes** to signify that the Detectors are connected to the Command Module in a fault tolerant loop configuration (See Section 2-8.3 for further setup information.) Failing to set this value to **Yes** for a loop configuration will mean that the fault monitoring advantages of the Detector loop are lost. Setting the value to **Yes** for a non-fault tolerant configuration will generate Detector loop errors, so it is important that the appropriate configuration is identified.

3-5.37 Poll Timeout (30-255 - CM only)

This is the time, specified in milliseconds, which a device has to respond to a poll from the Command Module. If no response is received for this time then, a **Comms fault** message is shown for this device on the Command Module display. This may be caused by communications delays, e.g., when units are communicating across a Wide Area Network. This function may then be set to a more suitable value.

Note: If in doubt about the setting of this function, please contact Technical Support at (866) 287-2531.

3-5.38 Call Center (Numeric - CM only)

This is the phone number the modem dials up to send a message. For more detail on this and the other functions in the "Pager" sub-menu, refer to Appendix A.

3-5.39 Password (Alpha - CM only)

This is an optional password used to access the system.

3-5.40 Pager (Numeric - CM only)

Note: This is the number of the actual pager.

3-5.41 Page on Fault (Yes/No - CM only)

Where a pager has been allocated as above, this function determines whether the pager holder is to be paged when a fault condition is generated by the Command Module.

3-5.42 Page on Alarm (Yes/No - CM only)

Where a pager has been allocated as above, this function determines whether the pager holder is to be paged when a fire alarm condition is generated by the Command Module.

3-5.43 View Event Log (Display - Address 000-127)

This function shows the start and stop time and date of events such as FastLearn, alarm condition and error messages. (See Section 3-6 for more information on logging events.) The event log can also be downloaded to a PC via the RS232 serial port. (See Section 2-11 for details on how to connect to a PC.)

3-5.44 Diagnostics (Test - Address 001-127)

This function puts the Detector into self-test mode. On a Command Module, it tests all Detectors on the loop.

3-5.45 Detector Read (Display - Address 001-127)

This function displays five values as shown:

010.5%

064 067 066 067

The top value is the Detector's current smoke level reading as a percentage of the full-scale value, and the bottom four readings are the current flow rates on each pipe. The flow rates are scaled based on the application. The absolute flow reading is less important than a change in the reading.

3-5.46 Loop Errors (Display)

This displays the percentage of loop errors in messages addressed to the Detector or Command Module from the Detector loop, along with a count of the number of received messages since the last message was received on port 1 and port 2 of the RS485 bus.

3-5.47 Dust Separator Condition (Display - Address 001-127)

The value given at this function is the efficiency rating of the dust separator (filter) in the Detector. A new cartridge will give the reading **Separator 100.0%** in this function. When the efficiency has decreased to 80%, the Fault indicator LED will illuminate and the text display will show **Separator renew**.

If the separator (filter) cartridge is missing or improperly fitted, the display will read **Separator change**. Installing a new cartridge will automatically reset this figure to 100%. (For more information about how to clean or replace a dust separator (filter) cartridge, refer to Section 6-3.8.)

3-5.48 Relay Tests (Test - Address 000-127)

This tests the connection of the Command Module or Detector to an alarm panel by operating the alarm or fault relay currently selected. Assuming proper connection, this should give appropriate indications on the fire panel. The test runs through the sequence:

Aux –> Pre-Alarm + Fault –> Fire 1 + Fault –> Fire 2 + Fault –> Fault

The test steps to the next test on the list when you press the **ENTER** key. Although the relevant relays are activated at each stage, the associated lights on the front panel are not illuminated or recorded in the event log.

CAUTION **Operating the Alarm or fault relays will physically activate and switch the contacts. Ensure that the receiving Fire Panel is in test/maintenance mode before initiating this test.**

3-5.49 Watchdog Trip Count (Display)

The watchdog is a circuit built into the controller that restarts the controller in the event of a failure to function properly. This could be as a result of electrical spikes. This count shows the number of interruptions found. The details of each problem can be found in the event log.

3-6 EVENT LOG

An event is defined as operation of any of the front panel controls (when enabled), a signal received from a remote source (e.g., the Command Module or PC), a Detector level exceeding the **Aux**, **Pre-Alarm**, **Fire 1** or **Fire 2** thresholds or certain commands sent from the remote software or SenseNET. The event log will also store items such as day and night start times, demonstration mode, power fault, Detector fault, etc. The Detector keeps a log of the last 200 events for reference purposes.

The event log can be downloaded using a PC that has the remote software installed and is connected to the ASD-640's RS232 port using a serial cable. (See Section 2-11 for details on how to connect to a PC.)

