Power Budget

Team Number:	201
Project Name:	**Environment Condition Sensor Array**
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Version:	**1**

A. List ALL major components (active devices, integrated circuits, etc.) except for power sources, voltage regulators, resistors, capacitors, or passive elements

All Major Components	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	PIC series Microcontroller	PIC18F27Q10	+1.8V - 5.5V	1	350	350	mA
	Wifi Board	ESP32 Dev Kit01	+0 - 3.6V	1	500	500	mA
	Motor Driver	1IFX9201SGAUMA1	+0 - 5.5V	1	13	13	mA
	DC Brushed Motor	MOT-KM NJSC-12-A	+5V	1	550	550	mA
	Temperature Sensor	TC74A4-3.3VCTTR	+2.7V - 5.5V	1	0.35	0.35	mA
	Humidity Sensor	HIH6130-021-001	+2.3 - 5.5V	1	1	1	mA

B. Assign each major component above to ONE power rail below. Try to minimize the number of different power rails in the design.

+7.4V Power Rail	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	DC Brushed Motor	MOT-KM NJSC-12-A	+5V	1	550	550	mA
					Subtotal	550	mA
					Safety Margin	25%	
					Total Current Required on +7.4V Rail	687.5	mA
c1. Regulator or Source Choice	+7.4 Battery Pack	L74A26-2-1-2WX	+7.4V	1	2600	2600	mA
					Total Remaining Current Available on +7.4V Rail	1912.5	mA

+3.3V Power Rail	Component Name	Part Number	Supply	#	Absolute	Total	Unit
	PIC series Microcontroller	PIC18F27Q10	+1.8V - 5.5V	1	350	350	mA
	Wifi Board	ESP32 Dev Kit01	+0 - 3.6V	1	40	40	mA
	Motor Driver	1IFX9201SGAUMA1	+0 - 5.5V	1	13	13	mA
	Temperature Sensor	TC74A4-3.3VCTTR	+2.7V - 5.5V	1	0.35	0.35	mA
	Humidity Sensor	HIH6130-021-001	+2.3 - 5.5V	1	1	1	mA
					Subtotal	404.35	mA
					Safety Margin	25%	
					Total Current Required on +3.3V Rail	505.4375	mA
c2. Regulator or Source Choice	+3.3V Regulator	L6981N33DR	+3.8 - 38V	1	1500	1500	mA
					Total Remaining Current Available on +3.3V Rail	994.5625	mA

C. For each power rail above, select a specific voltage regulator using the same process as for major component selection. Confirm that the Total Remaining Current Available on

D. Select a specific external power source (wall supply or battery) for your system, and confirm that it can supply all of the regulators for all of the power rails simultaneously. If you

External Power Source 1	Component Name	Part Number	Supply	Output	Absolute	Total	Unit
Power Source 1 Selection	+7.4 Battery Pack	L74A26-2-1-2WX	-	+7.4V	2600	1912.5	mA
Power Rails Connected to External Power Source 1	+3.3V Switching regulator	L6981N33DR	+3.8 - 38V	1	0.8	0.8	mA
					Total Remaining Current Available on External Power Source 1	1911.7	mA

E. Calculate Battery Life (if applicable). For each battery, also check the worst-case lifetime of the battery by indicating the capacity in mAh.

	Component Name	Part Number	Supply	Capacity	Required	
	Battery	L74A26-2-1-2WX	+7.4V	2600	688.3	mAh
				Battery Life	3.777422635	hours

Notes

External Supply Voltage should be determined by the dropout voltage for highest-voltage regulator (e.g., +14V for a +12V regulator).
If you have multiple units in your design (e.g., a base unit and remote unit) then you need a separate power budget for each unit