RemoTI Target Emulator (TE) User's Guide

Document Number: SWRU202B

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Acronyms and Definitions

EM	Evaluation module
LED	Light Emitting Diode
DLL	Dynamic Link Library
RNP	RemoTI Network Processor
TE	Target Emulator
USB	Universal Serial Bus
HID	Human Interface Device

1 References

[1] RemoTI Sample Applications User’s Guide, SWRU201
[2] RemoTI Development Kit Quick Start Guide, SWRA277

2 Introduction

This guide describes the Target Emulator features, system requirements and how to run the application. The Target Emulator (TE) is used to demonstrate the usage of the RemoTI application framework interface and the RemoTI network processor. It is also used to test RemoTI target node inter-operability with the RF4CE remote controller.

TE is a Windows application that connects to a Remote TI network processor through serial port or USB (using HID profile). Using the Remo TI application framework interface, TE simulates a target application as it receives and transmits CERC profile packets using RF4CE protocol.

3 System Requirements

This emulator requires the following hardware and firmware:

- One RemoTI CC2530 (UART), CC2533 (UART) or RemoTI CC2531 (USB HID) Target Board playing a role as an RF4CE target node loaded with RemoTI network processor (RNP) firmware with UART settings for Serial Port Target or USB HID settings for USB HID Target.
- One RF4CE remote controller supporting CERC profile.
- One Windows XP PC with Microsoft .NET framework

The Target Emulator executable (**TargetEmulator.exe**) is dependent on the following dll files:

- **RTILibWrapper.dll**
- **rtilib.dll**
- **USBHidLib.dll**

TargetEmulator.exe, **RTILibWrapper.dll**, **rtilib.dll** and **USBHidLib.dll** must reside in the same directory. The RemoTI development kit installs these files in **\Texas Instruments\RemoTI-CC2530DK-1.2\bin by default.** If you want to execute the Target Emulator from a different directory, for example, if **TargetEmulator.exe** is copied into a directory C:\ABC, **RTILibWrapper.dll**, **rtilib.dll** and **USBHidLib.dll** must be copied into the same directory, C:\ABC.

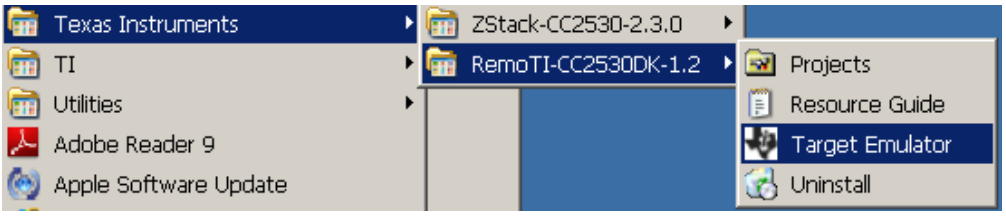
The RemoTI Target Board should be loaded with the correct **RNP firmware** image provided in the same development kit (USB HID or Serial Port interface).

The remote control must support RF4CE protocol and CERC profile.

4 Operations

4.1 Running the TE application

Target Emulator can be executed in a couple of ways. RemoTI development kit installer must have created a short cut in start menu and selecting the short cut would execute Target Emulator.



Another way is to navigate to the folder where you either copied or installed the required files (**TargetEmulator.exe, RTILibWrapper.dll, rtilib.dll and USBHidLib.dll**) and to double click on **TargetEmulator.exe** to run the application. By default, these files are installed under **\Texas Instruments\RemoTI- CC2530DK-1.2\bin** from RemoTI CC253x development kit installer. When executed, the Target Emulator will look like this:

