

Title	Demonstrate and apply knowledge of transducers and their interfaces with digital circuits		
Level	4	Credits	10

Purpose	<p>This unit standard covers transducers and associated digital interfaces for electronics technicians.</p> <p>People credited with this unit standard are able to:</p> <ul style="list-style-type: none"> – demonstrate knowledge of electronic transducers and their applications; – demonstrate knowledge of interfacing transducers with digital circuits; and – test transducers and interface circuits using testing instruments.
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Classification	Electronic Engineering > Core Electronics
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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 References
Health and Safety in Employment Act 1992 and associated regulations; and all subsequent amendments and replacements.
- 3 Definitions
a.c. – alternating current.
BCD – binary coded decimal.
d.c. – direct current.
Enterprise practice – those practices and procedures that have been promulgated by the company or enterprise for use by their employees.
Industry practice – those practices that competent practitioners within the industry recognise as current industry best practice.
LCD – liquid crystal display.
LED – light emitting diode.
- 4 Range
 - a Electrical, radiation, and workshop or laboratory safety practices are to be observed at all times.
 - b All measurements are to be expressed in Système Internationale (SI) units and multipliers.
 - c Use of non-programmable calculators is permitted during assessments.

- d All activities and evidence presented for all outcomes and performance criteria in this unit standard must be in accordance with legislation, policies, procedures, ethical codes, Standards, applicable site and enterprise practice, and industry practice; and, where appropriate, manufacturers' instructions, specifications, and data sheets.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of electronic transducers and their applications.

Range transducers may include – optical linear and rotary shaft encoders, Hall effect devices, slotted optical proximity switches, temperature sensors, dew sensors, pressure sensors, vacuum sensors;
evidence of four transducers is required.

Performance criteria

- 1.1 Transducer applications in electronic products or systems are identified.
- 1.2 The construction of transducers is outlined and their operation explained.
- 1.3 Transducer output type is identified, and any requirements this imposes on interfacing circuitry are stated.

Outcome 2

Demonstrate knowledge of interfacing transducers with digital circuits.

Performance criteria

- 2.1 The interfacing circuitry between transducers and the inputs of digital devices is identified and explained, with reference to given schematic diagrams of commercial electronic products.

Range inputs – switches, keypads, BCD switches, opto-couplers, optical linear and rotary encoders, Hall effect devices, slotted optical proximity sensors, infrared receiving diodes;
evidence of three different types of interfaces is required.

- 2.2 The interfacing circuitry between digital devices and output transducers is identified and explained, with reference to given schematic diagrams of commercial electronic products.

Range outputs to – d.c. sinks and source loads, multiplexed LCD and LED displays, optically isolated a.c. loads, H bridges, multi-phase drivers for stepper and brushless d.c. motors, relays, pull-in solenoids, contactors, pulse drivers for infrared emitting diodes;
evidence of three different types of interfaces is required.

Outcome 3

Test transducers and interface circuits using testing instruments.

Range test instruments may include but are not limited to – multimeter, oscilloscope, signal generator, signal tracer.

Performance criteria

3.1 Transducers and interface circuits are tested to confirm operation.

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	26 July 2004	31 December 2012
Review	2	21 July 2011	31 December 2024
Review	3	25 May 2023	31 December 2024

Consent and Moderation Requirements (CMR) reference

0003

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