

Dion Gealy

by Alun Gealy

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PROJECT DESIGN PRESENTATION

BY DION GEALY

COMPANY BACKGROUND

TATA STEEL EUROPE - PORT TALBOT

- One of the largest steel producers in Europe.
- Port Talbot produces slab, hot rolled, cold rolled and galvanised coil.
- I'm based at the sinter plant

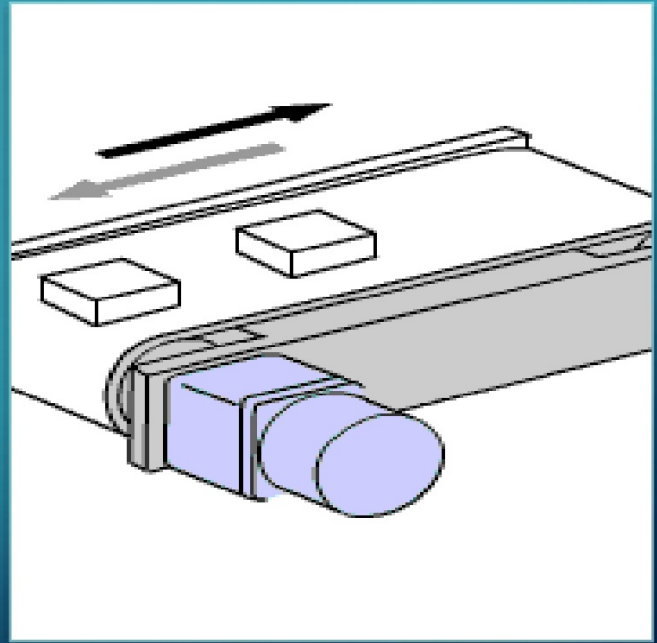


PROJECT OBJECTIVE.

To control the speed, direction and position of
A conveyor belt

WHY ?

- So that the belt can speed up and down depending on production needs.
- Reduce running costs
- Positioning So that a imaging camera could be used for quality purposes.



SOLUTION 1.

Using a siemens servo motor and drive.

PROS.

- Accurate and easily adjusted.
- Allow for adaption.
- Siemens soft wear readily available

CONS.

- Costly.
- Can be complicated as many configuration.



SOLUTION 2.

Stepper motor and driver.

PROS

- Ease of implementation.
- Reduced wire complexity
- Low cost.

CONS

- Lack of customizability.
- Reduced configuration options.



CHOSEN OPTION

Solution 2. Stepper motor and driver.

WHY?

- Cost effective. £65 for Solution 2, £650 for Solution 1.
- Easier to assembly and connect. To help make the project more realistic to finish within the timescale.

STEPPER MOTOR AND DRIVE



NEMA 17 STEPPER MOTOR

NEMA 17 Stepper Motor Technical Specifications

Rated Voltage: 12V DC

Current: 1.2A at 4V

Step Angle: 1.8 deg. (200 steps)

No. of Phases: 4

Motor Length: 1.54 inches

4-wire, 8 inch lead



DIGITAL STEPPER DRIVE.
DM320T

Electrical Specifications.

Output current – 0.3~2.2A

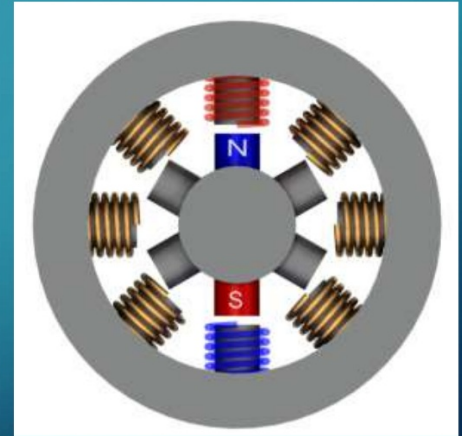
Input voltage - +10~30VDC

Pulse input frequency – 0-60kHz

Insulation resistance – 100MΩ

ABOUT STEPPER MOTORS.

