



Australian Government

Department of Education, Employment and Workplace Relations

ICTRFN3146A Install WiMAX customer premises equipment broadband wireless access equipment

Release: 1

ICTRFN3146A Install WiMAX customer premises equipment broadband wireless access equipment

Modification History

Not Applicable

Unit Descriptor

Unit descriptor	<p>This unit describes the performance outcomes, skills and knowledge required to install and set up worldwide interoperability for microwave access (WiMAX) customer premises equipment (CPE) in homes and commercial premises.</p> <p>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.</p>
------------------------	--

Application of the Unit

Application of the unit	<p>Technical staff who install outdoor WiMAX CPE equipment for wireless broadband access to customer premises apply the skills and knowledge in this unit. It involves connecting the indoor unit to customer network.</p>
--------------------------------	--

Licensing/Regulatory Information

Refer to Unit Descriptor

Pre-Requisites

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 for WiMAX equipment installation	1.1. Arrange access to the site according to required procedure 1.2. Verify <i>customer requirements</i> , type of <i>WiMAX CPE equipment</i> and location of proposed installation according to the plans obtained from <i>authorised personnel</i> 1.3. Prepare <i>tools, equipment</i> and CPE required for installation
2. Install the outdoor unit and antenna	2.1. Make worksite safe by identifying existing and potential <i>hazards</i> 2.2. Comply with <i>relevant legislation, codes, regulations and standards, occupational health and safety (OHS) and environmental requirements</i> 2.3. Mount the outdoor unit according to manufacturer's specifications and enterprise plans 2.4. Connect the outdoor unit to the indoor unit using specified cable 2.5. Position the antenna towards the distant WiMAX base station for preliminary orientation 2.6. Align the unit for maximum signal strength using received signal strength indication (RSSI) display 2.7. Record the installation and alignment details 2.8. Connect <i>indoor unit and accessories</i> to customer equipment
3. Test the performance of the installation	3.1. Test WiMAX CPE according to manufacturer's procedures 3.2. Check operating environment does not degrade test results 3.3. Evaluate test results to verify operational performance with customer
4. Restore site and complete documentation	4.1. Restore worksite to the customer's satisfaction 4.2. Complete reports on installation 4.3. Notify customer and obtain sign off

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

REQUIRED SKILLS AND KNOWLEDGE

Required skills

- communication skills to liaise with customers on technical and operational matters
- literacy skills to interpret technical documentation and standards and incorporate technical language into written reports
- numeracy skills to interpret technical data such as specifications of equipment operations
- problem solving skills to address common operational problems in installation
- safety awareness skills to:
 - apply precautions and required action to minimise, control or eliminate hazards that may exist during work activities
 - select and use required personal protective equipment conforming to industry and OHS standards
 - work systematically with required attention to detail without injury to self or others, or damage to goods or equipment
- technology skills to:
 - install outdoor units and antenna
 - connect to indoor units
 - test WiMAX equipment

Required knowledge

- WiMAX:
 - products
 - protocols IEEE 802.16 and IEEE 802.11
- microwave propagation and losses caused by foliage, buildings, and metallic structures

Evidence Guide

EVIDENCE GUIDE	
<p>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.</p>	
Overview of assessment	
Critical aspects for assessment and evidence required to demonstrate competency in this unit	<p>Evidence of the ability to:</p> <ul style="list-style-type: none"> • install and test WiMAX CPE outdoor unit • install indoor unit and connect to customer network • reinstate site, document and complete installation reports.
Context of and specific resources for assessment	<p>Assessment must ensure:</p> <ul style="list-style-type: none"> • sites on which WiMAX installations can be conducted • tools and equipment required for installation • relevant regulatory and equipment documentation..
Method of assessment	<p>A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit:</p> <ul style="list-style-type: none"> • review of a hands-on project completed by the candidate • review of an oral and written report with completed documentation • direct observation of the candidate installing and connecting WiMAX CPE equipment.
Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended, for example:</p> <ul style="list-style-type: none"> • ICTDRE3165A Install a complex digital reception system • ICTRFN4095A Conduct radio frequency measurements. <p>Aboriginal people and other people from a non-English speaking background may have second language issues.</p> <p>Access must be provided to appropriate learning and assessment support when required.</p>

EVIDENCE GUIDE

	<p>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.</p> <p>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.</p> <p>Where applicable, physical resources should include equipment modified for people with special needs.</p>
--	--

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.

