

Figure 2-21. Reading and setting registers in CoolTerm

Basic ZigBee Chat

Networks are all about connections, so configuring a single radio doesn’t qualify as making a network because it’s not connected to anything. You need at least two radios to make a network, so here’s what you’ll need to create your first project—a simple ZigBee chat session.

Parts

- One XBee Series 2 radio, configured as a ZigBee Coordinator AT (Digi: XB24-Z7WIT-004, DK 602-1098-ND).
- One XBee Series 2 radio, configured as a ZigBee Router AT (same as previous).
- Two XBee USB adapter boards (SFE: WRL-08687).
- Two computers, each running a serial terminal program, or one computer running two different serial terminal programs. Using two computers is less confusing, so find a buddy if you can.

Addresses

Every XBee radio has a 64-bit serial number address printed on the back ([Figure 2-22](#)). The beginning or “high” part of the address will be 0013A200, Digi’s pre-assigned range of address space. The last or “low” part of the address will be different for every radio. It will look something like this: 4052DAE3.

Write down your coordinator and router addresses so you can refer to them later:

| Coordinator address | Router address |
|---------------------|----------------|
| 0013A200 _____ | 0013A200 _____ |



Figure 2-22. Back of XBee showing 64-bit address

Coordinator

Start with the XBee ZIGBEE COORDINATOR AT radio you configured earlier in this chapter. Remember that every ZigBee network must have one coordinator radio—and only one coordinator radio—so that the network can be properly defined and managed. Use your serial terminal program and AT commands (or X-CTU if you have access) to configure the coordinator radio with the settings in [Table 2-5](#).

Table 2-5. Coordinator setup for paired chat

| Function | Command | Parameter |
|--------------------------|---------|--|
| PAN ID | ATID | 2001 (any address from 0 to FFFF will do) |
| Destination address high | ATDH | 0013A200 |
| Destination address low | ATDL | <u><see your recorded Router Address></u> |

When you're finished, check your work by reissuing each AT command without any parameter so the radio can show you the addresses it's using ([Figure 2-23](#)).

As a final step, use the **ATWR** command to write the new configuration to your radio's firmware so it's saved for the next power-up.

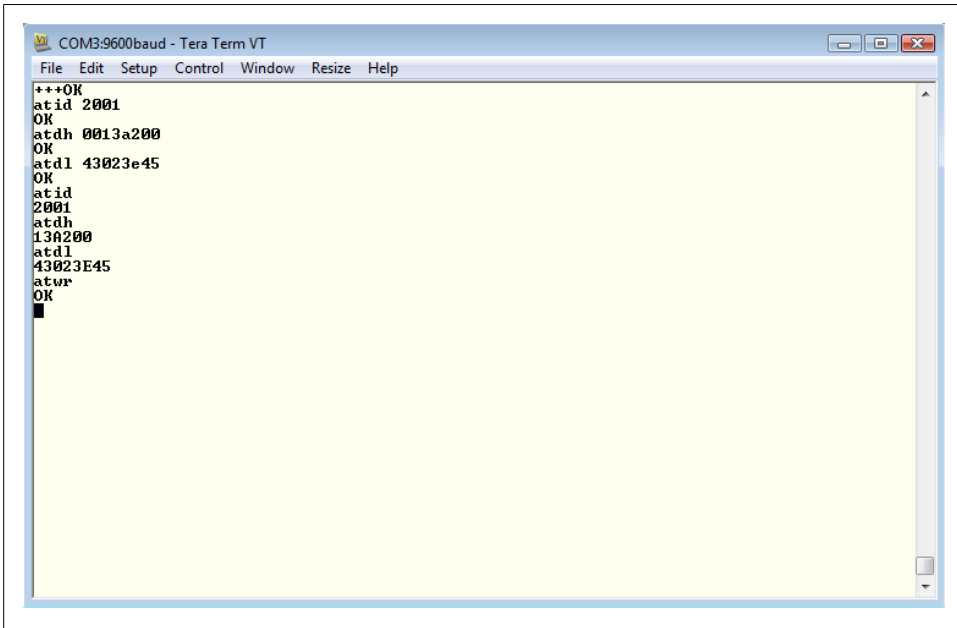


Figure 2-23. Setting and checking the coordinator radio

Here's what a session might look like:

```
+++  
OK  
ATID 2001  
OK  
ATDH 0013A300  
OK  
ATDL 43023E45  
OK  
ATID  
2001  
ATDH  
13A200  
ATDL  
43023E45  
ATWR  
OK
```



You should get an OK response after issuing each command to set parameters, and another OK response when you write the changes to firmware. If you don't get an OK response, most likely you took more than 10 seconds to issue the command and you've dropped out of command mode. This can happen quite frequently when you're starting out, but you'll get better at it as you go along. The other common mistake is not issuing the **ATWR** command to save your changes, then losing your configuration when the radio is powered down.

