

Transmission Test

Date Completed: 1/28/2010

Performed by: Jeffrey Abbott + Kingzi Ye

Tested Specifications:

Test #	Engineering Specification	Description	Pass Requirement
T6	ES7	Data Rate	>40kbps
T7	ES8	Transmission Range	>100m
T9	ES10	Bit Error Rate	<0.12

Revision History:

Revision	Description	Date
1	Document Created	12/9/2010
2	Document Updated	1/6/2011
3	Document Updated	1/25/2011

Equipment Needed:

Name of Equipment	Accuracy
2 Communication Boards	-
1 CC2531 Evaluation Board	
2 USB cables type B male type B female	-
1 PC with Hyperterminal Installed and Custom Script	-
1 PC with Hyperterminal Installed and TI Packet Sniffer	-
Distance Measurer	1m
Tape	-
Marker	-



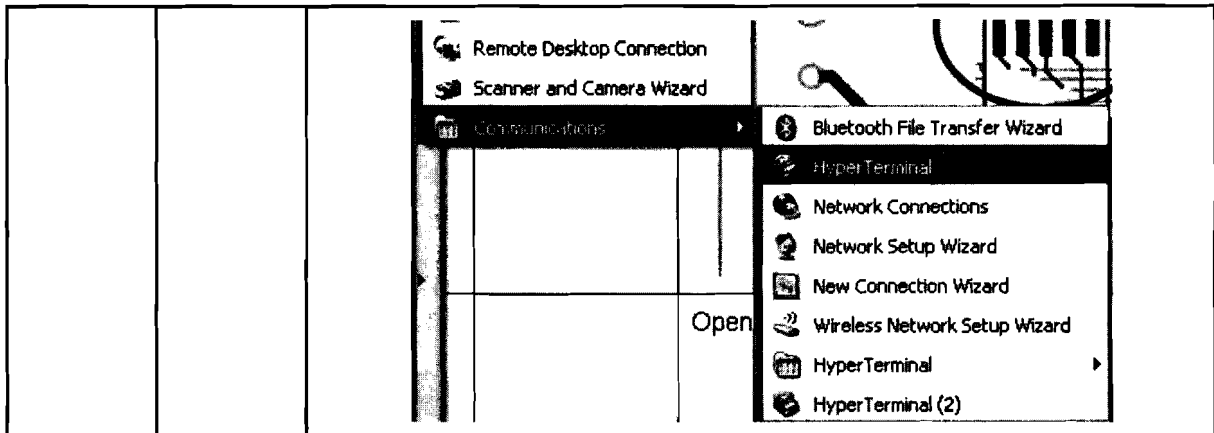
Resources Needed:

Resource	Comment
HyperTerminal	The proper drivers provided from TI are required. These can be found on the RIT Edge Website.
TI Packet Sniffer	-
Custom Script	The script compares the received data with the transmitted text file and calculates the Bit Error Rate. These can be found on the Edge Website.
Gordan Field House Space	Measurement should be performed in Line of Sight.
Transmission Text File	File Provided on the RIT Edge Website (transmission_file.txt)

Test Procedure:

Step #	Check Off	Procedure
1	✓	Put a distance marker (tape with the corresponding distance written on it) at 1m, 50m, 100m, and 250m with respect to a starting marker using a measuring device for accuracy.
2	✓	Place a communication board at the starting marker upon a static free surface at least two feet off the ground. Orientate the antenna vertically.
3	✓	Place a PC by the communication board and turn it on.
4	✓	Connect the communication board to the USB port of the PC using a USB cable. Look up the port number assigned to the communication board in your control panel.
5	✓	Open up HyperTerminal from your program menu.





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Assign a name and click OK.

✓

A screenshot of the 'Connection Description' dialog box. The title bar says 'Connection Description'. Below the title bar, there is a 'New Connection' icon and text. The main text reads: 'Enter a name and choose an icon for the connection:'. There is a text input field labeled 'Name:' which is currently empty. Below that is an 'Icon:' section with a row of seven icons: a globe, a flag, a computer monitor, an MCI logo, a globe, a printer, and a satellite dish. At the bottom of the dialog are 'OK' and 'Cancel' buttons.

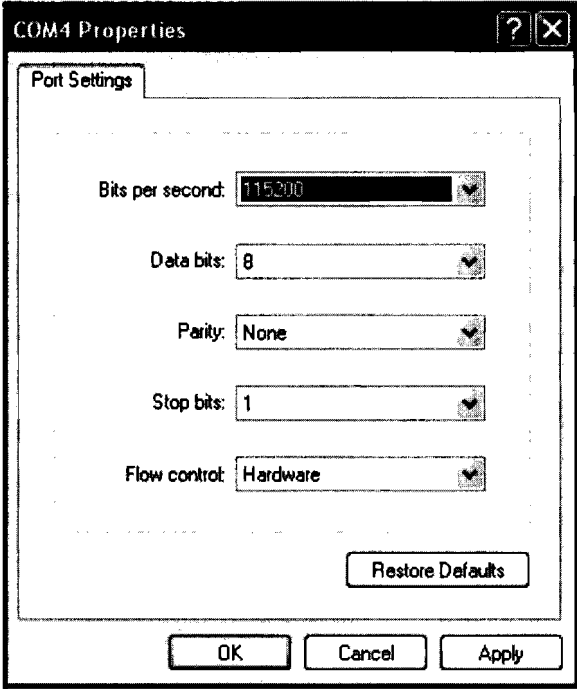



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Select the corresponding COM channel and click OK.

✓

A screenshot of the 'Connect To' dialog box. The title bar says 'Connect To'. Below the title bar, there is a 'Test' icon and text. The main text reads: 'Enter details for the phone number that you want to dial:'. There are three input fields: 'Country/region:' with a dropdown menu showing 'United States (1)', 'Area code:' with an empty text box, and 'Phone number:' with an empty text box. At the bottom, there is a 'Connect using:' dropdown menu showing 'COM4'. At the very bottom are 'OK' and 'Cancel' buttons.



8	✓	<p>Change the data rate to 115200bps, 8 data bits, no parity, 1 stop bit, and Flow control of Hardware. Click OK.</p> 
9	✓	Plug in the evaluation board to a different USB port.
10	✓	<p>Open up the program TI Packet Sniffer.</p> 
11	✓	<p>Choose the Generic Protocol and click Start.</p> 
12	✓	Place a communication board at the 1m marker upon a static free surface at least two feet off the ground. Orientate the antenna vertically.
13	✓	Follow steps 4 through 8 with the second board.
14	✓	<p>On the computer with the first board, click on the play button within the Packet Sniffer program and click on the two vertical arrows to turn on auto scrolling.</p> 



15	✓	From the HyperTerminal on the first computer, select a test file to send by clicking Transfer/Send Text File. This file should have the protocol already implemented for arranging communication. Click Open.														
16	✓	<p>After transmission has completed, look up the last packet on the Packet Sniffer program. Calculate the data rate from the time using the formula: $DR = \frac{\text{Length of packet}}{\text{Transmission time}}$</p> <table border="1"> <thead> <tr> <th>P.nbr.</th> <th>Time (us)</th> <th>Length</th> <th>Payload</th> <th>RSSI (dBm)</th> <th>LQI</th> <th>FCS</th> </tr> </thead> <tbody> <tr> <td>835</td> <td>+4394262</td> <td>15</td> <td>01 88 99 07 20 DE 25 07 20 EB 25 99 7F</td> <td>-39</td> <td>107</td> <td>OK</td> </tr> </tbody> </table>	P.nbr.	Time (us)	Length	Payload	RSSI (dBm)	LQI	FCS	835	+4394262	15	01 88 99 07 20 DE 25 07 20 EB 25 99 7F	-39	107	OK
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17	✓	Copy the received text from the HyperTerminal console to Notepad (or any text editing program) and save the file in a known location as a *.txt file.														
18	✓	Open up the Custom Script and input the path corresponding to the text file previously saved in Step 17. Record the Bit Error rate in the Measured Results Table.														
19	✓	In the Measured Results Table, if both the BER and Data Time pass for the 10m marker then record a value of Yes for a successful transmission. If either the BER or Data Rate are not acceptable, record a No for a successful transmission.														
20	✓	Repeat steps 11 through 24 at the other three markers.														



