

Title	Demonstrate knowledge of consumer electronic systems and products		
Level	4	Credits	15

Purpose	<p>This unit standard is intended for electrical technicians and servicepersons who are responsible for the installation, diagnosis and repair of consumer electronic systems, products and associated equipment.</p> <p>People credited with this unit standard are able to demonstrate knowledge of:</p> <ul style="list-style-type: none"> – operating principles and installation requirements of consumer electronic systems and products; – associated equipment used with consumer electronic systems; and – the impact of an emerging or converging technology for consumer electronic systems or products; – describe professional development opportunities undertaken regarding new technologies.
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Classification	Electrical Engineering > Electrical Appliance Servicing
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Available grade	Achieved
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Guidance Information

- 1 This unit standard has been developed for learning and assessment off job.
- 2 Recommended unit standards for entry
Unit 27912, *Demonstrate knowledge of electrical principles in an electrotechnology or telecommunications environment*;
Unit 30641, *Demonstrate knowledge of electromechanical engineering principles for technicians*.
- 3 References
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Health and Safety at Work Act 2015;
and all subsequent amendments and replacements.
- 4 Definitions
a.c. – alternating current.
Company practice – those practices and procedures that have been circulated by the company for use by their employees.
CPU – central processing unit.

d.c. – direct current.

Industry conventions – a set of agreed, specified, or generally accepted standards.

Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.

IR – infra-red.

Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000:2007, *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*.

5 Range

a Competence may be assessed on:

- i Consumer electronic systems may include but are not limited to – data communications boards and systems, audio-visual hub and systems, surround sound, connectivity, home automation connectivity, solar power;
 - ii Consumer electronic products may include but are not limited to – radio receivers, television sets, MP3 players, video recorders, DVD players, digital cameras, camcorders, personal computers, video game consoles, telephones, mobile phones; and
 - iii Associated equipment which may include but is not limited to – hard wired remote control, wireless remote control, internet remote control, hydraulic systems, pneumatic systems, mechanical systems, motors, power supplies, standby systems.
- b Electrical, radiation, and workshop or laboratory safety practices must be observed at all times.
- c All measurements are to be expressed in Système Internationale (SI) units and multipliers.
- d Mathematical proof of the subject matter covered by this unit standard is not required.
- e All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with:
- i legislation;
 - ii policies and procedures;
 - iii ethical codes;
 - iv Standards – may include but are not limited to those listed in Schedule 2 of the Electricity (Safety) Regulations 2010;
 - v safe and sound practice;
 - vi applicable site, company practice, industry practice, and industry conventions;
 - vii where appropriate or applicable, environmental requirements, manufacturer instructions, specifications, data sheets and manufacturer, supplier and company health and safety procedures.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of operating principles and installation requirements of consumer electronic systems and products.

Performance criteria

- 1.1 Describe system functions in accordance with given industry-specific diagrams.
- Range diagrams may include but is not limited to – block diagrams, functional flow block diagrams, signal flow graph, schematic. evidence of two different systems and three different consumer products using at least two types of diagrams is required.
- 1.2 Explain the function and theory of operation of each identified segment or section in the diagrams used.
- 1.3 Describe the expected values and identify the test points for expected signals and voltages associated with each identified segment or section in the diagrams used.
- 1.4 Describe system interfaces, explain how they work and identify the nature of the interface signals.
- Range interface may include but is not limited to – hardware, software, human, electronic, software, signal; evidence of two is required.
- 1.5 Identify typical faults for each segment or section in each diagram and describe typical symptoms for the fault conditions in terms of expected changes to signals and voltages attributable to the fault.
- 1.6 Describe typical configuration adjustments found in systems and consumer products.
- 1.7 Describe means of achieving connectivity between systems and consumer products.
- 1.8 Describe control and/or configuration adjustment functions provided by electronic modules that control systems.
- Range may include but is not limited to – CPU, micro-processor, embedded, manual; evidence of three is required.
- 1.9 Describe the use of test equipment required to take measurements, and perform adjustments in terms of configuration, commissioning and restoration of operation of consumer electronic systems and products.
- 1.10 Describe the function of software embedded in electronic modules used to control consumer electronic systems and products.
- 1.11 Describe software adjustments that are available to modify electronic modules or system performance.

- 1.12 Identify hazards associated with installing or servicing consumer electronic systems and products and outline the safe management procedures in each case.

Outcome 2

Demonstrate knowledge of associated equipment used with consumer electronic systems.

Performance criteria

- 2.1 Describe the operation of associated equipment used with the consumer electronic systems in accordance with given industry-specific diagrams.
- Range evidence of associated equipment relevant to two systems is required.
- 2.2 Explain the operation of common interfacing methods used with the associated equipment in terms of method and expected data transfer.
- Range method of data transfer may include but is not limited to – serial communications, parallel communications, wireless communications, IR communications, d.c. voltage control, a.c. voltage control, variable frequency control; evidence of four types of interface is required.
- 2.3 Describe features and specifications of the identified interfaces between the associated equipment and the consumer electronic systems.
- 2.4 Describe common human interface systems in terms of type, user friendliness, and reliability.
- 2.5 Describe the expected measurements at given points of the associated equipment described for the consumer electronic systems.
- 2.6 Identify typical faults in associated equipment and describe typical symptoms for the fault conditions in terms of expected changes to signals and voltages attributable to the fault.

Outcome 3

Demonstrate knowledge of the impact of an emerging or converging technology for consumer electronic systems or products.

Performance criteria

- 3.1 Describe an emerging or converging technology that may impact on existing systems or products with reference to purpose, facilities or services offered.
- Range selected technology should be one that is likely to be applied in the New Zealand environment.

- 3.2 Describe how the emerging or converging technology will impact upon or integrate with existing technologies.

Range may include but is not limited to – customer benefit, business efficiencies, competitive advantage.

Outcome 4

Describe professional development opportunities undertaken regarding new technologies.

Performance criteria

- 4.1 Describe professional development opportunities undertaken for technologies likely to be applied to New Zealand.

Range may include but is not limited to – conferences, trades shows, internal and external training courses, product courses, meetings, books, brochures, manuals, surveys, webinars; evidence of three is required.

This unit standard is expiring. Assessment against the standard must take place by the last date for assessment set out below.

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	28 March 2019	31 December 2025
Review	2	30 January 2025	31 December 2025

Consent and Moderation Requirements (CMR) reference

0003

This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.