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DIGITAL DIMMER

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project guide

ABSTRACT
The purpose of this paper to present that how to develop such a system which will remove limitations of the current system.Here we will develop such a system where we can set the required voltage using the keypad, and system will automatically set the output as per the input set point given through the keypad.

KEYWORDS: Single phase auto transformer, digital electronics

INTRODUCTION

In this today's world digital technology is becoming normal part of our life. In each and every field the automation looks a essential part. We use so many devices for that digital electronics is integrated part. We use some measurement device like voltmeter multimeter ammeter, frequency meter etc. all these now we found have digital electronics. We use function generator. also we use dimmer switch for maintaining the required voltage output as per our next circuit requirement Now its time use some digital electronics for this equipment to make this equipment digital one.

PROPOSED WORKING

1) The user can set the required output voltage with the help of keypad. LCD will provide user interface.
2) The system will have facility to sense the voltage and that present voltage will be displayed on lcd
3) System will control the motor movement as per the requirement
4) If set point is more than the present voltage then microcontroller will move the motor clockwise and stop when the required output voltage is achieveif set point is less than the present voltage then microcontroller will move the motor anticlockwise and stop when the required output voltage is achieved. Transformer is used as sensing device which sense the present voltage and give the signal to the microcontroller.

We use a LCD which is used 16X2 type. i.e. 16 characters per rows and two rows. The function of LCD is to display the status of events performed by the respective circuit or to display those resulting.it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display etc. The data register stores the data to be displayed on the LCD.

We use High efficiency, high quality low cost DC motor with gear boxVery easy to use and available in standard size. Nuts and threads on shaft to easily connect and internal threaded shaft for easily connecting it to wheel.

FEATURES

- 3.5 RPM to 1000 RPM at 12V DC motors with Gearbox, RPM can vary when operating from 3 to 15V
- 5kgcm torque
- 3000RPM base motor
- 6mm shaft diameter with internal hole
- 125gm weight
- Same size motor available in various rpm
- No-load current = 60 mA(Max), Load current = 300 mA(Max)

We use PIC16F877A devices which are available in 40-pin and 44-pin packages. All devices in the PIC16F87XA family share common architecture with the following differences:

PERIPHERAL FEATURES

• Timer0: 8-bit timer/counter with 8-bit prescaler
• Timer1: 16-bit timer/counter with prescaler, can be incremented during Sleep via external crystal/clock
• Timer2: 8-bit timer/counter with 8-bit period register, prescaler and postscaler
• Two Capture, Compare, PWM modules
- Capture is 16-bit, max. resolution is 12.5 ns
- Compare is 16-bit, max. resolutions is 200 ns
- PWM max. resolution is 10-bit
• Synchronous Serial Port (SSP) with SPI™ (Master mode) and I2C™ (Master/Slave)
• Universal Synchronous Asynchronous Receiver Transmitter (USART/SCI) with 9-bit address detection
• Parallel Slave Port (PSP) – 8 bits wide with external RD, WR and CS controls (40/44-pin only)
• Brown-out detection circuitry for Brown-out Reset (BOR)

ANALOGFEATURES

• 10-bit, up to 8-channel Analog-to-Digital Converter (A/D)
• Brown-out Reset (BOR)
• Analog Comparator module with:
- Two analog comparators
- Programmable on-chip voltage reference (VREF) module
- Programmable input multiplexing from device inputs and internal voltage reference
- Comparator outputs are externally accessible

SPECIAL MICROCONTROLLER FEATURES

• 100,000 erase/write cycle Enhanced Flash program memory typical
• 1,000,000 erase/write cycle Data EEPROM memory typical
• Data EEPROM Retention > 40 years
• Self-reprogrammable under software control
• In-Circuit Serial Programming™ (ICSP™) via two pins
• Single-supply 5V In-Circuit Serial Programming
• Watchdog Timer (WDT) with its own on-chip RC oscillator for reliable operation
• Programmable code protection
• Power saving Sleep mode
• Selectable oscillator options
• In-Circuit Debug (ICD) via two pins

CMOS TECHNOLOGY

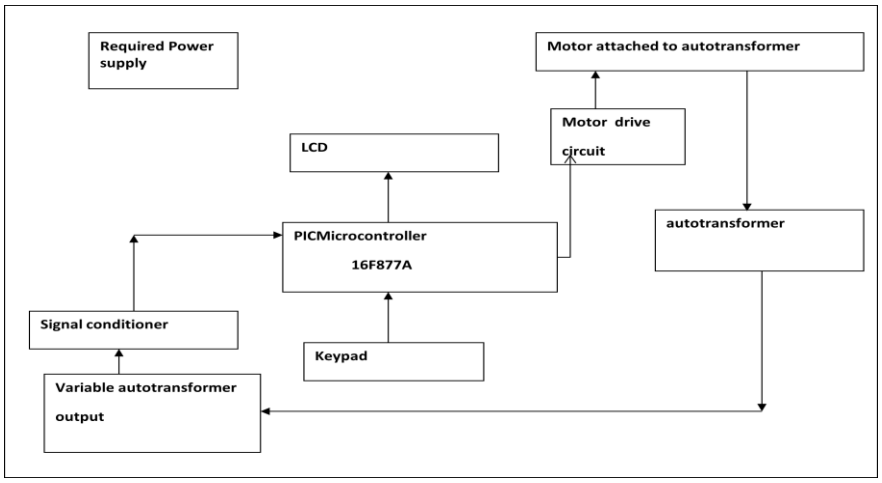
• Low-power, high-speed Flash/EEPROM technology
• Fully static design
• Wide operating voltage range (2.0V to 5.5V)
• Commercial and Industrial temperature ranges

PIC16F874A have one-half of the total on-chip memory of the PIC16F876A Additional information may be found in the PIC micro® Mid-Range Reference Manual (DS33023), which may be obtained from yourLocal Microchip Sales Representative or downloaded from the Microchip web site. The Reference Manual should be considered complementary document to this data sheet and is highly recommended reading for a better understanding of the device architecture and operation of the peripheral modules.

The microcontroller need +5V DC, These specifications dictate the use of a low-cost, ubiquitous linear regulator National Semiconductor LM7805. The LM7805 requires an input voltage of at least 7.5V in order to guarantee regulation, so the unregulated power supply should supply at least this voltage under worst-case current consumption, assumed to be about 200mA.Because a full-wave rectifier will be used for efficiency (diodes D1-D2), we can assume that about 1.4V will be lost across the bridge (0.7V per conducting diode). We therefore need a transformer was selected as T1, which is of rating 9-0-9 secondary at 500 mA

FIGURES

BLOCK DIAGRAM



CONCLUSION

This paper presentthe user can set the required output voltage with the help of keypad. The system will have facility to sense the voltage and that present voltage will be displayed on lcd. System will control the motor movement as per the requirement. i.e. if set point is more than the present voltage, then micro-controller will move the motor clockwise and stop when the required output voltage is achieved. if set point is less than the present voltage then micro-controller will move the motor anticlockwise and stop when the required output voltage is achieved.

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