



PIC18F4550 DEMO BOARD



# PIC18F4550 Demo Board™ User's Guide

# Table of Contents

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## **Chapter 1:**

### *Introduction*

1.1	<a href="#">Welcome</a> .....	03
1.2	<a href="#">PIC18F4550™ Demo Board</a> .....	04

## **Chapter 2:**

### *Hardware Features*

2.1	<a href="#">Display LEDs</a> .....	05
2.2	<a href="#">Power Supply</a> .....	05
2.3	<a href="#">RS232 Serial Port</a> .....	05
2.4	<a href="#">Switches</a> .....	05
2.5	<a href="#">Oscillator Option</a> .....	05
2.6	<a href="#">Analog Input</a> .....	06
2.7	<a href="#">Temperature Sensor</a> .....	06
2.8	<a href="#">Serial EEPROM</a> .....	06
2.9	<a href="#">LCD</a> .....	06
2.10	<a href="#">Buzzer</a> .....	06
2.11	<a href="#">Port Extension Pins</a> .....	07
2.12	<a href="#">ICSP Connector</a> .....	08

## **Chapter 3:**

	<a href="#">Board Layout</a> .....	8
	<a href="#">Schematic</a> .....	9
	<a href="#">Logic Power Contact Us</a> .....	10

## Introduction

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### 1.1 Welcome

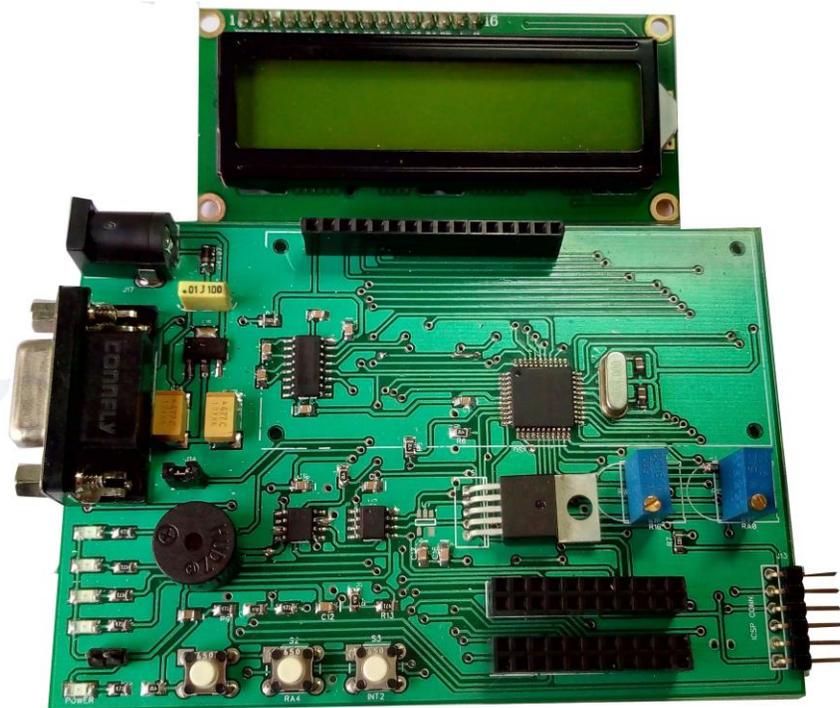
*Thank you for purchasing the ADVANCE 40-Pin™ Demo Board from Logic Power!!*

*The PIC18F4550™ Demo Board is a simple board which demonstrates the capabilities of the PIC18F4550 PIC device. Sample programs are provided to demonstrate the unique features of the supported devices.*

*The PIC18F4550™ Demo Board comes with the following:*

- **PIC18F4550™ Demo Board**
- **CD-ROM, which contains:**
  - a) *Sample Programs*
  - b) *PIC18F4550 Demo Board User's Guide*

*If you are missing any part of the kit, please contact your nearest Logic Power office listed in the back of this user guide for help.*



## 1.2 PIC18F4550 DEMO BOARD

This document describes the PIC18F4550 size (75mm x 110mm) demonstration board permanently mounted PIC18F4550 device tutorial and demonstration software. 4 MHz external crystal (Y1) is used detailed information on individual microcontrollers may be found in the device's respective data sheet. Development Board supports the MPLAB® programmer and debugger for full emulation and debugs capabilities. It has the ability to extend its functionality through modular expansion interfaces. It allows controllers to interface with 5V peripheral devices.

### Hardware Key Features:

1. PIC18F4550 TQFP 44pin package.
2. On-board +5V regulator for direct input from 9V, 500 mA AC/DC wall adapter or 9V battery, or hooks for a +5V, 500 mA regulated DC supply.
3. RS-232 socket and associated hardware for direct connection to an RS-232 interface.
4. Debugger / programmer (PICkit-3) connector.
5. 5 K  $\Omega$  pot (R2) for devices with analog inputs.
6. Three push button switches for external stimulus and Reset.
7. Yellow power-on indicator LED.
8. Four red LEDs connected to PORTB.
9. 4 MHz external crystal oscillator.
11. Piezo buzzer.
12. 32K x 8 Serial EEPROM.
13. 2-line by 16-character LCD.
14. 256K SPI Bus Serial EEPROM.
15. Microchip TC74 thermal sensor.
16. J14 buzzer jumper.
17. six-pin interface for the PICkit™ Programmer (j13).
18. Extension port pins (j1, j3).

## 1.3 REFERENCE DOCUMENTS

1. PIC18F4550 datasheet.
2. 24LC256 EEPROM datasheet.
3. 25LC256 datasheet.
4. TC74 thermal sensor datasheet.

## 2.0 HARDWARE DETAILS:-

### 2.1 Display LEDs

Four red LEDs are connected to PORTB of each processor type. The PORTB pins are set high to light the LEDs. These LEDs may be disconnected from PORTB by removing jumper J6.

One green LED is provided to determine whether there is power to the PIC18F4550 board (LED on) or not (LED off).

### 2.2 Power Supply

There are two ways to supply power to the PIC18F4550 demo board:

A 9V-12V, 500 mA DC supply can be plugged. Power supply can be purchased through LOGIC POWER

**Note:** PIC18F4550™ Demo Board kit does not include a Power Supply.

An internal power supply can also be provided by using PICKit2/ PICKit 3/ MPLAB ICD 3/ MPLAB ICD4/ MPLAB PICKit 4 (Please check particular Programmers User Guide to set an internal power supply, also we recommend you to use an EXTERNAL Power Supply for your demo board).

(To Purchase any programmer/debugger from Logic Power,

Please email your requirement to the below email Id.: [sales@logicpower.in](mailto:sales@logicpower.in) or Buy it from our website directly: [www.logicpower.in](http://www.logicpower.in))

### 2.3 RS232 Serial Port

RS-232, level-shifting IC has been provided with all the necessary hardware to support connection of an RS-232 host through the DB9 connector. The port is configured as DCE and can be connected to a PC using a straight-through cable.

The PIC18F4550 RX and TX pins are tied to the RX and TX lines of the MAX232A

### 2.4 SWITCHES

Three switches provide the following functions:

- S1 - MCLR to hard reset the processor
- S2 - Active-low switch connected to RA4
- S3 - Active-low switch connected to RB0

Switches S1 and S3 have debounce capacitors, whereas S2 does not, allowing the user to investigate debounce techniques.

When pressed, the switches are grounded. When Idle, they are pulled high (+5V).

### 2.5 OSCILLATOR OPTIONS

- 4 MHz crystal oscillator.

## 2.6 Analog Input

PIC18F4550 demo board is provided with 10k $\Omega$ , is connected to AN0 channel of A/D module. POT can generate different analog voltage levels from VDD to GND to provide analog input to A/D module.

