

The Integration of Humans and Machines in Flexible Manufacturing Cell

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ABSTRACT

Flexible Manufacturing System(FMS) has been recognized as a suitable manufacturing method for a variety production of small amount in modern manufacturing industry. Flexible Manufacturing Cell (FMC) is a basic unit of FMS. Because of its low investment cost, FMC has become a first step toward factory automation in industry. This thesis deals with the research of man-machine interface of an FMC which comprises two CNC lathes, one CNC machining center, one 6-axis articulatory robot, and input/output conveyers. First, a PC-based PLC control card for a PC-386 computer is used as the control device of the Flexible Manufacturing Cell. It proceeds all the functions of FMC. Secondly, a man-machine Graphical User Interface (GUI) provides lots of convenient and useful functions such as function table, mouse button, dialogue box, horizontal and vertical scroll bars, windows, button control, and checking square. PCX picture files which are created by a drawing software "Desktop Paint". provides using in monitoring man-machine interface software. It also provides the resources for producing applied softwares of man-machine interface which monitors operation states of FMC. Finally, using disk-shape workpieces such as differential speed gears and as practical machining examples to verify the performance of each function, which is included in the practical operation of this FMC system.

Keywords : Flexibile Manufacturing Cell ; Man-machine Control ; Programmable Machine Control

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