The event log can also be viewed in the **Log menu** , which prints out the event log in reverse order, i.e., the last recorded event is printed out first.

When the buffer that stores events is full (200 events are stored) and a new event occurs, the oldest event in the buffer is discarded.

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CHAPTER 4
COMMISSIONING

4-1 INTRODUCTION

This chapter covers the commissioning procedures for the AIR-Intelligence™ ASD-640. The commissioning procedures initially depend upon the environment in which the Detector is installed. For instance, the test for a computer room with a relatively clean environment would be very different from, say, a flour mill, with a high level of airborne particulate content.

Commissioning should only be done by factory-trained technicians in accordance with applicable standards. These include:

(1) NFPA-70 (National Fire Protection Association)

(2) NFPA-72

(3) Any other local installation requirements.

4-2 COMMISSIONING CHECKLIST

The following brief checklist allows quick setup of the Detector. This procedure will be adequate for most standard installations.

1. Before powering up the Detector, visually check all cabling to ensure correct connection. If wire identification is not immediately clear (e.g. by use of different colored wires or wire identification sleeves), an electrical check should be made.

CAUTION **Ensure all wiring connections are checked prior to powering up the Detector. Incorrect wiring of the Detector will cause permanent damage to the Detector.**

2. Power up the unit and enter the Installer Access Code. The factory default setting for this is 0102. (See Section 3-2 in Chapter 3 for details.)
3. Ensure all Detectors in the network area are clear of Troubles and Alarms (if applicable).
4. Enter the **Setup** menu and verify that the time and date are correct. (See Section 3-5.1 in Chapter 3 for details.)
5. Get an appropriate alarm factor for the protected environment. The Detector will perform a FastLearn™ for the new alarm factor. (See Section 3-5.5 in Chapter 3 for details.)
6. When the Detector is still in FastLearn mode, exit the Programming Mode on the display by pressing **<RESET>** and set the Detector into Demonstration Mode (see Section 3-5 for details). To do this, press and hold down the **<RESET>** button and simultaneously depress the **<TEST>** and **<ISOL>** buttons. The text display will then display “Demo mode” and the time and date.
7. Wait for the FastLearn to finish (when the legend FastLearn is no longer displayed and the “rolling” LED indications stop sequencing) and perform any necessary smoke tests, ensuring that the Detector reacts appropriately, and let the smoke fully dissipate.
8. Perform another FastLearn, this time not putting the Detector into Demonstration Mode. The Detector will generate no alarms during the 15-minute FastLearn period, and after this, the Detector will operate at a reduced sensitivity for 24 hours while ClassiFire® acclimates to the protected environment and sets up appropriate day and night sensitivity settings.

4-3 PRE-COMMISSIONING PREPARATION

Commissioning is recommended after all construction has been completed and cleaned of any lingering post-construction dirt. If ambient monitoring conditions are recorded before the installation is cleaned up, they may not accurately reflect actual normal operating conditions that need to be used as reference data for follow-up maintenance procedures and tests.

4-4 ACCLIMATION PERIOD

The Detector will operate at a reduced sensitivity for 24 hours. ClassiFire will set up the appropriate day and night sensitivity settings. All air handling units, thermostats and other systems that can have an effect on the operating environment should be turned on to simulate normal operating conditions as closely as possible. After approximately one week of monitoring time (depending on chart log recording rate), download the Detector event log to a PC from the RS232 port using a serial cable.

4-5 SUCTION PRESSURE VERIFICATION

All sample hole suction pressures should be measured and recorded on the checklist.

Note: Measured suction pressures less than 0.5 inch of water are not acceptable.

Use the following method to measure sampling point suction pressures (as illustrated in Figure 4-1):

1. Attach a flexible hose onto the suction side of the magnehelic pressure gauge.
2. Place the hose against the sampling hole and hold in place.
3. Hold the gauge in the plane in which it was calibrated and read the suction pressure from the gauge.

