World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Prototype Development of ARM-7 Based Embedded Controller for Packaging Machine

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Abstract : Survey of the papers revealed that there is no practical design available for packaging machine based on Embedded system, so the need arose for the development of the prototype model. In this paper, author has worked on the development of an ARM7 based Embedded Controller for controlling the sequence of packaging machine. The unit is made user friendly with TFT and Touch Screen implementing human machine interface (HMI). The different system components are briefly discussed, followed by a description of the overall design. The major functions which involve bag forming, sealing temperature control, fault detection, alarm, animated view on the home screen when the machine is working as per different parameters set makes the machine performance more successful. LPC2478 ARM 7 Embedded Microcontroller controls the coordination of individual control function modules. In back gone days, these machines were manufactured with mechanical fittings. Later on, the electronic system replaced them. With the help of ongoing technologies, these mechanical systems were controlled electronically using Microprocessors. These became the backbone of the system which became a cause for the updating technologies in which the control was handed over to the Microcontrollers with Servo drives for accurate positioning of the material. This helped to maintain the quality of the products. Including all, RS 485 MODBUS Communication technology is used for synchronizing AC Drive & Servo Drive. These all concepts are operated either manually or through a Graphical User Interface. Automatic tuning of heaters, sealers and their temperature is controlled using Proportional, Integral and Derivation loops. In the upcoming latest technological world, the practical implementation of the above mentioned concepts is really important to be in the user friendly environment. Real time model is implemented and tested on the actual machine and received fruitful results.

Keywords : packaging machine, embedded system, ARM 7, micro controller, HMI, TFT, touch screen, PID
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020