



Australian Government

ICTDRE3248A Design communications wiring systems for customer premises

Release 1

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Modification History

Release	Comments
Release 1	This version first released with <i>ICT10 Integrated Telecommunications Training Package Version 3.0</i> .

Unit Descriptor

This unit describes the performance outcomes, skills and knowledge required to design a smart cable wiring system for customer premises.

All customer cabling work in the telecommunications, fire, security and data industries must be performed by a registered cabler. All cablers are required to register with an Australian Communications and Media Authority (ACMA)-accredited registrar. ACMA open registration with appropriate industry endorsements is essential.

Application of the Unit

Cablers installing cabling systems apply the skills and knowledge in this unit.

The unit applies to emerging opportunities in domestic and small to medium enterprise information technology. The digital reception stream in ICT qualifications has related units, such as ICTDRE4166A Integrate customer digital reception equipment.

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

ICTCBL2137B Install, maintain and modify customer premises communications cabling:
ACMA Open Rule

Employability Skills Information

This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements	Performance Criteria
<i>Elements describe the essential outcomes of a unit of competency.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Where bold italicised text is used, further information is detailed in the required skills and knowledge section and the range statement. Assessment of performance is to be consistent with the evidence guide.</i>

Elements and Performance Criteria

1. Prepare to design a wiring system for premises	1.1 Consult customer and visit work site to determine immediate and future functional needs of the cabling system 1.2 Identify and document immediate and future location of the cabling system customer interface elements, and seek confirmation from appropriate persons 1.3 Review technology used to deliver functional needs 1.4 Identify specific service provider requirements and requirements of applicable standards, codes and regulations
2. Design a wiring system for premises	2.1 Follow work health and safety procedures when carrying out the work 2.2 Transfer functional needs of customer to architectural plans 2.3 Determine size and location of home distributor, security system, carrier and carriage service facilities, antennas and switch boards 2.4 Identify cable pathways and cable support systems 2.5 Select appropriate cable types to meet functional needs 2.6 Develop cable identification method to aid the installation
3. Document the cable wiring system design	3.1 Document by room the customer interface elements 3.2 Document requirements for the home distributor, security system, carrier and carriage service facilities, antennas and switch boards 3.3 Document testing and commissioning requirements 3.4 Specify user documentation required after the completion of the installation 3.5 Provide customer quote that includes a bill of materials and a project schedule

Required Skills and Knowledge

This section describes the skills and knowledge required for this unit.

Required skills

- analytical skills to interpret customer requirements
- communication skills to liaise with customer to ensure requirements are identified
- literacy skills to interpret technical standards, regulations and codes
- numeracy skills to provide costings
- planning and organising skills to:
 - develop a cabling design
 - develop an installation schedule
- workplace safety awareness skills, with particular attention to accessing work sites safely
- writing and drafting skills to document specifications and record plans.
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Required knowledge

- cabling standards, regulations and codes:
 - building regulations that apply to the installation of cabling systems
 - code of practice for home wiring
 - standard called on by the code of practice for home wiring
 - standards mandated by ACMA
- carrier network delivery systems used in single dwelling and multi-dwelling units for:
 - fibre
 - fixed wireless
 - satellite
 - twisted copper pair
 - subscription TV
- cabling requirements of home technologies:
 - age and assisted living
 - communications
 - digital home health
 - energy management
 - entertainment
 - intelligent light and power
 - security and safety
- test methods and performance requirements.

Evidence Guide

The evidence guide provides advice on assessment and must be read in conjunction with the performance criteria, required skills and knowledge, range statement and the Assessment Guidelines for the Training Package.

Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	Evidence of the ability to: - capture customer functional needs for cabling system - apply industry standards, regulations and codes when designing the wiring system for customer premises - develop a detailed design in compliance with industry practices, including signal losses and/or expected measurements that need to be achieved at wallplates - document the design, including a bill of materials, schedule of work and associated costs.
Context of and specific resources for assessment	Assessment must ensure: - candidate is provided with a contemporary dwelling design, which covers all functional requirements of a modern home - candidate has access to all current standards, codes and regulations.
Method of assessment	A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: - direct observation of the candidate communicating with the customer - review of the planning sheets used by the candidate in developing the design - oral and written questioning to assess candidate skills and knowledge.
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: ICTTEN4229B Design, install and configure a customer smart technology network.

	Aboriginal people and other people from a non-English speaking background may have second language issues. Access must be provided to appropriate learning and assessment support when required. Assessment processes and techniques must be culturally appropriate, and appropriate to the oral communication skill level, and language and literacy capacity of the candidate and the work being performed. In all cases where practical assessment is used it will be combined with targeted questioning to assess required knowledge. Questioning techniques should not require language, literacy and numeracy skills beyond those required in this unit of competency. Where applicable, physical resources should include equipment modified for people with special needs.
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Range Statement

The range statement relates to the unit of competency as a whole. It allows for different work environments and situations that may affect performance. Bold italicised wording, if used in the performance criteria, is detailed below. Essential operating conditions that may be present with training and assessment (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) may also be included.

<i>Functional needs</i> may include:	• age and assisted living • communications • digital home health • energy management • entertainment • intelligent light and power • security and safety.
<i>Customer interface elements</i> may include:	• audio visual systems: • speakers • screens • remote control • entertainment outlets: F connectors • intercom: • internal station • outdoor station • light fittings • power points • security: • passive infra-red (PIR) sensors • smoke detectors • code pads • telecommunications outlets RJ45.
<i>Appropriate persons</i> may include:	• architect • builder • consultant • customer.
<i>Service provider</i> may include:	• age and assisted service providers • content providers, such as subscription TV providers • home health providers • internet/broadband service providers • security service providers • telecommunications carriers.
<i>Applicable standards,</i>	• AS/ACIF S009

codes and regulations may include:	• AS/NZS 1367 • AS/NZS 3000 • AS/NZS ISO/IEC 15018 • AS 4755.3.1 • AS 4755.3.2 • AS 4755.3.3 • code of practice for home wiring series: • Quick Guide to Smart Wired® • code of practice for home wiring • installer handbook for home wiring • digital taskforce handbooks • HB252 • ISO/IEC TR 15067-4 • subscription TV standards: • domestic installation manual • manuals for multi-dwelling units, multi-residential estates and commercial installations • installer product list • installer handbook for satellite feed into multi-dwelling units and commercial installations • vendor- and equipment-specific handbooks.
Work health and safety may include:	• identifying hazards: • installation site • earth potential rise (EPR) • personal protective clothing: • head protection • safety boots.
Cable support systems may include:	• cable tray • catenary • duct and conduit.
Cable types may include:	• coaxial cable RG6, RG11 or better • intelligent light and power: • data bus twisted pair • tough plastic sheath (TPS) • security cable: • four core multi-strand • six core multi-strand • unshielded twisted pair (UTP) Category 5, 6, 7 and beyond.
Testing and commissioning	• certification testing: • attenuation-to-crosstalk ratio (ACR)

requirements may include:	• attenuation • crosstalk • equal level far end crosstalk (ELFEXT) • far end crosstalk (FAXT) • length • power sum near end crosstalk PS (NEXT) • wire map • continuity and pair integrity testing • delay skew • return loss • radio frequency (RF) signal tests: • bit error ratio (BER) • modulation error ratio (MER) • reflection • testing to AS/NZS3017.
User documentation may include:	• as-built plans • cable losses • certificate of compliance of electrical testing • code compliance label • copy of test results • device losses • telecommunications cabling advice form.

Unit Sector(s)

Telecommunications - Digital reception technology