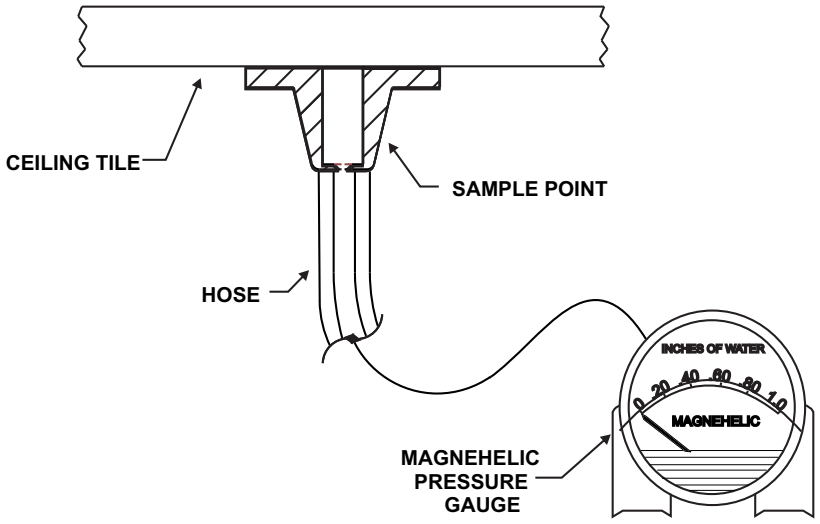


Figure 4-1. Magnehelic Test Setup

4-6 TRANSPORT TIME VERIFICATION

The maximum transport time verification test is the measure of the amount of time it takes for the Detector to respond to smoke that enters the pipe at the sampling point furthest from the Detector. The results of this test and the calculated maximum transport time from PipeCAD™ must be recorded on the checksheet. Measured transport time less than the calculated time is acceptable.

Follow these steps to measure the maximum transport time of the system:

1. Determine the furthest sampling point from the Detector.
2. Allow test smoke to enter the pipe at the furthest sampling point.
3. Record the amount of time for the Detector to respond. This is the actual maximum transport time.

4-7 GROSS SMOKE TESTING

The gross smoke test is a measurement of the amount of time elapsing from the activation of the smoke generating medium, until **Pre-Alarm 1** and **Alarm 1** is reached. This test should be repeated at least three times with consistent results. Recommended smoke generating medium is aerosol simulated smoke or wire burner.

4-7.1 Aerosol Smoke Spray

There are a number of commercially available aerosol smoke sprays or “canned smoke.” Please refer to your supplier for a recommended product. When using canned smoke, introduce only enough smoke into the protected area that will cause an **FIRE 1** condition. This may require a number of practice sprays. Follow the manufacturer’s instructions.

CAUTION

Oil-based canisters that are used to test point detectors are not suitable for testing aspirating systems, as the particulate is heavy and tends to drop out in the pipe, never actually reaching the Detector. Also, the oily residue that is left behind may affect the functionality of the Detector.

4-7.2 Wire Burner Tests

The wire burner test is considered the most representative test of incipient fire hazard detection in telecommunications or computer room environments. The test is performed by applying a voltage to a piece of PVC-insulated cable. Smoke is produced from the overheated PVC insulation by evaporation and condensation of the plasticizer. As the wire becomes hotter, hydrogen chloride (HCl) gas is emitted from the insulation. The by-products of overheated PVC insulation can be detected by the ASD-640.

4-7.2.1 WIRE BURNER TEST 1 (OPTIONAL)

The following test is considered unlikely to produce hydrochloric acid vapor. This test may be undertaken in underfloor spaces or ceiling voids.

1. Connect a 6.5-foot (2-meter) length of wire to a 6 VAC source of at least 16 Amps rating per wire for a period of **3 minutes**.
2. The system should respond within 120 seconds of cessation of energization. After this period, very little smoke is given off.

Note: The wire is subject to cooling if positioned in direct contact with air flows and may need to be shielded.

Note: The wire cross-section should be American Wire Gauge (AWG) 10 with the following diameter and area:

Diameter = 2.59 mm or 0.10189 in.

Cross-Section Area = 5.0 mm^2 or 0.00775 $in.^2$

4-7.2.2 WIRE BURNER TEST 2 (OPTIONAL)

WARNING **The following test is considered to produce sufficiently high temperature to generate small quantities of hydrogen chloride or hydrochloric acid gas. Be sure to keep a safe distance away while voltage is being applied.**

This test may be undertaken in underfloor spaces or ceiling voids where rapid airflow may render Test 1 unsuitable.

1. Connect a 3.25-foot (1-meter) length of wire to a 6 VAC source of at least 16 Amps rating per wire for a period of **1 minute**.
2. The system should respond within 120 seconds of cessation of energization. After this period, most of the insulation should be burned off.

Note: The wire cross-section should be American Wire Gauge (AWG) 10 with the following diameter and area:

Diameter = 2.59 mm or 0.10189 in.

Cross-Section Area = 5.0 mm^2 or 0.00775 in^2.

CAUTION **A wire burner/canned smoke test could activate spot-type detectors.**

CHAPTER 5
TROUBLESHOOTING

5-1 TROUBLESHOOTING THE ASD-640

This chapter provides some possible solutions if a problem should occur with your AIR-Intelligence™ ASD-640. If the problem is not addressed in this chapter or, if after performing the suggested actions, the problem persists, contact Technical Support at (866) 287-2531.

