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Control System Upgradation with SCADA and IOT on Vibrobot V 160 Machine

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ABSTRACT: In this design we're going to see about working module of the machine Vibrobot V 160. Vibrobot V 160 is used for plating process and there are four factors are used for plating. The process of plating is automated with the help of SCADA and IOT. This process is carried out through plc program by graduation sense methodology. The machine process is grounded on the PLC(Programmable Logic Controller) regulator. before PLC regulators are huge programme size, spare corridor are rare, inbuilt programming that we couldn't change as per the demand conditions and absolute model which is delicate to learn. To overcome this problem use the advanced PLC regulator model SIEMENS- S7 1200 rather of earlier telemachanic PLC regulator

KEYWORDS: IOT,SCADA,PLC,Plating

I. INTRODUCTION

Vibrobot V 160 Machine is used for plating purpose. There are four factors being plated in that machine. The design is under the department of Module conservation. The face of the factors are treated in the face treatment factory. The face is substantially treated to avoid rust and also for longlasting. The machine is executed with the help of PLC programming for controlling the process. The machine is enforced with SCADA with IOT for nonstop monitoring of the machine process. [1].

II. RELATED WORK

The telemachanic PLC is programmed by means of a programming device. The programming device is generally seperable from the PLC press so that it can be participated among different regulators. Different PLC manufacturers give different bias, ranging from simple teach pendant type bias, similar to those used in robotics, to telemachanic PLC programming keyboards and Circuit displays. PCs and laptops now considerably used for programming a important hastily and a PC/ laptop are also lower now. The software allows to produce, edit, document, store and trouble shoot programs. The particular computer communicates with the plc processor via journal or analogous data dispatches link Hand – held programming bias are occasionally used to program small PLCs. They are compact, affordable and easy to use, but are not suitable to display as important sense on screen as a computer examiner. Hand- held units are constantly used on the plant bottom for trouble shooting, modifying programs and transferring programs to multiple machines.

III. EXISTING METHOD

In Earlier time, the telemachanic PLC is used and programmed by means of a programming device. The programming device is generally seperable from the PLC press so that it can be shared among different regulators. The

telemechanic plc is truly delicate and long process and delicate to learn. The software allows druggies to produce, edit, document, store and trouble shoot programs are'n't applicable in this process. The particular computer communicates with the plc processor via periodical or resemblant data dispatches link Hand – held programming bias are constantly used to program small PLCs. They're compact, affordable and easy to use, but aren't suitable to display as important sense on screen as a computer monitor. Hand- held units are frequently used on the plant bottom for trouble shooting, modifying programs and transferring programs to multiple machine

IV. PROPOSED SYSTEM

Residual Current Circuit breaker switch is used to prevent current leakage, overcurrent and short circuit conditions. Here Switch Mode Power Supply is used to convert electrical power efficiently that converts 230V power supply to the 24V and 5A DC which is required for the operation of relays, sensors, solenoid coils. Siemens S7-1200 PLC is used in commercial and industrial control applications. PLCs differ from office computers in the types of tasks that they perform and the hardware and software they require to perform these tasks. SCADA System is used for controlling industrial processes, which is the gathering of data in real time from remote locations in order to control equipment and conditions. Data Storage in IOT where the entire data will be stored for analyzing process. Plating Rectifier Process is carried on the components to avoid rust and the components are treated in the surface for long lasting. In Machine Input side there will be Switches process, float switch, Temperature Sensor and in Machine Output side there will be pumps, heaters, solenoid coils.

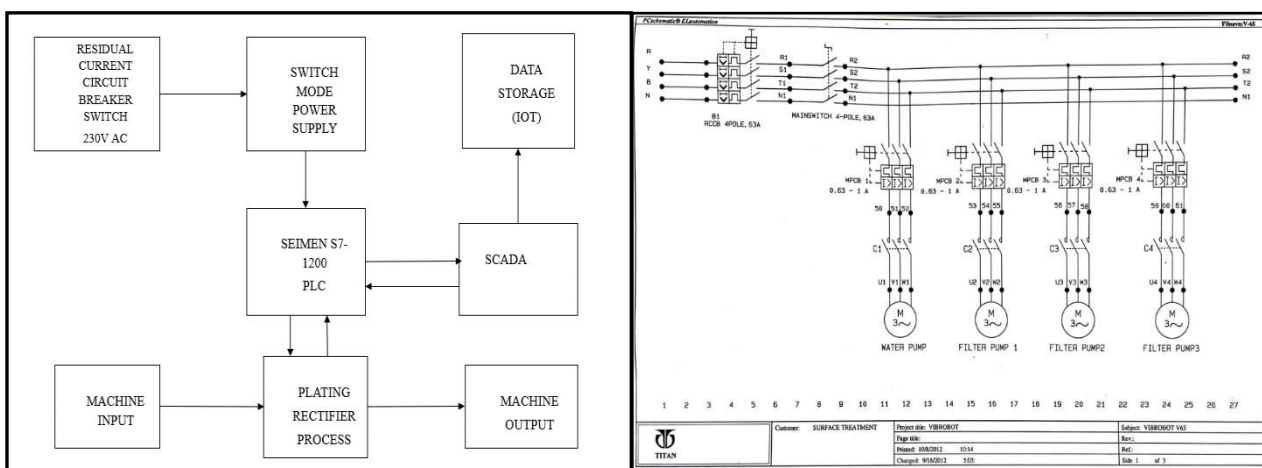


Fig.1.Block diagram

Fig. 2. Wiring diagram

a.PLATING PROCESS

Pre-cleaning:

