



Australian Government

UEEEEC0069 Troubleshoot digital sub-systems

Release: 1

UEEEEC0069 Troubleshoot digital sub-systems

Modification History

Release 1. This is the first release of this unit of competency in the UEE Electrotechnology Training Package.

Application

This unit involves the skills and knowledge required to troubleshoot digital sub-systems.

It includes working safely, applying problem-solving procedures, using measuring devices, and providing solutions from measurements and calculations to provide solutions in digital components circuits.

The skills and knowledge described in this unit require a licence or permit to practice in the workplace where work is carried out on electrical installations which are designed to operate at voltages greater than 50 volt (V) alternating (a.c.) or 120 V direct current (d.c.).

Competency development activities in this unit are subject to regulations directly related to licensing. Where a licence or permit to practice is not held, skills and knowledge described in this unit require a relevant contract of training, such as an Australian Apprenticeship.

Additional and/or other conditions may apply in some jurisdictions subject to regulations related to electrical work. Practice in the workplace and during training is also subject to work health and safety (WHS)/occupational health and safety (OHS) regulations.

Permits may also be required for some work environments, such as confined spaces, working aloft, near live electrical apparatus and site rehabilitation.

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

Pre-requisite Unit

UEECD0007 Apply work health and safety regulations, codes and practices in the workplace

UEEEEC0060 Repairs basic electronic apparatus faults by replacement of components

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

PERFORMANCE CRITERIA

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

1 Prepare to troubleshoot digital sub-systems

- 1.1** WHS/OHS processes and workplace procedures for a given work area are obtained and applied
- 1.2** WHS/OHS risk control work preparation measures and workplace procedures are followed
- 1.3** Scope of fault is obtained from documentation and/or work supervisor to determine work to be undertaken
- 1.4** Advice is sought from work supervisor to ensure the work is coordinated effectively with others
- 1.5** Sources of materials required for work are determined in accordance with workplace procedures
- 1.6** Tools, equipment and testing devices required for work are obtained and checked for correct operation and safety

2 Troubleshoot digital sub-systems

- 2.1** WHS/OHS risk control work measures and workplace procedures are followed
- 2.2** Need to test and measure live work is determined in accordance with WHS/OHS requirements and workplace procedures
- 2.3** Circuits are checked and isolated in accordance with WHS/OHS requirements and workplace procedures
- 2.4** Fault finding of digital components is conducted using measured and calculated values of parameters in accordance with workplace procedures
- 2.5** Unplanned situations are dealt with safely and with approval of relevant person/s
- 2.6** Fault-finding activities are carried out efficiently without waste of materials or damage to apparatus, the surrounding environment or services using sustainable energy practices

3 Complete work and document troubleshooting

- 3.1** WHS/OHS work completion risk control measures and workplace procedures are followed

activities

- 3.2 Worksite is cleaned and made safe in accordance with workplace procedures
- 3.3 Work completion is documented and relevant person/s notified in accordance with workplace procedures

Foundation Skills

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

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEE Electrotechnology Training Package Companion Volume Implementation Guide.

Troubleshooting a digital sub-system must include the following:

- at least three digital components/circuits or functions
- at least three faults

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH112A Troubleshoot digital sub-systems.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>

Assessment Requirements for UEEEC0069 Troubleshoot digital sub-systems

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - using risk control measures
- calculating parameters correctly and accurately
- carrying out fault-finding activities without waste and damage to materials, apparatus, environment or services
- checking and isolating circuits
- dealing with unplanned situations safely and with approval of relevant person/s
- determining sources of material required for work
- measuring and calculating values of parameters in fault finding
- obtaining and checking tools, equipment and testing devices for correct operation and safety
- obtaining scope of fault from documentation and/or work supervisor
- preparing to troubleshoot digital sub-systems
- seeking advice from work supervisor to ensure work is coordinated
- testing and measuring live circuits
- troubleshooting digital sub-systems
- using sustainable energy practices.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements, performance criteria and range of conditions and include knowledge of:

- analogue and digital signals
- binary addition and subtraction
- combinational logic circuits, including logic gate types and characteristics, truth tables and logic gate operation
- digital building blocks, including clocks, multiplexers and demultiplexers, encoders and

- decoders, counters, flip-flops, latches and registers
- digital displays, including liquid-crystal display (LCD) and 7-segment
- digital fault-finding principles
- digital numbering schemes, including binary, hexadecimal, binary-coded decimal (BCD), American Standard Code for Information Interchange (ASCII) and Unicode
- digital sub-system building blocks
- electrostatic precautions when handling devices,
- logic families (CMOS and transistor-transistor logic (TTL)), including comparisons, input and output types, unit load and noise margin
- numbering systems, including conversions
- principles of analogue-to-digital and digital-to-analogue conversion
- problem-solving techniques
- relevant checking and isolating circuit methods
- relevant circuit measurements and parameter values calculations
- relevant digital sub-systems
- relevant industry standards
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications and operating instructions
- relevant materials, tools, equipment and testing devices
- relevant testing and measuring methods
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace instructions, policies and procedures, including handling sensitive electronic components
- sustainable energy principles.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in simulated suitable workplace operational situations that replicate workplace conditions.

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.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or simulations
- relevant and appropriate materials, tools, facilities, equipment and relevant industry standards currently used in industry

- resources that reflect current industry practices in relation to troubleshooting digital sub-systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

Companion Volume implementation guides are found in VETNet - -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b8a8f136-5421-4ce1-92e0-2b50341431b6>