Power Budget

Team Number:	303
Project Name:	
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Version:	

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 Voltage Range	#	Absolute Maximum Current (mA) [1	Total Current (mA)	Unit
	Microchip Module	PIC18F27Q10-I/S	(range)	1	200	200	mA
	Temperature Sensor	TC74A4-3.3VCTT	+4.5 to -4.5	1	100	100	mA
	Wifi transceiver	ESP32	+1.8 - 3.3V	1	350	350	mA
	Stepper motor	HC385G-303	+12 - 24V	1	300	300	mA

B. Assign each major component above to ONE power rail below. Try to minimize the number of different power rails in the design. Add additional power rails or change the power rail voltages if needed.

+12V Power Rail	Component Name	Part Number	Supply Voltage Range	#	Absolute Maximum Current (mA)	Total Current (mA)	Unit
	Stepper motor	HC385G-303	+12 - 24V	1	300	300	mA
						0	mA
						0	mA
					Subtotal	300	mA
					Safety Margin	25%	
					Total Current Required on +12V Rail	375	mA
c1. Regulator or Source Choice	+3.3V regulator	LM2575T	+4.75V - 40V	1	1000	1000	mA
					Total Remaining Current Available on +12V Rail	625	mA

+3.3V Power Rail	Component Name	Part Number	Supply Voltage Range	#	Absolute Maximum Current (mA)	Total Current (mA)	Unit
	Microchip Module	(full part number)	(range)	1	200	200	mA
	Opamp	(full part number)	+4.5 to -4.5	1	100	100	mA
	Wifi transceiver	(full part number)	+1.8 - 3.3V	1	350	350	mA
						0	mA
					Subtotal	650	mA
					Safety Margin	25%	
					Total Current Required on +3.3V Rail	812.5	mA

c4. Regulator or Source Choice	+3.3V regulator	LM2575T	+4.75V - 40V	1	1000	1000	mA
					Total Remaining Current Available on 3.3V Rail	187.5	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 each rail above is not negative.

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 need multiple power sources, list each separately below and indicate which regulators will be connected to each supply. Confirm that the Total Remaining Current Available on each power source below is not negative.

External Power Source 1	**Component Name**	**Part Number**	**Supply Voltage Range**	**Output Voltage**	**Absolute Maximum Current (mA)**	**Total Current (mA)**	**Unit**
Power Source 1 Selection	Plug-in Wall Supply	VER12US120-JA	90-264V	+12V	1000	1000	mA
Power Rails Connected to External Power Source 1	+3.3V regulator	LM2575T	+5V - 20V	1	500	500	mA
					Total Remaining Current Available on External Power Source 1	500	mA

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

[1] For inductive loads (e.g., motors, solenoids) this is often called "stall current" on the data sheet