

presentation ET

by Elias Thomas

Submission date: 10-Jan-2023 01:54PM (UTC+0000)

Submission ID: 194362578

File name: 17426_Elias_Thomas_presentation_ET_172461_2048678067.pptx (1.28M)

Word count: 594

Character count: 2896

FLIR CAMERA FIRE SAFETY SYSTEM

Presented by Elias Thomas

Company background

Trostre Works is located in Llanelli, Carmarthenshire, South Wales, and manufactures approximately 400,000 tonnes per annum of tin, chrome and 'polymer' coated steels for the packaging industries. All steel packaging material produced at Trostre is 100% recyclable.



This project is relevant to industry as it is a fire safety system to protect the DC motors seen in the picture on the left. The project will include the use of PLC's, SCADA system and an extensive monitoring system, supplied by FLIR. This is also an environmentally friendly project as it stops greenhouse gasses being released into the atmosphere. And uses less parts by using spftawre in the PLC

Identifying the problem to solve

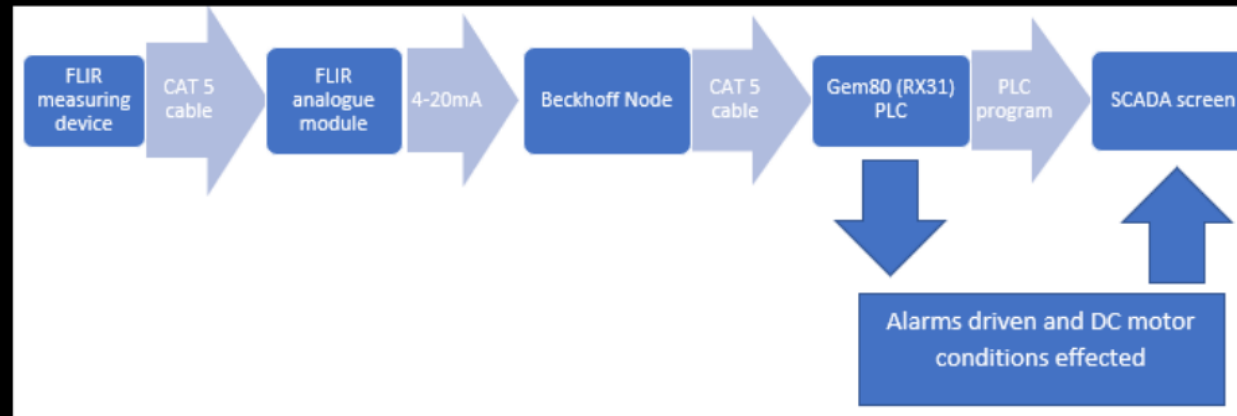
After receiving an annual fire audit from our insurers. A comment was left on our DC motor room on The Five Stand Mill. This comment highlighted the risk of a thermal incident. The chances of a thermal incident in this area is high as some motors can reach 15000 meters per minute.



A decision was made to reduce this risk. The decision made was to create a fire safety system to monitor the motor room constantly. From the monitoring, an analogue signal could then be sent to a PLC. And in the PLC using logic the mill could be stopped depending on the signal.

Functional specification

An inferred sensing camera will be used to monitor regions of interest for temperature. This will then create a 4-20mA signal using the range set at 30°C to 150°C. Using this range, when the signal is sent to the PLC, conditions can be made. Once a temperature of 70°C is reached an alarm will be made. Once a temperature of 120°C is met. The motors that are being monitored will be switched off.

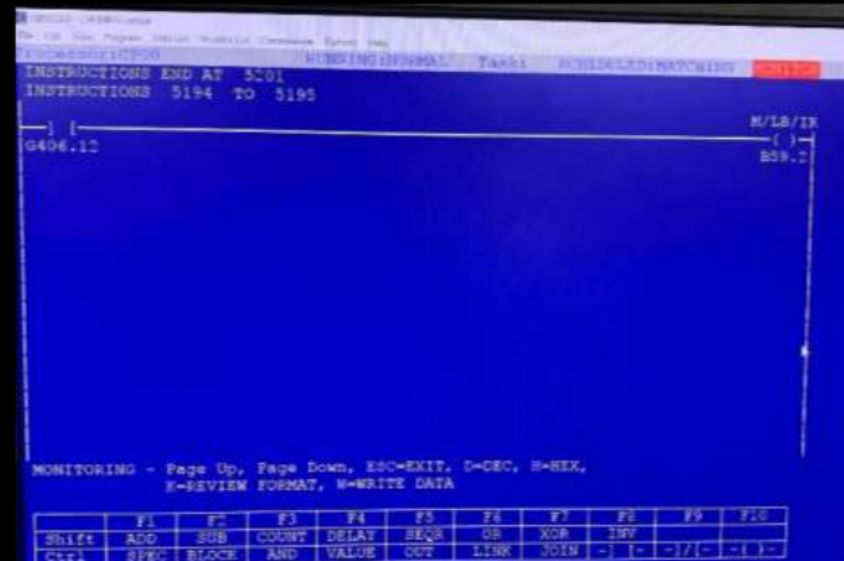


Software and hardware specification



FLIR A500f Advanced Smart Sensor Thermal Cameras are ideal for users who want alarm capabilities for outdoor condition monitoring and early fire detection. The protective housing can withstand temperatures between -30° to 50°C. Multiple communication options including HMI/SCADA, ONVIF, Modbus

The PLC used will be a RX3i. The PLC has 32k bits Discrete I/O, 32k Words for Analog I/O. The software used is Gemcad/P80i. Within this software, outputs can be switched to cut power off to the DC motors.



