Title	**Restore operation and performance of home automation systems, hardware, and support facilities**		
Level	**4**	**Credits**	**30**

Purpose	This unit standard is intended for service technicians and servicepersons, who test, diagnose and repair complex faults to a modular level and/or configure systems to restore operation and performance of home automation systems, associated hardware, and support facilities. People credited with this unit standard are able to: – perform routine maintenance and/or complex fault location on home automation systems, associated hardware, and support facilities; – restore faulty home automation systems, associated hardware, and support facilities to normal operation and performance; and – update maintenance records for home automation systems, associated hardware, and support facilities following maintenance or fault correction.

Classification	Electrical Engineering > Electrotechnology

Available grade	Achieved

Prerequisites	Unit 27911, *Demonstrate knowledge of workplace safety in an electrotechnology or telecommunications environment*; Unit 28881, *Enhance workplace safety and mitigate environmental impacts in an electrotechnology or telecommunications environment*; or demonstrate equivalent knowledge and skills.

Guidance Information

1 This unit standard has been developed for learning and assessment on-job or off-job in a simulated workplace environment or combination, and where electrical work is included under adequate supervision as defined in the Electricity Act 1992, unless the candidate is registered and licenced under the Electricity Act 1992.

2 Recommended unit standards for entry:
Unit 30644, *Demonstrate basic knowledge of diagnostics and fault finding for service and installation technicians*;
Unit 30651, *Explain regulatory requirements for installing and servicing extra-low and low voltage customer premises systems*;

Unit 32018, *Demonstrate knowledge of home automation systems*.

3 References

AS/NZS 3000: 2018: *Electrical Installations - Known as the Australian/New Zealand Wiring Rules*, available from https://www.standards.govt.nz/;
AS/NZS 11801.1:2019 *Information technology - Generic cabling for customer premises Part 1: General requirements (ISO/IEC 11801-1:2017, MOD),* available from https://www.standards.govt.nz/;
Consumer Guarantees Act 1993;
Contract and Commercial Law Act 2017, Part 3 Sale of Goods;
Electricity Act 1992;
Electricity (Safety) Regulations 2010;
Fair Trading Act 1986;
Hazardous Substances and New Organisms Act 1996;
Health and Safety at Work (Hazardous Substances) Regulations 2017;
Health and Safety at Work Act 2015;
New Zealand Electrical Codes of Practice, ISSN 0114-0663, available from https://worksafe.govt.nz;
Privacy Act 1993;
Resource Management Act 1991;
TCF Premises Wiring Cable Installers Guidelines for Telecommunications Services, available from https://www.tcf.org.nz;
and all subsequent amendments and replacements.

4 Definitions

Company practice – those practices and procedures that have been circulated by the company for use by their employees.
Co-ordinate – includes supervision, facilitation, and active involvement in the work to be completed.
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.
Non-standard – three or more services/network types, hardware or subsystems used or operating together to provide a purpose-built network system solution based on customer or installation requirements.
Safe and sound practice – relating to the installation of electrical equipment as defined in AS/NZS 3000:2018 *Electrical Installations - Known as the Australian/New Zealand Wiring Rules.*
Service technicians and servicepersons – for the purposes of this unit standard means, people who hold or who are working towards electrical registration as an Electrical Service Technician, Electrical Appliance Serviceperson (endorsed to disconnect and connect), or Electrical Appliance Serviceperson.

5 Assessment

a Competence may be assessed on:
   i Home automation systems may include but are not limited to – heating, ventilation, air-conditioning, occupancy awareness, lighting, security, audio visual, appliance control and integration (connected cooking), pet and baby care, home automation for elderly and disabled, voice activation;
   ii Transfer medium may include but is not limited to – signal cables, power line cables, radio signals, Wi-Fi, Bluetooth, IR, ultrasound;
   iii Connecting hardware and structure may include but is not limited to – sensors

and actuators, home automation and/or databus, central unit, connecting blocks, patch panels, interconnections, cross-connections, or some combination of these components.

b Evidence of three different home automation system installations is required for each outcome of this unit standard, with one being a non-standard solution, except where otherwise indicated in Outcomes 3 and 4.

6 Range

a 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;
   v applicable site, company and industry practice, and industry conventions;
   vi 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

Perform routine maintenance and/or complex fault location on home automation systems, associated hardware, and support facilities.

