![Australian Government](Australian Government logo with Commonwealth Coat of Arms)

MEM29013 Integrate sensors into digital manufacturing processes

Release: 1

MEM29013 Integrate sensors into digital manufacturing processes

Modification History

Not applicable.

Application

This unit defines the skills and knowledge required to prepare, configure and test sensors for integration into other digital advanced manufacturing systems and technologies including those covered under the term Industry 4.0. The term sensor is used in this unit for devices that receive a stimulus signal and convert the signal to an electrical signal either within the sensor (i.e. a transducer) or with the aid of an external processor. The term transducer is only used where the distinction between onboard and external processing is important in the unit. Sensors covered by the skills and knowledge in the unit are often referred to as smart sensors and transducers and are usually wireless, distributed, and networked.

The unit applies to individuals responsible for integrating smart sensors with other Industry 4.0 systems and processes to ensure effective data identification, communication, and processing as well as monitoring and control of physical processes. The unit does not include mechanical or electronic maintenance or repair of sensors or connection to electricity supply levels that require an electrical licence.

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

Pre-requisite Unit

Nil.

Competency Field

Applied technologies

Elements and Performance Criteria

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
1. Select appropriate sensor for a required application	1.1 Identify workplace health and safety (WHS) procedures and risk control measures relevant to the selection of sensors in manufacturing and engineering 1.2 Identify and review data required to be gathered by sensor

Elements	Performance Criteria
Elements describe the essential outcomes.	Performance criteria describe the performance needed to demonstrate achievement of the element.
	1.3 Identify optimal location for sensor
	1.4 Review up and downstream sensor communication requirements
	1.5 Identify if on board, next stage, or remote processing of sensor or transducer data is required
	1.6 Select optimal sensor connectivity option
	1.7 Select optimal sensor for location and data collection requirements
2. Identify opportunities for using sensors and transducers to optimise Industry 4.0 related systems	2.1 Recommend sensor strategy for improved process monitoring
	2.2 Recommend sensor strategy for improved predictive and preventative maintenance
	2.3 Recommend sensor strategy for improved use of robotics and automation
	2.4 Recommend sensor strategy for improved quality management
	2.5 Recommend sensor strategy for improved waste control
3. Install and configure sensors	3.1 Mount sensor according to manufacturer's instructions and workplace requirements
	3.2 Install shielding or case in accordance with manufacturer's specifications
	3.3 Install and test connections and interfacing in accordance with manufacturer's specifications
	3.4 Calibrate sensor according to manufacturer's instructions and workplace requirements

Foundation Skills

This section describes those language, literacy, numeracy and employment skills that are essential to performance.

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.

Industry 4.0 related systems include one or more of the following:	- industrial internet of things (IIoT) devices - collaborative robots - networked and cloud connected traditional robots and other industrial automation - networked and cloud connected supervisory control and data acquisition systems (SCADA) - networked and cloud connected enterprise resource planning (ERP) systems - networked and cloud connected CAD and CAM systems - digital twins - augmented and virtual reality systems - networked and cloud connected CNC and additive manufacturing machines - networked and cloud connected data storage and processing facilities - networked and cloud connected edge devices - other networked and cloud connected digital devices and systems relevant to the workplace.
Physical properties measured by sensors include one or more of:	- temperature - pressure - position - weight - vibration - gas and liquid flow - location - proximity - movement - state/phase - conductivity - magnetism - other physical properties.

Unit Mapping Information

No equivalent unit

Links

Companion Volume Implementation Guides are found in VETNet - https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b7050d37-5fd0-4740-8f7d-3b7a49c10bb2