



## Upgradation of Milling Machine Using PLC

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### ABSTRACT

This work is about Programmable Logic Controller upgradation from Messung Nexgen-4000 to Mitsubishi-FX5U in H-series cylinder head LA8290 milling machine bay-1 in shop 5. Milling machine is used in the line for milling inlet manifold of Cylinder head. This machine contains Component fixing fixture, Hydraulic power pack, controlled by limit switch, actuators and sensors. These elements are in-turn controlled by logic programmed in PLC of Mitsubishi make, of model: FX5U. This up gradation is done because of obsolescence of Messung Nexgen-4000 PLC. Mitsubishi PLC of model: FX5U is more populated in the shop for various machines, this PLC is wiser and user friendly than Nexgen-4000, so we have planned to upgrade to model Mitsubishi-FX5U PLC. This PLC is having more advantages than Nexgen- 4000, some of the advantages are it is highly reliable, extremely user and maintenance friendly, modularized PSU, CPU, IO units. It combines high performance to meet complex requirement, versatile communication facility to integrate intelligent device.

**Keywords :** Programmable Logic Controller, FX5U,

### I. INTRODUCTION

The Programmable Logic Controller (PLC) could be a solid-state instrumentation, essentially designed to perform logical deciding for industrial management applications. Since their development in early 1970's, PLCs have evolved to challenge not solely relays however additionally different separate management devices like stepping switches, drum sequencers, etc. The relatively little size of PLC attended with less hardwired interlocks reduces the electrical device size significantly.

The powerful instruction set has reduced variety of elements as timers, counters, etc. The utilization of solid-state devices builds PLC terribly reliable as compared to electro-mechanical devices employed in relay management panels.

It is practiced that, during a PLC system, regarding ninetieth of the faults that occur area unit external to PLC. Dead of limit switches, gap of wires, etc. During a PLC system, aside from effecting the logical selections, the difficulty shooting is significantly simplified.

The machine or method standing, timer- counter values, method parameters may be displayed in clear format. Program may be developed to pin purpose the faults, leading to quick identification.

## II. BLOCK DIAGRAM

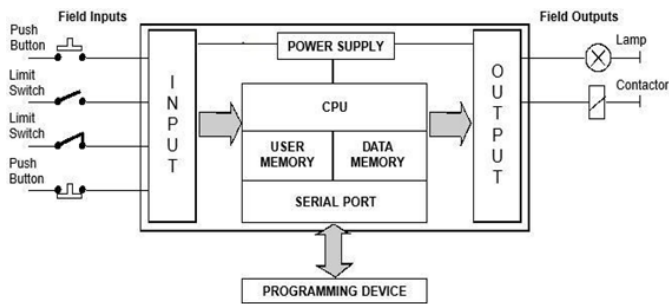


Fig. 1 Block Diagram

### DESCRIPTION

This project relies on the electronic refitting of management unit from older PLC that's Messung PLC to new PLC that's Mitsubishi PLC and mistreatment HMI. The system antecedently used was with the Messung PLC however currently it's replaced to Mitsubishi PLC. Due to this the productivity has exaggerated, higher and smart quality have created by Mitsubishi PLC. The first model within the IQ-F series is that the FX5U, giving high performance during a compact, price effective package. The FX5U continues the FX tradition of total flexibility by giving an enormous vary of latest and existing add-on choices that additional enhance the intrinsic functions of LAN, analogue I/O, information work, position management, security, communications and networking functions incorporated as commonplace.

The FX5U can give users with the flexibility to specify additional powerful systems however with fewer overall parts, saving time and price. FX5U processor base units with in no time interval Versions with up to 256 inputs and outputs. Enlarged input/output space for networks and sophisticated applications are often upgraded by combining with growth modules, intrinsic South Dakota card slot, Run/Stop/Reset switch, intrinsic LAN port, RS485 Displays the input and output states via LEDs. Integrated period of time clock.

Programming software package GX Works3. Before we've used the Messung PLC that have some disadvantage that square measure MTTR (Mean time to repair) is additional, Modification is tough, Scan time is additional, Production is a smaller amount to beat all this disadvantages we have a tendency to used Mitsubishi PLC.



Fig.2 PLC

Programming software package melsoft. Before we've used the Messung PLC that have some disadvantage that square measure MTTR (Mean time to repair) is additional, Modification is tough, Scan time is additional, Production is a smaller amount to beat all this disadvantages we have a tendency to used Mitsubishi PLC.

### CIRCUIT DIAGRAM

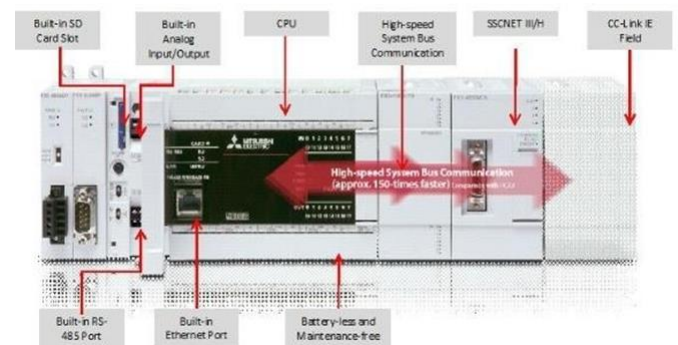


Fig.3 Circuit Diagram

Using these plc, the run time of the machine can be reduced and high reliability of the machine can be Ensured.

### III. RESULTS



**Fig.5** Result (Model)

By using the FX 5U PLC Response time of the machine can be increased and low power consumption than the messung plc.

We can also implement the idle time turn off for the hydraulic motor and the air compressor used in the milling machine

### IV. CONCLUSION

Our project is about PLC upgradation from Messung Nexgen-4000 to Mitsubishi FX5U in LA8290 milling Machine. This project is taken because of obsolescence of Messung Nexgen-4000 PLC, so we have gone for replacing Mitsubishi FX5U. These have various advantage of FX5U over Nexgen-4000. Some of advantages are isolated power supply, CPU Module, Input Module, Output Module. Individual modules can be diagnosed and replace.

By this project we are Aspiring MTTR (Mean Time to Repair) From 12hours to 1hour.

MTBF (Mean Time Between Failures) from 36 hours to 480 hours and reliable machine.

### V. FUTURE WORKS

In future these manual works done in machine to can be reduced by implementing fully automated control assembly line and increase the production rate of machine

### VI. ACKNOWLEDGMENT

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