

Network Objects

Instructor: Rob Faludi

Plan for Today

- Alphabet Blocks
- Final Three Presentations
- Espionage
- XBee I/O
- Readings & Assignments

XBee Firmware

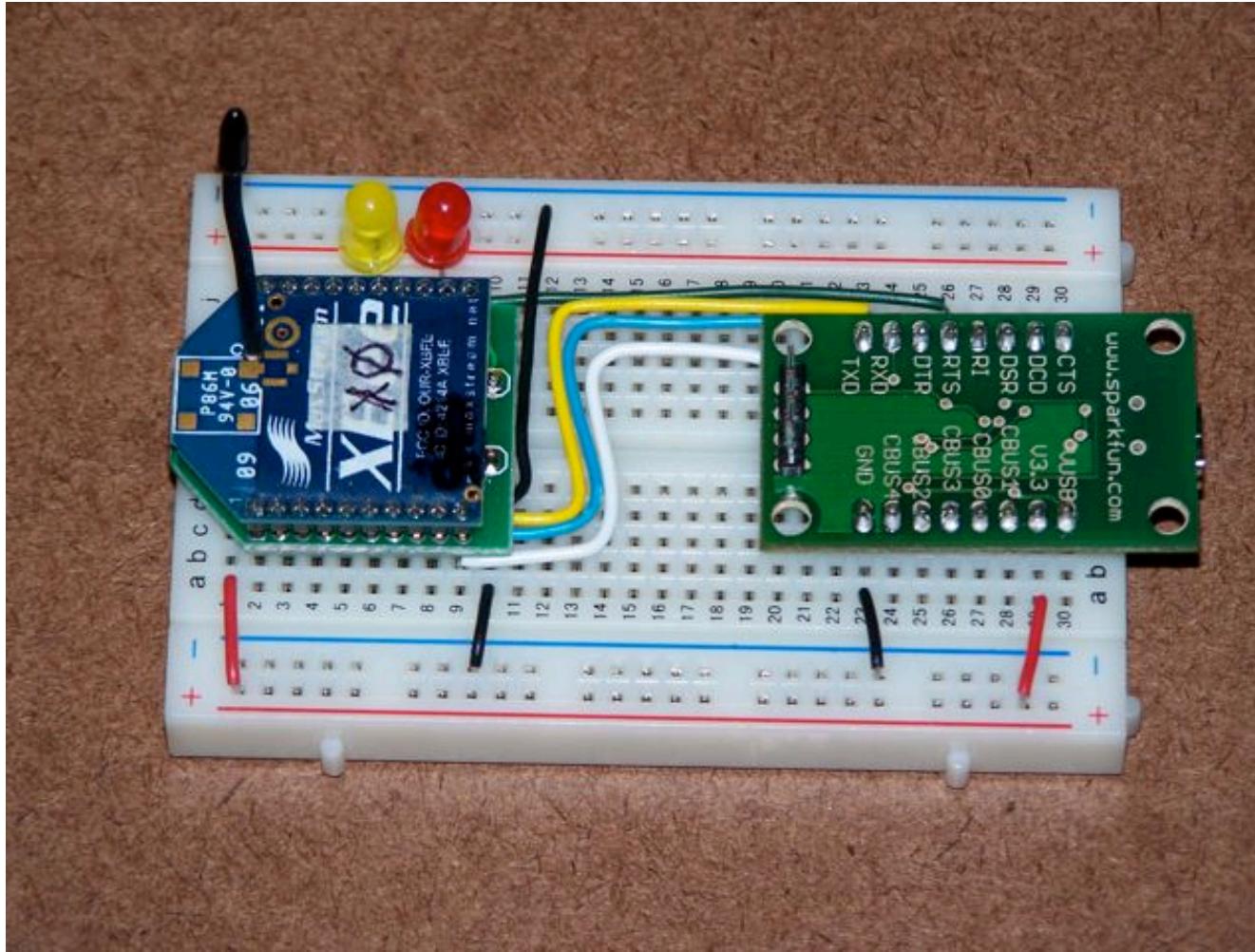
X-CTU

- Features:
 - terminal
 - firmware
 - configuration
 - tests
- Demo: updating firmware

Firmware Upload

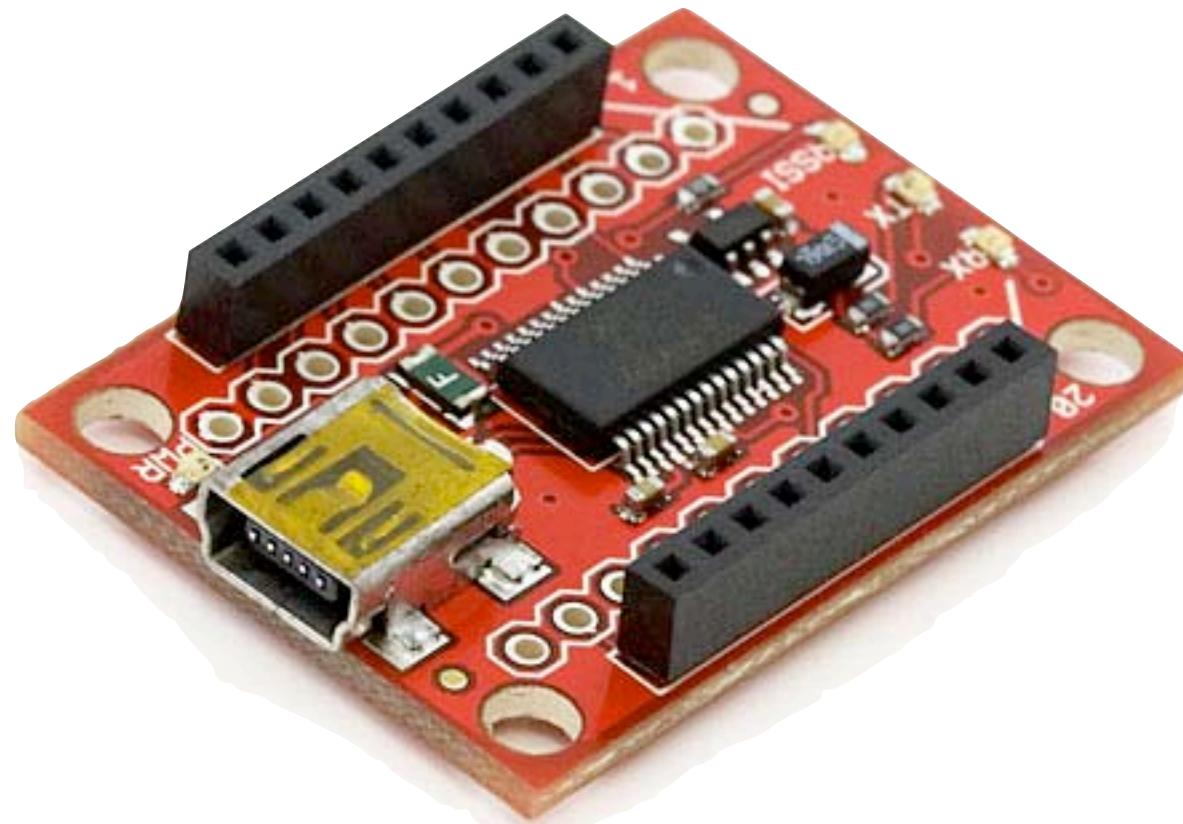
- X-CTU Program
- Special circuit, dongle or development board
- Firmware, command interface, test area, terminal all Windows-only

Firmware Upload Board



SparkFun part#PCB-FT232RL, wired to RX, TX, RTS, DTR, 3.3V, Gnd

XBee Explorer



XBee I/O mode

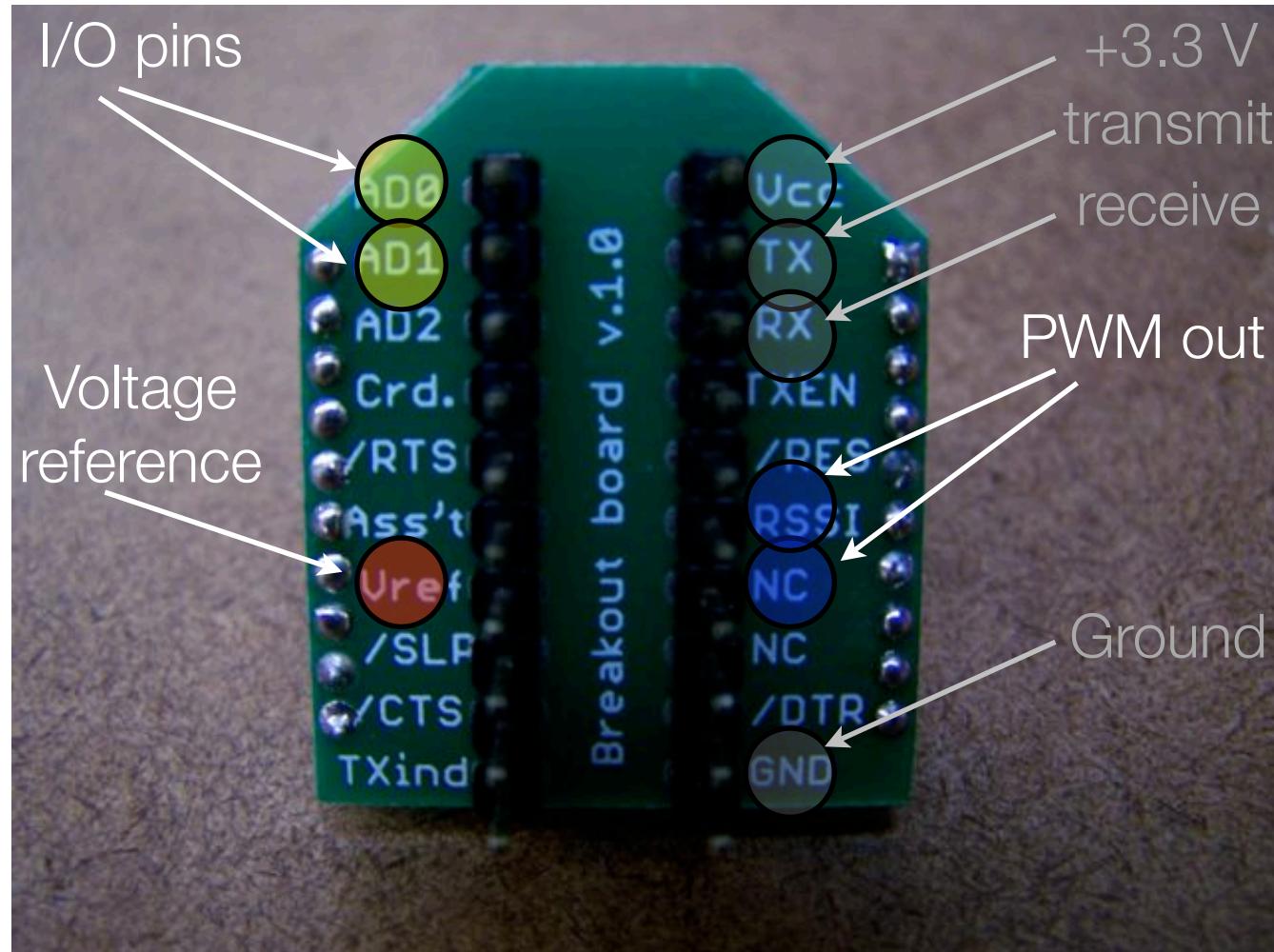
I/O Why

- Why:
 - Save space, save power, save weight and save money
 - Reduce complications
- Why not:
 - Limited inputs/outputs
 - No access to logic
 - Each radio must be manually configured

