Getting Started with the Teensy Circuits and Programming
Solderless Breadboards

Power bus (red)

Ground bus (blue)
Component bus

Note that the two sides are not connected
Wiring Standards

When possible, use wire colors for different types of signals. The common color assignments are:

- Black: ground
- Red: power
- Other: various signals
Clean Wiring

A clean breadboard will make debugging easier – and it makes circuits more robust.
Care with Power

• Only insert components and wires into the breadboard when power is disconnected
• “Wire, check-twice, then power”
  • Never reverse power and ground (this is a very common mistake)
Care with Power

We are using a mixture of 3.3V and 5V components

• Be careful: we can’t always mix and match
• The teensy is powered by connecting 5V to Vin and GND to GND (these lines come from the lower deck)
• The teensy can provide 3.3V supply (up to 250mA)
• Even though the teensy uses 3.3V as its base voltage, it is 5V tolerant (but not all 3.3V components will be)

• USB connection does not provide power – only communication
Suggested Wiring Procedure

• Power supply
• Power/ground buses
• Insert primary components
• Wire power/ground for components
• Add signals and remaining components
Debugging Techniques

• Test incrementally
• Test intermediate sub-circuits
Teensy 3.5
Teensy 3.5 Reverse Side

Teensy 3.6 pins are not 5 volt tolerant. Do not apply more than 3.3 volts.

Cut to separate VIN from VUSB, if using a battery charger or external power.

USB Power
H = Host
D = Device

Interior:
Reset Program GND
3.3V VBatt
3V coin cell for RTC

www.pjrc.com
Teensy 3.1 vs Teensy 3.5
Teensy Programming Interface

Connect the Teensy to your laptop via a USB cable
• Be careful not to torque the USB connection on the Teensy
Demonstration…
General Program Hints

• Use LEDs to show status information (e.g., to indicate what part of your code is being executed)
• Remember: on the Teensy boards, there is a LED connected to port C, bit 5
• Have one LED blink in some unique way at the beginning of your program
• Go slow:
  • Implement and test incrementally
  • Insert plenty of pauses into your code (e.g., with delay ())
Project 0

• Summary:
  • Connect 4 LEDs and a switch to your Teensy board
  • Write a program that: waits for the switch to be pressed, then displays an interesting LED flashing pattern

• Details are on the class web page
Project Completion

See me or the TA for a code review
• Every member of the group must be present
• Every member of the group must demonstrate their own program and downloading to the Teensy
• Deadline: Friday, February 8 @3:30pm

Future projects: we will have more formal coding, documentation and hand-in procedures