EPSILON
Controls & Automation
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APPLICATION NOTE...

OBSTACLE DETECTION SYSTEM

Customer

Recognized as a leading manufacturer and supplier of Pig Iron in India

Background

Majority of the large manufacturing plants get their materials or the products being produced transferred from one part to other part of the unit by a moving assembly. There is uncertainty of any obstacle causing harm / accident, which is an undesirable event.

Customer Requirement

The customer had a requirement for the detection of the presence of any probable obstacle that might arrive in front of a moving assembly. The consequence of collision will cause a fatal damage to plant equipment / humans, so the safety of workers needs to be assured. Hence to fulfill the purpose of safety, customer wanted a low cost, reliable and sustainable system for proper detection of the obstacle. Customer also want to limit height of the system up to 190mm.

Why Epsilon?

Even though there is a readymade system available in the existing technologies, the customer needed an innovative solution to tackle this detection problem which will be efficient and low budget obstacle detection system.

Challenges

- Controlling a very robust and heavy machinery is a very difficult task
- Efficient detection is necessary
- Direction from which the obstacle may occur isn't fixed
- Detection should be done at a substantial distance from the obstacle
- Make system with maximum height below 190mm.

EPSILON solution

Epsilon provided the customer with an arduino controller based system. The system has two parts first is Sensor assembly & second is Controller assembly. Sensor assembly consists long range photoelectric sensor, stepper motor, proximity sensor to maintain the coverage of intended region. Controller assembly consist stepper motor driver, Arduino & power supply units. This two parts made separately to limit height of system.

Designing for the customer

- We have designed a stainless steel cylinder shaped enclosure, on which the photoelectric sensor i.e. obstacle detector is mounted.
- This detector is protected from environmental factors like dust or water by a dome shaped toughened glass.
- The detector is rotated to and fro in specified angles by the stepper motor.
- The speed of the stepper motor is controlled using a driver circuit.
- The whole system is powered by two SMPS units.
- The two limit switches are installed in such a way they handle the rotation of the obstacle detector and confine it to a predefined angle.
- The values of the limit switches are given as inputs to the arduino controller input pins
- Arduino programming is done to change the direction of the motor as per the combination of inputs from two limit switches.

Customer Benefits

- Improved safety for the workers, working in close vicinity of the moving assembly
- Low budget obstacle detection system with full satisfaction
- The solution can be easily installed and commissioned

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