

**1. Module details**

**Module name**

**Security System Installation**

**Suggested structured learning time**

A learner possessing the prerequisite skills and knowledge should achieve the module purpose in 36 to 40 hours.

**Module code**

NUE481

**Discipline code**

0703

**2. Module purpose**

This module provides an introduction to, and overview of, security system installations. General security principles are considered on the context of regulations and system designs. System components such as intrusion detectors, control panels, locking devices, communication systems and closed circuit television are surveyed. Security lighting techniques are also considered.

**3. Learning pathway**

**Intended use in the structured learning program**

This module is intended to supplement supervised workplace experience in installing security systems. In particular it focuses on the system design, equipment selection and the application of regulations.

Therefore before undertaking this module a learner should have a clear understanding of how services integrated into building structures, installation skills and the need to work safely.

**Recommended prerequisites**

For the most effective learning this module should be undertaken only after modules covering Occupational Health and Safety, safe use of hand and power tools and building methods have been completed.

**4. Relationship to competency standards**

This module provides some of the knowledge and skills underpinning units of competence in the Electrotechnology Training Package UTE99.

**5. Content**

1. Regulations applicable to the security industry

2. Mechanical detectors
  - Pressure pads
  - Trip wires
  - Window tape
  - Screens
  - Switches
  - Vibration
3. Electro-mechanical detectors
  - Ultra sonic
  - Microwave
  - Glass break
  - Smoke
  - Active Infra Red beams
  - Passive Infra Red
  - Strain system
  - Electromagnetic
  - Optical fibre cable
4. Design a domestic security system
5. Security panels – Batteries: types, application and Maintenance
6. Communication systems
7. Closed Circuit Television, CCTV
8. Locking devices
9. Lighting

**6. Assessment strategy**

**Assessment methods**

- Questioning.
- Written tests/problem solving./assignments.
- Practical tests/written reports.

**Conditions of assessment**

Normally learning and assessment will take place in a classroom/laboratory environment

<b>7. Learning outcome details</b>	On the completion of this module the learner will be able to:
<b>Learning outcome 1</b>	Define the regulations applicable to the security industry.
<b>Assessment criteria</b>	<ol style="list-style-type: none"><li>1.1 Security Act</li><li>1.2 Occupational Health and Safety Act</li><li>1.3 Australian Standards AS2630, AS2201</li><li>1.4 ACA Standards</li><li>1.5 State the reasons for End Line Resistor (ELR) systems in ELR circuits, balanced bridge circuits and the two resistor ELR.</li></ol>
<b>Learning outcome 2</b>	Select, install and describe the operation of a range of detectors used in a security system.
<b>Assessment criteria</b>	<ol style="list-style-type: none"><li>2.1 Describe the construction and operating principles of mechanical detectors</li><li>2.2 Describe precautions and procedures to be observed when using the following devices:<ul style="list-style-type: none"><li>• Magnets</li><li>• Vibration (hammer type, ball &amp; pin type)</li><li>• Screens</li><li>• Switches</li><li>• Pressure mats</li><li>• Trip wires</li><li>• Window tape</li></ul></li><li>2.3 Describe the construction and operating principles of electro-mechanical detectors</li></ol>

- 2.4 State the most appropriate applications for the following devices:
- Gun diode and flat PCB
  - Active IR beams
  - Single twin type
  - Beam fence
  - Missing pulse system
  - Glass break
  - Smoke
  - Ultra sonic
  - Optical fibre
  - Strain system
  - Resistance circuit
- 2.5 Define the terms used with PIR's:
- 2.6 Describe the construction and use of Pyro sensors
- 2.7 State the RF problems associated with Pyro sensors
- 2.8 Define the area of coverage and fields of a range of sensors
- 2.9 Draw block diagrams for single, dual and quad PIR's
- 2.10 Explain the following:
- Voltage diagrams as in a trigger circuit
  - Voltage versus time
  - Room reference
  - Trip points
  - Internal count
  - Pulse count added
  - RFI and EMI
  - White light and voltage surges
- Learning outcome 3** Describe a Passive Infra-red III (PIR III) system.
- Assessment criteria**
- 3.1 Describe Anti-masking, ie, detecting damage of a PIR by a potential intruder

	3.2	Write a report on a PIR unit tested in the classroom
<b>Learning outcome 4</b>		Design a domestic security system.
<b>Assessment criteria</b>	4.1	Design a security system around given parameters
	4.2	Describe the components used
<b>Learning outcome 5</b>		Identify and select resistors used in the security industry
<b>Assessment criteria</b>	5.1	Describe the need for resistors in a security system
	5.2	State the range of typical resistor values used in alarm systems
<b>Learning outcome 6</b>		Describe various types of security panel used in an installation
<b>Assessment criteria</b>	6.1	Explain the features of commonly used panels
	6.2	Explain the operation of programmable and non-programmable panels
	6.3	Compare the advantages/disadvantages of a range of sound sources used with security alarms
	6.4	Compare a range of power sources used with security systems
	6.5	Define a range of codes used with security alarm installations
<b>Learning outcome 7</b>		Describe various panel communication systems.
<b>Assessment criteria</b>	7.1	Discuss a range of panel to base communication systems
	7.2	Explain the operation of a range of communication systems including: <ul style="list-style-type: none"><li>• Dialler sequence</li><li>• SESCOA dialling system</li><li>• Dual Tone Multi Frequency</li><li>• Ademco High Speed</li><li>• Ademco contact ID</li></ul>
	7.3	Explain up/down loading
	7.4	Define base stations
<b>Learning outcome 8</b>		Discuss the application of Closed Circuit Television in the security industry.
<b>Assessment criteria</b>	8.1	Show the application of CCTV to different size sites

	8.2	Compare different types of cameras and monitors used
	8.3	Identify the types of synchronising control used
	8.4	Compare the types of cables used with CCTV
	8.5	Explain the importance of lighting and the methods used for CCTV
	8.6	Describe switching methods used with CCTV
	8.7	Explain the importance of earthing in a CCTV system
<b>Learning outcome 9</b>		Discuss the importance of locking devices
<b>Assessment criteria</b>	9.1	Define a range of locks commonly used in the security industry.
<b>Learning outcome 10</b>		Explain the importance of lighting in the security industry
<b>Assessment criteria</b>	10.1	Explain the applications for security lighting
	10.2	Define types and installation methods for a range of lighting
	10.3	Define the terms used with lighting
<b>8. Delivery of the module</b>		
<b>Delivery strategy</b>		Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective to achieve this is by the integration of theory and practice where students learn by experimentation and through research and laboratory reports. It is recommended that learning and assessment be facilitated in a holistic manner which may requires learning outcome sequence other than indicated in the module.
<b>Resource requirements</b>		Resources should be sufficient for students to carry out experiments on an individual basis. This will require a range of experimental circuit devices and measuring instruments.  Useful reference:  Jenneson, J. R. 1995, <i>Electrical Principles for Electrical Trades</i> , McGraw Hill, Sydney.

**Occupational health  
and safety requirements**

Where this module is used in an approved Traineeship or Apprenticeship program learners should be advised to obtain, where available, respective EEQSBA<sup>1</sup> *User Guides* (these outline in detail what training and work performance the Learner is required to undertake for the program).

A safe and healthy environment will be provided for learners and teachers. Safety procedures for the particular learning facilities shall be followed as part of the learning / teaching activity and assessment.

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<sup>1</sup> EEQSBA – ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd.