



INTERNAL ASSESSMENT APPROVAL FORM (INCLUDING COLLABORATIVE PROVISION)

This form is used to ensure that assessment specifications have been through an internal review process prior to external examination/approval and release to students. It should be completed for each assessment for a particular module. The assessment tasks, criteria and marking scheme should accompany this form.

PARTNER (and taught location if relevant):	Coleg Sir Gar				
EXTERNAL EXAMINER NAME:	Dr Alison Griffiths				
ASSESSMENT AUTHOR :	Robert Davies				
MODULE TITLE:	Programmable Logic Controllers				
MODULE CODE:	SGEE4004		MODULE LEVEL:	4	
COMPONENT NO. (e.g. 1 of 2):	1 of 2		COMPONENT WEIGHTING (e.g. 50% of the module):	50%	
ASSESSMENT PERIOD	☒ Semester 1	☐ Semester 1 <i>Re-sit</i>	☐ Semester 2	☐ Semester 2 <i>Re-sit</i>	<i>Other, please state</i>
TYPE OF ASSESSMENT:	☒ Coursework		☐ Examination		☐ Practical
LANGUAGE OF ASSESSMENT:	English		TRANSLATION REQUIRED (Y/N):	N	
FOR EXAMINATIONS ONLY. SPECIFY BELOW ANY ADDITIONAL MATERIAL(S) TO BE USED IN THE EXAMINATION					
<i>This box will expand as you type</i>					

INTERNAL MODERATOR PLEASE TICK TO INDICATE THAT THE ASSESSMENT INCLUDES:		<i>Please</i> ✓		Comments
		YES	NO	
1	Tasks that are specified clearly, accurately and comprehensibly, with appropriate use of language and neat presentation	☒	☐	
2	Tasks which enable the module learning outcomes to be demonstrated (as per the module syllabus)	☒	☐	
3	Tasks which conform to the assessment described in the module syllabus	☒	☐	
4	Tasks which are written at the appropriate level of the Framework for Higher Education Qualifications (see http://www.gaa.ac.uk/docs/gaa/quality-code/qualifications-frameworks.pdf?sfvrsn=170af781_14).	☒	☐	
5	Clear criteria for assessment and guidance about how marking/grading will be applied	☒	☐	
6	Guidance about expected evidence for submission, e.g. essay or report, word count, bibliography and references	☒	☐	
7	Reference to good academic conduct, for example referencing, plagiarism and Turnitin	☒	☐	
8	Actions to complete			
<i>This box will expand as you type</i>				

SIGNATURE OF APPROVAL:	SIGNATURE	DATE
INTERNAL MODERATOR: I confirm that this version of the assessment specification is ready to be sent to the Partnership Team Leader		23/11/2020

ONLY TO BE COMPLETED IF THE ASSESSMENT IS LINKED TO A COLLABORATIVE PARTNER

PARTNERSHIP TEAM LEADER PLEASE TICK TO INDICATE THAT THE ASSESSMENT INCLUDES:		Please ✓		Comments
		YES	NO	
1	Tasks that are specified clearly, accurately and comprehensibly, with appropriate use of language and neat presentation			
2	Tasks which enable the module learning outcomes to be demonstrated (as per the module syllabus)			
3	Tasks which conform to the assessment described in the module syllabus			
4	Tasks which are written at the appropriate level of the Framework for Higher Education Qualifications (see http://www.gaa.ac.uk/docs/gaa/quality-code/qualifications-frameworks.pdf?sfvrsn=170af781_14).			
5	Clear criteria for assessment and guidance about how marking/grading will be applied			
6	Guidance about expected evidence for submission, e.g. essay or report, word count, bibliography and references			
7	Reference to good academic conduct, for example referencing, plagiarism and Turnitin			
8	Actions to complete <i>This box will expand as you type</i>			

SIGNATURE OF APPROVAL:	SIGNATURE	DATE
PTL: I confirm that this version of the assessment specification is ready to be sent to the External Examiner		

UWTSD PROVISION: please submit the completed document to the appropriate Programme Director.

COLLABORATIVE PROVISION: please submit the completed document (or make available electronically) to the Partnership Team Leader. This must be in accord with specific arrangements for sharing electronic documents (e.g. via SharePoint or similar).

The assessment tasks, criteria and marking scheme should accompany this form

THIS DOCUMENT IS ALSO AVAILABLE IN WELSH

LEVEL 4 ASSESSMENT SPECIFICATION

Student name:		Student ID number:	
Programme:	HNC Electrical and Electronic Engineering		
Module:	PROGRAMMABLE LOGIC CONTROLLERS		
Module code:	SGEE4004	Contribution to Overall Module Assessment (%):	50
Lecturer:	Robert Davies	Internal Verifier:	Robert Jenkins
Assignment Title:	1. Pick and Place Robot	Word count (or equivalent):	2500
Submission deadline:	18 th January 2021	Return date of provisional marks & written feedback:	18 th February 2021
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Module Learning Outcomes (from module syllabus)

1. Demonstrate an understanding of the standard methods used for programming PLCs for a range of industrial applications.
2. Apply basic PLC system design and implementation processes, comparing theoretical expectations to actual outputs ensuring correct operation with consideration of maintenance and reliability.

TASK DESCRIPTION

Aims and Objectives

The purpose of this assignment is to introduce you to PLC system design concepts for an industrial process involving a pick and place robot where sequencing is a key factor. You will use the IEC programming languages available and their usage, I/O (input and output) device listing, basic program design, testing and documentation. You will be required to work in small teams and will need to demonstrate the ability to develop a system that includes maintenance and reliability checking, and customer and user needs.

Figure 1 shows the pick and place robot to be controlled in this assignment. The axes of the robot are operated by pneumatic pistons controlled by solenoid valves. This allows the robot to move in, out, left, right, up and down while the gripper of the robot can also be opened and closed. There are reed switch sensors distributed around the robot that give indication of the position of each piston. There are four stations, the first being at the bottom of the entry chute and the last being on the top of the exit chute. A proximity switch on the entry chute provides senses an object entering and could be used to automatically trigger the sequence.