## 2.7 TEMPERATURE SENSOR

This is a serial digital thermal sensor (TC74) connected to the 28 and 40-pin microcontrollers via RC3 and RC4. Communication is accomplished with the TC74 via its 2-wire I2C™ compatible serial port. This device has an address of 1001101b.

**Note:** Remove jumper J2 while interfacing TC74

## 2.8 SERIAL EEPROM

A 24L256 256K (32K x 8) serial EEPROM is included on the board to illustrate I2C bus concepts.

A 25LC256 256K (32K x 8) serial EEPROM (U4) is included for nonvolatile firmware storage, it is also used to demonstrate SPI bus operation. 25LC256 is SPI bus device, so the SDO (RC7), SDI(RB0), SCL(RB1) and SS(RA5) signal are interface with PIC18F4550.

**Note:** Remove jumper J2 while interfacing 24LC256 and 25LC256

## 2.9 LCD

PIC18F4550 Demo Board has LCD display connection with two lines, 16 characters each, is connected to PIC18F4550. There are three control lines (RD3:RA1) and four data lines (RD3:RD0). A 2.2k $\Omega$  resistor is installed into R12 for fixed contrast of LCD. Also, provision for 5k $\Omega$  (R16) or (R10) Potentiometer for adjusting LCD contrast.

## 2.10 Buzzer

This mode turns on the Piezo buzzer, using the CCP1 module I/O pin, RC2. The period and duty cycle of the CCP1 frequency can be changed while the buzzer is on. The changes in period and duty cycle are recognized immediately in the buzzer tone. You can disconnect the buzzer if you remove the j14 jumper. If you are using Buzzer, check that j14 jumper whether it is connected or not.

## 2.11 PORT EXTENTION

PIC18F4550 demo board provide port extensions pins so that you can interface with its other device.

## 2.12. ICSP

In-system programming (ISP), also called in-circuit serial programming (ICSP), is the ability of some programmable logic devices, microcontrollers, and other embedded devices to be programmed while installed in a complete system, rather than requiring the chip to be programmed prior to installing it into the system.

**Vpp** - Programming mode voltage. This must be connected to the MCLR pin, or the Vpp pin of the optional ICSP port available on some large-pin count PICs. To put the PIC into programming mode, this line must be in a specified range that varies from PIC to PIC. For 5 V PICs, this is always some amount above Vdd, and can be as high as 13.5 V.

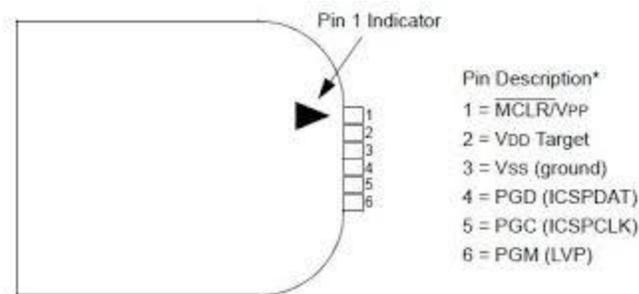
**Vdd** - This is the positive power input to the PIC. The Embed Inc programmers expect to drive the Vdd line themselves and require the target circuit to be off during programming.

**Vss** - Negative power input to the PIC and the zero volts reference for the remaining signals. Voltages of the other signals are implicitly with respect to Vss.

**ICSPDAT** - Serial data line. The serial interface is bi-directional, so this line can be driven by either the programmer or the PIC depending on the current operation. In either case this line swings from GND to Vdd. A bit is transferred on the falling edge of PGC.

**ICSPCLK** - Clock line of the serial data interface. This line swings from GND to Vdd and is always driven by the programmer. Data is transferred on the falling edge.

**AUX/PGM** - Newer PIC controllers use this pin to enable low voltage programming (LVP). By holding PGM high, the micro-controller will enter LVP mode. PIC micro-controllers are shipped with LVP enabled - so if you use a brand new chip you can use it in LVP mode.





