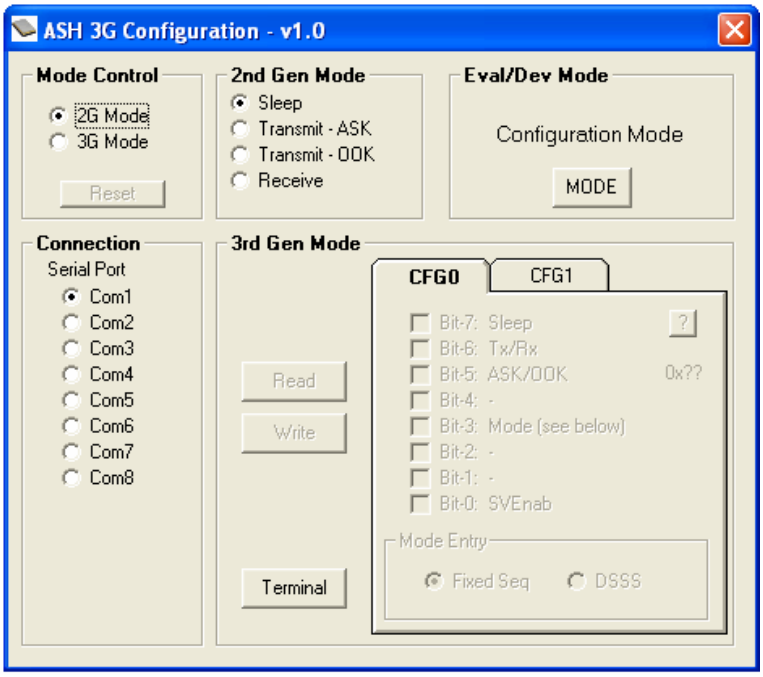
Third Generation Configuration Software

General Overview

The Third Generation Configuration Software works with the following 3G Development Kits available as:

- DR7000-DK (433.92 MHz)
- DR7001-DK (315.00 MHz)
- DR7003-DK (303.825 MHz)
- DR8000-DK (916.5 MHz)
- DR8001-DK (868.35 MHz)
- DR8100-DK (916.5 MHz w/DSSS)

The 3G Configuration Software allows for complete evaluation and application development of RFM's SRR (Short Range Radio) line of RFIC's. A communication link or Range Test can be executed with the Data Terminal to evaluate system performance.



Key Features:

- Full development with Silicon Labs C8051F330 IDE (sold separately)
- Comprehensive Evaluation of Third Generation Virtual Wire devices
- Individual parameter configuration
- Adjustable RF output power
- USB 2.0 serial communication
- Example Code
- 2-way communication link
- Range Test
- Fixed 4.8kbps Data Rate
- Data Terminal Program
- Diagnostic LED's
- "Out of the box" operation
- Device register Read/Write
- Backward-compatible 2G mode

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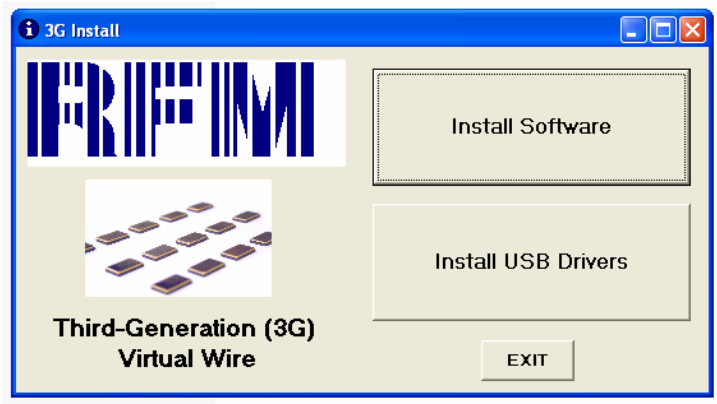
Software Setup and Use

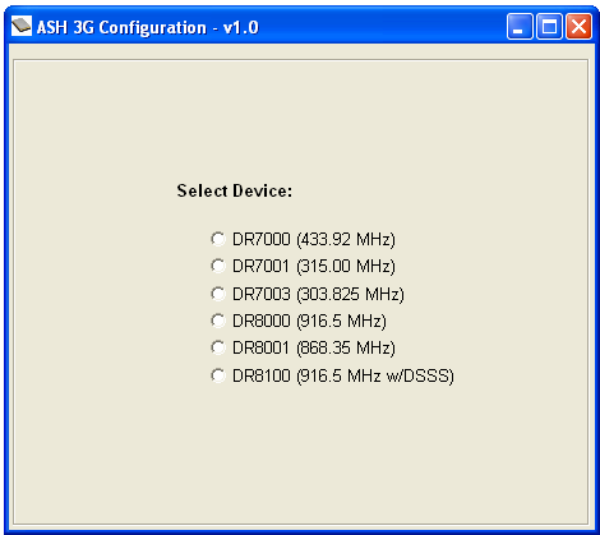
1.1 Installation

When the CD is inserted into the CD drive, the installation should begin automatically. If it does not then open the CD drive through Explorer and Click on the “Install.exe” file and a pop-up box will allow you to install the application software as well as the USB drivers needed for the USB to UART interface chip. Follow the instructions to install the files in the desired folder. When finished simply Click on EXIT.



1.2 Getting Started

Double-click on the 3G Config SW icon to start the software. The initial screen will ask for what development kit is being used. Click on the development kit you are using.



1.3 Setup

After selecting the kit you will be prompted to set the COM port being used for communication between the PC and the development board.