Customer requirements may include:

- backup procedures
- bandwidth
- congestion
- network connectivity
- power back up
- quality of service (QoS)
- redundancy
- wireless access.

WiMAX CPE equipment may include:

- indoor unit
- outdoor unit
- USB unit.

Authorised personnel may include:

- customer
- network administrator
- network planner
- project manager
- supervisor.

RANGE STATEMENT	
Tools may include:	<ul style="list-style-type: none"> • crimping tool • cable stripping tool • drill bits • screwdrivers • spanner • wall anchors and screws.
Equipment may include:	<ul style="list-style-type: none"> • compass • global positioning system (GPS) • inclinometer • laptop.
Hazards may include:	<ul style="list-style-type: none"> • building debris • earth potential rise • glass fibre • live power lines • manual handling • radio frequency (RF) equipment emitting radiation.
Relevant legislation, codes, regulations and standards may include:	<ul style="list-style-type: none"> • Australian Communications Industry Forum (ACIF) standards and codes • Australian Communications and Media Authority (ACMA) technical standards • Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) electromagnetic radiation (EMR) standard • AS/NZS 4268:2008 • AS/NZS 4295:2004 • AS/NZS 4415.1:2003 • AS/NZS 4582:1999 • AS/NZS 4583:1999 • AS/NZS 4769.1:2000 • AS/NZS 4770:2000 • Australian building codes and regulations • Australian standards • enterprise standards • environmental protection • equipment standards • European Telecommunications Standards Institute (ETSI) EN 300 220-1 • ETSI EN 301 406

RANGE STATEMENT	
------------------------	--

- | | |
|--|---|
| | <ul style="list-style-type: none">• fire regulations• heritage legislation• international standards• intrinsically safe lightning protection• local government• OHS• Radcoms Act• RSS-119• site engineering standards• spectrum planning reports• Telecommunications Act• Telecommunications Industry Alliance and Electronic Industries Alliance (TIA/EIA) standards. |
|--|---|

RANGE STATEMENT

OHS and environmental requirements may relate to:

- decommissioning and isolating worksite and lines prior to commencement
- identifying other services, including power and gas
- personal protective clothing:
 - earmuffs
 - gloves:
 - plastic
 - rubber
 - leather
 - head protection
 - head protection
 - kneepads
 - masks
 - protective suits
 - safety boots
 - safety glasses
 - safety harness
 - safety line
- safe working practices, such as the safe use and handling of:
 - asbestos
 - chemicals
 - materials
 - tools and equipment
 - work platforms
- safety equipment:
 - flashing lights
 - gas and other hazard detection equipment
 - safety barriers
 - trench guards
 - warning signs and tapes
 - witches hats
- special access requirements
- suitable light and ventilation
- environmental considerations:
 - clean-up protection
 - stormwater protection
- waste management.

RANGE STATEMENT	
<i>Indoor unit and accessories</i> may include:	<ul style="list-style-type: none"> • correct cable: <ul style="list-style-type: none"> • crossover • straight-through • optional extension module: <ul style="list-style-type: none"> • voice over internet protocol (VoIP) • wireless fidelity (WiFi) • power unit: <ul style="list-style-type: none"> • AC power • DC power adaptor • DC power supply • protection device: <ul style="list-style-type: none"> • lightning protection • surge protection.

Unit Sector(s)

Unit sector	Telecommunications
--------------------	--------------------

Co-requisite units

Co-requisite units		

Competency field

Competency field	Radio frequency networks
-------------------------	--------------------------