## Figure 3.2. PIC18F4550 Demo Board Schematic

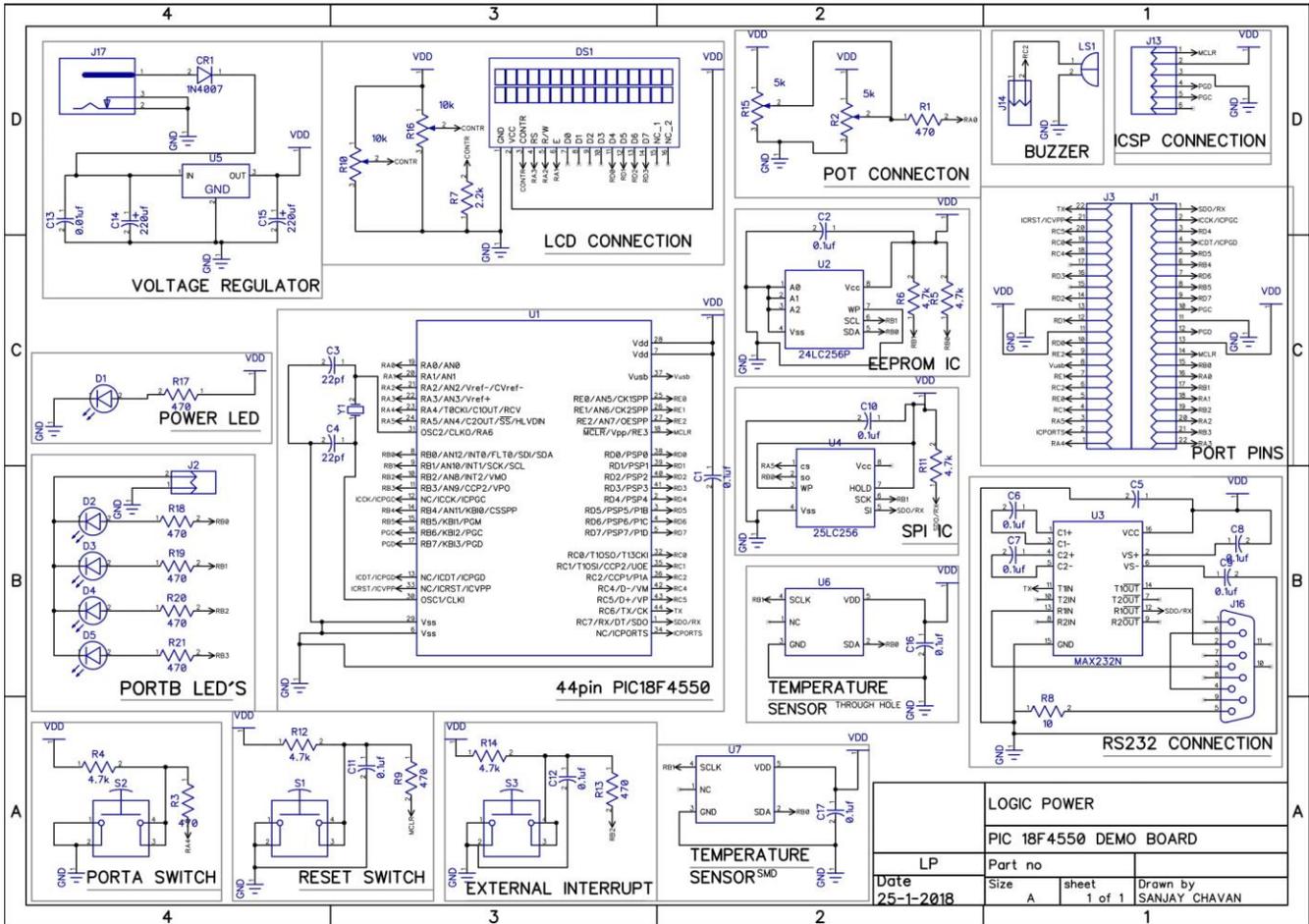


Fig.: 3.2



## PIC18F4550 DEMO BOARD



Please contact us for any query related to our Product.

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