Table 5-1. Troubleshooting Guide

Problem	Solution / Corrective Action
Pressing <Reset> or <Isol> Button Has No Effect	Check that the controls have been enabled. **These functions are disabled by default.** (See Section 3-5.24 in Chapter 3 for details.)
Nuisance Alarms Occur Too Often	• Check that the ClassiFire® alarm factor setting is appropriate for the normal working environment of the protected area. (See Section 3-5.5 in Chapter 3 for details.) • Check that the Detector is not in Demonstration Mode. This can be ascertained by viewing the event log and checking that the entry **Demo mode** has a higher log entry number than the most recent **FastLearn start** and **FastLearn end** entries. (See Section 3-5.43 and Section 3-6 in Chapter 3 for details.) **Remember that the log entries are in reverse order, with the most recent entries appearing first.** If the log shows that Demonstration Mode was invoked during the last FastLearn period, start a new FastLearn and allow it to complete its 24-hour cycle. (Refer to Section 3-5.8 in Chapter 3 for details.) • From the event log, check that at least 24 hours have elapsed since the last **FastLearn end** entry. (See Section 3-5.43 and Section 3-6 in Chapter 3 for details.) • Check that day-night switchover times are appropriately set to reflect active and non-active periods. (Refer to Section 3-5.6 in Chapter 3 for details.)
Elevated Smoke Levels Do Not Generate Alarms	• Check that Detector is not Isolated or in FastLearn (if Isolated, the **Fault** light will be lit). • Check that the Detector sampling points are in the smoke stream. • Check that unused sampling pipe ports are closed and that sampling pipes are firmly and cleanly seated in their ports and undamaged. • Check that the correct ClassiFire alarm setting has been set. (Refer to Section 3-5.5 in Chapter 3 for details.) • Check that the Detector has either had a 24 hour learning period or that it has been placed in Demonstration Mode.
Low Mean Output	Check that the dust separator (filter) does not require changing (refer to Section 3-5.47 in Chapter 3 for details) and that the air plenum chamber is clean. The chamber may become clogged when, for example, heavy building activity has occurred near the sampling pipes. If so, the chamber may require factory service. The Detector is not designed to handle large quantities of coarse debris and dust.

Table 5-1. Troubleshooting Guide

Problem	Solution / Corrective Action
Detector Sensitivity Varies Over Time	There are many reasons why particle densities may vary, and the ClassiFire system automatically compensates for this in order to replace the likelihood of nuisance alarms due to normal variations in background smoke density. Within limits set by the ClassiFire alarm factor, this is a normal part of the Detector's operation.
Flow Fault Errors	• These occur when the airflow rate into the Detector exceeds the pre-programmed parameters. As the Detector "learns" the flow setup from the initial installation, this usually means that there has been some change in conditions. A **Flow high** fault may indicate that a sampling pipe is damaged, and a **Flow low** fault may indicate that the pipe has been blocked, e.g., by nearby building operations. • If the Detector input is sampled from one area and the exhaust is in another area with different pressure (e.g., the Detector is in a roof space and sampling from an enclosed room), this may lead to flow faults. In this case, it would be necessary to lead a pipe from the exhaust to the protected area to ensure nominal flow.
"Low Flow" Error Message	• Check that the pipe giving the error is not blocked. • If the pipe is unused, check that the flow sensor for this pipe has been disabled. (Refer to Section 3-5.30 in Chapter 3 for details.) • Check that the low flow fault threshold is not set too high. (Refer to Section 3-5.30 in Chapter 3 for details.) • Consider increasing the aspirator (fan) speed. (Refer to Section 3-5.28 in Chapter 3 for details.)
"High Flow" Error Message	• Check that the pipe is pushed home into the inlet and is not broken or cracked. • Check that installed pipework is fitted with endcaps. PipeCAD™ pipe modeling software prompts for the use of appropriate endcaps. Open bore pipes are not recommended. • Check that the high flow fault threshold is not set too low. (Refer to Section 3-5.30 in Chapter 3 for details.) • Consider reducing the aspirator (fan) speed. (Refer to Section 3-5.28 in Chapter 3 for details.)
Cannot Refit the Front Cover	• Check that the recessed top edge of the cover is securely located behind the locating guard rails on the chassis. (Refer to Section 2-4.1 in Chapter 2 for details.) • Check that the key is turned to the unlocked position (counter-clockwise).
No Display	Check that the display ribbon cable is securely connected to the Detector/Command Module main board and to the display board as appropriate. (Refer to Section 2-4.1 in Chapter 2 for details.)

