

EDEXCEL NATIONALS
UNIT 25 PROGRAMMABLE LOGIC CONTROLLERS

ASSIGNMENT No.1

SELECTION CRITERIA

NAME:

I agree to the assessment as contained in this assignment. I confirm that the work submitted is my own work.

Signature

Date submitted

Time allowed for completion is 4 weeks from the date it is issued.

FEEDBACK COMMENTS

This assignment assesses P1, P5 and M1

Grade Awarded:

Assessor Signature _____

Date: _____

Internal verifier Signature _____

Date: _____

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Grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that the learner is able to:	To achieve a distinction grade the evidence must show that the learner is able to:
<p>P1 describe the selection criteria and a practical application for a unitary, a modular and a rack-mounted programmable controller</p> <p>P2 explain the system hardware and software requirements for a programmable controller application</p> <p>P3 use a programming method to produce, store and present a program that demonstrates the full range of instruction types</p> <p>P4 explain the program documentation that has been used for a complex engineering application</p> <p>P5 describe the importance of health and safety when working with programmable controlled equipment</p>	<p>M1 select and describe the benefits and limitations of a programmable controller for a specific application</p> <p>M2 justify the choice of a specific programming method and the methods used to produce, store and present the program</p> <p>M3 compare two different networks used for a modern programmable controller system.</p>	<p>D1 evaluate program documentation used to control an automated machine/process and make recommendations for improvement</p> <p>D2 compare the current capabilities and limitations of a programmable controller and identify possible areas of future development.</p>

Grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that the learner is able to:	To achieve a distinction grade the evidence must show that the learner is able to:
<p>P6 explain how one example of each of the three types of communication media would be selected for a specific programmable controller application</p> <p>P7 describe a network and relevant standards and protocols used for a modern programmable controller system.</p>		

DETAILS

In this assignment you must produce a written report explaining all the items detailed below. You should read your notes, study textbooks and draw on any other source of information such as manufacturers catalogues.

BAR TRIMMING MACHINE

PART 1

A steel company requires a single custom built machine to do the following.

Batches of flat bars are to be trimmed to length and stacked.

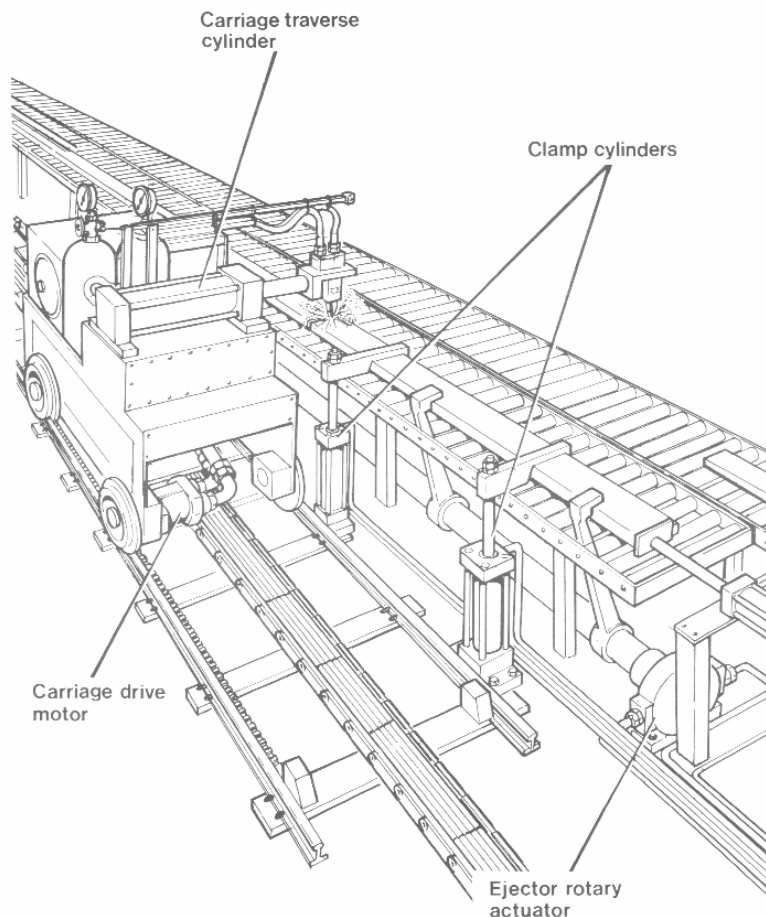
The bar comes along a roller track and hits an end stop.

The bar is clamped tightly.

An acetylene cutter head moves to the correct cutting position for the batch.

The cutter cuts the length in a controlled manner and retracts.

The cut bar must be ejected and the process repeated.



All the actuators are hydraulic and controlled by electric solenoid valves and they are fitted with position sensors to signal their movements. Recommend a PLC that would be suitable to control the valves. What would be the cheapest method of programming the PLC? Be sure to explain all your reasons.

PART 2

At some later stage after installation it is decided to integrate the machine with all the other machines and processes in the production line so that overall control and monitoring takes place with a mimic panel in a central control room. All the PLCs in the production line must be reprogrammable from a central source and interrogation of the PLCs must take place to obtain statistical data about quantities and sizes.

Explain in outline how the whole system may operate with a local area network and field bus system.

PART 3

Bearing in mind the type of workshop where the machine is installed, what sort of risks do you think would have to be considered if a Job Safety Analysis was conducted? What kind of Personal Protection Equipment would be needed by anyone working around the machinery?

What sort of risks would apply to anyone working in the control room?

Outline the dangers to persons working on the production line when the operators is making adjustments to the PLC programme and testing them out.