

Automatic zari thread counting and control system for handloom weavers

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ABSTRACT

Aim of this project is to count the zari thread automatically for utilizing the handloom weavers. In handloom industries full automation is challenging one. The Subsisting system is very arduous to count the zari thread. This counted zari thread is utilized to the buta's of sarees. Thist system is performs an automatic process to count the zari thread. Human power is need to monitor and do the zari thread designing process. Semi automation only available, additionally the subsisting systems have a Drawback.So, the proposed system is overcome the drawback of the subsisting system.

Key Words: Sensor networks, counting value monitering, zari thread detection, energy minimization, man power reduction.

INTRODUCTION

The Embedded Technology is now in its prime and the wealth of Cognizance available is mind-blowing. Embedded System involves both hardware and software. Embedded system plays a vital role in integrating the sundry functions associated with it. This proposed system reduces the human resources, preserves time and operates efficiently without human intervention. It specifies the first step in achieving the desired target. With the advent in technology, the subsisting systems are developed to have in built astuteness. In handloom industries full automation is challenging one. IR TX and RX are habituated to find whether the threat (zari) under connection with motor or not. Whenever press the key (motor on/off) it checks zari whether is placed or not. If it is placed designates operation will be taken mundane manner. Otherwise it will stop immediately buzzer and LCD will give vigilant. Under mundane condition motor will one direction (forward or reverse). Whenever the revolutions procure the required (fine-tuned) revolution it will transmute the direction of rotation into antithesis, to that of antecedent one. The number of revolution is exhibited in the LCD. The vicissitude in direction of rotation is controlled by microcontroller by utilizing driver circuits. Every time controller will check the position of zari thread whether it is placed or not by utilizing sensor IR TX and RX. Speed sensor is utilized to calculate revolutions of motor. DC Motor with speed quantifying arrangement is nothing but it has provision to quantify the motor revolution.

Proposed system: The proposed system is explicated the automatic process of the zari thread counting system.

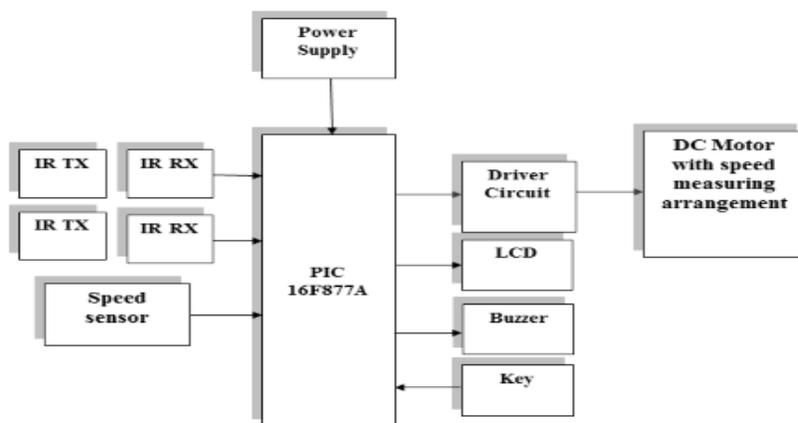


Figure.1. Block Diagram of Proposed System

Power supply Unit: The supply of 5V DC is given to the system, which is converted to the 230V AC supply. Firstly, the step down transformer used here is for converting the 230V AC into 12V AC. The microcontroller will fortify only the DC supply, so the AC supply is converted to DC. We are utilizing the 2200uf capacitor for filtering those disturbances.

The output is given to the 7805 voltage regulator, which will convert the 12V direct current to 5V direct current. The output from the controller will be filtered utilizing the 1000uf capacitor, so the pristine 5V DC is getting as the output from the puissance supply unit.

