

## Common Mistakes with XBee Radios by Rob Faludi

SparkFun Electronics Summer Semester

### Common XBee Mistakes

Your XBee project isn't working? Here are some common mistakes that both beginners and experts make:

- Not using the latest firmware (especially if ATD0 or ATIR is giving an error)
- No reference voltage to VREF pin on the 802.15.4 radios (analog and digital reads give wrong values)
- Forgetting that AT commands use hexadecimals
- Hitting return after +++ (or otherwise not respecting 1 second default guard time)
- Conversely, `_not_` hitting return after an AT command
- Letting the XBee time out of command mode before issuing an AT command (you'll know because you get no response)
- Forgetting to write the configuration to firmware with ATWR (unless your application configures the radio interactively)
- Not using ATRE (restore factory defaults) before re-configuring a previously used radio (previous settings lurk unless you manually reset them all)
- Looking for analog output on the analog input pins instead of pins 6 and 7 (P0, P1)
- Using a voltage regulator without decoupling capacitors (10uF on input, 1uF on output is good)
- Mixing up TX and RX pins (fastest way to check this is switch the wires and see if it starts working)
- Using ZigBee version (ZB Pro or ZNet 2.5) when 802.15.4 version would do just fine (if you don't need to make a mesh network)
- Trying to read more than 1.2 Volts on the ZB Pro and ZNet 2.5 analog inputs (that's the limit)
- Buying Pro radios when you don't need them. (Cost more, bigger, use a lot more battery)
- Deciding the XBees are flaky. (You may not be using them correctly, but they are very reliable)

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- Deciding an XBee is burned out when it's set to a different baud rate (check ON and ASSC lights)
  - Deciding an XBee is burned out when it is just sleeping (Check ON light to see if it blinks occasionally)
  - Forgetting to supply power or ground (ON light may go on and ASSC light may blink but both will be significantly dimmer)
  - Not contacting Digi sooner for support, especially if your radio seems dead or you keep getting an error you don't understand.
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- XBee Arduino Mistakes
    - Sending continuously without any delay (try 10ms delay)
    - Not removing RX and TX connections before uploading code (Arduino will give an error)
    - Not removing RX connection when resetting, if you are continuously receiving data. (Arduino will never reset)
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- XBee LilyPad Mistakes
    - Hooking up more than 4 Volts to the 3.3V pin
    - Using switches without pull-down resistors (but not if you use the internal pull-ups)
    - Not using a pull-up or pull-down resistor on pins 5 and 7 (these don't have internal pull-ups at all)
    - Using sensors without voltage divider resistors (if your sensor needs that circuit)
    - Using too-resistive conductive thread for power and ground (try fabric or wires)
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- Windows and X-CTU are required for firmware upgrades