

# COOKING WITH TEAM 279

## RPI BEST PRACTICES – POWER USAGE

These best practices will help you avoid potential issues while using your Pi.



### GENERAL BEST PRACTICES

- Use a high quality power supply
  - Avoid cheap cell phone chargers
- Use the Pi primarily for computation purposes
- Use the Pi for low power electric switching
- Use separate power supplies for
  - High power switching
  - Motors
  - Larger/Complex circuits
- Isolate (buffer) circuits where possible
- Limit power draw to the minimum needed on circuits as much as possible
- Avoid accidental back powering from USB hubs or 5v pins
  - Know when and why if done

### LIMITING CURRENT

- Hook up as few peripherals as possible
- USB
  - Use Wireless Keyboards (eg, Logitech “Unifying”)
    - ~20mA for the receiver
  - Avoid fancy devices with lots of LEDs, etc...
  - Use powered hub for larger devices (especially disk drives)
- Use Wi-Fi instead of Ethernet?
  - about 10-20mA savings when idle – needs more testing
- Only use 3.3V circuits on GPIO pins
- Limit GPIO supply current (output) to circuits to 100mA TOTAL
  - ... and no more than 16mA per pin
- Limit GPIO sink current (input) to 16mA per pin max
- Limit 5V rail current to circuits to 250mA TOTAL
- Always have resistors on GPIO Pins
  - 220Ω minimum total resistance
- Don't directly connect GPIO pins to each other (short)
- Don't forget CPU usage takes power (about 500mA to go from idle to max)
  - Comes mostly from the 3.3V rail, which has a 1A maximum limit
- If in doubt, measure...