



Australian Government

ICTTEN201 Use electrical skills in telecommunications work

Release: 1

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Modification History

Release	Comments
Release 1	This version first released with ICT Information and Communications Technology Training Package Version 2.0.

Application

This unit describes the skills and knowledge required for an entry-level worker to use electrical skills, working with analog and digital, cabling and wireless networking in telecommunications.

It applies to individuals who undertake basic testing, circuit building, and evaluation of cable and wireless devices, and who may work in domestic, commercial or industrial situations.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Unit Sector

Telecommunications – Telecommunications Networks Engineering

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element.</i>
1. Connect up, test and verify DC and AC circuitry	1.1 Identify any hazards and work health and safety (WHS) issues for a safe work site, and notify appropriate personnel 1.2 Connect a series and a parallel DC and AC circuit configuration following safe work practices 1.3 Choose appropriate test equipment and measure values of electrical quantities of circuits 1.4 Use calculations to verify measured values of electrical quantities in a series and in a parallel circuit configuration 1.5 Compare measured values to calculated values, and determine reasons for any variations

ELEMENT	PERFORMANCE CRITERIA
	1.6 Measure low voltage (LV), extra low voltage (ELV) or telecommunications network voltage (TNV) to determine if values are within equipment or power supply specifications 1.7 Use appropriate test equipment to measure AC voltage (multimeter) or AC current (clamp meter) in a safe manner that does not require an LV circuit to be disconnected 1.8 Test residual current devices (RCD) or earth leakage devices to ensure they are operational prior to working with AC mains powered equipment, power supplies and tools 1.9 Evaluate results and determine probable faults, if relevant
2. Evaluate analog and digital signals	2.1 Compare characteristics of an analog signal and a digital signal 2.2 Produce a layout using building blocks to represent a typical analog and a digital circuit showing different characteristics between an analog signal and a digital signal 2.3 Produce 4-bit binary codes with their decimal equivalent to represent output voltages of a digital to analog converter 2.4 Choose appropriate test equipment and measure output voltage of a digital device for <i>high</i> and <i>low</i> logic states
3. Perform cable selection	3.1 Compare basic transmission characteristics of different types of cables used in telecommunications and select the most appropriate cable type to suit application characteristics 3.2 Connect two devices with a patch cable and test the connection

Foundation Skills

This section describes language, literacy, numeracy and employment skills incorporated in the performance criteria that are required for competent performance.

Skill	Performance Criteria	Description
Reading	2.1, 3.1	Interprets textual information to inform decision-making process
Writing	2.2	Uses industry specific language to produce technical documentation
Oral Communication	1.1	Articulates specific concerns and issues clearly and listens to and acts on responses of others

Numeracy	1.4-1.6, 1.9, 2.2, 2.4	• Performs basic calculations to check data, make predictions and make comparisons • Selects and uses appropriate tools to take measurements, analyse results and perform calculations
Navigate the world of work	1.1, 1.2, 1.7, 1.8	• Follows legislative requirements and organisational protocols, policies and procedures relevant to own role
Get the work done	1.3, 1.5, 1.6, 1.9, 2.3, 2.4, 3.1	• Determines job sequence and works logically and systematically to undertake clearly defined tasks • Analyses task requirements to decide on appropriate equipment and practices • Applies problem-solving processes to locate and resolve faults, and reviews impact of decisions

Unit Mapping Information

Code and title current version	Code and title previous version	Comments	Equivalence status
ICTTEN201 Use electrical skills in telecommunications work	ICTTEN2008A Use electrical skills in telecommunications work	Updated to meet Standards for Training Packages	Equivalent unit

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=a53af4e4-b400-484e-b778-71c9e9d6aff2>

Assessment Requirements for ICTTEN201 Use electrical skills in telecommunications work

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Performance Evidence

Evidence of ability to:

- use fundamental electrical principles to solve basic AC and DC electrical problems
- connect and test an AC and DC circuit
- evaluate and compare characteristics of analog and digital signals
- compare and select cables according to transmission characteristics.

Note: If a specific volume or frequency is not stated, then evidence must be provided at least once.

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- describe principles of AC and DC electricity and how it impacts telecommunications work including:
 - AC and DC electrical SI units of measurement
 - work health and safety (WHS) issues
 - Ohm's law and other relevant calculations
 - circuit configuration
- identify and describe common AC and DC faults, fault finding techniques and use of testing equipment
- explain application of binary to decimal conversion and vice versa
- describe principles of analog and digital electronics and building blocks common to analog and digital circuits
- explain the distinction between analog and digital signals and devices
- explain encoding techniques and their application in wired, wireless and optical communications systems
- outline features and applications of unshielded twisted pair (UTP), coaxial and fibre cables

- list typical electronic devices, cable types and their applications
- explain modulation techniques used in wired, wireless and optical communications systems
- explain techniques to convert analog to digital and digital to analog
- describe characteristics of signal transmission
- list and describe common telecommunications cables and the characteristics of use and application.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances must be typical of those experienced in the Telecommunications Network Engineering field of work and include access to:

- appropriate AC and DC testing equipment
- manufacturer's documentation and equipment
- safety equipment.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Links

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