

Document Title	HSI of Digital Calculator
Project Name	PO1_DGC
Document Version	1.1

Document Change History				
Version	Author	Date	Change	Status
1.0	Esraa Awad	23/1/2020	Initial creation	Draft
1.1	Esraa Awad	30/1/2020	-Change in Requirement`s names. -Change in system hardware block diagram adding external switch for powering LCD on and off.	Draft

Table of Content

1. Hardware Description
2. Pins Configuration
3. Features Description

Index of Figures

- 1.1 System hardware block diagram

Hardware Description

Hardware	Description
AVR ATmega32 (MCU)	Low-power Microchip 8-bit AVR RISC-based microcontroller Program Memory Size 32 (KB) Pin Count 44
LCD (LMB161A)	LCD Mode: STN Positive Transflective Display Color: Dark Blue Background Color: Yellow-Green Driving Duty: 1/16 Duty Viewing Direction: 6:00 Backlight : LED
4*4 Keypad	Four rows of matrix and four are columns of matrix. 8 pins are driven out from 16 buttons present in the module.
Buzzer	Resonant: 2300 +/-300HZ Frequency: 2300 +/- 300 HZ Rated Voltage: 5V Voltage range: 4: 8 V Rated Current: 30 ma Min Sound output at 10 cm: 85 dB

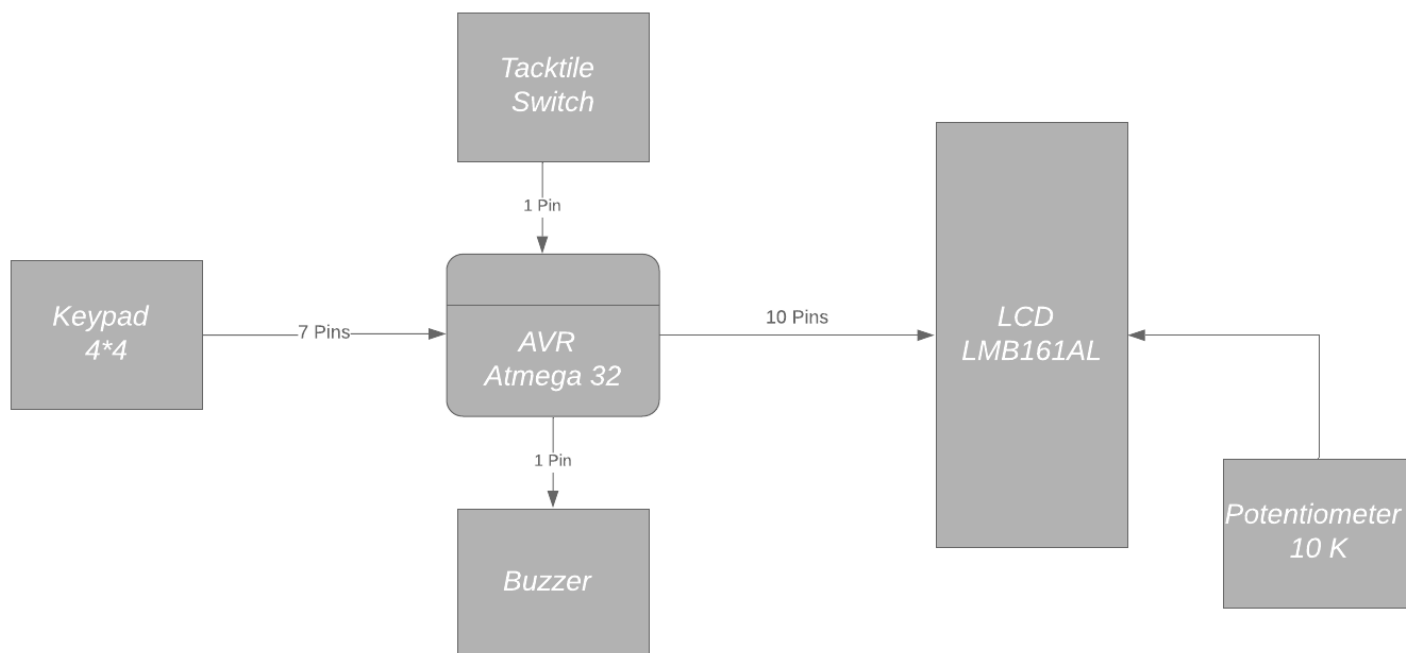


Figure 1.1 System hardware block diagram

Pins Configuration (ATmega32 AVR):

PORT	Configuration
PORTA	Pin(0:7) connected to data pins of LCD
PORTB	Pin(0:3) connected to control pins of LCD
PORTC	Pin(0:7) connected to Keypad pins rows (0:3 Output) and columns (4:7 Inputs)
PORTD	Pin 0 connected to Buzzer

Features description

Requirement Name	Hardware Requirement Description
Req_PO1_DGC_HSI_001_V01	Keypad consists of 10 numbers (0:9), basic operation keys (+-/*) and clear key, its eight pins are connected to MCU
Req_PO1_DGC_HSI_002_V01	Buzzer has 2 pins one GND and the other connected to MCU as output.
Req_PO1_DGC_HSI_003_V01	Micro controller 8-bit AVR ATmega32 has 32 DIO pins
Req_PO1_DGC_HSI_004_V01	LCD has 3 control pins and 8 pins for data to be displayed on its screen
Req_PO1_DGC_HSI_005_V01	A tactile switch has 2 pins one GND and the other connected to MCU as input for switching LCD on and off .