5-2 ERROR MESSAGES

The ASD-640 front panel display can provide a wide range of information about the Detector. Table 5-2 lists error messages and their meanings.

Table 5-2. Error Messages

Error Message	Meaning and Suggested Action
Separator renew	The dust separator (filter) requires replacement. (See Section 6-3.8 in Chapter 6 for details.)
Separator change	The dust separator (filter) is missing or improperly fitted. (See Section 6-3.8 in Chapter 6 for details.)
Bad value , Bad time , Bad date	A value has been input into a function, which is outside the parameter range for that value. Take note of the range of values allowed (in brackets) and try again.
Bad detector	A Detector address has been entered which is either outside the allowed range or which is not present on the loop. This may also happen if the user has entered address 000 (Command Module) for a function which it does not support (e.g., alarm factors).
No response	The Command Module has unsuccessfully attempted to read a function value from a connected unit. Check that the unit connected supports this function.
001 ⬅ X ➡ 002 Loop break	There is a break in the communications loop between the Detector addresses specified. Check the wiring.
Comms fault	The Command Module has polled a Detector and no response has been received after the specified poll timeout value. (See Section 3-5.37 in Chapter 3 for details.)
Bad access code	An incorrect access code has been entered. Enter the correct code.
Battery fault	This indicates either that the standby battery has discharged to a predetermined level or that no standby battery is fitted. In the former case, the battery should be replaced and recharged. In the latter case, the battery check should be disabled. (See Section 3-5.26 in Chapter 3 for details). It is important that the battery fault be acted upon as soon as noticed, as excessive discharge may cause damage to the battery. The battery fault condition occurs before the battery reaches this portion of the discharge curve.

Table 5-2. Error Messages

Error Message	Meaning and Suggested Action
`Watchdog reset`	This indicates that there has been a power supply fault. If there are frequent power outages, it may be advisable to power the unit from a UPS.
`Detector fault`	This indicates that there is a problem with the Detector head. This may be due to a number of causes. Refer to the chart readout if this can be downloaded to a PC and note the Detector signal level at the time of the fault. When as much information as possible has been determined about the conditions at the time of the error, please contact Technical Support.

CHAPTER 6
ROUTINE MAINTENANCE

6-1 INTRODUCTION

This chapter contains maintenance instructions for the AIR-Intelligence™ ASD-640 system. These procedures should be performed on a scheduled basis. In the event that system problems are found during routine maintenance, refer to the Troubleshooting section of this manual, Chapter 5.

6-2 SCHEDULED MAINTENANCE

The scheduled maintenance of the system should be performed at an established interval. The interval between performance of maintenance procedures should not exceed any imposed regulations. (See NFPA-72 or other local requirements.)

6-3 MAINTENANCE PROCEDURES

The following paragraphs outline general scheduled maintenance procedures to be performed on an "as necessary" basis.

6-3.1 Visual Check

The visual check must be performed every six months. This check is to ensure pipe network integrity.

To perform the visual check, observe the entire piping network and check for abnormalities in the pipes, including any breaks, blockages, crimps, etc.

6-3.2 Battery Status Check

The backup battery used in the power supply to power the Detector must be tested every six months.

A battery status check is best accomplished by running the load with the batteries for about one hour. While the load is still on, measure the individual battery voltages. If any battery reads $\geq$1.5 Volts below its rated voltage, that battery should be replaced.

Generally, if one of a series set of batteries is low, the others will soon fail. Therefore, it is advisable to replace all the batteries of a series set when one requires replacement.

CAUTION **Any battery that has been in service for 48 months or more must be replaced.**

6-3.3 Gross Smoke Test

The gross smoke test is a Go/No-Go test which ensures that the Detector responds to smoke. This test must be performed at system commissioning and every year thereafter.

To perform this test, smoke must be introduced into the last sampling hole in each branch of the pipe network and the proper response must be verified by the Detector. Smoke from a punk or cotton wick may be used. Aerosol test smoke may also be used.

Note: For cleanroom applications, consult with supplier for gross smoke test methods.

6-3.4 Suction Pressure Verification Test

The sampling hole airflow verification test ensures the pipe network is drawing air from the protected area. This test must be done at commissioning and within one year after installation and every year thereafter.

To perform this test, the suction pressure of the last sampling hole in each pipe branch must be checked. (Refer to Section 4-5 in Chapter 4 of this manual for test details.) The most recent suction pressures should be compared to the original measurements. If any differences are noted, the cause of the deviation must be determined.

Note: Measured suction pressures less than 0.5 inch of water are not acceptable.

