**IGCSE Design & Technology**

**Microprocessor Control Project Assignment**

**What you will learn and use**

In this module you are going to learn about microprocessor control, writing control programs and using a peripheral interface to control machines. The purpose of this module is to provide you with the knowledge and skills necessary to include microprocessor control into your Assessed Task (Major Project) which will start just before the beginning of the summer holidays.

You will use;

* The peripheral interface modelling board.
* Logicator software.
* Various INPUT & OUTPUT devices.

**How you will be assessed**

You must produce a Design Folder

You must demonstrate the required practical programming tasks

**The Design Folder** must describe everything that you have in this module. It must be written in the same style as your previous design folders and it must have the following sections.

The Introduction

The Research

The Peripheral Interface

Logicator Software

Your Control Programs

The Evaluation

**The Practical Programming Tasks** must be demonstrated on the Interface Modelling Board.

**Year 10 - Microprocessor Control Project Assignment**

**The Design Folder Writing Frame**

**The Introduction**

* Explain what is meant by micro-processor control.
* Inform your reader about the different forms of control systems there are and illustrate your explanation with real life examples.
* Explain to your reader about the benefits and limitations of mechanical control, electronic control and microprocessor control.
* Explain to your reader how computers are programmed by humans to control machines and what artificial intelligence actually is.
* Give several examples of how microprocessor control is used in the home and at work.
* Explain to your reader how control programs work and how you will program your modelling board.
* Explain how you will eventually integrate microprocessor control into your major project.

**Research**

* Using a spider diagram – identify all of the things that you will need to know about for this module. (This will act as the contents list for the research section.) Hardware – Software – System Analysis – Block Analysis – Analogue – Digital – INPUTS – PROCESS – OUTPUT – Flowcharts – Peripheral Interface – PIC – Download – Routines – Sub Routines – Fault finding & Bugs – High/Low/On/Off/1/0 – Open & Closed Loops
* Using written text and appropriate diagrams and images explain to your reader each topic identified on the spider diagram.

**Your Peripheral Interface Modelling Board**

* Using a series of fully annotated photographs of the board. Provide your reader with an explanation of every aspect and feature of your PCB.
* Explain how and where to connect the various external electronic components.
* Describe how and why you have to specially prepare components for fitting onto the interface board.

**Logicator**

* Using screen prints explain how Logicator works.
* Explain what a flowchart is.
* Explain the various command terms and how they are used.
* Explain about the port settings.
* Explain what to look for when fixing problems with your programs.

**Your Control Programs**

* For every control program that you write – first, provide a written explanation about how what it is supposed to do in layman’s terms.
* Provide a fully annotated printout of every program showing the port settings in the appropriate command boxes.
* Identify any problems (Bugs) that you have had with each program and how you fixed them.

**The Evaluation**

* List all of the new skills that you have learned.
* Explain why these new skills will be beneficial for this course and you major project.