Solution two

One solution to the problem is to use smoke detectors . Smoke detectors are trailed and proven to be a reliable way of detecting fires. There are internal outputs that can be switched in such events. These outputs could then be used in the local PLC's program to cut power to the motors. FP200 cable will be used to adhere to current fire regulations.



Comparison

FLIR system

Smoke detectors

<u>Advantages</u> • Analogue outputs • A range of temperatures monitored • Multiple regions of interest monitored	<u>Advantages</u> • Not much hardware needed
<u>Disadvantages</u> • Quite a lot of hardware needed and cables run	<u>Disadvantages</u> • Only gives one digital output at one given temperature • Will need a multitude of smoke detectors to cover all areas of interest

The solution that has been chosen is the FLIR fire system. This has been chosen because the camera used is capable of an analogue output, therefore alarms can be raised before cutting power. By using the PLC.

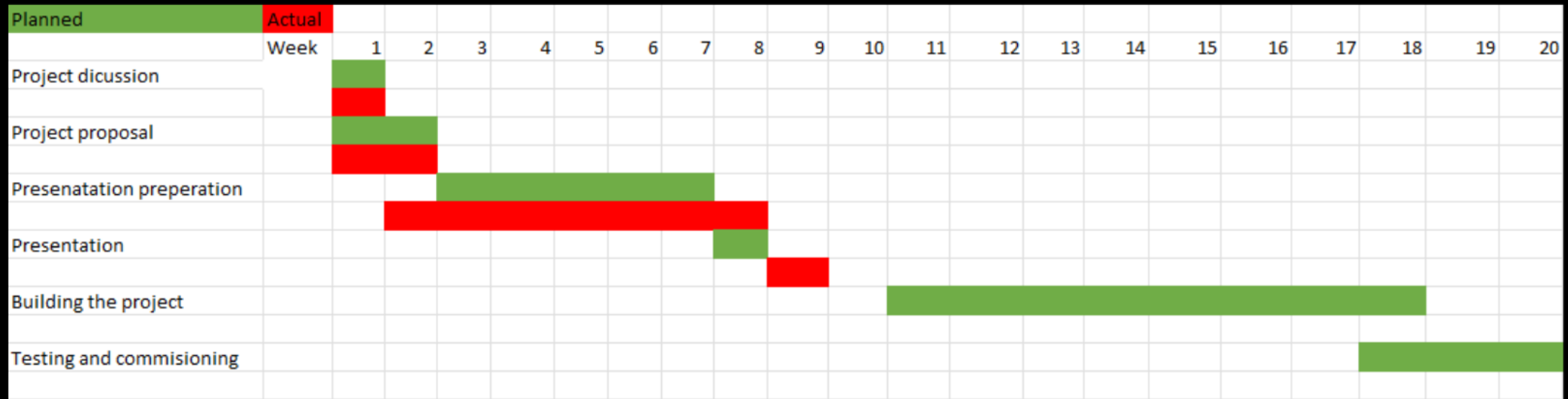
Testing table

Test	Temperature (°C)	Outcome	Expected output (mA)	Pass or fail
1	25°C	No alarms	6mA	
2	70°C	High temperature alarm	12mA	
3	120°C	High temperature alarm, Mill stop, Mill stop alarm.	20mA	

Budget breakdown

Qty	Description	Price
2	A500f-42 degree lens	£11,849.00 + VAT each
2	Wall Brackets	£129.00 +VAT each
2	Bridge Pro	£2,399.00 + VAT each
2	Bridge Power supply	£109.00 +VAT
2	PoE Injector	£129.00 +VAT each

Gantt chart



presentation ET

GRADEMARK REPORT

FINAL GRADE

GENERAL COMMENTS

Instructor

77 /100

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

ELIAS THOMAS

0

RESEARCH-INFORMED LITERATURE

 Background research has been carried out and includes relevant points for project. Good use of industrial examples to justify project. 8/10
Research for solutions has been explained in depth. Good details of solutions, and a good level of reading around the subject area. 8/10

16/20

KNOWLEDGE AND UNDERSTANDING

 Problem definition was explained in detail with reference application from industry. 3.5/5
Constraints and codes of practice were identified with software licencing, standards and intellectual properties relevant to the industry. 3.5/5
Environmental issues have been included in the form of software replacing hardware, and sustainable program structure will enable expansion of the system. 3.5/5
Functional design was explained very competently with a block diagram and backed up with test plan. 3.5/5

22/30

Response to questioning was very good and demonstrated a good understanding of the project and the problem. 8/10

ANALYSIS

-  Problem definition has been identified with a good clear understanding of the objective and procedures. 4/5
Good understanding of functional design and specification. Good explanation from the block diagram, and covered in detail with significant technical points indicated. 8/10
Final solution justified and explained with environmental and sustainability issues used in the justification. 4/5

16/20

PRACTICAL APPLICATION AND DEP.

-  Design spec was explained in detail with relevant additional components identified. 3.5/5
Critical choice has been justified through evaluation of solutions. Good arguments were presented for the final choice. 8/10
Project plan with breakdown of activities was included and explained with management methods.
Test plan was included and explained clearly. 3.5/5

15/20

SKILLS FOR PROFESSIONAL PRAC.

-  Slides included good relevant content. 4/5
Delivery of content demonstrated a good understanding of the project. 4/5

8/10

