

National Burglar & Fire Alarm Association

Understanding Alarm Systems

Course Syllabus

A. Course Description

This class is designed for staff and business owners who seek an overview of the alarm industry. In 8 hours of intensive instruction followed by a 1 hour examination, this program provides an overview on the theory, installation and maintenance of alarm systems.

B. Number of Classroom Hours

The Understanding Alarm Systems course has eight (8) contact hours. Subject areas will be covered as follows:

1.	Introduction	1 Hour
2.	Sensors	1.5 Hours
3.	Control Panels	1 Hour
4.	Communications	1 Hour
5.	False Alarm Prevention	2 Hours
6.	Site Survey	1.5 Hours
7.	Examination	1 Hour

C. Overall Goal of the Course

To point out the general concepts of the electronic security and alarm industry to the student including;

- the operation and application of commonly used equipment and components,
- industry standards and legal requirements,
- considerations in a site survey, and
- the students role in the industry.

D. Overall Learning Objectives

Each attendee will

- Describe the basic elements of the electronic security field including: Sensors, Control Panels, Communications, False Alarm Prevention, and Site Surveys.
- Identify the proper devices to be used with perimeter, space and fire protection systems.
- Identify the various types of control panels and review how to select a control based on the application.
- Compare electronic communications methods.
- Demonstrate the need for an adequate site survey.
- Illustrate the importance of false alarm prevention and of the relationships and interactions between the electronic security and alarm professional and law enforcement and fire prevention officials.

E. Topical Learning Objectives

Each attendee will;

1. Introduction

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- Identify basic alarm system components.
- Recall the customer service practices.
- Show the burglary threat.
- Cite the fire threat.
- Identify the organizations that develop industry standards.
- Identify the relationship between the AHJ and fire system design.

2. Sensors

- List types of sensors
- Identify the objective of a perimeter device.
- Contrast a magnetic mechanical switch with a magnetic reed switch and a balanced magnetic reed switch.
- Describe common patterns of foil.
- Describe common uses of alarm screens.
- Define contacts.
- Compare shock, vibration and piezo detectors.
- Relate the role of space detection.
- Show how sensors can be disguised.
- Describe the operation of;
 - photoelectric active sensors.
 - ultrasonic detectors.
 - microwave active sensors.
 - PIRs
 - Mats.
 - stress sensors.
 - infrasonic sensors.
 - dual-technology sensors.
- Define the four stages of fire.
- Match the proper detector to the stages of fire.
- Describe the operation of;
 - fixed temperature heat detectors.
 - rate of rise detectors
 - ionization smoke detectors.
 - photoelectric smoke detectors.
 - beam smoke detectors
 - duct smoke detectors
- Select proper pull station locations.
- Select proper residential smoke detector locations.

3. Control Panels

- Name the four components of alarm systems. (detection, control, annunciation & transmission)
- List the functions of control panels.
- List some reasons for partitions.
- List some uses of circuits.
- Define zoning.
- Compare hardwire to wired system.
- Compare types of user controls.
- Identify types of annunciators.
- Identify types of sounding devices.

- Calculate battery stand-by time.
- State why grounding is done (protect panel from lightning).

4. Communications

- List the purposes of communication.
- Compare central stations, monitoring stations, proprietary monitoring & police department facilities.
- Define digital communicators.
- List the advantages of digital communications.
- List the disadvantages of digital communications.
- Describe line fault monitoring.
- Describe long range radio central station interconnect.

5. False Alarm Prevention

- Define a false alarm.
- Identify how false alarms are caused.
- Relate the impact of false alarms on police and fire departments.
- Describe verification.
- Provide customer demonstrations to reduce false alarms.

6. Site Survey

- List the steps of a proper site survey.
- Identify common considerations for;
 - doors
 - windows
 - floors, ceilings roofs
 - walls
 - interior areas
- Select the appropriate fire symbols.
- Select the appropriate intrusion symbols.
- Apply the principles relayed in the course to design a sample system.

F. Topical Outline

1. Introduction 1 Hour

- Contents
 - Alarm Systems
 - Sensors
 - Controls
 - Communications
 - False Alarm Prevention
 - Site Survey
- Class rules
- Security industry overview
- Security industry history.
- Professional associations
- What is the burglary threat?
- Burglars favorite entrances
- What is the fire threat?

- I. Fire alarm objectives
- J. Burglar alarm objectives
- K. Common objectives
- L. What is an alarm system?