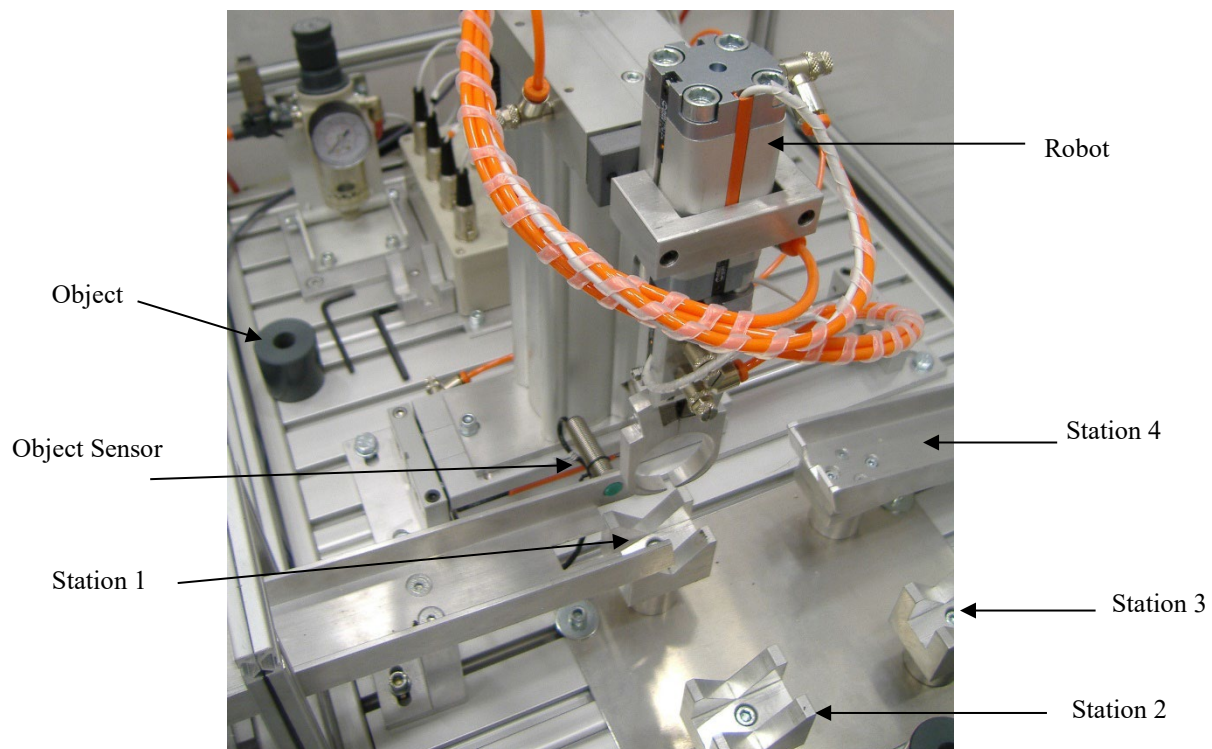


Figure 1: Pick and Place Robot

The overview diagram of figure 2 shows the robot stations 1 to 4 together with the location of the object sensor. The robot sensors and solenoids are connected to a Siemens S7-1214 PLC. There are 3 pushbuttons and 2 rocker switches also connected to the PLC. Compressed air is supplied to the solenoid manifold at around 4 bar.

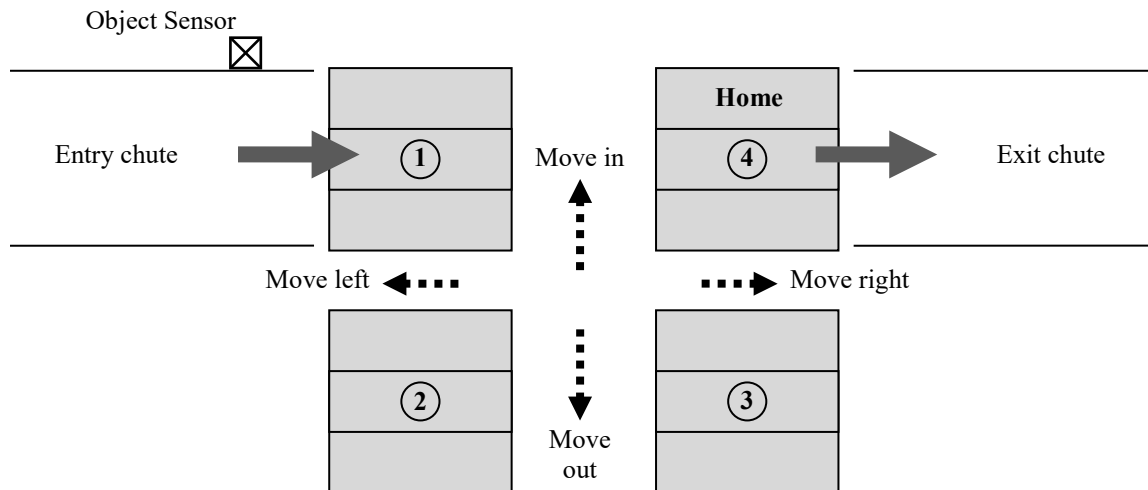


Figure 2: Overview Diagram

1. Research *(This is an individual task)*

Siemens has a range of PLCs available. Carry out research into each type, discuss them and determine whether the PLC used in the Robot control panel is the most suitable for this application. Consider technical and cost implications, note that actual data must be provided in your comparison tables not just qualitative adjectives. Use the Harvard method for all your in-text citations.

2. Hardware Investigation and Input-Output List *(This is an individual task)*

Investigate the hardware used on the Pick and Place Robot and provide a complete explanation of each device used together with an electrical drawing of the PLC, (see template drawing included in this brief). From this, create an input-output list distinguishing between inputs and outputs, digital and analogue together with addresses. This will be the basis of a PLC tag table in the next task

3.1. Program Design and Manual controls *(This is an individual task)*

Create a TIA project that includes the PLC and HMI screens with suitable IP addresses. You must use memory element as a substitute for the actual inputs so that a simulation block can be used (supplied by your lecturer) to design the program without the robot hardware. A bit must be used to change between simulation and actual inputs. Start your memory elements from M2000.0 onwards to avoid conflict when mapping inputs into memory elements. Create a PLC tag list based on your I/O list together with any necessary memory elements and data blocks. Structure the PLC program with suitable function calls. Automatic and manual modes must be selectable. Develop the following manual controls and interlocks with the PLC and HMI.

1. Two HMI screens should be created, one for the operator and the other for an engineer. Both screens must contain a switch to select auto or manual modes.
2. When in manual mode, each piston should be operated safely via the engineer's screen and all sensor information should be visible.
3. Safety interlocks must be added to prevent the robot from being damaged. DO NOT ALLOW THE ROBOT TO:
 - a. Move left, right, in or out unless the robot is in the up position.
 - b. Move down unless it is located over one of the stations.