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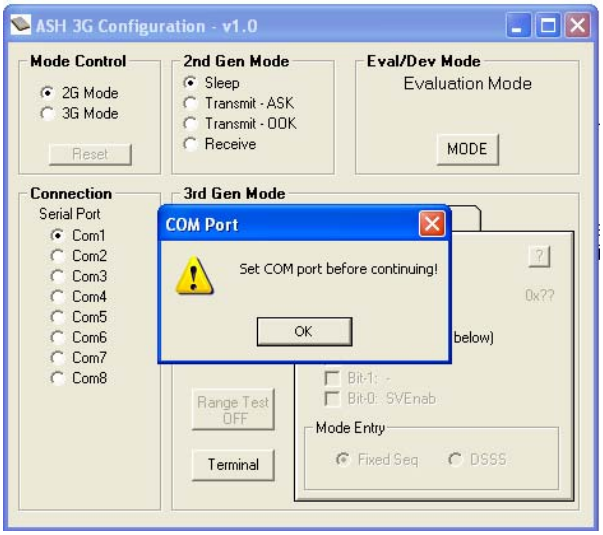


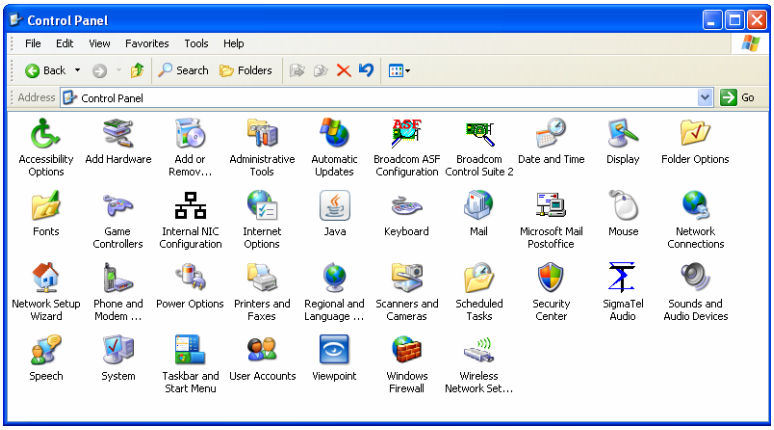
Before clicking “OK”, follow the steps below to determine the COM port being used by the PC:

1 – Get into the Control Panel by:

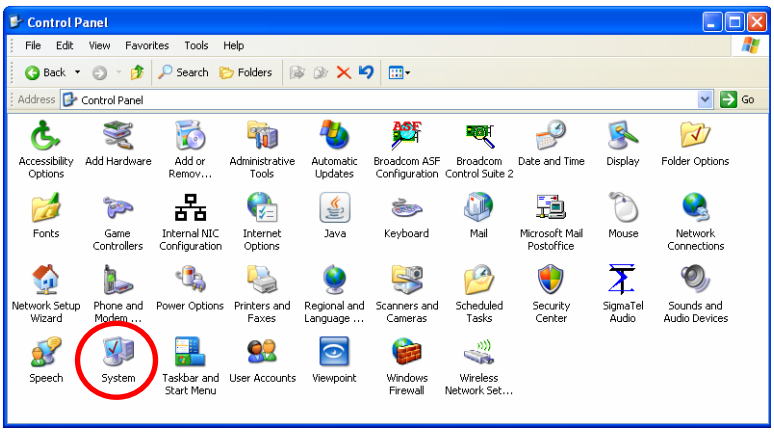
Click >Start>Settings>Control Panel

OR

Click from the desktop >My Computer>Control Panel



2 – Double click “System”.



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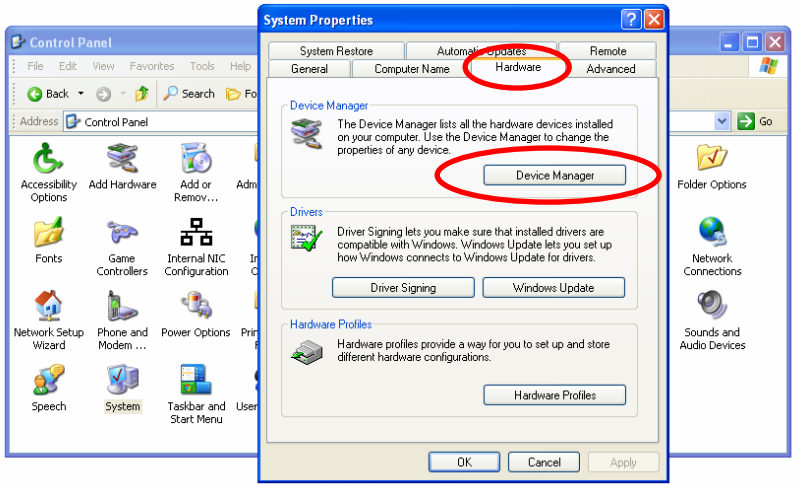
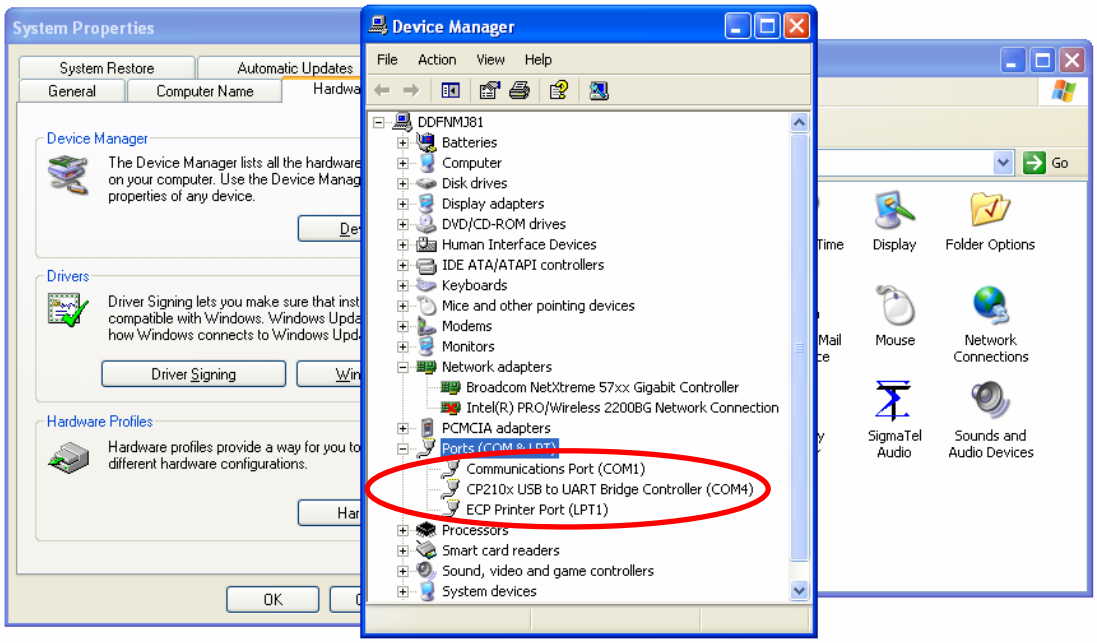
3 – Click on the “Hardware” tab and click on “Device Manager”.



4 – Double click on “Ports (COM & LPT)” to expand the listing.



Under the COM port listings the connection will be listed as:

CP210x USB to UART Bridge Controller (COM?)

Use this as the COM port to enable communication between the PC and the development board. If you have two boards connected, two COM ports will show to be connected. You can determine which board uses which COM port by sending a command and verifying a response. No response, wrong port.

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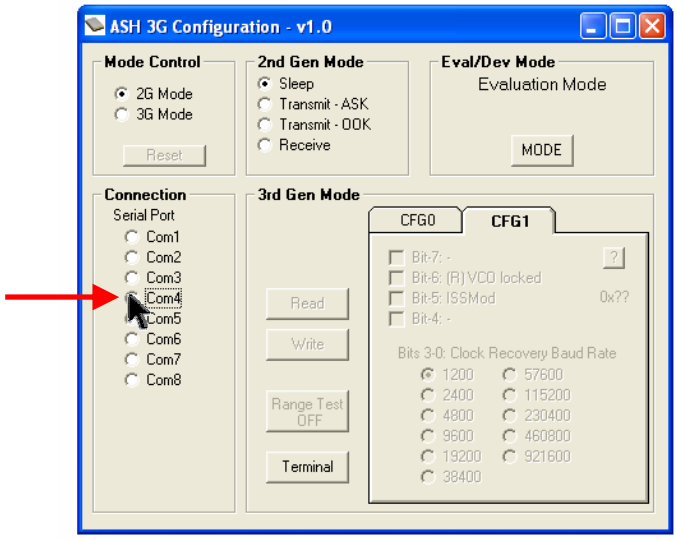
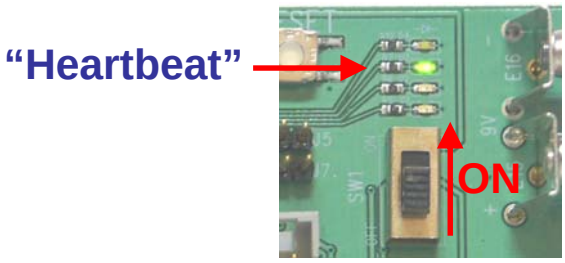
Once the COM port has been identified, select the appropriate port connection.

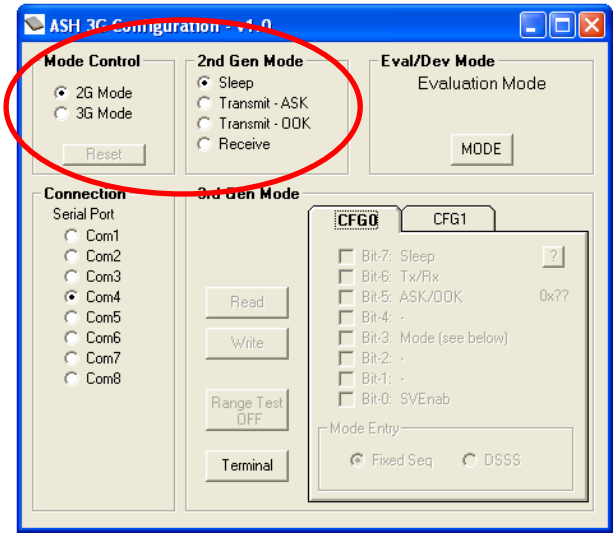


After selecting the COM port, turn on the development board. The LED's should light in sequence and the "Heartbeat" will flash.



1.4 Second-Generation (2G) Operating Mode

The software is primarily designed to exercise the third-generation functions of the device. Although it is possible to setup the device in backward compatible second-generation mode, the active functions of the software, the Terminal and Range test, for example, are primarily for operation using the third-generation operating mode, thus, Range Test is not available using 2G mode. This will be an option added in a future revision of the software.



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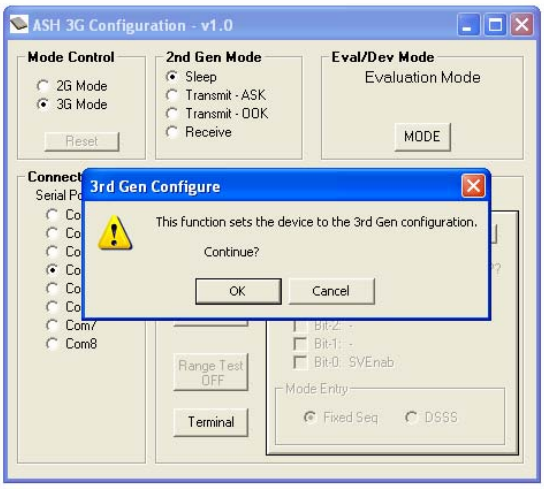
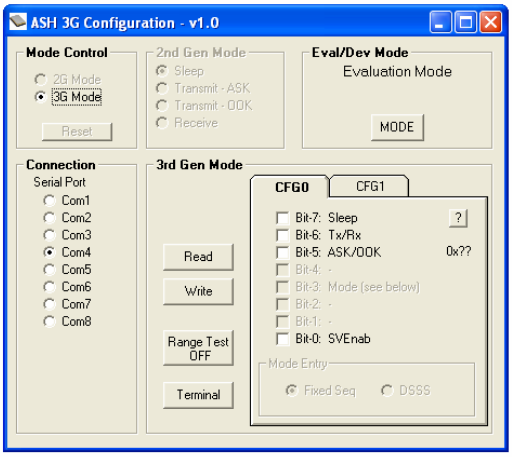
Transmitting using 2G Mode requires applying an external signal to the TX testpoint terminal from a user application or function generator. Received data may be viewed by connecting an oscilloscope probe to the RX testpoint terminal or connecting to a user application.

1.5 Third-Generation (3G) Operating Mode

3G Mode is invoked by selecting "**3G Mode**" in the **Mode Control** frame. When selected the software requires confirmation to set to 3G mode. This is necessary because it is **NOT** possible to revert back to 2G Mode once the device is configured into 3G Mode without cycling power to the board OFF, then ON again.



Once 3G Mode is enabled, the 2nd Gen Mode frame becomes inactive and the controls on the 3rd Gen Mode frame become active.



If the switch is not turned on to power the board then a message will pop up indicating unsuccessful communication with the board.

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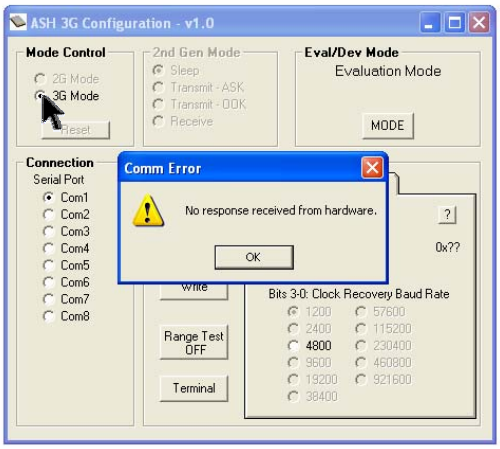
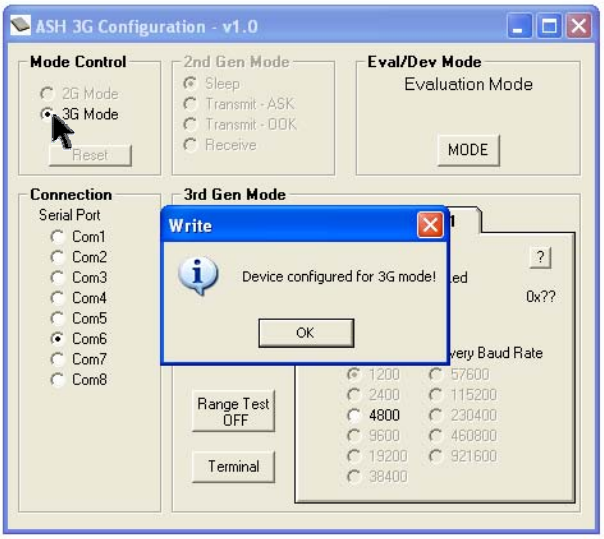


Otherwise, a message will pop up confirming successful communication and configuration.



Once the COM port assignment has been established and 3G Mode enabled, configuration of the device may be performed.

1.6 Third-Generation (3G) READ Configuration

A register Read or Write may be performed at this point. To check the internal state of the configuration registers, click on the Read button. A READ can be performed at any time.

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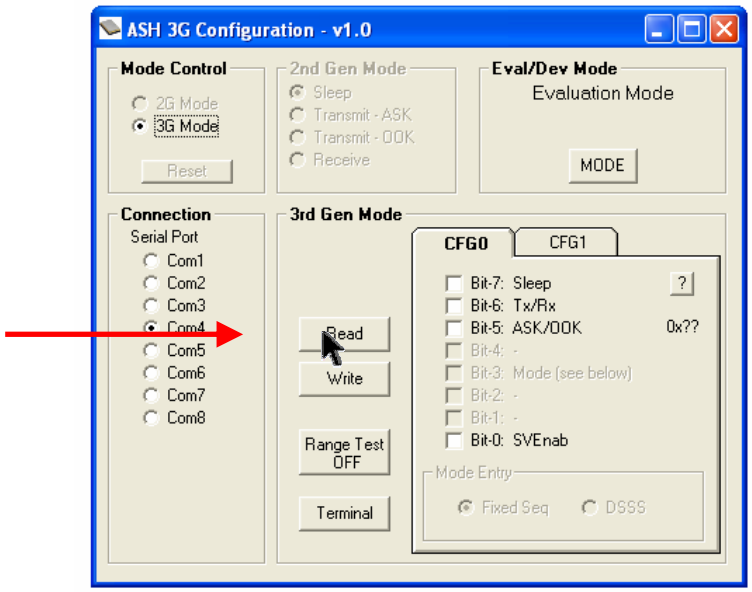
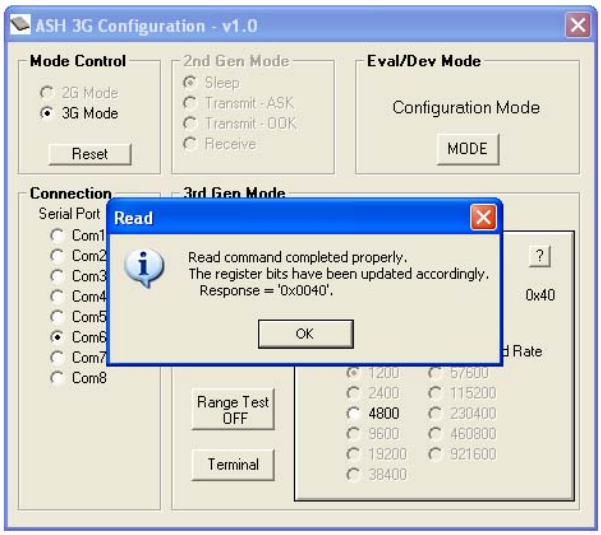


A message box will pop up with the hexadecimal value (0x????) of both registers.



The default READ value of the internal registers is 0x0040. Click “OK” to close the pop up widow and view the individual bit settings.

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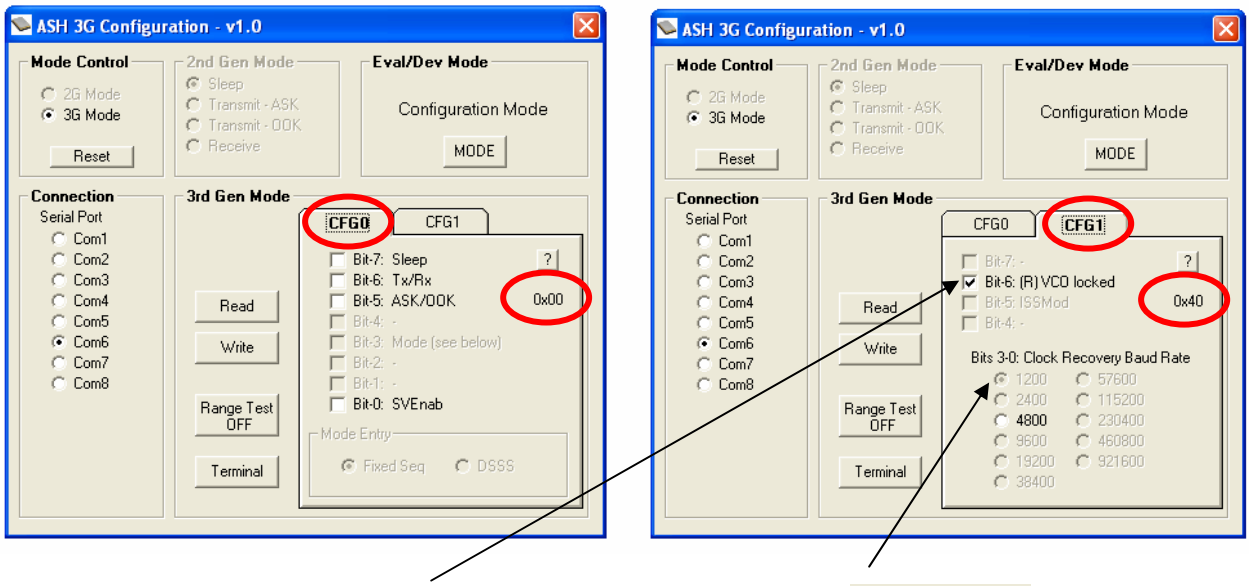
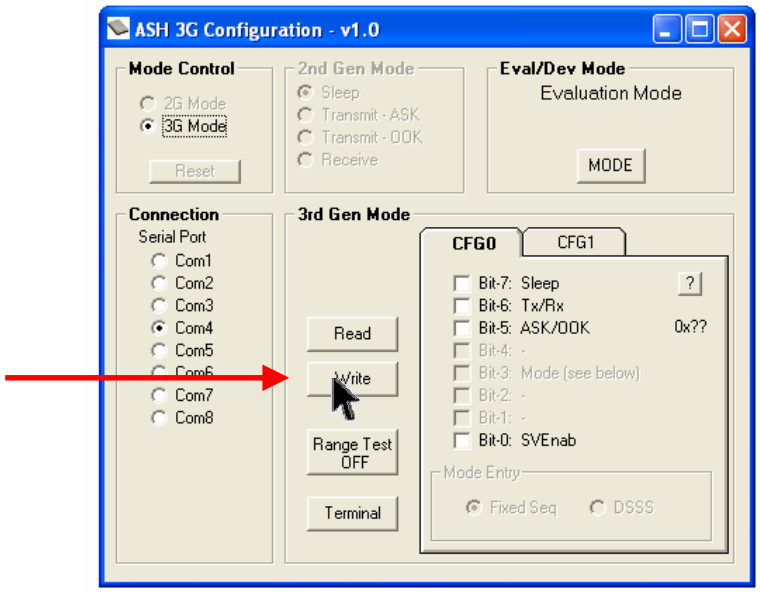


Bits that are set are shown as “checked” or option button filled ()

NOTE: *If on power-up there is residual voltage on capacitor C3 from the last powered state, this can cause the default Read value to be slightly different. Make sure C3 is totally discharged by setting SW1 to the **OFF** position for at least 10 secs. This is ample amount of time for the capacitor to discharge enough to reset the internal configuration registers.*

1.7 Third-Generation (3G) WRITE Configuration

A WRITE to the device will write the current configuration to the internal configuration registers.



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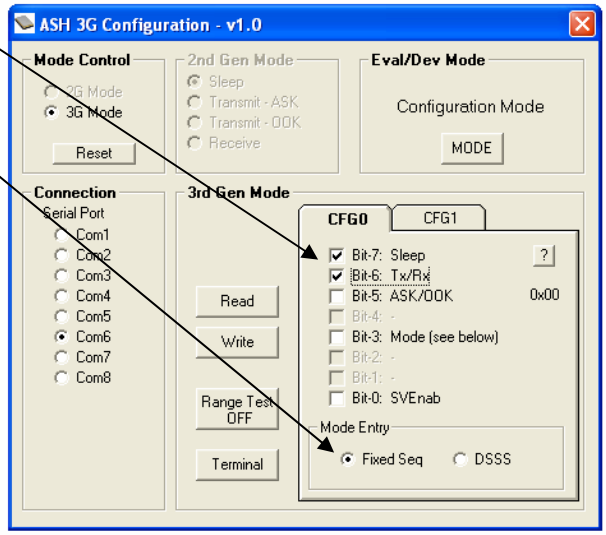
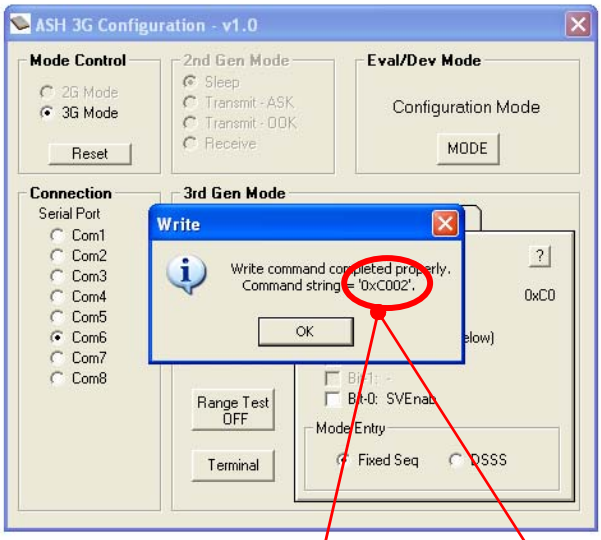
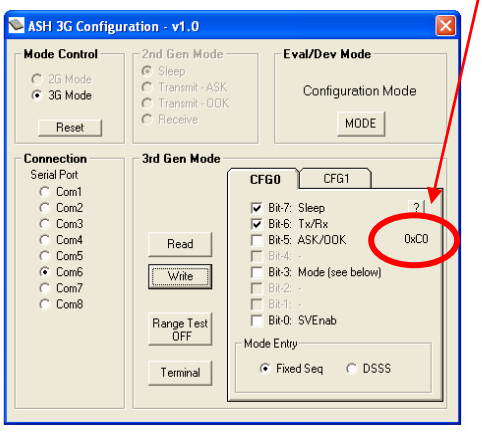
To SET a bit, simply click on the bit and the box will be marked with a checkmark, indicating the bit is SET or ‘1’. A box that has no mark is regarded as CLEAR or ‘0’. The same is true for the option buttons. To SET a bit, simply click on the option.

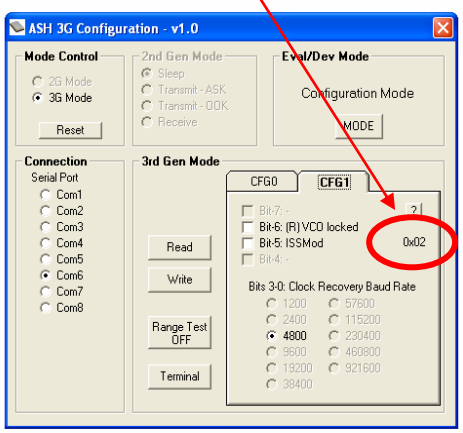


Once the configuration is written, a message box will pop up confirming a successful write to the device as well as what configuration word was written. All bit states are updated after a WRITE.



The “Command string” can be verified by the contents of each configuration register.





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Refer to the individual device datasheets for a detailed explanation on each bit function.

1.8 RANGE TEST Configuration

The development boards are equipped to perform range testing, providing a benchmark for performance in different environments. When Range Test is initiated, the board will begin transmitting a predefined data packet. The opposite board need only be programmed for Receive Mode.

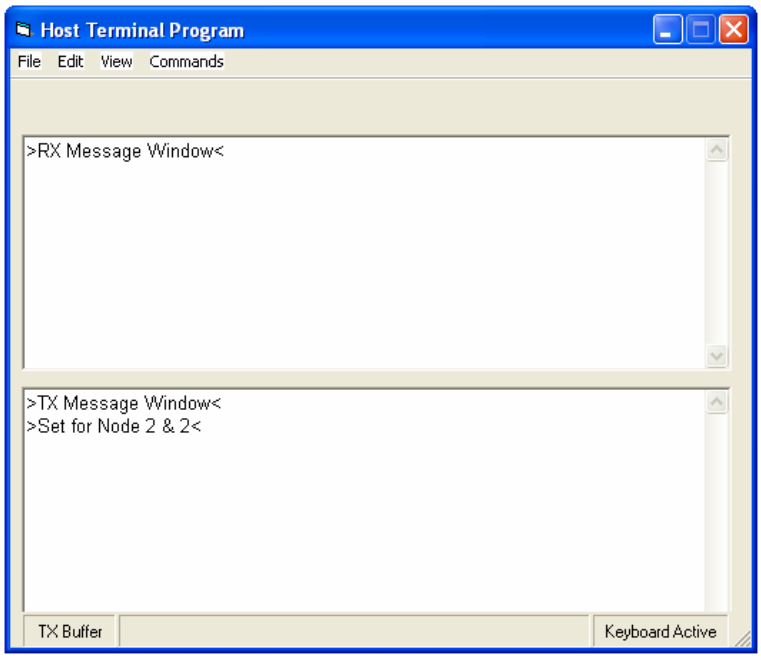
To activate the Range Test install a shorting jumper on to J5 prior to switching SW1 **ON**. When using J5 to enable the Range Test the board will begin transmission immediately after power-up.

To disable Range Test, switch SW1 to **OFF**, remove jumper, switch SW1 back to **ON** to power the board.

Refer to the 3G VWO User's Guide for a detailed discussion of the Range Test hardware function.

1.9 Software Terminal

The configuration software has a built-in terminal program that can be used to view RF traffic between the two boards. The terminal has a separate Transmit and Receive window.



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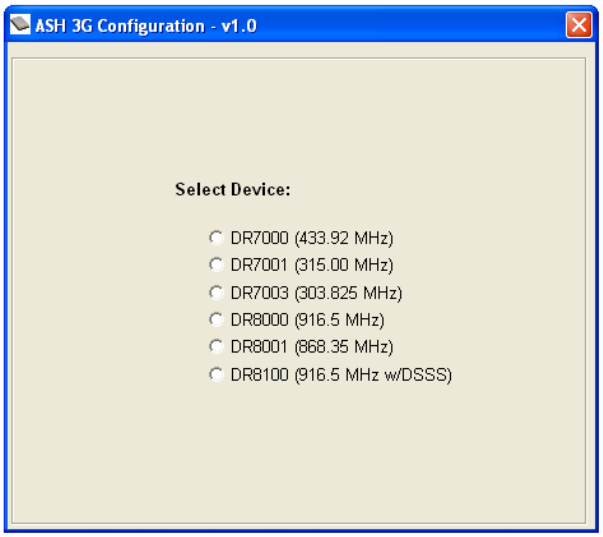
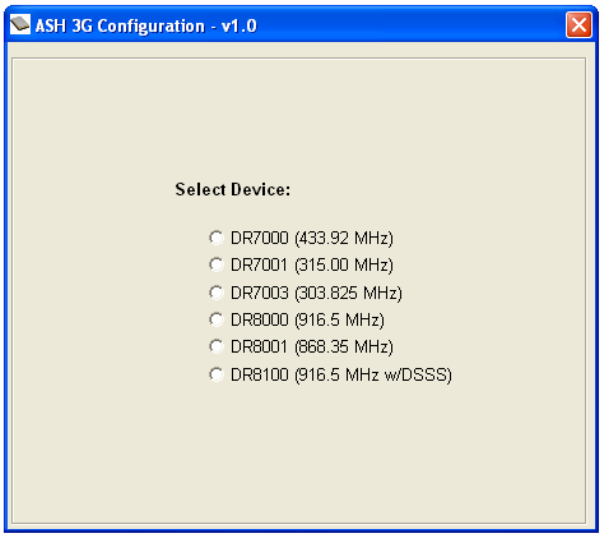
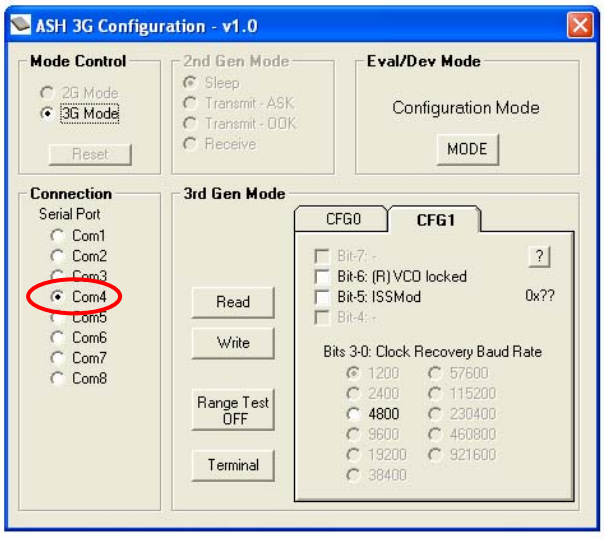
The Terminal application is automatically set to the same COM port as the configuration application.

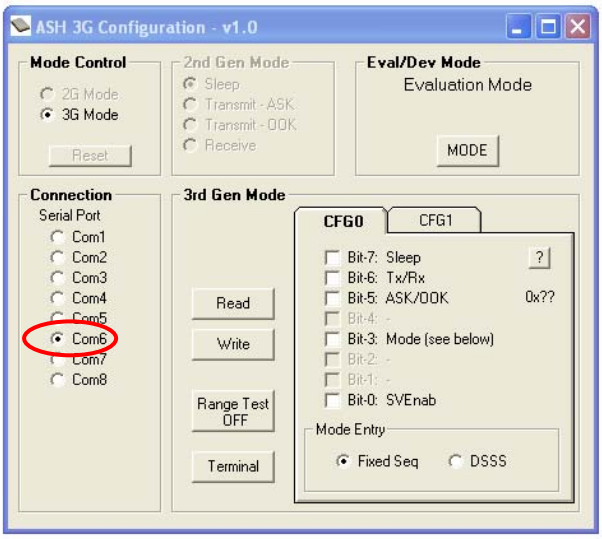
In order to run two development boards on one PC, this will require opening two separate configuration tools.





Once the device is selected, the COM port may be selected for each board so that configuration can be performed without changing COM port assignments.





Click READ on each device and make sure that the synthesizer is locked. This should read out a 0x0040, but may depend on the previous power-up state. As long as bit 6 of the CFG1 register is checked, the synthesizer is locked.

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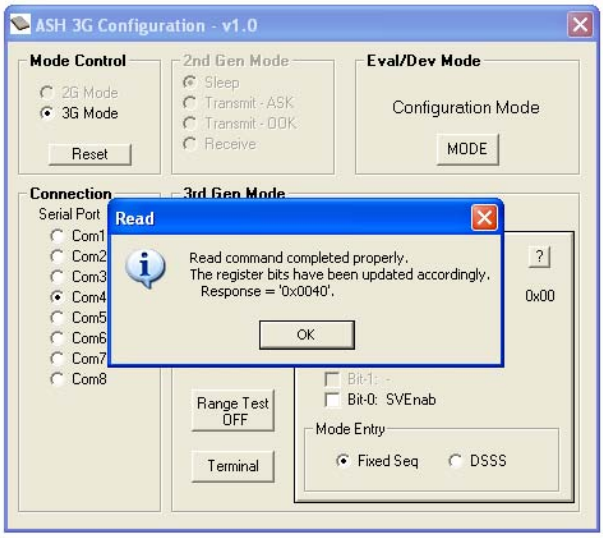
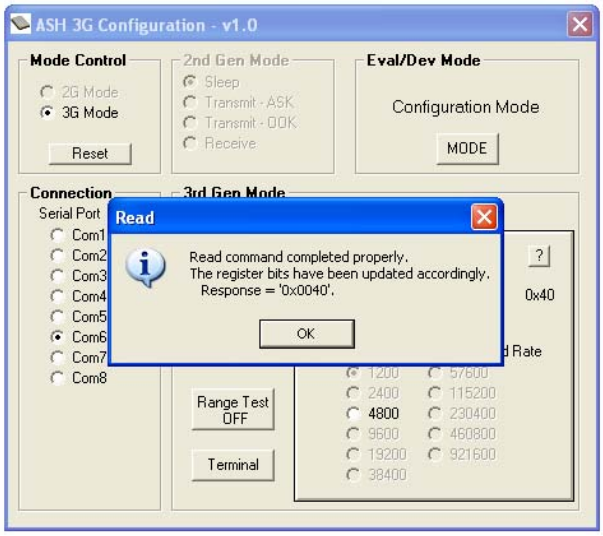
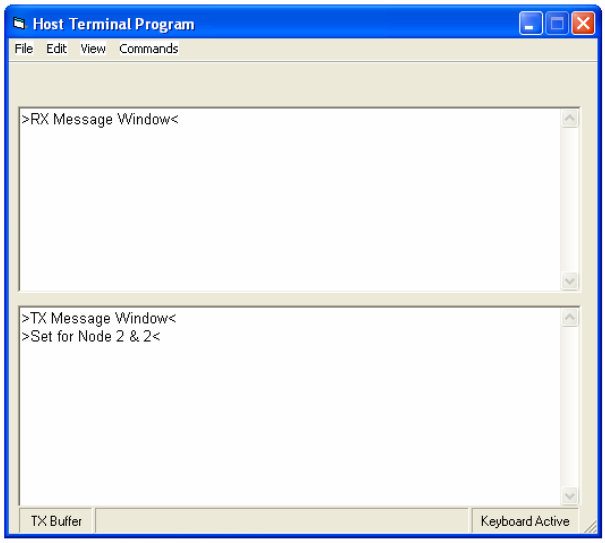
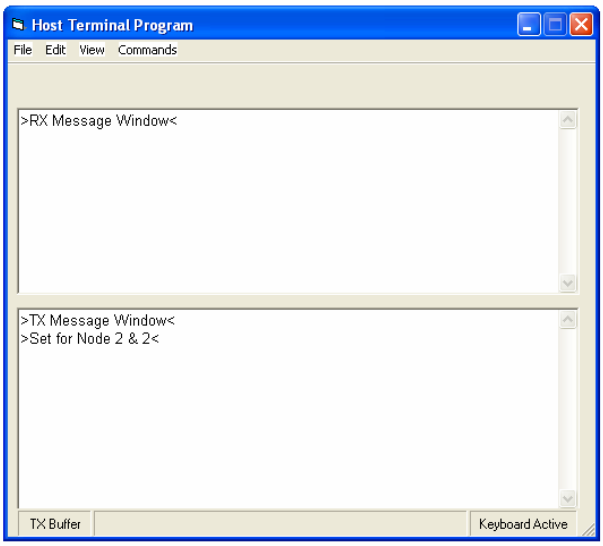




Then select the Terminal application by clicking on the “Terminal” button in each window.





1.9.1 Range Test using the Terminal

After configuring the terminals as above and enabling the Range Test, as described in section 1.8, the actual Range Test packets may be observed in the Receive window of the receiving device.

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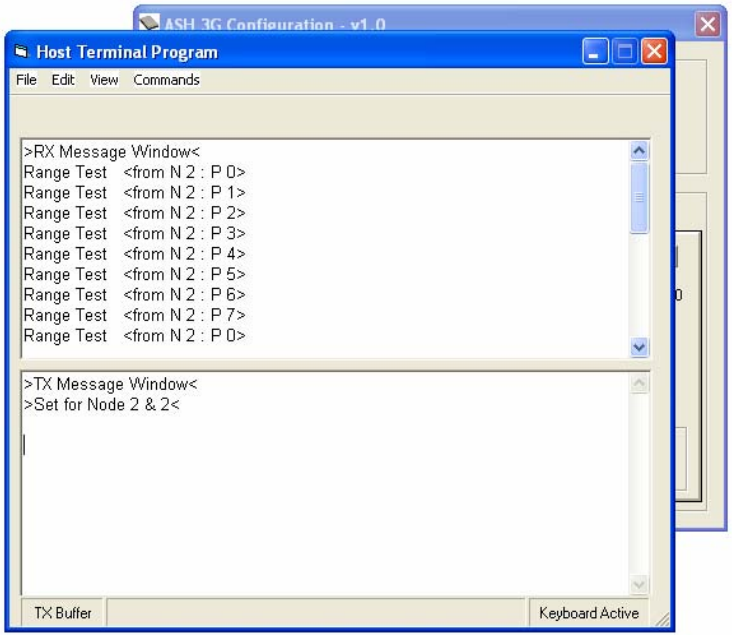
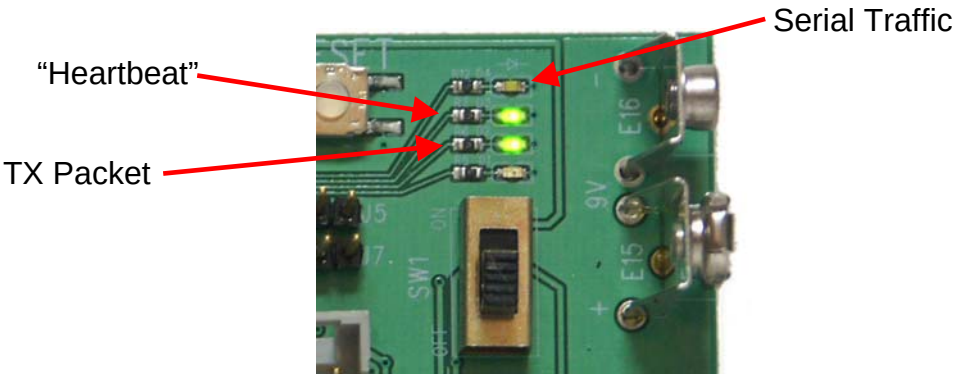
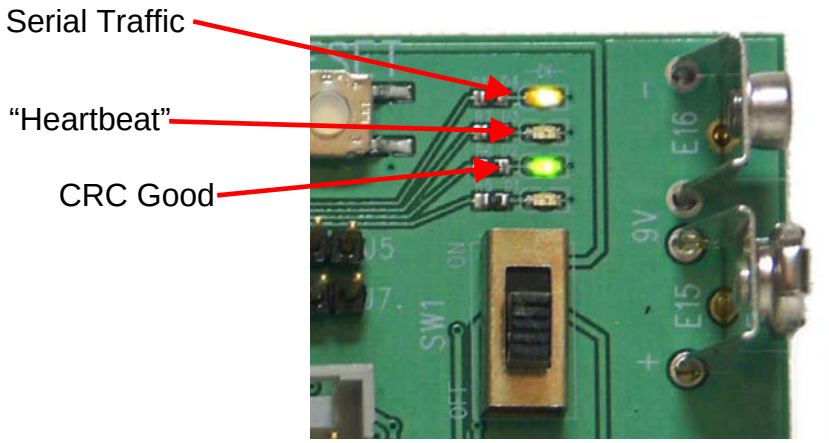


On the development boards, the transmitting board will flash the TX Packet LED, indicating each time the TX packet is sent, and the Serial Traffic LED each time an ACK or nACK is sent to the PC.



On the receiver board two LED's will flash continuously. The "CRC Good" LED flashes when the packet is received and the frame check (CRC) of the packet has been verified as good and the "Serial Traffic" LED will flash when an ACK or nACK is sent to the PC via the serial port. The ACK or nACK will appear in the Transmit window of the configuration software.



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