- Open-loop design, no need for feedback mechanism such as encoder or tachometer.
- Can vary speed, change direction and lock into position instantly.
- No of steps determined by number of teeth,
- Usually 200 steps. So $\frac{360 \text{ (degrees)}}{200 \text{ teeth.}} = 1.8^\circ \text{ per step}$
- When a pole is energised the nearest teeth while align with that pole.

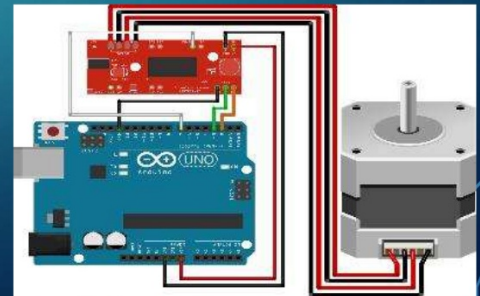
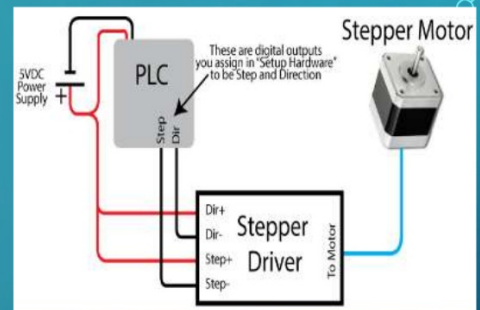


SPECIFICATIONS.

Using a PLC, HMI and driver, Create a program to control the conveyor.

Be able to control speed, direction and positioning on a HMI Screen.

Alternative option is to use a Arduino board.

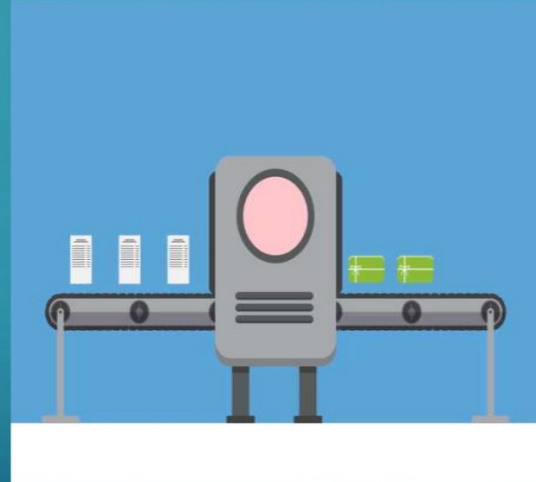


TESTING.

Create full test table.

Fully test For -

- Speed.
- Direction
- Positioning
- Program and HMI are working correctly



PROJECT MANAGEMENT.

How will I manage the project.