6-3.5 Transport Time Verification Test

The maximum transport time of the pipe network must be measured and compared to the recorded transport time at commissioning. (Refer to Section 4-6 in Chapter 4 of this manual for test details.) The transport time verification test must be done at commissioning and every year thereafter.

6-3.6 Detector Sensitivity Test

The Detector sensitivity test must be performed within one year of installation and every alternate year thereafter.

Example:

- Year-one check
- Year-three check
- If years one and three are OK, go to five-year interval.

The Detector employs a self-monitoring, automatically-adjusting calibration for the system. The inspection only requires a periodic visual inspection for a Detector fault indication and performing the Detector sensitivity test function.

If the self-monitoring feature of the system senses that the operation of the Detector head is outside its normal range, a trouble condition will be generated.

6-3.7 Cleaning the Detector

The exterior of the Detector should be cleaned as necessary. Clean the Detector with a damp (not wet) cloth.

CAUTION **Do not use solvents to clean the Detector. Use of solvents may cause damage to the Detector.**

6-3.8 Replacing the Dust Separator (Filter) Cartridge

The only part that may require field replacement during servicing is the dust separator (filter) cartridge. Its condition can be checked using the **Dust Separator** test in the **Diagnostics** menu, which gives a percentage reading of dust separator (filter) efficiency. When this level drops to 80%, the Detector will signal a **Separator renew** fault indicating that the dust separator (filter) cartridge needs to be replaced. (See Section 3-5.47 in Chapter 3 of this manual for further details.)

WARNING **If, due to the environment of the area being protected, the dust in the dust separator (filter) will expose maintenance personnel to health hazards, it is recommended that suitable masks and protective clothing be worn when changing filters. Maintenance work should be performed in compliance with applicable OSHA and other standards.**

Note: Used dust separator (filter) cartridges are not intended for re-use and should be discarded.

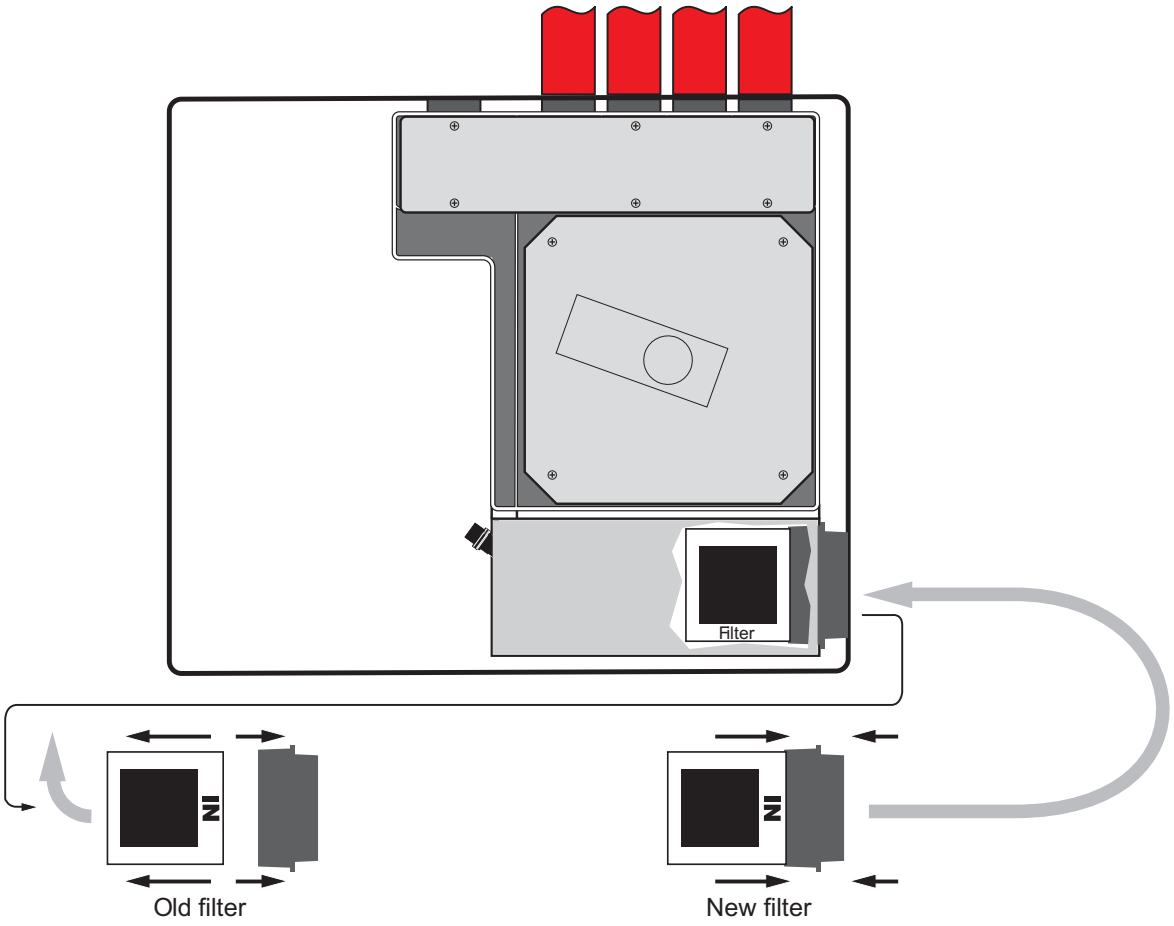
To replace the cartridge:

1. Open the unit's front cover and locate the dust separator (filter) handle at the bottom right of the Detector.
2. Remove the black end piece from the filter cartridge and dispose of the cartridge.
3. Fit the new cartridge into the plastic end piece and slide the entire assembly into the Detector, using the handle. The cartridge should be fitted with the legend "IN" towards the front of the Detector.

Note: If the cartridge is inserted with the wrong orientation, the Detector will not register its presence and the **Separator change** message will remain on the display.

4. When the replacement cartridge is in place, the Detector will automatically start a FastLearn™ routine.

Figure 6-1 shows how the dust separator (filter) cartridge is replaced. Make sure to push the cartridge fully home, or the Detector will fail to register its presence, and will continue to indicate **Separator change**.



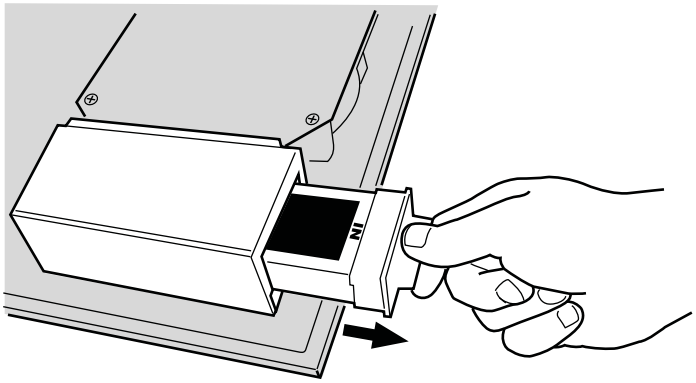


Figure 6-1. Replacing the Dust Separator (Filter) Cartridge

CHAPTER 7
PARTS LIST

7-1 AVAILABLE PARTS

Refer to Table 7-1 below for descriptions and part numbers for the AIR-Intelligence™ ASD-640:

Category	Part Number	Part Name
Units	33-30621A	AIR-Intelligence ASD-640 Standard Detector in Molded Plastic Case (Includes: Detector, CD-ROM, 2 Strain Reliefs and 2 Ferrite Beads)
	33-30620A	AIR-Intelligence ASD-640 Detector fitted with Command Module in Molded Plastic Case (Includes: Detector, CD-ROM, 2 Strain Reliefs and 2 Ferrite Beads)
	33-30624A	Stand-Alone Command Module in Molded Plastic Case (Includes: Module, CD-ROM, 2 Strain Reliefs and 2 Ferrite Beads)
	33-30627A	19" Rack Mounted Command Module
	33-30706A	AIR-Intelligence ASD-640 Standard Detector in Steel Case
	33-30707A	AIR-Intelligence ASD-640 Detector fitted with Command Module in Steel Case
	33-30709A	Stand alone Command Module in Steel Case
	33-30710A	AIR-Intelligence ASD-640 in Steel Case- Minimum Display Version
Replacement Parts	33-30690A	Replacement Command Module Main PCB
	33-30691A	Replacement Command Module Display
	33-30695A	Replacement AIR-Intelligence ASD-640 Detector Flow Sensor Assembly
	33-30696A	Replacement AIR-Intelligence ASD-640 Detector Display
	33-30697A	Replacement AIR-Intelligence ASD-640 Detector Main PCB
	33-30698A	Replacement AIR-Intelligence ASD-640 Detector Head Assembly
	33-30699A	Replacement AIR-Intelligence ASD-640 Dust Filter
Accessories	33-30051	Wire Overload/Burn Unit
	33-30058	AIR-Intelligence ASD-640 High Efficiency Aspirator Unit
	33-30419	9-pin Null Modem Serial Cable Female/Female. Required for PC Programming.
	33-30422	ASD Air Heater Box
	33-30425	Aspirator with Thermostat. Optional Component for use with ASD Air Heater Box.
	33-30711	Interference Suppression Ferrite Rings (Pack of 5)
	33-30730	ASD External Filter Assembly
	33-30805A	SenseNET™ Contact Monitor

