EASIER WAY OF UPDATING / REPLACING MANUFACTURING EQUIPMENT USING IoT

By Rodney Ham

This project is to demonstrate how IoT can make replacing or adding manufacturing equipment to a production line easier to do by using the internet to replace having to hardwire the equipment to a control panel. Through a dashboard the operation parameters can be adjusted and equipment linked to a central control panel without the need of pulling/removing control wires inside conduit, thus reducing labor expenses. Just supply power for the controls are sent not through hard wires but through the internet.

This project aims to simulate:

* Sense material moisture content, temperature, holding tank barometric pressure;
* Control a feed door of a hopper to fill a mold;
* Adjustable mold vibrations to settle various materials;
* “smell” for evidence of previous material used in the hopper to eliminate contamination as the mold is filling – an interrupt will push the defective mold into a separate area;
* Check for dust in the air to eliminate an explosion from occurring [sound alarm];
* Weigh the mold and close the feed door of the hopper when the weight is within a preset yet adjustable range;
* Push the mold onto a conveyor after the hopper door shuts and the weight is proper;
* Read the simulated RFID chip to track and identify the mold;
* Simulate ultrasonic scanning the shaken mold material for voids or defects;
* Near the end of a conveyor sense the presence of the mold and if defective an arm will block the conveyor and force the mold one way for defects, and another way for good.

Particle Argon

Adafruit BME280

Seeed Grove - Air Quality Sensor v1.3

Seeed Grove - Dust Sensor

HX711A Load Cell

MPU6050 Accelerometer [read and adjust x-y vibrations]

Hall Effect Sensor [to simulate RFID chip reading]

Adafruit SSD 1306 128x32 i2c display

µSD Card

Servo Motor [hopper door, good/bad deflection arm]

BYJ Stepper Motor [drive conveyor]