Degreasing process is carried out for about 10-15 mins with the help of electro cleaner, cascade rinsing, acid pickling based on component size and then cascade rinsing.

Plating cycle:

After pre-cleaning process, the components are loaded in the machine. Nickel plating is done by treating with the nickel bath and the cascade rinsing is done on the components when loaded and the bath is maintained at the temperature of 50-60 degree Celsius. The vibration process starts by cathode and anode present in inside the machine and the components are plated. It takes around 30-45 mins to complete the process.

Post-cleaning:

Some Components are Drag out from the concentration of sodium cyanide and cascade rinsing is done and for steel component Iso Propyl Alcohol is used and for Brass component Demineralized water is used.

b. RESIDUAL CURRENT CIRCUIT SWITCH BREAKER

RCCB is an electrical wiring device that disconnects a circuit whenever it detects that the electric current is not balanced between the energized captain and the return neutral captain. RCCBs are designed to disconnect snappily enough to help current leakage and not intended to give protection against over current or short circuit conditions.



Fig 3: RESIDUAL CURRENT CIRCUIT BREAKER

c. SWITCH MODE POWER SUPPLY (SMPS)

It's an electronic power force that incorporates a switching controller to convert electrical power efficiently. The input 230V force is given to the SMPS, which converts it to 24V & 5A DC which is needed for the operation of relays, contactors, detectors, solenoid faucets, LED's etc

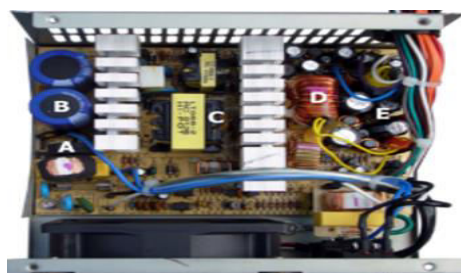


Fig 4: SMPS

d. SEIMENS S7 1200 PLC

A programmable sense regulator(PLC), also appertained to as a programmable regulator, is the name given to a type of computer generally used in marketable and artificial control operations. PLCs differ from office computers in the types of tasks that they perform and the tackle and software they bear to perform these tasks. While the specific operations vary extensively, all PLCs cover inputs and other variable values, make opinions grounded on a stored program, and control labors to automate a process or machine

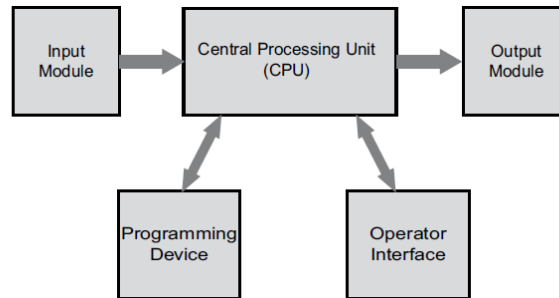


Fig 5: BASIC PLC OPERATION

e.SCADA

SCADA(supervisory control and data acquisition) and it is also an administrative control and data accession as a order of software operations for controlling artificial processes, which is the gathering of data in real time from remote locales in order to control outfit and conditions.

f.IOT

The internet of effects, or IoT, is a system of interrelated computing bias, mechanical and digital machines, objects, creatures or people that are handed with unique identifiers(UIDs) and the capability to transfer data over a network without taking mortal- to- mortal or mortal- to- computer commerce. Industrial IOT bias, from detectors to outfit, give business possessors detailed, real- time data that can be used to ameliorate business processes.

V. EXPERIMENTAL RESULTS

1. SOFTWARE REQUIRED

SIMATIC software is the universal configuring and programming terrain for SIMATIC regulators and process control systems. SIMATIC software with multitudinous engineering tools supports all phases of product deployment, from tackle configuration of the system and parameterization of modules to service of the installed system. A variety of programming options are available. This includes introductory programming languages(Instruction List, Ladder Diagram, and Function Block Diagram), high- position languages(Structured Text and successional Function Map), and engineering tools(S7 Structured Control Language, S7- Graph, S7- PLCSIM, S7- HiGraph, and nonstop Function Map).

