

# ENGINEERING PROGRAMMABLE SYSTEMS

*Moderators' report*

INCLUDED ON THE  
KS4 PERFORMANCE TABLES

OCR Level 1/Level 2

## Cambridge National in Engineering Programmable Systems

**J824**

For first teaching in 2022 | Version 1

**R048 Summer 2023 series**

[ocr.org.uk/cambridgenationals](https://ocr.org.uk/cambridgenationals)



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## Introduction

Our Lead Moderators' reports are produced to offer constructive feedback on centres' assessment of moderated work, based on what has been observed by the moderation team. These reports include a general commentary of accuracy of internal assessment judgements; identify good practice in relation to evidence collation and presentation and comments on the quality of centre assessment decisions against individual Learning Objectives. This report also highlights areas where requirements have been misinterpreted and provides guidance to centre assessors on requirements for accessing higher mark bands. Where appropriate, the report will also signpost to other sources of information that centre assessors will find helpful.

OCR completes moderation of centre-assessed work in order to quality assure the internal assessment judgements made by assessors within a centre. Where OCR cannot confirm the centre's marks, we may adjust them in order to align them to the national standard. Any adjustments to centre marks are detailed on the Moderation Adjustments report, which can be downloaded from Interchange when results are issued. Centres should also refer to their individual centre report provided after moderation has been completed. In combination, these centre-specific documents and this overall report should help to support centres' internal assessment and moderation practice for future series.

## Online courses

We have created online courses to build your confidence in delivering, marking and administering internal assessment for our qualifications. Courses are available for Cambridge Nationals, GCSE, A Level and Cambridge Technicals (2016).

### Cambridge Nationals

All teachers delivering our redeveloped Cambridge Nationals suite from September 2022 are asked to complete the Essentials for the NEA course, which describes how to guide and support your students. You'll receive a certificate which you should retain.

Following this you can also complete a subject-specific Focus on Internal Assessment course for your individual Cambridge Nationals qualification, covering marking and delivery.

Please note, the content for this report is based on candidate work submitted in the June 2023 series and does not include work from the extraordinary autumn submission opportunity. It is possible that not all units are covered within the report, however candidate style work is available for all internally-assessed units on Teach Cambridge and candidate exemplars from the 2023 series will be available from the autumn.

### GCSE, A Level and Cambridge Technicals (2016)

We recommend all teachers complete the introductory module Building your Confidence in Internal Assessment, which covers key internal assessment and standardisation principles.

Following this you will find a subject-specific course for your individual qualification, covering marking criteria with examples and commentary, along with interactive marking practice.

## Accessing our online courses

You can access all our online courses from our teacher support website [Teach Cambridge](#).

You will find links relevant to your subject under Assessment, NEA/Coursework and then Online Courses from the left hand menu on your Subject page.

If you have any queries, please contact our Customer Support Centre on 01223 553998 or email [support@ocr.org.uk](mailto:support@ocr.org.uk).

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If you do not have access to Acrobat Professional there are a number of **free** applications available that will also convert PDF to Word (search for PDF to Word converter).

## General overview

It is important for moderators to receive candidate work from centres by the deadline date. Delayed submission of samples slows down the moderation process and the resolution of issues, should they arise during moderation.

Centres should check carefully what sample work is being requested for moderation and make sure that the correct sample of candidates is sent to the moderator.

A completed Unit Recording Sheet (URS) is required for each candidate in the requested sample. Without a correctly completed URS for each candidate moderation cannot take place and will be delayed.

Please make sure that all candidates are correctly identified on their paperwork with the correct candidate number. This includes in the naming of electronic files.

### Clerical errors

Please carefully check the addition of marks on the URS and their transcription to Interchange. If they are incorrectly totalled or transcribed, we will need to reconfirm them with centres at moderation. This introduces delay to the moderation process.

A copy of the IMS1 mark sheet generated by Interchange is no longer required to be sent to your moderator and can be retained in centre.

### Marker comments on the URS

Marker commentary on the URS, along with clear indication of how the mark given is derived, helps greatly with the moderation process. Page numbers of where evidence can be found in the candidate evidence is also extremely useful. Candidate work can also be directly annotated showing where each Topic Area and mark band is being addressed.

Centres are reminded that work cannot be double counted, and if used as evidence for one Topic Area should not be used for others. This is also the case for work that overlaps more than one Topic Area or Unit within the qualification. Work that is double counted might be discounted if found during moderation, thereby disadvantaging the candidate.

### Internal standardisation

If more than one marker is marking a cohort of work, it is crucial to standardise marking across markers. Internal standardisation makes sure that the marks presented are accurate and consistent, and that the rank order of marks is maintained. Rank order errors are referred back to the centre by the moderator and often require the centre to remark work, thereby delaying the moderation process.

Photographic evidence should be annotated by the candidate to explain what is being presented. It should also clearly identify the candidate using their candidate number.

## Authentication

It is essential that candidate work is authentic. This means that it is individual, and that sources of information are referenced. This is not only good practice but avoids the risk of penalties being applied. Moderators check for authenticity during moderation, referring any suspected cases to OCR for further investigation. This will delay moderation and may have serious consequences for the centre and candidate. Copies of Candidate and Unit authentication statements are required to be completed and should be kept in centre in case they are requested. They do not need to be sent to the moderator.

Centres must use the Teacher Observation Records (TORs) included with the Live Assessments to support and corroborate candidate-generated evidence where independence is part of the marking criteria. Where a TOR is not included, and the Topic Area requires the corroboration of independence then this should be noted on the URS.

