



Australian Government

UEEIC0006 Design and configure Human-Machine Interface (HMI) networks

Release: 1

UEEIC0006 Design and configure Human-Machine Interface (HMI) networks

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 and configure human-machine interface (HMI) networks.

It includes applying safe working practices; designing, installing and configuring controllers and devices; monitoring system operations; diagnosing malfunctions and faults; and documenting development activities.

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

Pre-requisite Unit

Not applicable

Competency Field

Instrumentation & Control

Unit Sector

Electrotechnology

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Select and design HMI control system network

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 identified, obtained and applied
- 1.2** Hazards are identified, WHS/OHS risks assessed, and

- control measures and workplace procedures are implemented in preparation for work
- 1.3** Scope of HMI control system network is determined from network specifications/design brief and in consultation with relevant person/s
 - 1.4** Activities are planned to meet scheduled specifications/design brief timelines in consultation with person/s involved in the work
 - 1.5** Management tools and software are selected based on specified requirements and performance standards
 - 1.6** Strategies are implemented to ensure network development is carried out efficiently
- 2 Install, configure and manage HMI control system network**
- 2.1** WHS/OHS risk control measures and workplace procedures for carrying out work are followed
 - 2.2** Network infrastructure components are installed and configured in accordance with industry standards and variants as specified for the network
 - 2.3** Structural components of directory services are installed and configured in accordance with industry standards and variants as specified for the network
 - 2.4** Management components of network control system are configured in accordance with industry standards and requirements specified for the network
 - 2.5** Security components of network control system are created in accordance with industry standards and requirements specified for the network
 - 2.6** Network malfunctions/faults are identified and rectified using logical problem-solving techniques of complex network control system infrastructure
 - 2.7** Network is monitored and solutions are developed to optimise network performance and reliability in accordance with workplace procedures
 - 2.9** Security events are analysed and actions taken in accordance with workplace policies and protocols
 - 2.10** Methods for dealing with unplanned issues/problems are analysed to provide the most effective solutions in

		accordance with workplace procedures
	2.11	Quality of work is monitored in accordance with performance agreement/specifications and/or workplace procedures or industry standards
3 Report HMI network administration activities	3.1	Written justification is produced for HMI network services development activities and relevant person/s notified in accordance with workplace procedures
	3.2	Network service development records are maintained 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.

Designing and configuring HMI networks must include at least the following:

- controllers and devices installation and configuration
- development activities documentation
- malfunctions and faults diagnostics
- operation of distributive and central control system networks monitoring and maintenance
- safe working practices
- system operations monitoring

Unit Mapping Information

This unit replaces and is equivalent to UEENEEI153A Design and configure Human-Machine Interface (HMI) networks.

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 UEEIC0006 Design and configure Human-Machine Interface (HMI) networks

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 problem-solving techniques
- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - implementing workplace procedures and practices
 - using of risk control measures
- applying sustainable energy principles and practices
- configuring management components of human-machine interface (HMI) network services
- creating security components of HMI network services
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- developing solutions to optimise network performance
- documenting HMI network services development activities
- establishing network services to be developed
- identifying and rectifying HMI network malfunctions/faults
- installing and configuring network infrastructure components
- installing and configuring structural components of directory services
- installing, configuring and managing HMI control system networks
- preparing to design control system networks
- reporting network administration activities in accordance with workplace procedures.

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:

- problem-solving techniques and troubleshooting remote access including remote access policy, configuration of remote access profile, virtual private network (VPN), multi-link connection, routing and remote access for dynamic host configuration protocol (DHCP)

- control system networks interface
- DHCP
- HMI control system networks
- installation, configuring and troubleshooting of internet protocol (IP) routing protocols including updating routing tables and implementing demand-dial routing
- internet naming services in a network
- IP routing, including border routing, internal routing and IP routing protocols
- network address translation (NAT)
- network infrastructure
- network protocols
- open and common proprietary control system networks models (layers) and protocols, including CANopen, ControlNet, devicenet, ethernet, foundation fieldbus, interbus, modbus and profibus
- purpose and application of HMI control system networks systems
- relevant certificate services
- relevant domain name service (DNS)
- relevant job safety assessments or risk mitigation processes
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation
- relevant workplace policies and procedures
- remote access security including authentication protocols, encryption protocols and access policy.

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, equipment currently used in industry
- resources that reflect current industry practices in relation to designing and configuring HMI networks
- 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>