The command mode timeout can be changed to a longer value with **ATCT**, but it's best to wait on doing this until you are more comfortable with the radios so you don't set the timeout to an impossibly short value by accident.

Router

Replace the coordinator radio with the XBee ZigBee Router AT radio you configured earlier in this chapter. Use your serial terminal program and AT commands (or X-CTU if you have access) to configure the router radio with the settings in [Table 2-6](#).

Table 2-6. Router setup for paired chat

| Function | Command | Parameter |
|--------------------------|---------|---|
| PAN ID | ATID | 2001 (must be the same for all radios on your network) |
| Destination address high | ATDH | 0013A200 |
| Destination address low | ATDL | <u><see your recorded Coordinator Address></u> |

When you've finished configuring the radio, check your work by reissuing each AT command without any parameter so the radio can show you the addresses it's using (see [Figure 2-24](#)).

As a final step, use the **ATWR** command to write the new configuration to your radio's firmware so it's saved for the next power-up. Disconnect the XBee from the computer for now.

Two Computers

Get ready to chat. Connect your coordinator XBee via an adapter to one computer's USB port. Launch a serial terminal application, or use the Terminal tab in X-CTU. (Make sure you select the current port and configure the terminal application for the right baud rate and other settings.) Your router radio should be connected in the same way to the second computer, which should be running its own serial terminal application.

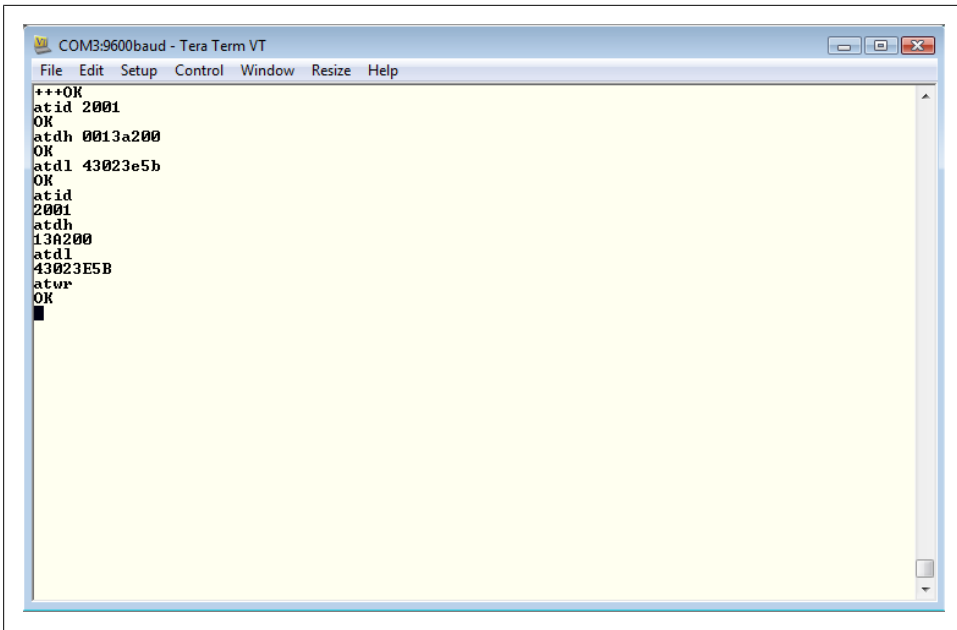


Figure 2-24. Setting and checking the router radio

One Computer

If you have only one computer, connect both radios to that computer's USB ports. Then choose two different terminal windows, like Tera Term and HyperTerminal on Windows, or CoolTerm and ZTerm on Macintosh. Pick one radio's port in one program and the other radio's port in the other program. Pretend that your first terminal program is one computer, and that your second terminal program is another one. Keeping all of this straight might make your head hurt a bit, but it's a valid test when you can't find a real second computer.

Chat

This is the moment you've been waiting for. If everything is set up properly, the text that you type in the serial terminal program on the first computer will be relayed to the second computer and appear on its serial terminal screen as well. Give it a try.



Remember that chatting will happen only when the radios are in transparent mode. If you are in command mode, type **ATCN** and press Return, or simply wait 10 seconds for command mode to time out.