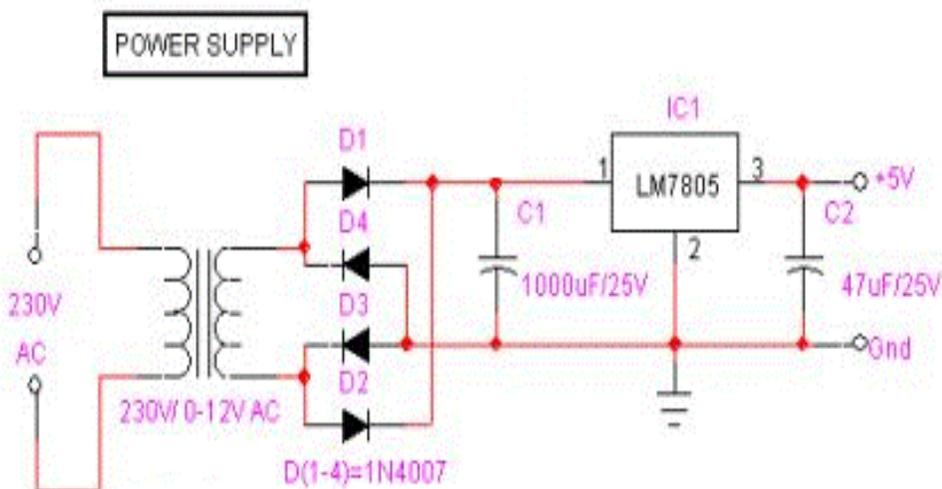


Figure.2.Power Supply Unit

Microcontroller Unit:

Pic16f877a Microcontroller: The four features that you might cause you to utilize a 16F887 in lieu of a 16F877 (A) are

- External gate
- Volt Reference
- Nano Watt™
- Internal Clock

The gate could be habituated to more accurately capture an input time. The volt reference denotes you don't require an external reference albeit it will probably not be subsidiary for highly precise operation. It is definitely more utilizable in a battery powered operation where you optat to compare the input battery voltage to a kened reference. Nano Watt™ could be utilizable for battery powered operation. The internal clock is utilizable for lab development (not for precision) and for general operation - it can withal be set to 31 kHz so consuming less puissance. All the above depend on your concrete application requisites.

PIC Controller 16F877A: The 40 pins make it more facile to utilize the peripherals as the functions are spread out over the pins. This makes it more facile to decide what external contrivances to affix without worrying an inordinate amount of if there are enough pins to do the job. The main advantages is that every pin is only shared between two or three functions so it's more facile to decide what the pin function (other contrivances have up to 5 functions for a pin).

Note: A disadvantage of the contrivance is that it has no internal oscillator so you will require an external crystal of other clock source.

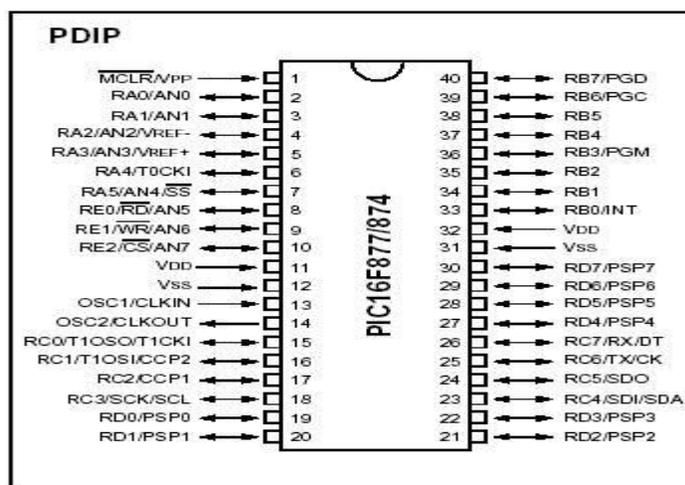


Figure.3.40 DIP PIC Controller pin diagram

Sensors Unit:

IR Transmitter: This IR transmitter sends 38 kHz (frequency can be adjusted utilizing R2). IR carriers at around 38 kHz carrier frequencies are widely utilized in TV remote controlling and ICs for receiving these signals are quite facily available. IR transmitter constructed by utilizing IC555 timers and mode of operation under a stable multi-vibrator.