Category	Part Number	Part Name
Power Supply Equipment and Batteries	33-12V12	12V 12Ah Backup Rechargeable Battery
	33-12V18	12V 18Ah Backup Rechargeable Battery
	33-30902US	Single Zone 24V DC Regulated Power Supply, 2.5amp capacity
	33-BC5US	Battery Enclosure With Shelf
	33-BH512	Battery Harness
	33-PD8US	8-Output Optional Power Distribution Module
	33-PS5MUS	Multi-Detector 24V DC Regulated Power Supply, 4amp capacity

APPENDIX A
EXTERNAL COMMUNICATIONS

A-1 BMS PROTOCOLS ON THE ASD-640 COMMAND MODULE

The Command Module of the AIR-Intelligence™ ASD-640 has a second RS232 port that can be used to send messages to a pager or compatible GSM phone using a modem, or to enable connection to a Building Management System (BMS). This comprises the terminals "RS 232 Tx" (transmit), "RS 232 Rx" (receive), and "GND" on the green terminal block inside the unit.

The set-up of the Command Module uses three functions:

- BMS protocol
- Page on fault
- Page on alarm

When either **Page on fault** or **Page on alarm** is enabled, the second serial port is reserved exclusively for paging purposes by setting BMS protocol to 0 (TAP paging).

The programmable function “BMS protocol” sets the communications format that is used by the second serial port to communicate with the BMS. Setting **BMS protocol** to anything other than 0 (Tap paging) will disable functions **Page on fault** and **Page on alarm** if they are enabled.

Table A-1. BMS Protocols

Protocol Number	Protocol
1	TAP paging (default)
2	Output only. Events are sent in the same ASCII text format as the internal event long display. This may be used to drive a serial printer if required.
	BACnet ANSI/ASHRAE standard 135-1995

A-1.1 Text Output Support (Protocol 1)

Text is output at 9600 baud, 8 bit with no parity. When an event occurs, the event is printed in the following format:

Device “Command Module” or “Detector *n*”
Event “Fire 1”
Timedate 10:32 21/03/2001

A-1.2 BACNET Support (Protocol 2)

The Command Module models the attached detectors as analog value object types instances 2 to 128. The Command Module status is stored as analog value instance 1. The Present_Value property of the analog objects can have one of the values shown in Table A-2.

Table A-2. Analog Objects Value

Device Object Properties	Analog Object Properties
0	Disabled
2	Fault
32	Normal
48	Pre-Alarm
64	Fire 1
128	Fire 2

The device object properties and the analog value objects support the values shown in Table A-3.

Table A-3. Device Object and Analog Object Properties

Device Value Objects	Analog Value Objects
0bject_Identifier	0bject_Identifier
Object_Name	Object_Name
Object_Type	Object_Type
System_Status	System_Status
Vendor_Name	Vendor_Name
Vendor_Identifier	Vendor_Identifier
Model_Name	Model_Name
Firmware_Revision	Firmware_Revision
Application_Software_Version	
Protocol_Version	
Protocol_Conformance_Class	
Protocol_Services_Supported	
Protocol_Object_Types_Supported	
Max_APDU_Length_Accepted	
Segmentation_Supported	
APDU_Timeout	
Number_Of_APDU_Retries	

For additional information on BACnet implementation, visit the AIR-Intelligence website: *www.air-intelligence.com*

A-2 PAGING FROM THE COMMAND MODULE

The ASD-640 Command Module has the ability to send text messages to alphanumeric pagers or SMS messages to some mobile phones.

In order to send messages to a pager or similar device, a modem must be plugged into the RS232TX and RS232RX terminals of the Command Module using a suitable cable.

The pager or SMS-capable phone call centers must support the TAP protocol.

Contact your pager provider to check whether they provide access with the TAP protocol.

A-3 CONFIGURING THE SOFTWARE

No manual configuration of the modem is required, as the Command Module configures the modem automatically on dialing.

The Command Module has three entries used to send messages. They are described below:

- Call Center: The phone number the modem dials up to send a message.
- Password: An optional password used to access the system.
- Pager: The number of the actual pager. This number will be detailed in the pager or SMS phone documentation.

The functions are located in **Setup menu**>**Pager**.

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AIR-Intelligence
400 Main Street
Ashland, MA 01721 USA
Customer Service: (508) 881-2000
Technical Support: (866) 287-2531
Website: *www.air-intelligence.com*

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