EEE L5-S01

Assignment 2 – Human Machine Interface

Consolidation Report

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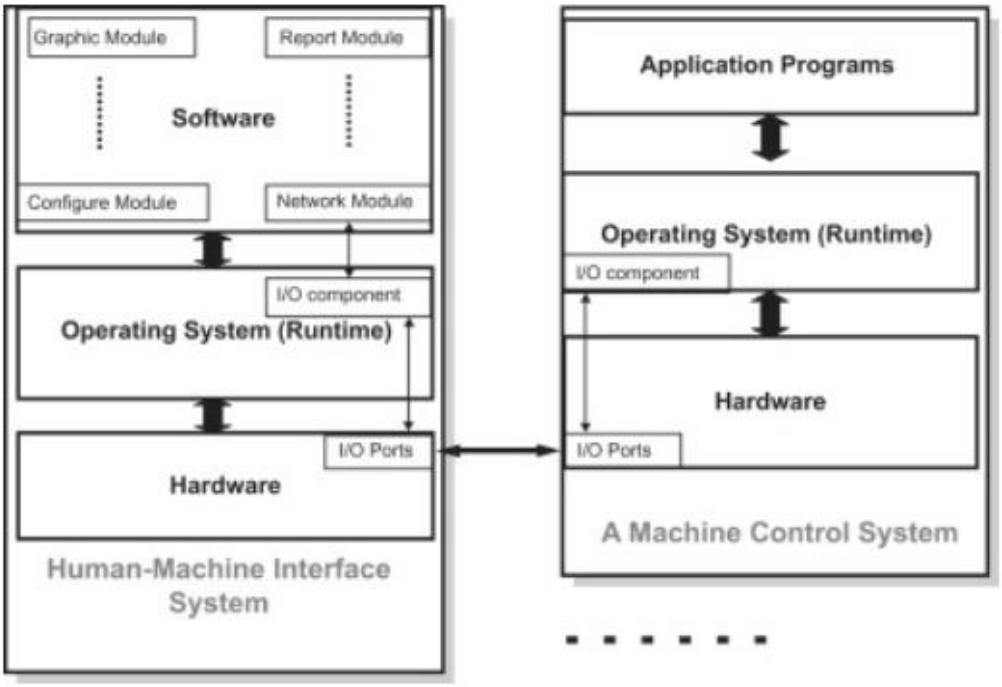
Introduction

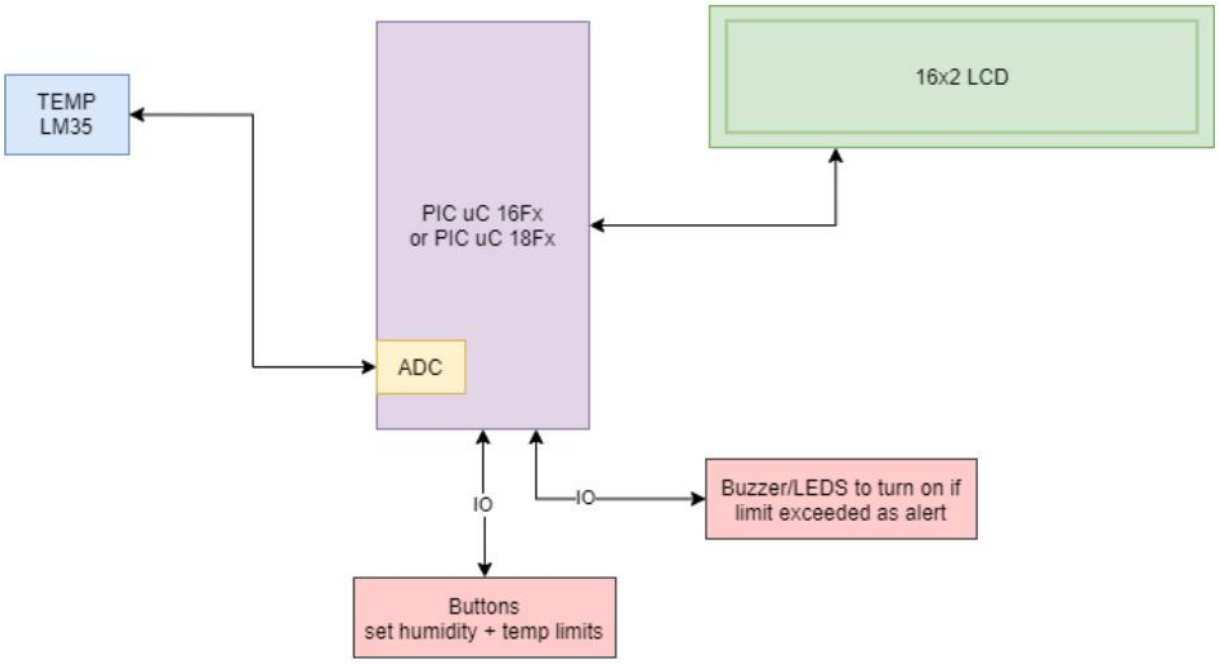
What is a human machine interface? Its an interface that is built on either a microprocessor or FPGA chipset, which needs its software to consist of two things: an application program and operating system. The fig down below shows a typical human machine interface software and system architecture. However, the human machine interface software must be compatible with the system's operating system and hardware.



SW Design Architecture of the application:

In the introduction there was a general brief about what a human machine interface is. However, the task at hand is to construct an LCD 16x2 Interface that displays humidity and temperature sensor-controlled sensors via I2C Interface. The real life application of the task at hand is that its HMI (Human Machine Interface) which reports the temperature over the Car Display.

As we can see the fig down below the architecture of the task is that the Temperature sensor (TEMP LM35) reads temperature in the room, which is connected to RA2, and then its goes to analogue and digital converter (ADC)which converts the signal to a digital one to be read by PIC18F45K50 and then the temperature can be read on the 16x2 LCD. The 16x2 LCD is connected to Port E and D on PIC18F45K50. The push button is used to change upper limit temperature and lower limit temperature. The function of buzzer it buzzes when the temperature exceeds the upper limit or is below the lower limit of temperature.



List of BOM:

Temperature sensor price: $9.00
Buzzer price: $3.00
EasyPic V8: $250
Keypad 4x4: $8.00
LCD:$16.00

Test Cases:

	Buzzer	Heater	Cooler
Temp>UL *(When temperature is bigger than upper limit)*	ON	OFF	ON
Temp<LL *(When temperature is smaller than lower limit)*	ON	ON	OFF

Video of picsimLab:

https://elsewedyedu1-my.sharepoint.com/:v:/g/personal/roudina_hagag_tkh_edu_eg/EWvy77RriT9Bsd98t-Xs2WAB02TPq6Ug-LtBi5zRlC8dRQ?e=+MjLleY