



Australian Government

ICTDRE3249A Develop integrated digital reception systems

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 develop integrated digital reception system applications, topologies, devices and capabilities, and system programming methods. The unit also covers the use of diagnostic tools and documentation of developed systems.

The skills and knowledge described in this unit do not require a licence to practice in the workplace. Practice in the workplace and during training are subject to work health and safety (WHS) regulations and codes of practice.

Application of the Unit

This unit applies to cablers who install digital reception equipment and cabling systems. It 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 ICTDRE3248A Design communications wiring systems for customer premises.

Licensing/Regulatory Information

Refer to Unit Descriptor.

Pre-Requisites

Nil

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 develop an integrated system	1.1 Determine types and location of loads and control devices from project specifications and customer requirements 1.2 Determine number of control bus networks and current requirements from load calculations for devices on the system 1.3 Determine appropriate placement of system devices to optimise bus network power and load parameters, and to maintain system stability 1.4 Develop an integrated system to comply with regulator, safety and manufacturer requirements 1.5 Document take-off of the number of devices and accessories required for the system using manufacturer's title and ID for each 1.6 Download required programming and diagnostic tools to a compatible PC and check for correct operation and safety
2. Program integrated system devices	2.1 Follow WHS risk control measures and procedures 2.2 Apply correct modes of programming to develop integrated system according to manufacturer's programming software instructions 2.3 Follow manufacturer's instructions and recommendations when programming system devices to project requirements 2.4 Program the parameters for operation of loads to project requirements and within manufacturer's designated range 2.5 Save and back up the programmed system database according to manufacturer instructions
3. Load and test integrated system	3.1 Follow WHS risk control work measures and procedures 3.2 Transfer database of integrated system program to the network 3.3 Test all functions of the integrated system for compliance with project requirements and manufacturer specifications 3.4 Use diagnostic tools to locate system faults, defects and anomalies 3.5 Correct defects and anomalies to comply with project requirements and manufacturer specifications 3.6 Provide copy of documentation of integrated system at handover to customer

Required Skills and Knowledge

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

Required skills

- communication skills to:
 - negotiate with site owner and organisations or individuals who may be affected by an outage
 - provide advice and guidance to others or seek assistance
- literacy skills to interpret technical documentation, specifications and service orders
- numeracy skills to:
 - check that equipment is calibrated
 - interpret results of system testing
 - evaluate different types of technical data
- planning and organising skills to organise and prepare installation resources
- problem-solving skills to respond to programming challenges
- task-management skills to:
 - work systematically with required attention to detail
 - adhere to safety requirements
- technical skills to:
 - operate computer equipment
 - perform diagnostic procedures
 - undertake fault-finding activities, including the use of multimeters, oscilloscopes, system analysers and diagnostic software.
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Required knowledge

- applications and advantages of integrated systems
- bus system cable type, polarity, length and acceptable topologies
- controlling digital system integration (DSI) and communicating with digital addressable lighting interface (DALI) electronic ballasts
- factors that affect control bus stability, including number of units on a network, and current drawn by devices in relation to current output of power supplies
- operating parameters of integrated systems and programming to an extent indicated by the following aspects:
 - importance of project documentation and backup
 - importance of the location of output and input devices and control bus power supplies
- lighting dimmer capabilities and selection
- low voltage (LV) supply overcurrent and surge protection
- multiple network connectivity
- software for system and device programming, monitoring and control
- system and device programming, encompassing:
 - addressing conventions for networks, devices, applications, output groups, types of control and outputs, which include 'on', 'off', a specific level, and over a specific time

- PC programming tools and methods (programming includes configuring network database using addressing tools and objects, function objects, editing, altering and transferring the data base to network)
- system fault-finding processes
- system components, encompassing:
 - support devices for control bus supply and control
 - support devices for programming, interconnection between networks and integration with third party systems
- types and capabilities of output devices
- types and capabilities of input devices.

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: • implement WHS procedures and practices when developing an integrated system • apply sustainable energy principles and practices when developing an integrated system • determine the types and location of loads and control devices • use load calculations to correctly determine the number of network and current requirements • place system devices appropriately in the system scheme • check programming and diagnostic tools • apply appropriate modes of programming to develop the integrated system • follow manufacturer instructions and recommendations in programming devices and setting load operating parameters • develop an integrated system to comply with regulator, safety and project requirements • download program to network successfully • use diagnostic tools to locate and correct system defects, faults and anomalies • document and back up an integrated system during the following stages of the project: • at preparation • at programming • at completion.
Context of and specific resources for assessment	Assessment must ensure: • a typical contemporary dwelling into which a digital system will be developed • availability of all functional requirements of a modern home • access to contemporary digital equipment • 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 installing a digital reception system • direct observation of the candidate conducting signal measurement and adjusting for optimal performance • oral or written questioning of the candidate to assess knowledge of complex digital reception systems • oral or written questioning of the candidate to assess knowledge of test methods and performance requirements.
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.

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>Customer</i> may include:	• consultant • individual customer • project manager • site manager • site supervisor.
<i>Handover to customer</i> may include:	• demonstrating functionality • providing appropriate literature • training customer on equipment use.

Unit Sector(s)

Telecommunications - Digital reception technology