

National Added Value Unit Specification



Unit title: Developing an Electronic Solution (National 4)

SCQF: level 4 (6 SCQF credit points)

Unit code: to be advised

Unit outline

This is the Added Value Unit in the Practical Electronics (National 4) Course. The general aim of this Unit is to enable the learner to provide evidence of added value for the Practical Electronics (National 4) Course through the successful completion of a practical activity which will allow the learner to demonstrate challenge and application.

Learners who complete this Unit will be able to:

- 1 Develop, with guidance, an electronic solution which will draw on and apply skills and knowledge of designing, simulating and constructing electronic circuits

This Unit is a mandatory Unit of the Practical Electronics (National 4) Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Course Support Notes*, which provide advice and guidance on delivery and assessment approaches. Exemplification of the assessment in this Unit is given in the *National Assessment Resource*.

Recommended entry

Entry to this Unit is at the discretion of the centre. It is recommended that the learner should be in the process of completing, or have completed, the Units of the Practical Electronics (National 4) Course:

- ◆ Circuit Design (National 4)
- ◆ Circuit Simulation (National 4)
- ◆ Circuit Construction (National 4)

Equality and inclusion

This Unit Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information please refer to the *Course Support Notes*.

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

- 1 Develop, with guidance, an electronic solution which will draw on and apply skills and knowledge of designing, simulating and constructing electronic circuits by:**
 - 1.1 Analysing a straightforward problem specification
 - 1.2 Designing an electronic solution to the problem
 - 1.3 Constructing an electronic solution to the problem
 - 1.4 Applying safe working practices
 - 1.5 Testing and reporting on the solution to the problem

Evidence Requirements for the Unit

This Added Value Unit will be assessed internally by the teacher/lecturer.

Evidence for this Unit will be generated through a practical activity in which the learner will draw on and apply skills and knowledge related to designing, simulating and constructing electronic circuits.

The practical activity will assess learners' skills in analysing a problem, designing a solution to the problem, simulating or constructing a solution to the problem, and testing and reporting on that solution.

Some possible exemplar specifications for the practical activity are suggested in the *Course Support Notes*.

- ◆ The specification for the practical activity will be agreed between the learner and the teacher/lecturer.
- ◆ The practical activity should clearly demonstrate application of knowledge and skills, at an appropriate level, related to designing, simulating and constructing electronic circuits (as defined in the 'Further mandatory information on Course coverage' section of this document).
- ◆ The teacher/lecturer will provide overall guidelines for the activity and a list of questions/tasks/prompts which will lead learners through the activity in clear stages.
- ◆ The activity will be carried out under supervised open book conditions.
- ◆ The teacher/lecturer may also give learners support and guidance, as appropriate to National 4 level, to help them progress through each stage of the activity; where a significant amount of support is provided, this should be reflected in the assessment decision. All learners should be provided with a clear outline of the assessment, including when and how they will be assessed. The teacher/lecturer should offer the learner guidance on an appropriate choice of activity, including questions/tasks/prompts which will lead learners through the assignment in clear stages. It would be reasonable for the activity choice the learner makes to be one where the teacher/lecturer has some expertise and has resources available to enable the learner to more successfully meet the Assessment Standards.

- ◆ The activity will be a meaningful and appropriately challenging task. Within the notional 40 hours for the Unit, time will be required for:
 - preparation for the activity, which could include considering exemplar activities and practising the application and integration of skills
 - carrying out the stages of the activity, with teacher guidance and support
 - assessing the process and completed solution
 - providing opportunities for re-assessment if required
- ◆ Evidence should include:
 - the completed solution
 - a record of progress through the activity (such as an informal log or blog produced by the learner)
 - a short report on the testing of the solution (in written, electronic or oral form)

Further information is provided in the exemplification of assessment in the *National Assessment Resource*. Advice and guidance on possible approaches to assessment is provided in the *Course Support Notes*.

Development of skills for learning, skills for life and skills for work

Please refer to the Course Specification for information about skills for learning, skills for life and skills for work.

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Further mandatory information on Course coverage for the Practical Electronics (National 4) Course

The following gives details of mandatory skills, knowledge and understanding for the Practical Electronics (National 4) Course. Assessment of this Added Value Unit will involve selecting appropriate skills, knowledge and understanding from those listed below, in line with the Evidence Requirements above. This list of skills, knowledge and understanding also provides the basis for the assessment of all the Units in the Course.

Components and concepts

Concepts

- ◆ current, voltage and resistance
- ◆ analogue/digital

Components

- ◆ power supplies
- ◆ resistors (inc. variable)
- ◆ LEDs, diodes, lamps
- ◆ capacitors, transistors, switches
- ◆ connectors and wires
- ◆ ICs (logic gates, 555 timer)

Combinational logic

- ◆ AND, OR and NOT

Input devices, including LDR, thermistor and switch

Process devices, including transistor switch and logic gates

Output devices, including lamp, LED, motor and buzzer

Circuit construction

Use of prototype board, strip board and PCB

Wiring and assembly techniques, including:

- ◆ crimp connections, terminal block
- ◆ heat shrink, spiral wrap
- ◆ cable ties, markers
- ◆ stripping and connecting
- ◆ bundling and fixing

Safe working practices:

- ◆ safe use of tools including soldering irons
- ◆ eye protection

Administrative information



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Superclass: to be advised

History of changes

Version	Description of change	Authorised by	Date

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