3.2. Automatic Control *(This is an individual task)*

A sequential function chart should be created according to the following specification when automatic mode is selected.

1. On power up, the robot must move safely to the home position above station 4 and wait.

2. A counter must be used record the number of objects in the machine.
3. On the HMI, you must display the sequence step number and the object counter, and any other information that would assist the operator in the smooth running of the machine.
4. If an object is rolled down the entry chute, a delay of 2 seconds must occur before any movement takes place. A separate test button must be added to the HMI to simulate this feature but only on the Engineer's HMI Screen.
5. After the delay, the counter must be checked and if there are already two objects in the machine, the object at station 3 must be moved to station 4 and the object at station 2 moved to station 3 before the new object is placed in station 2. If there is only 1 object in the machine at station 2, it must be moved to station 3 before the new object is moved to station 2. If there are no objects in the machine, the new object can be placed in station 2. When an object is placed at station 2, the counter must be incremented but when an object is place at station 4, the counter must be decremented.
6. On the Engineer's HMI Screen, provide a Pause button that freezes the sequences and a Continue button to allow the sequence to progress.
7. The robot software must be designed to ensure it is reliable and therefore, you are required to add any information to the engineer's screen that would assist the engineer in the maintenance of the system.

Use memory elements as requests to move the robot in automatic mode. Do not write directly to outputs in your SCL code. These requests will be included in your main ladder program and must not override the safety interlocks.

3.3. PLC Program Internal Documentation (*This is an individual task*)

The PLC program must contain internal documentation which must include network/rung titles and brief comments. This program must also be briefly explained in the report. The code can be included in the report as images snipped from TIA Portal.

4. Simulation Testing (*This is an individual task*)

A testing table must be produced that covers every aspect on the requirements described in the above tasks. The PLC program and HMI screens must be simulated and fully working with test results added to your table.

5. Practical Testing and Team Working (*This is a team task*)

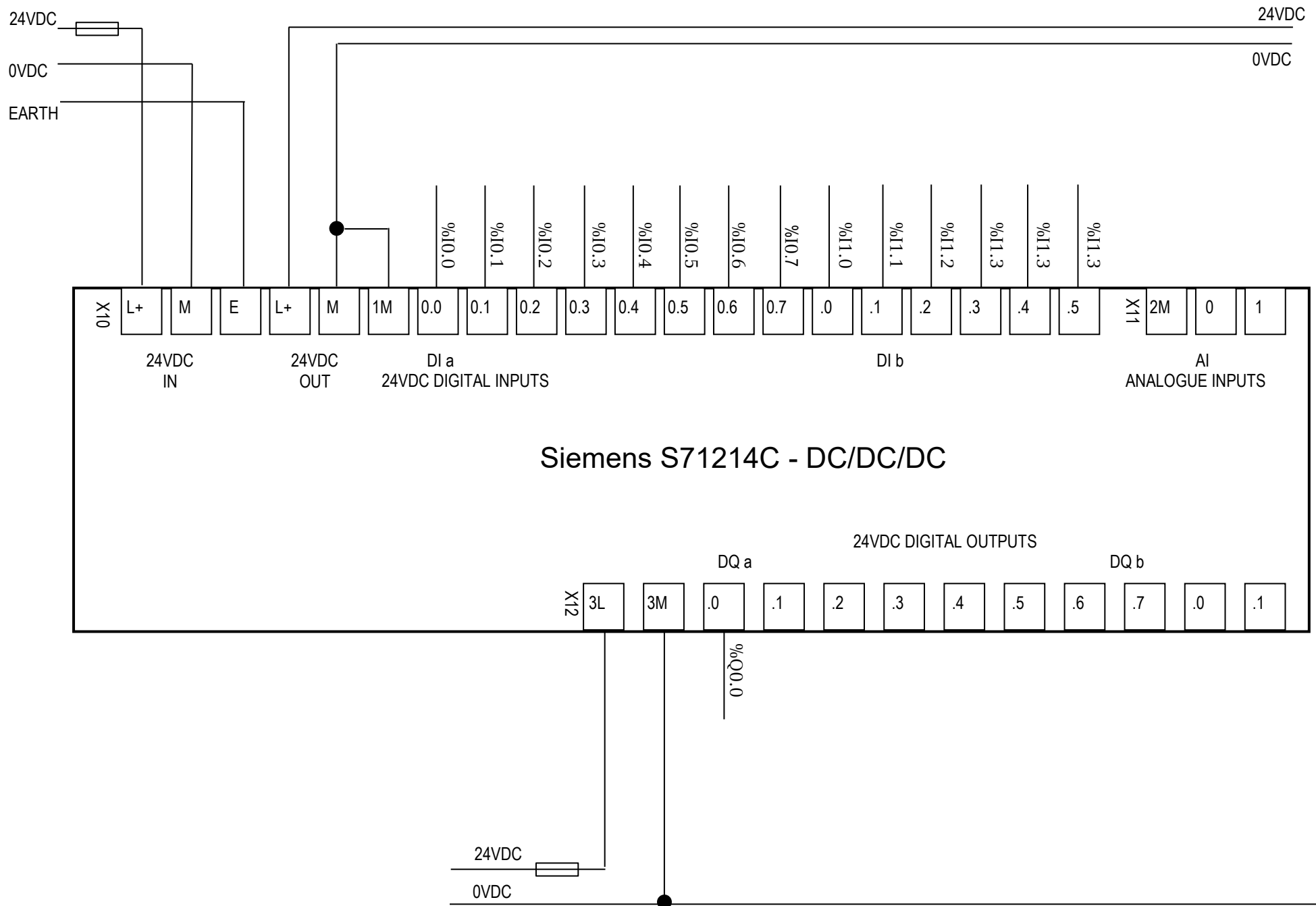
Working in groups of 3 or 4, while observing all COVID-19 safety requirements, select the best program to take forward to final practical testing. Provide another copy of the testing table, fully test the robot in manual mode with interlocks. Then, by using the pause and continue facilities, test each step of the sequence. For all tests, provide photographic evidence of it working. Decide in your team how this should be performed and write a full explanation of how you worked as part of a team and explain your role within the team.

6. Discussion, Conclusions and Recommendations (*This is an individual task*)

Provide a discussion of the practical results together with an explanation given of how you have considered the maintenance and tested the reliability of the system and how you have met the customer and user needs. Write a suitable conclusion and give recommendations for further work.

7. Citation List (*This is an individual task*)

Add a citation list to your report using the Harvard method. This is best generated automatically by MS Word or other plug in referencing tool.



GUIDANCE FOR STUDENTS IN THE COMPLETION OF TASKS

You are required to present an electronic report containing detailed observational notes of your work. This report must be a maximum of 2500 words and should be laid out in the following sections preceded by a title page and a table of contents:-

1. Research
2. Hardware Investigation, Circuit Diagram and I/O List
3. Program Design and Explanation
4. Simulation Testing
5. Practical Testing and Team Working
6. Discussion, Conclusions and Recommendations
7. Citation List

Your title page for the report should contain the following information:

Course:	HNC Electrical and Electronic Engineering
Module:	SGEE4004 Programmable Logic Controllers
Assignment:	1. Pick and Place Robot
Name:	Fred Bloggs
University number:	123456789
Date submitted:	DD/MM/YYYY
Word count:	?????

Further guidance:

- Do not use a styled document (template) and don't add your company logo.
- Do not include photographs of course notes or formative classroom work.
- All pages and figures must be numbered and listed in the Table of Contents and List of Figures.
- There is no need to include whole datasheets; simply cite their source or include a "snip" of the relevant information.
- Write all sections in the third person.
- Note which sections of your report have been identified above as places where the marks will be awarded and use your word allocation wisely.
- Save your report as a .pdf with your university number as the file name. **The program printout can be appended to the report by also converting to a pdf file and by using the college's software combine facility before uploading the final pdf version to TurnIt-In.**
- The TurnIt-In rubric will be used to record your marks and provide you with tutor feedback.

Going Over the Word Limit

If you are found to have exceeded the specified word limit for an assessment, your work may be subject to a penalty:

- Under length - No penalty, but your work is probably missing key information
- Up to 10% over length - No deduction off final mark
- 11% or more over length - Deduction of 5 marks off final mark (but cannot reduce mark below 40%)

To measure the word count, DO NOT use Turnit-In and do not include the following:

- Assignment brief

- Index, Table of Contents and Table of Figures
- Formula and calculations (use MS Equation or text boxes to contain these)
- Reference list or bibliography
- Appendices used for: large results tables, computer code listings, data sheet extracts and any other 3rd party information

Spot checking of declared word counts will be carried out by your lecturer and second marker.

NOTE: The guidance offered below is linked to the five generic assessment criteria overleaf.

1. Engagement with Literature Skills

Your work must be informed and supported by scholarly material that is *relevant* to and *focused* on the task(s) set. You should provide evidence that you have accessed an appropriate *range* of sources, which may be academic, governmental and industrial; these sources may include academic journal articles, textbooks, current news articles, organisational documents, and websites. You should consider the *credibility* of your sources; academic journals are normally highly credible sources while websites require careful consideration/selection and should be used sparingly. Any sources you use should be current and up-to-date, mostly published within the last five years or so, though seminal/important works in the field may be older. You must provide *evidence* of your research/own reading throughout your work, using a suitable referencing system, including in-text citations in the main body of your work and a reference list at the end of your work.

Guidance specific to this assessment: *This will be assessed by your research and use of credible sources.*

2. Knowledge and Understanding Skills

At level 4, you should be able to demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study. *Knowledge* relates to the facts, information and skills you have acquired through your learning. You demonstrate your *understanding* by interpreting the meaning of the facts and information (knowledge). This means that you need to select and include in your work the concepts, techniques, models, theories, etc. appropriate to the task(s) set. You should be able to explain the theories, concepts, etc. to show your understanding. Your mark/grade will also depend upon the *extent* to which you demonstrate your knowledge and understanding.

Guidance specific to this assessment: *This will be assessed by your descriptions and explanations.*

3. Cognitive and Intellectual Skills

You should be able to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study. You should be able to evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work. Your work must contain evidence of logical, analytical thinking. For example, to examine and break information down into parts, make inferences, compile, compare and contrast information. This means not just describing what! But also justifying: Why? How? When? Who? Where? At what cost? You should provide justification for your arguments and judgements using evidence that you have reflected upon the ideas of others within the subject area and that you are able to make sound judgements and arguments using data and concepts. Where relevant, alternative solutions and recommendations may be proposed.

Guidance specific to this assessment: *This will be assessed by the explanation of your testing, evaluation, discussion of maintenance and reliability, customer and user needs, conclusions and recommendations.*

4. Practical Skills

At level 4, you should be able to apply the basic underlying concepts and principles to evaluate and interpret these within the context of your area of study. You should be able to demonstrate how the subject-related concepts and ideas relate to real world situations and/or a particular context. How do they work in practice? You will deploy models, methods, techniques, and/or theories, in that context, to assess current situations, perhaps to formulate plans or solutions to solve problems, or to create artefacts. This is likely to involve, for instance, the use of real world artefacts, examples and cases, the application of a model within an organisation and/or benchmarking one theory or organisation against others based on stated criteria.

Guidance specific to this assessment: *This will be assessed by the quality of your program design, use of languages, HMI screen designs and the presentation of your test results.*

5. Transferable Skills for Life and Professional Practice

Your work must provide evidence of the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility. This includes demonstrating: that you can communicate the results of your study/work accurately and reliably, and with structured and coherent arguments; that you can initiate and complete tasks and procedures, whether individually and/or collaboratively; fluency of expression; clarity and effectiveness in presentation and organisation. Work should be coherent and well-structured in presentation and organisation.

Guidance specific to this assessment: *This will be assessed by the written and presentational quality of your report including page numbering, figure quality, figure numbering and listing, writing style, punctuation, grammar and spelling and includes your word count. This will also be assessed by your explanation of team working.*

Achieving the PLOs for IET/IEng accreditation

The following PLOs have been targeting to be satisfied or partially satisfied by this assignment. Details are given below. The marking scheme on the next page will also be used to record your PLO achievements and comments will be found in the Turnit-in rubric.

EA3i - *Ability to use the results of engineering analysis to solve engineering problems and to recommend appropriate action.* This will be satisfied by your application of standard testing methods to the system and the use of results to prove its correct working and recommend and implement appropriate changes to improve its performance.

EA4i - *Ability to apply an integrated or systems approach to engineering problems through know-how of the relevant technologies and their application.* This will be satisfied by your explanation and design of the system which links the I/O to the PLC and HMI, use of IEC programming languages and TIA portal software, networked technology, sequence design and application to robotics.

D1i - *Be aware of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.* This will be partially satisfied by your consideration of customer and user needs met through testing.

D4i - *Apply problem-solving skills, technical knowledge and understanding to create or adapt design solutions that are fit for purpose including operation, maintenance, reliability etc..* This will be satisfied by your design solutions (PLC and HMI programs), use of research, checking of solution, operation and maintenance and reliability checking.

EP7i - *Awareness of team roles and the ability to work as a member of an engineering team.* This will be satisfied by your explanation of team working.

STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available
1. Engagement with Literature Skills	
	20
2. Knowledge and Understanding Skills	
	20
3. Cognitive and Intellectual Skills	
	20
4. Practical Application Skills	
	20
5. Transferable Skills for Life and Professional Practice	
	20

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

GENERIC ASSESSMENT CRITERIA

Level 4

In accordance with the Framework for Higher Education Qualifications, at the end of Level 4 students will be expected to have demonstrated knowledge of the basic underlying concepts and principles of a subject, and an ability to evaluate and interpret these within the context of that area of study. They should be able to present, evaluate and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of their subject(s) of study. They will have learned how to evaluate different approaches to solving problems, and will be able to communicate the results of their study/work accurately and reliably, and with structured and coherent arguments. They will be able to undertake further training and develop new skills within a structured and managed environment and will have the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
Engagement with literature (including reading, referencing, academic conventions and academic honesty)	Little or no evidence of reading and/or reliance on inappropriate sources. Views and findings mostly unsupported and non-authoritative. Referencing conventions used incoherently or largely absent.	Poor engagement with essential reading. No evidence of wider reading. Reliance on inappropriate sources, and/or indiscriminate use of sources. Heavily reliant on information gained through class contact. Inconsistent and weak use of referencing.	Engagement with a limited range of mostly relevant and credible sources but with some reliance on information gained through class contact. Some omissions and minor errors. Referencing conventions evident though not always applied accurately or consistently.	Engagement with an appropriate range of literature, including sources retrieved independently. Some over-reliance on texts rather than other sources. Referencing may show minor inaccuracies or inconsistencies.	Engagement with a wide range of literature, including sources retrieved independently. Selection of relevant and credible sources. Generally sound referencing, with no/very few inaccuracies or inconsistencies.	Engagement with an extensive range of relevant and credible literature. Consistently accurate application of referencing.	Exceptional engagement with an extensive range of relevant and credible literature. High-level referencing skills consistently applied.
Knowledge and understanding (Knowledge of the basic underlying concepts and principles of a subject.)	Major gaps in knowledge and understanding of the basic underlying concepts and principles of the subject matter. Inclusion of irrelevant material. Substantial inaccuracies.	Gaps in knowledge of the basic underlying concepts and principles, with flawed or superficial understanding. Some significant inaccuracies and/or irrelevant material.	Limited knowledge and understanding of the basic underlying concepts and principles within the subject area. Some elements may be missing.	Knowledge of the basic underlying concepts and principles is accurate with a good understanding of the field of study but lacks depth and/or breadth.	Competent knowledge of the basic underlying concepts and principles. Exhibits very good understanding.	Excellent knowledge and understanding of the basic underlying concepts and principles of the subject.	Exceptional, detailed knowledge and understanding of the basic underlying concepts and principles

