

A New Approach towards the Development of Next Generation CNC

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Abstract : Computer Numeric Control (CNC) machine has been widely used in the industries since its inception. Currently, in CNC technology has been used for various operations like milling, drilling, packing and welding etc. with the rapid growth in the manufacturing world the demand of flexibility in the CNC machines has rapidly increased. Previously, the commercial CNC failed to provide flexibility because its structure was of closed nature that does not provide access to the inner features of CNC. Also CNC's operating ISO data interface model was found to be limited. Therefore, to overcome that problem, Open Architecture Control (OAC) technology and STEP-NC data interface model are introduced. At present the Personal Computer (PC) has been the best platform for the development of open-CNC systems. In this paper, both ISO data interface model interpretation, its verification and execution has been highlighted with the introduction of the new techniques. The proposed is composed of ISO data interpretation, 3D simulation and machine motion control modules. The system is tested on an old 3 axis CNC milling machine. The results are found to be satisfactory in performance. This implementation has successfully enabled sustainable manufacturing environment.

Keywords : CNC, ISO 6983, ISO 14649, LabVIEW, open architecture control, reconfigurable manufacturing systems, sustainable manufacturing, Soft-CNC

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