Formula frequency: $T = 0.69(Ra+2Rb) C$

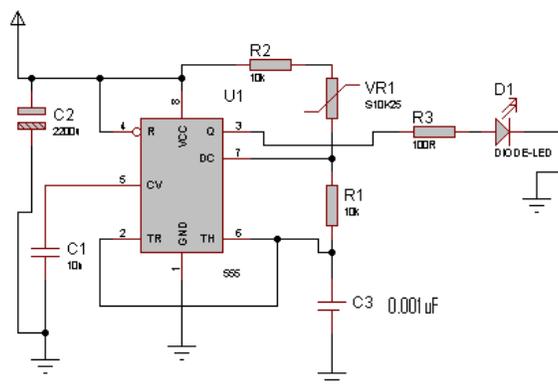


Figure.4.Schematics IR Transmitter

IR Receiver: This is a minutely diminutive IR receiver predicated on the TSOP1738 receiver. This receiver has all the filtering and 38 kHz demodulation built into the block. It focuses towards the infrared remote at the receiver, a stream of 1s and 0s out of the data from IR transmitter and TSOP capable of receiver only 38khz frequency because in circumventing so many contrivances transmitting IR signal at different frequency so we constructed receiver to receive at 38khz frequency only and output of IR receiver given to microcontroller port three at P3.2.

IR RECEIVER CIRCUIT

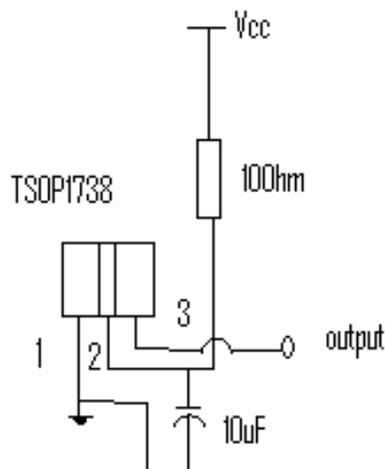


Figure.5.Schematics IR Transmitter

Exhibit LCD Unit: A liquid crystal exhibit (LCD) is a flat panel exhibit, electronic visual exhibit, or video exhibit that utilizes the light modulating properties of liquid crystals (LCs). LCDs do not emit light directly. The main utilization of this is to view the current status of the Process such as Moisture level, Rain and Strain Gauge level etc.

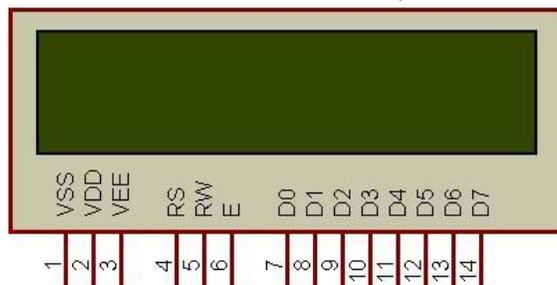


Figure.6.Character LCD type HD44780 Pin diagram

DC motor: A DC motor is designed to run on DC electric puissance. Two examples of pristine DC designs are Michael Faraday's homopolar motor (which is unorthodox), and the ball bearing motor, which is (so far) a novelty. By far the most prevalent DC motor types are the brushed and brushless types to engender an oscillating AC current from the DC source—so they are not pristinely DC machines in a rigorous sense.



Figure.7.DC motor

Software Unit: Software is utilized to compile the coding of the desired application for the corresponding embedded system.

RESULTS AND DISCUSSION

In this project, several obstacles faced by the Handloom weaver's considered and felicitous solution is developed to surmount these short comings. Measuring and handling microcontroller through the use of sensors and motors avails them to communicate much better than the past technologies. Thus the result of the proposed system is observed and the performance of the Counting and Control System is discussed and compared respectively in this chapter. Predicated on the project, the zari thread comes through the IR sensor. Whenever cut zari thread during the process, the motor ceased immediately and buzzer will vigilant the people.



Figure.8.Output of the project

Input / Measured Parameter	Values
Input Supply Range (V)	5V
Speed of the DC motor	60 rpm
Maximum No. of Zari thread Count/min	60

CONCLUSION

In this project, automation for counting handloom threads (Zari) in handloom industries is designed. Nowadays, automation for counting threads is found subsidiary other than manual process. For this purport, IR-TX and RX is utilized. In this process, thread is counted and inferred weather the threads is perpetual and it is arranged in opportune way. If the thread is arranged eccentrically. It is alerted with a buzzer and displaying the spot in LCD. Microcontroller is utilized to check the revolution of thread and its direction and to regulate it. Speed sensor is incorporated here to sense the motor direction and to quantify the speed. In this project, the automation for counting threads for handloom weaving industries is designed.

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