



Australian Government

MEM18059 Modify electronic systems

Release: 1

MEM18059 Modify electronic systems

Modification History

Release 1. Supersedes and is equivalent to MEM18059B Modify electronic systems

Application

This unit of competency defines the skills and knowledge required to undertake modifications to electronic systems and includes testing and evaluating the modified system.

Where soldering of components is required to advanced or military specifications, where the reliability of electrical connections is critical, or where surface mounted devices are being soldered/de-soldered then unit MEM05002 Perform high reliability soldering and desoldering should also be selected.

Where drafting skills are required unit MEM09003 Prepare basic engineering drawing and unit MEM09004 Perform electrical or electronic detail drafting should also be selected as appropriate.

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

Band: B

Unit Weight: 4

Pre-requisite Unit

MEM05001	Perform manual soldering/desoldering - electrical/electronic components
MEM09002	Interpret technical drawing
MEM11011	Undertake manual handling
MEM12004	Perform precision electrical/electronic measurement
MEM12023	Perform engineering measurements
MEM13015	Work safely and effectively in manufacturing and engineering
MEM16006	Organise and communicate information
MEM18001	Use hand tools
MEM18002	Use power tools/hand held operations
MEM18056	Diagnose and repair analog equipment and components

MEM18057	Maintain/service analog/digital electronic equipment
MEM18058	Modify electronic equipment
MEM18065	Diagnose and repair digital equipment and components

Competency Field

Maintenance and diagnostics

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1 Determine job requirements	1.1 Follow standard operating procedures (SOPs) 1.2 Comply with work health and safety (WHS) requirements at all times 1.3 Use appropriate personal protective equipment (PPE) in accordance with SOPs 1.4 Identify job requirements from specifications, drawings, job sheets or work instructions
2 Determine modification	2.1 Determine modification requirements by reference to schematics, circuit diagrams, documentation and/or consultation with appropriate authority 2.2 Analyse maintenance reports and system output information to confirm the need and nature of modification, where appropriate 2.3 Determine scope and nature of modifications, confirm with appropriate authority and record according to SOPs
3 Undertake modification/s	3.1 Undertake modification/s using appropriate tools, procedures and techniques 3.2 Amend circuit diagrams, schematics and equipment manuals to reflect modifications undertaken

Elements describe the essential outcomes.

Performance criteria describe the performance needed to demonstrate achievement of the element.

3.3 Update computer software, if required

4 Test and evaluate modified electronic systems

4.1 Check/test modifications and evaluate for compliance with desired outcome or specification using appropriate tools, test equipment and techniques

4.2 Recommend additional modification changes in accordance with SOPs, if required

Foundation Skills

This section describes those required skills (reading, writing, oral communication and numeracy) that are essential to workplace performance in this unit of competency.

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

Modifications include the following:

- approved design changes and/or replacement of components or sub-assemblies on electronic analog and digital systems
- updating proprietary software, where appropriate

Systems include one (1) or more of the following:

- computer
- process
- communication
- digital
- security/fire

Test equipment includes one (1) or more of the following:

- continuity testers
- ammeters
- voltmeters
- cathode ray oscilloscopes

This field allows for different work environments and conditions that may affect performance. Essential operating conditions that may be present (depending on the work situation, needs of the candidate, accessibility of the item, and local industry and regional contexts) are included.

- frequency counters
- signal generators
- digital probes

Unit Mapping Information

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Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2>

Assessment Requirements for MEM18059 Modify electronic systems

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy the requirements of the elements and performance criteria on at least two (2) occasions and include:

- following work instructions, standard operating procedures (SOPs) and safe work practices
- identifying and interpreting circuit diagrams, specifications, schematics, maintenance records, drawings, supplier catalogues and obtaining relevant data, including relevant maintenance reports and system output information with respect to modifying electronic systems
- obtaining approval for modifications to electronic systems from appropriate authorities and recording the proposed modifications in accordance with SOPs
- carrying out modifications on electronic analog or digital systems
- checking modified electronic system for compliance to specifications utilising appropriate test equipment
- programming computers, including uploading/downloading of proprietary software, where appropriate
- testing and evaluating modified electronic system for compliance to specifications
- amending circuit diagrams, schematics, equipment manuals, specifications affected by the modifications
- recording all modifications in accordance with SOPs.

Knowledge Evidence

Evidence required to demonstrate the required knowledge for this unit must be relevant to and satisfy the requirements of the elements and performance criteria and include knowledge of:

- safe work practices and procedures and use of personal protective equipment (PPE)
- implications of electro-static discharge (ESD) upon the electronic equipment
- advanced analog and digital electronics theory
- modifications to be made to the electronic system and reasons for undertaking the modification
- appropriate personnel to consult for technical advice
- probable causes for any detected trends and/or deviations from specification
- appropriate authority to authorise modifications to electronic systems and changes to documentation, circuit drawings and schematics

- procedures to be followed when undertaking and recording modifications to electronic systems
- tools and techniques to be used to modify the electronic system
- procedures for amending documents, circuit drawings and schematics
- procedures for checking the performance of the modified electronic system
- test equipment, techniques and operational specifications to be used to evaluate the modified electronic system
- deviations/variations of test results from operational specifications and probable causes of any deviations/variations from specification
- likely effect of further modifications on electronic system performance.

Assessment Conditions

- Assessors must:
 - have vocational competency in modifying electronic systems at least to the level being assessed with relevant industry knowledge and experience
 - satisfy the assessor requirements in the *Standards for Registered Training Organisations 2015* or its replacement and comply with the *National Vocational Education and Training Regulator Act 2011*, its replacement or equivalent legislation covering VET regulation in a non-referring state/territory as the case requires
- Where possible assessment must occur in operational workplace situations. Where this is not possible or where personal safety or environmental damage are limiting factors, assessment must occur in a sufficiently rigorous simulated environment that reflects realistic operational workplace conditions. This must cover all aspects of workplace performance, including environment, task skills, task management skills, contingency management skills and job role environment skills
- Conditions for assessment must include access to all tools, equipment, materials and documentation required, including relevant workplace procedures, product and manufacturing specifications
- Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

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