2. Sensors 1.5 Hours

- a. **Types Of Sensors**
 - 1. Magnetic Mechanical Switch
 - 2. Magnetic Reed Switch
 - 3. Balanced Magnetic Reed Switch
 - 4. Foil Patterns
 - 5. Shock Or Vibration Detectors
 - 6. Mercury Devices
 - 7. Shock Sensors
 - 8. Piezo Electric Devices
 - 9. Screens
 - 10. Mechanical Switches
- b. **Space Detection**
 - 1. Roles Of Motion Detection
 - 2. Disguised Sensors
 - 3. Types of Sensors
 - a. Photoelectric Beam
 - b. Ultrasonic
 - c. Microwave
 - d. Passive Infrared
 - e. Audio Discriminators
 - f. Infrasonics
 - g. Pressure Mats
 - h. Stress Sensors
 - i. Combined Technology
- c. **Fire Systems**
 - 1. Stages Of Fire
 - 2. Detection Vs. Stages
 - 3. Types of Detectors
 - a. Fixed Temperature Heat Detector
 - b. Combination Heat Detectors
 - c. Ionization Smoke Detector
 - d. Photoelectric Smoke Detector
 - e. Beam Smoke Detector
 - f. Duct Detectors
 - g. Other Detector Types
 - 4. Detector Placement
 - a. Smooth & Flat Ceilings
 - b. Pull Stations
 - c. Home Smoke Detector Locations

3. Control Panels 1 Hour

- a. What Does The Control Do?
- b. Control Panel Components
- c. Partitions

- d. What Is a Detection Circuit?
- e. What Is A Zone?
- f. Why Zone A System?
- g. Circuit Uses
 - 1. Intrusion Detection Circuit Uses
 - 2. Fire Monitoring Circuits
 - 3. Panic & Emergency Circuits
 - 4. Ambush, Duress, Holdup Circuits
 - 5. Condition Monitoring
- h. Circuit Options
- i. Premise Wireless (RF) System
- j. User Control Points
 - 1. Serial Data Keypads
 - 2. Integrated Control-Key pads
- k. Visual Annunciators
 - 1. Strobes
 - 2. Other
- l. Types Of Audibles
 - 1. Bells
 - 2. Self Contained Siren
 - 3. Horns
 - 4. Speakers & Voice Drivers
- m. Audible Time-outs
- n. Audibility Considerations
- o. Secondary Power
- p. Standby Battery Calculation Form
- q. Control Panel Locations
- r. Protecting The Panel
- s. Panel Protection Methods

4. Communications 1 Hour

- a. Objective
- b. Communications Methods
- c. Monitoring Options
 - 1. Central Stations.
 - 2. Monitoring Stations.
 - 3. Proprietary.
 - 4. Police Department.
- d. Communications History
- e. Digital Communicators
 - 1. Standard Formats Flow Chart
 - 2. Potential Problems
 - 3. Line Fault Monitor Functions
- f. Long Range Radio
 - 1. Frequencies
 - 2. One Way
 - 3. Two Way

5. False Alarm Prevention 2 Hours

- a. What Is A False Alarm?
- b. Causes of False Alarms
- c. How Many False Alarms Occur?
- d. What Do False Alarms Cost?
- e. What Police And Fire Departments Can Do

- f. **What Alarm Dealers Can Do**
- g. **Communicating With Alarm Users.**
 - 1. **Justification**
 - a. **Explain What False Alarms Cost**
 - 2. **Knowledge**
 - a. **Causes**
 - b. **What They Can Do?**
 - c. **How To Do It.**
 - d. **What Help Is Available.**
 - 3. **Presentation**
 - a. **Communication Effectiveness**
 - b. **Customer Feelings Are Important.**
 - c. **Don't Ever Forget The Extra's**
 - d. **Guidance & Help**
 - e. **Checkout The Equipment**
 - f. **Realistic Examples**
 - g. **Teach Alarm Users To**
 - 1. **Cancel False Alarms.**
 - 2. **Test Their System.**
 - 3. **Use Their Touchpad.**
 - h. **Use Questions**
 - i. **Modes Of Learning**

6. Site Survey 1.5 Hours

- a. **Reason for the survey**
- b. **Why Are You There?**
- c. **Areas to Check**
 - 1. **Doors**
 - 2. **Windows**
 - 3. **Floor, Ceiling, Roof**
 - 4. **Walls**
 - 5. **Interior Areas**
- d. **Consider Operation or Lifestyle**
- e. **Design And Use A Survey Form**
- f. **Know Your Companies Standards**
- g. **KISS**
- h. **Standard Symbols**
- i. **System Design Exercises**

Total Hours

8 Hours