

Title	Design switching circuits and a PLC programme		
Level	4	Credits	4

Purpose	People credited with this unit standard are able to: <ul style="list-style-type: none"> - design and install switching circuits; and - design a PLC programme.
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Classification	Electrical Engineering > Electrical Installation and Maintenance
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Available grade	Achieved
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Guidance Information

- 1 This unit standard has been developed for learning and assessment on-job. However, it may be assessed in a classroom, workshop, or simulated work environment.
- 2 Unit standard or equivalent prior knowledge and skills recommended:
Unit 32620 *Demonstrate knowledge of electrical plans, switching circuits, and lighting systems.*
- 3 Definitions
Low voltage switching circuits – circuits that have more switching complexity than a simple on/off circuit. They may include semi-automated/automated or relay/contactors control of loads. It is acceptable for the low voltage switching circuit to include extra low voltage portions that control a low voltage switching device.
PLC – programmable logic controller.
Safe and sound practice – as it relates to the installation of electrical equipment is defined in AS/NZS 3000.
- 4 References
AS/NZS 3000 (version as cited in the Electricity (Safety) Regulations), *Electrical Installations (known as the Australian/New Zealand Wiring Rules)*;
AS/NZS 4836:2011, *Safe working on or near low-voltage electrical installations and equipment*;
or any current subsequent amended or replacement versions.
- 5 This unit standard can be used together with other relevant unit standards, additional learning and workplace training to meet the requirements of the Electrical Workers Registration Board (EWRB) core competencies, available at <https://www.ewrb.govt.nz>.
- 6 The PLC programme for Outcome 2 must have at least six different control functions.

- 7 This unit standard applies to installations and equipment rated above extra-low voltage unless specifically stated.
- 8 Range
- a Candidates may refer to current legislation and Standards during assessment.
 - b Demonstration of safe working practices and installation in accordance with *safe and sound practice* are essential components of assessment of this unit standard.
 - c 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 applicable site, enterprise, and industry practice; and
 - vi where appropriate, manufacturers' instructions, specifications, and data sheets.
- 9 Candidates are expected to locate and reference the relevant clauses in the Standards that relate to the electrical work being undertaken.

Outcomes and performance criteria

Outcome 1

Design and install switching circuits.

Range two different circuits;
circuits may include but are not limited to — three-or-more way switching, automated lighting control switching circuit, start-stop control, safety interlocking circuit, water heating control, basic building services control, industrial control, or similar.

Performance criteria

- 1.1 Design low voltage switching circuits.
- 1.2 Install designed circuits.

Outcome 2

Design a PLC programme.

Performance criteria

- 2.1 Design a PLC control programme.
- 2.2 Install a PLC control programme.
- 2.3 Test a PLC control programme for correct function.

Planned review date	31 December 2026
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Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	24 March 2022	N/A

Consent and Moderation Requirements (CMR) reference	0003
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Waihanga Ara Rau Construction and Infrastructure Workforce Development Council at qualifications@waihanga.nz if you wish to suggest changes to the content of this unit standard.