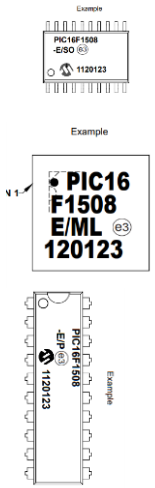
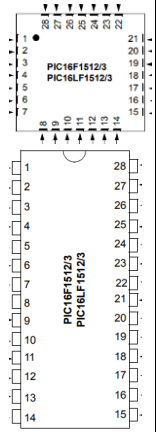
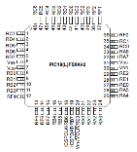
1. Determine your project-specific requirements		3. Look up specifications in the PIC datasheet		
Design Considerations	**Team Project-Specific Requirements** from Problem Definition and Block Diagram	**PIC Option 1**	**PIC Option 2**	**PIC Option 3**
How many GPIO Pins?[1]	At least 10 GPIO pins for general purpose	**18**	**24**	**44**
Built-in Analog to Digital Converter? How many?	Yes 2 for the thermometer and hydrometer	**12**	**17**	**43**
Built-in Hardware PWM? How many?	Yes 1 for the motor driver	**4**	**0**	**4**
Built-in I2C? SPI? How many?	At least 2 I2C; 0 SPI	**1**	**1**	**5/3**
Built-in UART? How many?	Yes 1 for the EPS32	**1**	**1**	**4**
Other Required Built-In Features? *(optional)*				
Additional considerations specific to your project specifications *(optional)*				
2. Find 3 microcontrollers that meet your team project-specific requirements and find information on each		**4. Look up part details in the PIC datasheet**		

[1] No PIC16F887, PIC16F917, PIC18F47Q10, or dsPICs allowed

Microcontroller Considerations	Instructions	PIC Option 1	PIC Option 2	PIC Option 3
Part Number[2]	*Include the entire part number (leave off any letters at the end that specify the package type)*	PIC16F1508	PIC16F1512	PIC16F1847
Link (URL) to product page	*Do not paste links directly into the table. Instead, link them like this.*	Link	Link	Link
Links (URL) to Data Sheets		Datasheet	Datasheet	Datasheet
Links (URL) to Application Notes	*Often provided by manufacturers to give you specific examples of how to use their products. Search for them in the search bar on the Microchip's website.*	Link	Link	Link
Links (URL) to Code Examples		Link	Link	Link
Links (URL) to External Resources	*Search on Google and YouTube for other resources for each specific microcontroller.*	Link	Link	Link
Production Unit Cost	*Find in the Microchip online store, or Digikey*	**$ 2.05**	**$1.51**	**$2.84**
Supply Voltage Range	*Find in the microcontroller datasheet*	**1.8V - 3.6V**	**2.3V - 5.5V**	**2.3-5.5V**
Absolute Maximum Current for	*Find in the microcontroller datasheet*	**250mA**	**200mA**	**350mA**

[2] General Purpose Input/Output Pins - calculate based on your block diagram and include at least 20% more than you need. Avoid using In-System Programming (ISP) pins for GPIO.

entire IC				
Maximum GPIO Pin Current (Source/Sink)	*Find in the microcontroller datasheet*	**+-35mA**	**+-30mA**	**+-50mA**
8-bit or 16-bit Architecture	*Find in the microcontroller datasheet*	**2(8Bit)/ 1(16Bit)**	**2(8Bit)/ 1(16Bit)**	**8-bit**
Available IC Packages / Footprints	*Find in the microcontroller datasheet. Choose a microcontroller with both surface mount and DIP/through-hole packages available. See Most Common Mistakes below for requirements to improve manufacturing reliability.*			
Supports External Interrupts?	*Find in the microcontroller datasheet*	**Yes**	**Yes**	**Yes**
In-System Programming Capability and Type	*Allows for programming the microcontroller without removing it from the PCB. Find in the microcontroller datasheet.*	**No**	**No**	**Yes**
Programming Hardware, Cost, and URL	*Find on the microcontroller product page*	**MPLab In-circuit Programmer,**	**MPLab In-circuit Program**	**MPLab In-circuit Progra**

		$399	**mer, $399**	**mmer, $399**
Works with MPLAB® X Integrated Development Environment (IDE)?	*Required. See Microchip Development Tools*	**Yes**	**Yes**	**Yes**
Works with Microchip Code Configurator?	*Required. Go to the MCC website, click the "Manual Downloads" tab, scroll to the device library that goes with the PIC you chose (likely "MCC 8-bit PIC") and read the release notes to make sure your microcontroller is in the list of supported devices.*	**Yes**	**Yes**	**Yes**

5. Write overall pros, cons, and rankings for the chosen microcontrollers				
Overall Pros	*Write at least 2 for each microcontroller*	**Has approxim-ately 18 GPIO pins and also has 4 PWM's**	**Is the least expensive option and has 24 GPIO pins**	**Has a PWM and gives us many options for future growth.**
Overall Cons	*Write at least 2 for each microcontroller*	**Is expensive and also has only 1 IC2**	**Has 0 PWM's and also has only 1 IC2**	**Has more pins than we would need, has has higher current draw than similar products**
Ranking	*1 = first, 2 = second, 3 = third*	**3**	**2**	**1**

6. Final Microcontroller Choice: PIC18F57K42-I/PT

Rationale: Our rationale behind choosing this microcontroller is that it allows us to have future expansion options while only requiring a minimal increase in current draw when compared to other microcontrollers. Having several PWMs as well as more I2Cs than we need will cover any changes in the design at a later date.