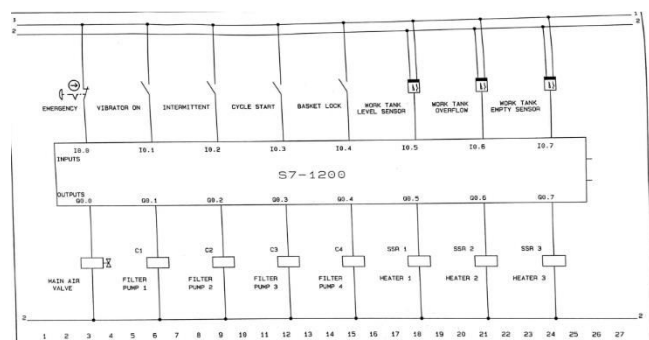


Fig 6: S7-1200

2. VIBROBOT MACHINE



Fig 7: VIBROBOT V 160

3. SCADA DEVICE IMAGE

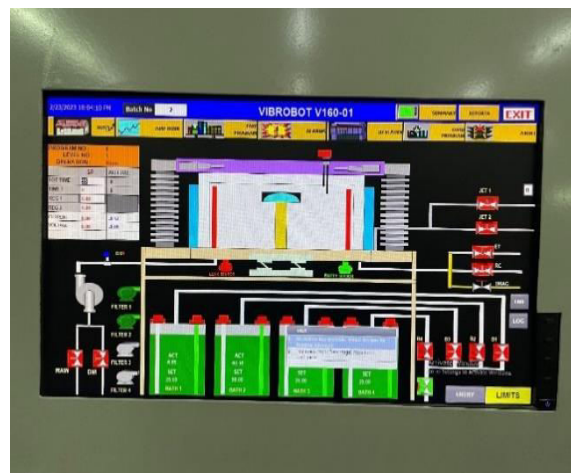


Fig 8: SCADA DEVICE IMAGE

4. MODULE DIAGRAM

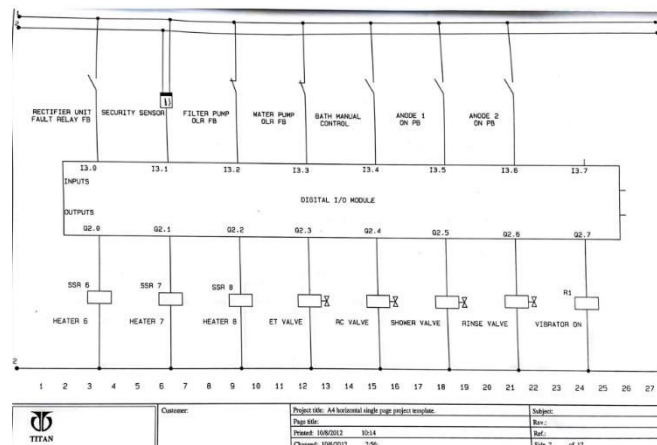


Fig 9: I/O MODULE

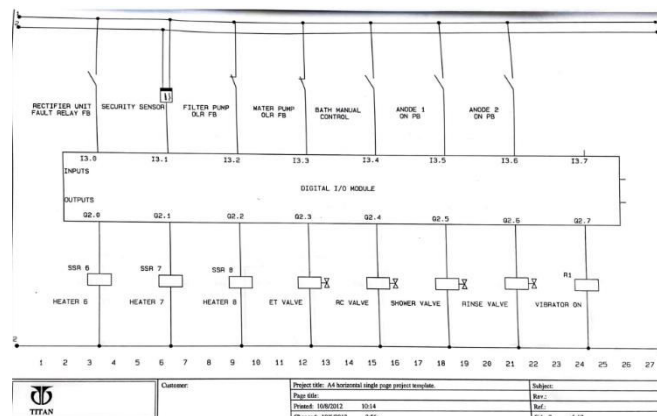


Fig 10: DIGITAL I/O MODULE

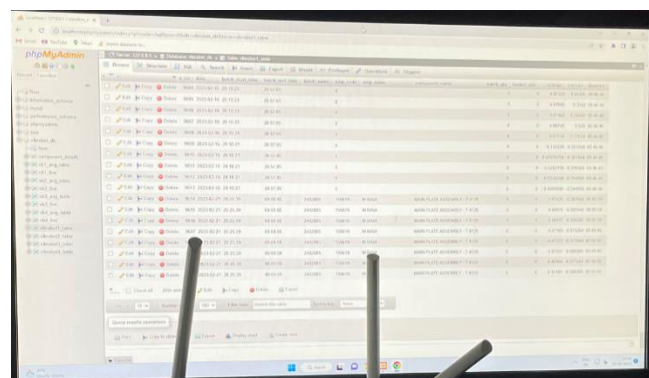


Fig 11: OUTPUT

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In this project, In this design, the perpetration and implementation of SCADA with IoT in the machine which has unique advantage. It consumes lower time to cover and control the process than a homemade system of telemechanic plc. The system can be modified according to the requirements of the stoner and can be enforced along with fresh technologies for future use.

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