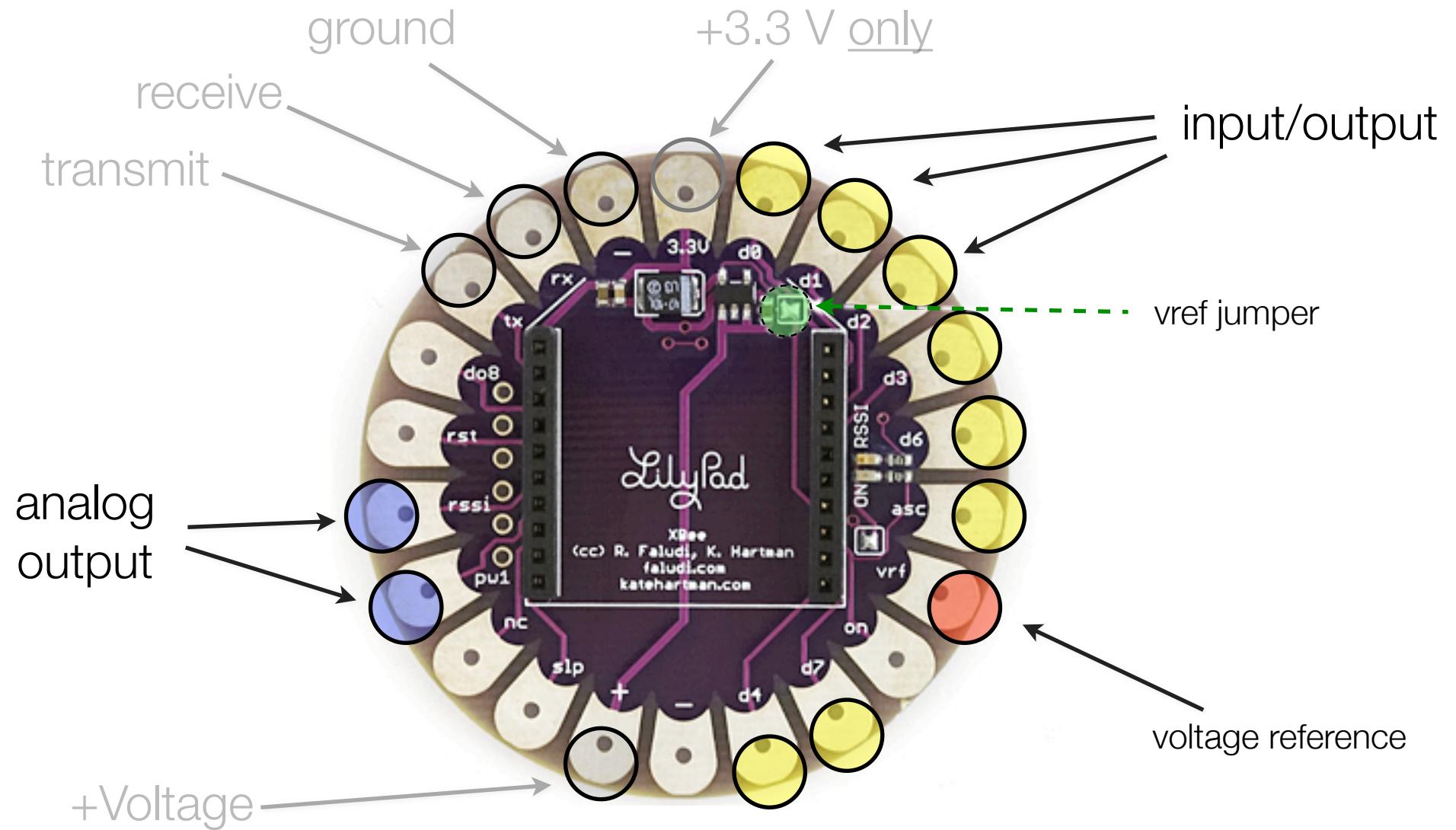
I/O Intro

- For simple input and/or output
- Eight digital input/outputs
- One additional digital output
- Seven analog inputs
- Two analog outputs
- But not all at once! Pins are shared.

Input/Output Wiring



Input/Output Wiring



I/O AT Commands

- ATD0...D8 -> configure pins for I/O
- ATIR -> sample rate
- ATIT -> samples before transmit
- ATP0...P1 -> PWM configuration
- ATIU -> I/O output enable (UART)
- ATIA -> I/O input address

Example Configuration

- ATID3456 (PAN ID)
ATMY1 my address 1
ATDL2 destination address 2
ATD02 pin 0 in analog in mode
ATD13 pin 1 in digital in mode
ATIR14 sample rate 20 milliseconds (hex 14)
ATIT5 samples before transmit 5
ATWR write settings to firmware
- ATID3456 (PAN ID)
ATMY2 my address 2
ATDL1 destination address 1
ATP02 PWM 0 in PWM mode
ATD15 pin 1 in digital out high mode
ATIU1 I/O output enabled
ATIA1 I/O input from address 1
ATWR write settings to firmware

Common XBee Mistakes

- <http://www.faludi.com/projects/common-xbee-mistakes/>

Readings and Assignments

- Assignment
 - Final Project