

NanoPC ARM-Based Panel Saw Machine with Industrial Internet of Things

Mohannad Farag

Faculty of Engineering Technology, Universiti Malaysia Pahang, 26600 Gambang, Kuantan, Pahang, Malaysia
Email: mohanadfaraj@gmail.com

Ehsan Aboosaedan and Eugene Ng Keng Leong

Formahero Machinery Sdn Bhd, Bandar Bukit Beruntung, 48300 Rawang, Selangor, Malaysia
Email: ehsan.aboosaedan@gmail.com, eugene.nkl@gmail.com

Abstract

Panel saw machines are available in different shapes and sizes, from small hand-held power saw machines to floor-mounted types. Floor-mounted machines comprise of a loading station and cutting surface where panels are transferred from the loading to the cutting station. Cutting wooden panel problem in furniture industry is one of the highest computation complexity optimization problems and belongs to rectangular layout problem. In this paper the mechanical design of floor-mounted panel saw machine is proposed. NanoPC ARM-based control system design with IIoT applications for remote and real-time monitoring, diagnostic and Machine-to-Machine (M2M) interfacing are described. The results of the cutting process are evaluated and discussed with achieved cutting size error less than 0.2 mm. In addition, the cutting wastage reduction and the cutline quality have been improved to 90% and 91% respectively based on the results of customer satisfaction survey.

Index Terms — panel saw, ARM controller, NanoPC, Industrial Internet of Things

Manuscript received August 7, 2018; revised July 17, 2019.

This work is registered under the Intellectual Property Corporation of Malaysia (MyIPO), Patent No. PI2018001384, August 1, 2018