



Australian Government

UEEEEC0014 Design signal-conditioning sub-systems

Release: 1

UEEEEC0014 Design signal-conditioning 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 design signal-conditioning sub-systems incorporating digital and analogue elements.

It includes following design brief, applying knowledge of digital and analogue devices, interpreting device specifications, constructing prototypes, testing developed system prototype operation, and documenting design and development work.

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

Pre-requisite Unit

Not applicable

Competency Field

Electronics and Communications

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Identify design signal-conditioning sub-system requirements

PERFORMANCE CRITERIA

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

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) processes and workplace procedures for a given work area are obtained and applied
- 1.2** Hazards are identified, WHS/OHS risks are assessed, control measures and workplace procedures are

implemented in preparation for work

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| | 1.3 | Scope of proposed signal-conditioning sub-system is determined from design brief in consultation with appropriate person/s |
| | 1.4 | Design signal-conditioning sub-systems development work is planned to meet scheduled timelines in consultation with person/s involved on the worksite |
| | 1.5 | Materials and devices/components required for work are determined on compatibility of their specifications with data acquisition system requirements and project budget constraints |
| 2 Design signal-conditioning sub-system | 2.1 | WHS/OHS risk control work measures and workplace procedures are followed |
| | 2.2 | Digital and analogue device elements used in signal-conditioning sub-systems and relevant industry standards are applied to the design specification |
| | 2.3 | Alternative design/s are considered based on the design brief |
| | 2.4 | Safety, functional and budget considerations are incorporated in the design specification |
| | 2.5 | Prototype devices and circuits are constructed, programmed and tested for compliance with design brief and regulatory requirements |
| | 2.6 | Prototype faults are rectified and retested to ensure effective operation of design |
| | 2.7 | Design specifications are documented for submission to appropriate person/s for approval |
| | 2.8 | Solutions to unplanned situations are implemented in accordance with workplace policy |
| 3 Obtain design approval for signal-conditioning sub-system | 3.1 | Signal-conditioning sub-system design is presented and explained to client representative and/or relevant person/s |
| | 3.2 | Modifications to design are negotiated with relevant person/s within the constraints of workplace policy, as required |
| | 3.3 | Final sub-system design is documented and approval |

obtained from appropriate person/s

- 3.4** Quality of work is monitored against performance agreement and/or workplace or industry standards

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.

Unit Mapping Information

This unit replaces and is equivalent to UEENEEH185A Design signal-conditioning subsystems.

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 UEEEC0014 Design signal-conditioning 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 and performance criteria on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements
- constructing signal-conditioning sub-systems prototype
- dealing with unplanned situations in accordance with workplace procedures
- developing outlines of alternative designs
- developing the design within the safety and functional requirements, and budget constraints
- documenting and presenting design effectively
- negotiating design alteration requests
- planning to design signal-conditioning sub-systems
- reading and interpreting design brief.

Knowledge Evidence

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

- comparator circuits (open loop, limited swing and hysteresis) using operational amplifiers
- design brief specifications and work requirements
- differential amplifiers of suitable characteristics
- feedback control systems basics
- operational amplifier circuits
- principles of signal conditioning
- relevant industry standards, regulations, codes of practice and WHS/OHS legislated requirements
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant workplace documentation
- relevant workplace policies and procedures
- sensors and transducers.

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 suitable simulated 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 and equipment currently used in industry
- resources that reflect current industry practices in relation to designing signal-conditioning sub-systems
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

Links

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