Performance criteria

1.1 Perform preparation tasks before leaving for site.

Range may include but not limited to – collection of fault information, system performance information, site access including permits and consents, health and safety, remote log in, other site checks, service spares, tools.

1.2 Evaluate and apply remote restoration methods and procedures.

1.3 Co-ordinate and apply site arrival procedures.

Range log in as on-site, inspect site for damage, health and safety.

1.4 Carry out visual inspection and maintenance checks on arrival.

Range may include but is not limited to – equipment integrity, corrosion, bonding and earthing, cable or interface management, weather proofing, connections, dust, equipment or ventilation system filters, air flow, fault codes;
fault codes may include but are not limited to – manuals, flowcharts, manufacturer specifications and diagnostic procedures, built in diagnostic modules, remote interface, computer or mobile phone app interface.

1.5 Select test instruments, diagnostic tools and/or equipment.

1.6 Apply logical fault-finding techniques to identify fault cause(s).

Range techniques may include but are not limited to – customer feedback, questioning, observation, simulation, measurement, identification of function loss, comparison with previous fault data including frequency of occurrence, manufacturer's documentation and diagnostic procedures, maintenance records, trending, built-in diagnostics, alarm priority, comparison with commissioning results, half split, step by step, resetting modules, testing.

1.7 Perform tests without impact on the performance of functioning services where relevant.

1.8 Interpret test results to identify faulty component(s) or subsystem(s).

Range may include but is not limited to – module, cable, component, interface, associated equipment, configuration, cooling system, power and backup system, firmware, software.

1.9 Replace faulty module in accordance with industry practice.

Range physical and software configuration recovery, replacement of module, ESD protection, re-configuration of module, evaluation of system status, fault monitoring.

1.10 Perform operational tests and performance verification after replacement.

Range may include but is not limited to – physical, firmware and software configuration, replacement of module and/or component, associated hardware and support facilities, evaluation of system status, evaluation of system performance, fault monitoring.

1.11 Co-ordinate site departure procedures in accordance with company practice.

Range may include but is not limited to – alarm check, system restored to automatic, alarm service restored to normal, ventilation system restored to normal.

1.12 Co-ordinate post job tasks in accordance with company practice.

Range may include but is not limited to – arrange faulty unit repair through appropriate processes, log and file information in relevant system, complete customer report as required, close out job tasks in management system.

Outcome 2

Restore faulty home automation systems, associated hardware, and support facilities to normal operation and performance.

Performance criteria

2.1 Repair or replace faulty module or subsystem in accordance with company, industry, and safe and sound practice.

Range physical, firmware and software configuration recovery, replacement of module, ESD protection, module re-configuration, system status evaluation, fault monitoring.

2.2 Carry out operational and performance verification tests after repair.

Range may include but is not limited to – physical, firmware and software configuration, replacement module and/or component, associated service and equipment, evaluation of system status, evaluation of system performance, fault monitoring.

2.3 Complete electrical, mechanical, and visual safety tests in accordance with current regulations and standards.

2.4 Co-ordinate site departure procedures in accordance with company practice.

Range may include but is not limited to – alarm check, system restored to automatic, ventilation system restored to normal, power and backup system restored to normal, enclosure and cover secure.

2.5 Co-ordinate post job tasks in accordance with company practice.

Range may include but is not limited to – arrange faulty module repair or replacement, log and file information, customer report, close out job task in management system, safety testing, ESC, COC, SDoC.

Outcome 3

Update maintenance records for home automation systems, associated hardware, and support facilities following maintenance or fault correction.

Range may include but is not limited to – plans, customer records, photographs, alterations;
two of the three systems required as evidence must use an electronic record system.

Performance criteria

3.1 Record details of fault and remedial action.

3.2 Record change(s) made to home automation and hardware during fault correction.

3.3 Complete documentation, advise, and hand restored home automation and hardware back to customer or supervisor in accordance with company requirements, and obtain acceptance from customer.

Planned review date	31 December 2024

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 January 2020	N/A

Consent and Moderation Requirements (CMR) reference	0003

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

Comments on this unit standard

Please contact The Skills Organisation reviewcomments@skills.org.nz if you wish to suggest changes to the content of this unit standard.