

## Power Budget

<b>Team Number:</b>	206
<b>Project Name:</b>	Modular Motion-and-light sensing control subsystem
<b>Team Member Names:</b>	Adrian Perez, Zane Brauer
<b>Version:</b>	

**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
	Curiosity Nano (PIC18F57Q43 board)	PIC18F57Q43	1.8V to 5.5V	1	50	50	mA
	Motor Driver	TB6612FNG	2.7V - 5.5V	1	50	50	mA
	DC Motor (Gearmotor)	Pololu 37D 12V DC	12V	1	5500	5500	mA
	PIR Motion Sensor	LS6501LP	11V - 25V	1	1	1	mA
	Pushbutton Switch	Omron B3F	Rated upto 24V	1	0	0	mA
	Indicator LED	WP710A10ND	2V (forward voltage)	1	10	10	mA

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

<b>+12V Power Rail</b>	<b>Component Name</b>	<b>Part Number</b>	<b>Supply</b>	<b>#</b>	<b>Absolute</b>	<b>Total</b>	<b>Unit</b>
	DC Motor (Gearmotor)	Pololu 37D 12V DC	12V	1	5500	5500	mA
	PIR Motion Sensor	LS6501LP	11V - 25V	1	1	1	mA
						0	mA
						0	mA
						0	mA
					<b>Subtotal</b>	5501	mA
					<b>Safety Margin</b>	25%	
					<b>Total Current Required on +12V Rail</b>	6876.25	mA
<b>c1. Regulator or Source Choice</b>	External 12V, 10A SMPS	Mean Well LRS-100-12	12V	1	8500	8500	mA
					<b>Total Remaining Current Available on +12V Rail</b>	1623.75	mA

<b>+5V Power Rail</b>	<b>Component Name</b>	<b>Part Number</b>	<b>Supply</b>	<b>#</b>	<b>Absolute</b>	<b>Total</b>	<b>Unit</b>
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	Curiosity Nano (MCU board)	PIC18F57Q43	1.8V to 5.5V	1	50	50	mA
	Motor Driver	TB6612FNG	2.7V - 5.5V	1	50	50	mA
	Indicator LED	WP710A10ND	2V (forward voltage)	1	10	10	mA
	Pushbutton	Omron B3F	Rated upto 24V	1	0	0	mA
	Subtotal					110	mA
	Safety Margin					25%	
	Total Current Required on +5V Rail					137.5	mA
c2. Regulator or Source Choice	+5V Regulator	Pololu S13V15F5	2.8V - 22V	1	1500	1500	mA
	Total Remaining Current Available on +5V Rail					1362.5	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**

<i><b>Rail</b></i>	<b>Component Name</b>	<b>Part Number</b>	<b>Supply</b>	<b>#</b>	<b>Absolute</b>	<b>Total</b>	<b>Unit</b>
<i>+12V Power Rail</i>	External 12V, 10A SMPS	Mean Well LRS-100-12	12V	1	8500	1	mA
<i>+5V Power Rail</i>	+5V Regulator	Pololu S13V15F5	2.8V - 22V	1	1500	1500	mA
					<i><b>Subtotal</b></i>	1501	mA

**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**

<b>External Power Source 1</b>	<b>Component Name</b>	<b>Part Number</b>	<b>Supply</b>	<b>Output</b>	<b>Absolute</b>	<b>Total</b>	<b>Unit</b>
<b>Power Source 1 Selection</b>	Plug-in Wall Supply	Mean Well GST25A24-P1J	110VAC	+24V	5000	5000	mA
<b>Power Rails Connected to External Power Source 1</b>	+12V regulator	LM7812	+12V - 35V	+12V	1000	1000	mA
	+5V Regulator	LM7805	+7V - 25V	+5V	1000	1000	mA
	<b>Total Remaining Current Available on External Power Source 1</b>					3000	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