Australian Government
Department of Education, Employment and Workplace Relations

ICTTEN5203A Dimension and design a radio frequency identification system

Release: 1

INDUSTRY
SKILLS
COUNCILS
Creating Australia's Future

ICTTEN5203A Dimension and design a radio frequency identification system

Modification History

Not Applicable

Unit Descriptor

| Unit descriptor | This unit describes the performance outcomes, skills and knowledge required to undertake a radio frequency identification (RFID) installation, configuration and testing. This could be part of the upgrade to an existing or the implementation of a new logistical or security network using RFID technology according to design specifications.

No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement but users should confirm requirements with the relevant federal, state or territory authority. |
|---|---|

Application of the Unit

Application of the unit	Officers in field work who carry out installation, maintenance and upgrade of ICT networks apply the skills and knowledge in this unit to integrate new and converging functionalities to a network. They would be employed by telecommunications and IT networking provisioning companies specialising in RFID technology.

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

Prerequisite units		

Prerequisite units		

Employability Skills Information

Employability skills	This unit contains employability skills.

Elements and Performance Criteria Pre-Content

Elements describe the essential outcomes of a unit of competency.	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.

Elements and Performance Criteria

ELEMENT	PERFORMANCE CRITERIA
1. Prepare to dimension and design an RFID system	1.1. Obtain **business requirements** for the **client** from an **appropriate person** for the design of the **RFID system** 1.2. Research **RFID technologies**, their functionalities and the different implementations of configurations 1.3. Select suitable software and hardware types to ensure that the proposed system is designed to meet business requirements 1.4. Conduct a survey of available interrogators or readers, tags and wireless units
2. Dimension and design an RFID system	2.1. Select the most appropriate interrogators or readers for the given specification to ensure their compatibility with current network infrastructure if applicable 2.2. Minimise interrogator to interrogator interference 2.3. Verify that antenna geometry and footprint are consistent with the chosen design 2.4. Minimise sources of interference 2.5. Incorporate into the **RFID design** the use of anti-collision protocols 2.6. Customise appropriate **tag to client requirements** 2.7. Predict the performance for read distance, write distance and tag response time to confirm that these conform with client requirements 2.8. Select the **optimal locations** for an RFID tag to be placed on an item 2.9. Prepare a design proposal for the RFID system including **specifications** 2.10. Prepare a report containing design **solutions** and recommendations of preferred products, including the justification for recommendations 2.11. Submit report to client for approval
3. Document the specified design	3.1. Complete documentation according to client requirements 3.2. Inform client about standards applying to the design 3.3. Secure sign off of RFID design from appropriate person

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Required skills

- communication skills to liaise with internal and external personnel on technical, operational and business related matters
- literacy skills to interpret technical documentation and write reports, design solutions and recommendations in required formats
- numeracy skills to interpret technical specifications and evaluate possible design solutions for optimum RFID system
- planning and organisational skills to plan, prioritise and monitor own work
- problem solving and contingency management skills to adapt configuration procedures to requirements of RFID network
- research skills to interrogate RFID vendor databases and website to implement different configuration requirements to meet client design specifications
- technical skills to:
  - evaluate and select RFID interrogators, readers and wireless units
  - evaluate antenna designs and protocols for design considerations to suit particular RFID system

Required knowledge

- business process design
- client business operations, business function and organisation
- compatibility issues with existing system and resolution procedures
- configuration of internet protocol (IP) networks
- customer and business liaison
- desktop applications and operating systems as required
- linkage between operational processes
- network protocols and operating systems
- network topologies
- radio spectrum and RFID frequencies
- RF interference
- RFID architecture
- RFID hardware and software
- RFID technologies incorporating substantial depth in network operating systems, protocols, interrogators and sensors, wireless technologies and cabling standards
- RFID vendor product knowledge
- security protocols, standards and data encryption

Evidence Guide

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: • adapt RFID technologies to specified plan and design • evaluate RFID client specifications against accepted industry practices • include RFID architecture across a secure environment • encode RFID tags • attach encoded RFID tags and track the movement of tagged items • integrate RFID information into business applications • produce design information in configuring the network with IP addressing • produce information that can be shared between businesses • make recommendations and offer optimum design solutions.

Context of and specific resources for assessment	Assessment must ensure:
	• sites providing:
	  • client functional requirements
	  • RFID equipment specifications
	  • database software
	  • simulation software
	  • organisational guidelines
	  • network or computer layout documentation and premises plans.

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 undertaking an RFID installation, configuration and testing • oral or written questioning to assess required knowledge • evaluation of research methodologies and the final

EVIDENCE GUIDE	
	design proposal prepared by the candidate outlining solutions and recommendations.

EVIDENCE GUIDE	
Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example: • ICTTEN5204A Produce technical solutions from business specifications. 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

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.	
Business requirements may include:	• application of RFID • business inventory • network or people in the organisation • systems currently in use
Client may include:	• external organisations

RANGE STATEMENT	
	• individuals • internal departments • internal employees • logistic company • security organisation • warehouse.

Innovation and Business Skills Australia

RANGE STATEMENT	
Appropriate person may include:	• authorised business representative • client • IT support manager • network administrator • RFID network manager • small or medium enterprise (SME) customer • small office home office (SOHO) customer • supervisor.
RFID system may include:	• antenna • cabling • databases • interrogators or readers • power supplies • tags • wireless units.
RFID technologies may include:	• RFID and networking tools and equipment • RFID interrogators/readers and tags • servers and workstations.
RFID design may include:	• hardware upgrades • implementing a new system • new hardware • new software • simulation software • software upgrades • user training.
Tag to client requirements may include:	• encryption requirements • memory size • security.

Optimal locations may include:	• media and adhesive selection for tags
	• package contents
	• packaging:
	  • inserts
	  • items
	  • labels
	  • tags
	• product to attach to:
	  • liquids
	  • metal
	  • polarisation

RANGE STATEMENT	
	• tag orientation and location • tag stacking (shadowing).

Specifications may include:	• cable drops
	• device mounting locations
	• electrical specifications for:
	    • adapters
	    • interrogators
	    • power units
	    • readers
	    • sensors
	    • tags
	    • wireless units
	• interrogation zone locations
	• RFID network topology
	• site diagrams.

Solutions may include:	• hardware upgrades • implementing a new system • new hardware • new software • software upgrades • user training.

Unit Sector(s)

Unit sector	Telecommunications

Co-requisite units

Co-requisite units		

Competency field

Competency field	Telecommunications networks engineering

Innovation and Business Skills Australia