1. Module details

Module name	Security Systems Installation
Suggested structured learning time	40 hours
Module code	NUE 481
Discipline code	0703225 Electrotechnology

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. Prerequisites

Nil

4. Relationship to competency standards

This module provides some of the knowledge and skills for 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
   - Ultrasonic
   - Microwave
   - Glass break
   - Smoke
   - Active infrared beams
   - Passive infrared

Strain system

Renamed magnetic reed switches

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

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.

7. Learning outcome details

Learning outcome 1

Define the regulations applicable to the security industry.

Assessment criteria

1.1 Security Act

1.2 Occupational Health and Safety Act

1.3 Australian Standards AS630, AS2201

1.4 ACA Standards

Learning outcome 2

Select, install and describe the operation of a range of mechanical detectors used in a security system.

Assessment criteria

2.1 Describe the construction, operating principles, precautions and procedures to be observed when using the following mechanical devices:

- Magnet reed switches
- Vibration detectors
- Wire screens
- Switches
- Pressure mats
- Trip wires
- Window tape

Learning outcome 3	Select, install and describe the operation of a range of electro-mechanical detectors.
Assessment criteria	3.1 Describe the construction, operating principles and state the most appropriate applications for the following electro-mechanical devices: • Active IR beams • Glass break • Smoke detector • Ultrasonic • Optical fibre • Strain system 3.2 Define the terms used with PIRs 3.3 Describe the construction and use of Pyro sensors. 3.4 State the RF problems associated with Pyro sensors. 3.5 Define the area of coverage and fields of a range of sensors. 3.6 Draw block diagrams for singe, dual and quad PIRs. 3.7 Explain the following: • Voltage diagrams as in a trigger circuit • Voltage versus time • Room reference • Trip points • Internal count • Pulse count added • FRI and EMI • White light and voltage surges.
Learning outcome 4	Design a domestic security system.
Assessment criteria	4.1 Design a security system around given parameters. 4.2 Describe the components used.
Learning outcome 5	Describe various types of security panels used in an installation.
Assessment criteria	5.1 Explain the features of commonly used panels. 5.2 Explain the operation of programmable and non-programmable panels.

	5.3 Compare the advantages/disadvantages of a range of sound sources used with security alarms.
	5.4 Compare a range of power sources used with security systems.
	5.5 Define a range of codes used with security alarm installations.
	5.6 State the reasons for end of line resistors (ELRs) and two end of line resistors in loop/zone circuits.
Learning outcome 6	Describe various panel communication systems.
Assessment criteria	6.1 Discuss a range of panel to base communication systems.
	6.2 Explain the operation of a range of communication systems, including: • Dialler sequence • Secsoa dialling system • Dual tone multi frequency • Ademco high speed • Ademco contact ID.
	6.3 Explain up/down loading.
	6.4 Define base stations.
Learning outcome 7	Discuss the application of closed circuit television in the security industry.
Assessment criteria	7.1 Show the application of CCTV to different size sites.
	7.2 Compare different types of cameras and monitors used.
	7.3 Identify the types of synchronising control used.
	7.4 Compare the types of cables used with CCTV.
	7.5 Explain the importance of lighting and the methods used for CCTV.
	7.6 Describe switching methods used with CCTV.
	7.7 Explain the importance of earthing in a CCTV system.

8. Delivery of the module

Delivery strategy

Delivery strategies must be suitable for learning both theoretical and practical aspects described in the module purpose. It is considered that the most effective way to achieve this is by the integration of theory and practice where students learn by experimentation and through research and reports. It is recommended that learning and assessment be facilitated in a holistic manner that may require learning outcome sequence other than that indicated in the module.

Resource requirements

Minimum teacher qualifications:

- Certificate IV Assessment & Workplace Training
- Trade qualifications in the electrical/electronic discipline and a demonstrated high level of competency in security installations. This would normally be achieved by relevant workplace experience in this field.

Non-human resources:

- Resources should be sufficient for students to carry out learning activities on and individual basis. This will require a range of experimental circuit devices and measuring instruments.

References:

- Jenneson, J. R. 1995, Electrical Principles for Electrical Trades, McGraw Hill, Sydney.
- Walker, P. *Electronic Security Systems*, 3rd Ed, Newnes, London.
- The Australian Standards 2201 and 2630
- Relevant Building codes and Electrical Standards for your state/territory
- The ACA registration handbook
- The following resources may be ordered or downloaded as PDF files from www.sentrol.com
- Sentrol Inc.
- Sentrol Application Notes.
- Sentrol System Application Guide: Smoke Detectors
- *Sentrol Course Guide*: Glassbreak University

Useful web sites:

- www.sentrol.com
- www.rokonet.com
- www.optexamerica.com
- www.ness.com.au

User guides:

	Where this module is used in an approved Traineeship or Apprenticeship program students should be advised to obtain, where available, respective EEQSBA[1] ***User Guides*** (*these outline in detail what training and work performance the student is required to undertake for the program*).
Occupational health and safety requirements	A save and healthy environment will be provided for students and teachers, as well as safety procedures with regard to learning/teaching activity.

[1] EEQSBA - ElectroComms and EnergyUtilities Qualifications Standards Body of Australia Ltd