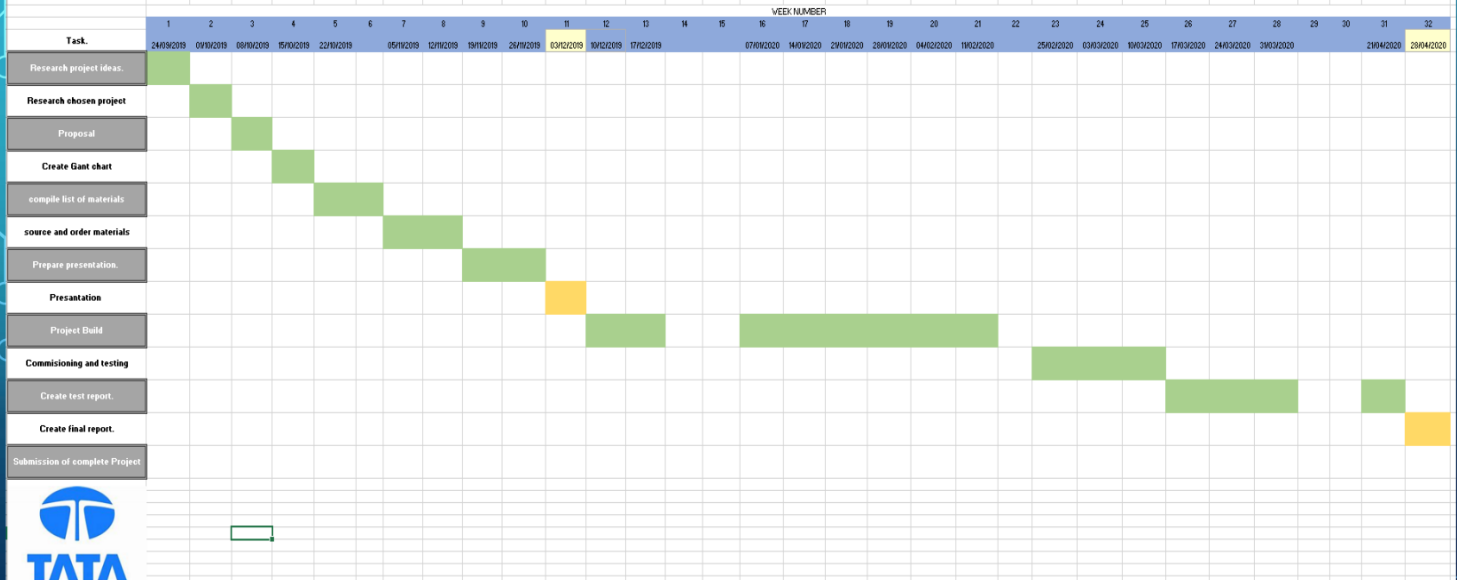
- Gant chart, to record of time, and to keep on track to complete project on time.
- Log sheets. Complete log sheet weekly to log work I've done.
- Keep records of all costs.



PROJECT PLAN

Dion Gealy
Project -

Control Speed, Direction and Positioning on a conveyor belt.



The slide features a blue gradient background with white circuit-like lines in the corners. These lines consist of small circles connected by straight lines, resembling a stylized circuit board or network diagram.

THANKS FOR LISTENING.

ANY QUESTIONS?

59/100

Instructor

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GRADING FORM: CSG-RUBIC

ALUN
GEALY

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RESEARCH-INFORMED LITERATURE

 Background research included relevant detail with a reasonable explanation. This should have included more detail. 5.5/10 More research could have been carried out but there was an understanding of the solutions considered.5.5/10 **11/20**

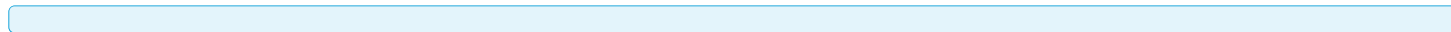
KNOWLEDGE AND UNDERSTANDING

 The problem was defined clearly. 3/5 Relevant constraint and codes of practice have been identified and the requirements have been planned as part of the project.3/5 Environmental and sustainability issues were discussed but more detail on this needs to be considered for the project .2.5/5 A clear understanding of functional requirements has been demonstrated with good use of block diagrams.3/5 Reasonable competence was demonstrated with response to questioning about project requirements. 5.5/10 **17/30**

ANALYSIS

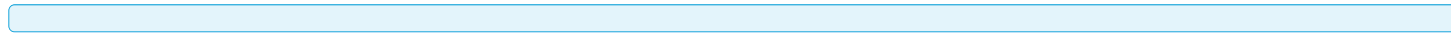
	A breakdown of the problem was delivered and showed a reasonable understanding.3/5 Functional design requirements was discussed and a clear understanding was shown.6.5/10 Justification of final solution was clear and a good competitive alternative for comparison.3.5/5	13/20
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PRACTICAL APPLICATION AND DEP.



	Design specification was clear with a reasonable explanation.3/5 Reasons for final solution was logical and a good comparison carried out to justify the choice. 6/10 Project planning has been very well thought out .3/5	12/20
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SKILLS FOR PROFESSIONAL PRAC.



	Quality of the slides was good and clear to read. 3/5 The presentation delivery was clear.3/5	6/10
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