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
Cognitive and intellectual skills (Evaluate underlying concepts and principles of a subject and interpret qualitative and quantitative data in order to develop lines of argument and make sound judgements.)	Wholly or almost wholly descriptive work. Little or no evaluation of the underlying concepts and principles. Failure to develop arguments, leading to illogical or invalid judgements. Minimal or no use of evidence to back up views.	Largely descriptive work, with superficial evaluation of the underlying concepts and principles. Weak interpretation of data, flawed development of arguments and judgements. Information accepted uncritically, uses generalised statements made with scant evidence and unsubstantiated opinions. Ideas sometimes illogical and contradictory.	Limited attempt at evaluation of the underlying concepts and principles, tending towards description. Can interpret qualitative and quantitative data but with some errors. Some evidence to support emerging arguments and judgements but these may be underdeveloped or with a little inconsistency / mis-interpretation.	Good evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data, with minor errors. An emerging ability to use evidence to support the argument. Mostly valid arguments and logical judgements.	Sound evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately. Ability to devise arguments using evidence to make mostly appropriate and valid judgements.	Excellent evaluation of the underlying concepts and principles. Can interpret qualitative and quantitative data accurately and with some insight. Excellent ability to devise arguments using evidence and make appropriate and valid judgements.	Exceptional evaluation of the underlying concepts and principles based evidence. Outstanding interpretation of qualitative and quantitative data. Exceptional ability to devise arguments using evidence and make wholly appropriate and valid judgements.
Practical skills (Different approaches to solving problems in particular contexts.)	Limited or no use of taught, basic methods, materials, tools and/or techniques. Little or no appreciation of the context of the application. Very weak evidence of different approaches to problem-solving in particular contexts.	Rudimentary application of taught, basic methods, materials, tools and/or techniques but without consideration and competence. Flawed appreciation of the context of the application. Weak evidence of different approaches to problem-solving in particular contexts.	An adequate awareness and mostly appropriate application of basic methods, materials, tools and/or techniques. Basic appreciation of the context of the application. Can identify problems in particular contexts and propose basic alternative approaches or solutions though there may be errors.	A good and appropriate application of basic methods, materials, tools and/or techniques. Clear appreciation of the context of the application. Good evidence of different approaches to problem-solving in particular contexts and proposes mostly appropriate solutions.	A very good application of a range of basic methods, materials, tools and/or techniques. Very good consideration of the context of the application. Very good evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	An advanced application of a range of taught, basic methods, materials, tools and/or techniques. The context of the application is well considered, and insightful. Excellent evidence of different approaches to problem-solving in particular contexts and proposes appropriate solutions.	Exceptional levels of application and deployment skills in particular practical contexts. Outstanding identification of problems in particular contexts and formulation of wholly appropriate, thoughtful solutions / different approaches.

Level 4	FAIL	MARGINAL FAIL	SATISFACTORY (3 rd / Pass)	GOOD (2.2 / Pass)	VERY GOOD (2.1 / Merit)	EXCELLENT (1 st / Distinction)	EXCEPTIONAL (1 st / Distinction)
Category	0-29%	30-39%	40-49%	50-59%	60-69%	70-84%	85-100%
Transferable skills for life and professional practice (Communicate the results of their study/work accurately and reliably, and with structured and coherent arguments; the qualities needed for employment requiring the exercise of some personal responsibility within a structured and managed environment.)	Work is poorly structured, disorganised, inaccurate and/or confusingly expressed. Very weak use of language and/or very inappropriate style. Failure to work effectively individual or as part of a group. Little or no evidence of the skills for employment requiring the exercise of some personal responsibility.	Work is poorly presented in a disjointed manner. It is loosely, and at times incoherently, structured, with information and ideas often poorly expressed. Weak use of language and/or inappropriate style. Flawed approach to individual or group work, meeting only partial obligations to others. Limited evidence of the skills for employment requiring the exercise of some personal responsibility.	Mostly ordered presentation and structure in which relevant ideas / concepts are reasonably expressed. Work may lack coherence and/or accuracy in places. Can work as part of a group, meeting most obligations to others but perhaps with limited involvement in group activities. Demonstrates the basic skills for employment requiring the exercise of some personal responsibility, with some areas of minor weakness.	Mostly coherent, organised and accurate work, in a suitable structure and is for the most part clearly expressed. Can work effectively independently and/or as part of a team, with clear contribution to group activities. Demonstrates the skills for employment requiring the exercise of some personal responsibility, with some areas of strength and some of minor weakness.	Work is accurate, coherent, fluent, well-structured and organised. Can work effectively independently and/or as part of a team, with very good contribution to group activities. Demonstrates very good skills for employment requiring the exercise of some personal responsibility, with just occasional minor weakness.	Work is coherent, very fluent and is presented professionally. Can work effectively independently and/or as part of a team, with an excellent contribution to group activities. Demonstrates excellent skills for employment requiring the exercise of some personal responsibility with an appetite for further development.	Work is accurate, exceptionally coherent, very fluent and presented well. Can work effectively independently and/or as part of a team, with an exceptional contribution to group activities. Demonstrates exceptional skills for employment requiring the exercise of some personal responsibility with an appetite for further development.