## Teacher Observation Records (TORs)

TORs are used to support and corroborate evidence produced by candidates and are useful where this evidence is difficult to show directly. Examples include working independently, working safely, and producing high quality finished items. They cannot be used as a direct source of evidence when the candidate is able to produce evidence themselves. Moderation will impose penalties where a TOR is used incorrectly. TORs should be individualised for each candidate, and not all be identical.

Full guidance on how to use the TOR correctly can be found alongside the supplied TOR each Live Assessment brief, with further guidance on the OCR website.

## Unit R048 General overview

There was good evidence in this unit of candidates being able to use software to create and simulate an electronic circuit, and to produce a PCB layout. Step by step evidence of safely making and populating the PCB was sometimes a little disappointing, as was evidence of testing and evaluation.

### Comments by Topic Area

#### Topic Area 1: Drawing and simulating electronic circuits

For Task 1 there was often good evidence of candidates being able to use software to create a circuit schematic diagram, and the circuit being simulated. Occasionally there was limited evidence of simulation, or of any circuit corrections through testing as is required for this task.

The task also requires candidates to demonstrate how they can use software to produce a PCB layout – which should include both track and component views. Annotated screenshots are an effective way to illustrate simulation and show PCB layout production.

#### Topic Area 2: Constructing electronic circuits

Task 2 asks candidates to safely manufacture a blank PCB and to populate the PCB using suitable components. While it was often clear that candidates had done this, their submission often lacked evidence of safely manufacturing the PCB (e.g. by (photo) etching or engraving).

Candidates need to clearly show step by step evidence of making the blank PCB and then populating the PCB with components. Health and safety is an essential requirement of this task and could be addressed using risk assessments.

It is the intention of this task that candidates use the PCB they have produced themselves to populate and test, and not be supplied with a pre-manufactured board for populating components to.

Annotated photographs are an excellent way for candidates to show step by step evidence of circuit construction. This task relies both on direct evidence from the candidate, and additional supporting evidence of independent working using a TOR. Evidence of independent working can be corroborated using the TOR supplied with the Set Assignment brief.

#### OCR support



Teacher Observation Records (TORs):

A blank TOR template along with full guidance on its use for Task 2 can be found in the Set Assignment brief.

It is important to remember that they cannot be used as a substitute for direct evidence that the candidate can produce. They should only be used to support and corroborate things like independent and safe working, or the quality of a finished product.

### Topic Area 3: Testing electronic circuits

Task 3 requires clearly presented evidence of testing, which could include visual inspection and taking of measurements using suitable instrumentation (e.g. multimeter, oscilloscope, logic probe).

In a few cases, there was limited evidence of testing and little or no measurements recorded.

An effective way to produce evidence for this task is for candidates to include annotated photographs showing testing taking place, and for them to produce a table of readings – comparing actual with expected values.

Candidates are also required to identify any faults in their own circuit. If their circuit contains no faults, then teachers should have circuits with known faults for candidates to use to identify faults to complete this part of the task.

Finally, an evaluation of the construction and operation of the circuit is required to secure marks in the higher mark bands.

#### Assessment for learning



##### Evaluation:

- Task 3 provides an excellent opportunity to develop skills of evaluation by evaluating how well the circuit was constructed, and how well it operates.



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## Teach Cambridge

Make sure you visit our secure website [Teach Cambridge](#) to find the full range of resources and support for the subjects you teach. This includes secure materials such as set assignments and exemplars, online and on-demand training.

**Don't have access?** If your school or college teaches any OCR qualifications, please contact your exams officer. You can [forward them this link](#) to help get you started.

## Reviews of marking

If any of your students' results are not as expected, you may wish to consider one of our post-results services. For full information about the options available visit the [OCR website](#).

## Access to Scripts

For the June 2023 series, Exams Officers will be able to download copies of your candidates' completed papers or 'scripts' for all of our General Qualifications including Entry Level, GCSE and AS/A Level. Your centre can use these scripts to decide whether to request a review of marking and to support teaching and learning.

Our free, on-demand service, Access to Scripts is available via our single sign-on service, My Cambridge. Step-by-step instructions are on our [website](#).

## Keep up-to-date

We send a monthly bulletin to tell you about important updates. You can also sign up for your subject specific updates. If you haven't already, [sign up here](#).

## OCR Professional Development

Attend one of our popular CPD courses to hear directly from a senior assessor or drop in to a Q&A session. Most of our courses are delivered live via an online platform, so you can attend from any location.

Please find details for all our courses for your subject on **Teach Cambridge**. You'll also find links to our online courses on NEA marking and support.

## Signed up for ExamBuilder?

**ExamBuilder** is the question builder platform for a range of our GCSE, A Level, Cambridge Nationals and Cambridge Technicals qualifications. [Find out more](#).

ExamBuilder is **free for all OCR centres** with an Interchange account and gives you unlimited users per centre. We need an [Interchange](#) username to validate the identity of your centre's first user account for ExamBuilder.

If you do not have an Interchange account please contact your centre administrator (usually the Exams Officer) to request a username, or nominate an existing Interchange user in your department.

## Active Results

Review students' exam performance with our free online results analysis tool. It is available for all GCSEs, AS and A Levels and Cambridge Nationals.

[Find out more](#).

## Need to get in touch?

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Call us on  
**01223 553998**

Alternatively, you can email us on  
**support@ocr.org.uk**

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