GLOVES TESTING MACHINE: Sutures a Bio Medical Project

Overview and Working

Sutures is a Bio Medical Project, this project is used to test micro and nano holes in surgical gloves by using air pressure to test the gloves.

Firstly the air pressure is blown into the gloves and pressure sensor are used to measure the initial pressure,then again the air pressure is blown into the gloves after 20seconds,again the air pressure are measured for final pressure.

The difference between the air pressure reading will decide the Good ,Bad,Retest gloves.

The System has Stator and Rotor Mechanism ,where rotor has mechanism of 4 modules ,each modules has 16 module to hold the Gloves(i.e 4\*16= 64 gloves) at a time using actuators. Where the solenoid valves are used to drive the compressed air into the gloves.

After one cycle ,Based on the pressure readings the gloves are thrown into the respective bins like GOOD,BAD ,RETEST.

**Type of Controller Used**

We have used STM32 controller to control the actuators and

solenoid valves.

4 pressure sensors are MUX and given to the ADC to measure the

pressure and read the readings.

**Type of Communication Used**

We have used RS-232 protocol communication .It is full duplex protocol means both PC and Controller sends and receives data at a same time.Each module will be having RS-232 adresses and uses this address for communication.

PC to Controller

MC: -Wait for reset twice, and send message to PC.

PC: - Wait for valid address (ID) to PC.

MC: - Send identifier (i.e ID) in ASCII format to PC in order to connect with SCADA.

PC: - Will check the received ID is valid or not and sends the ACK(A-YES or W-NO)

MC: - If W has received for 3 times, then the controller will be reset,if A is received then the data will be sent with ID to PC

PC :- Will check for the valid speed and send back the ACK to MC(B-valid , X-mismatch)

MC: -If X is received for 3 times then the controller will be reset,if B is received then sends Rx ACK (C-Success, Y-Failure) to PC.

After Succesful configuration

PC: - will send successful configuration matching Speed.

MC: - Will Stores the configuration Parameters,and send ACK (D-Succesful ,Z-Unsuccessful) to PC

PC: - If Z is received it will reset the controller ,if D is received then the succesful configuration is done for current module.