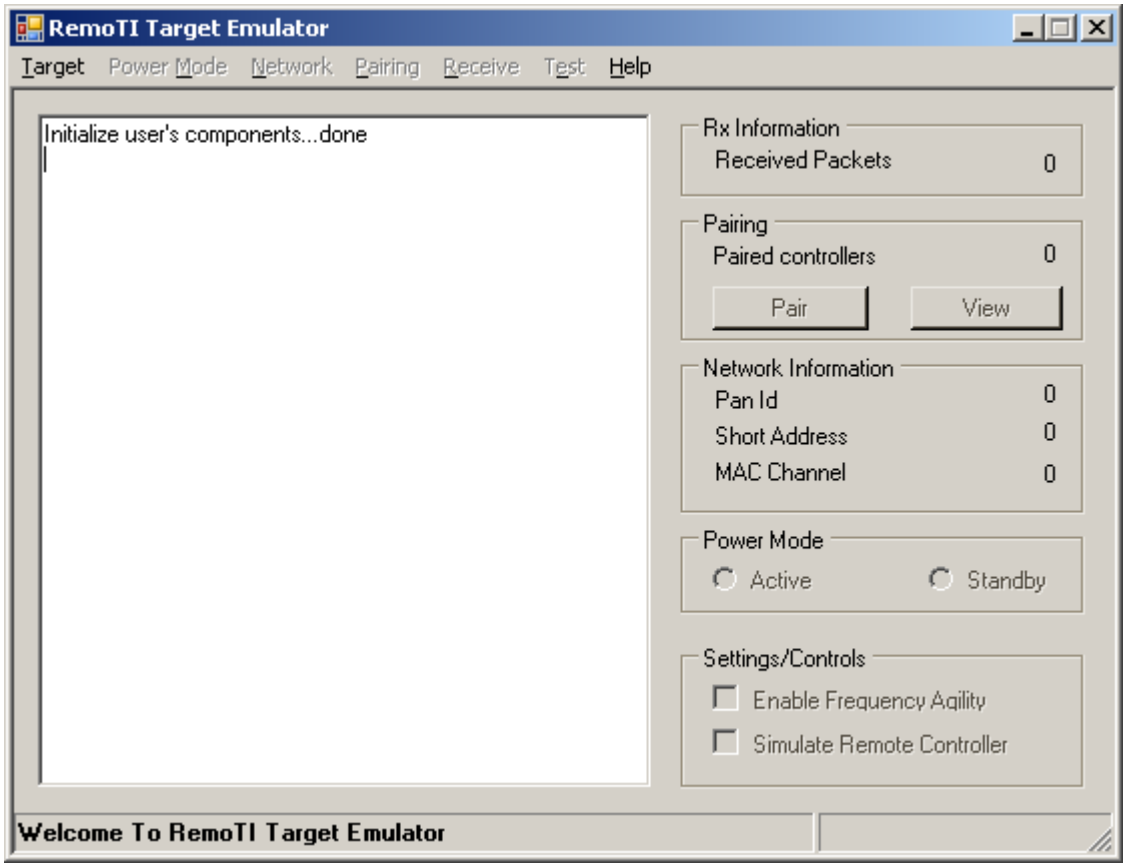


Figure 1 : Target Emulator GUI

4.2 Starting the Target Emulator

Go to Target menu, select “Start Target Emulator”

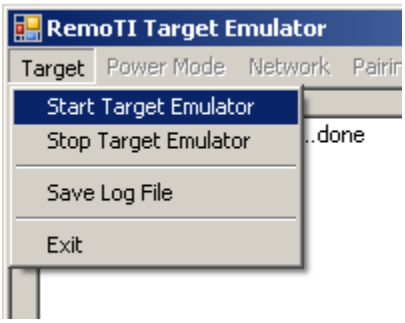


Figure 2 : Starting the Target Emulator

Target Emulator will ask the user to select a communication method. There are two methods of communication between the Target Emulator and the target. They are USB HID and Serial Port. Select which method to be used.

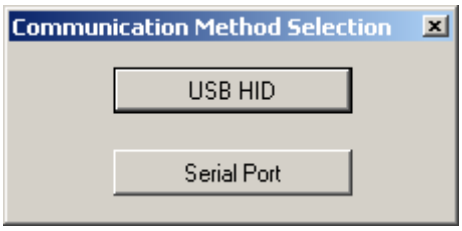


Figure 3: Communication Method Selection

4.2.1 Starting - USB HID Target

If the user selects USB HID device, the Target Emulator will prompt the user to enter the Vendor ID and Production ID of the searching USB HID device. For example: 1105 is TI Vendor ID and 5808 is CC2531 Product ID.

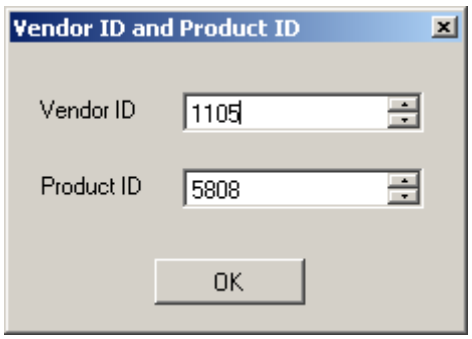


Figure 4: Vendor ID and Product ID input

The Target Emulator will present to the user the list of devices that matched with the Vendor ID and Product ID but differentiated by serial numbers. The user can select which device they want to use and click OK to move on.

Figure 5: USB HID Target Selection

The user will see the confirmation that the USB HID device has been initiated. The user also sees the RemoTI Controller Simulation GUI.

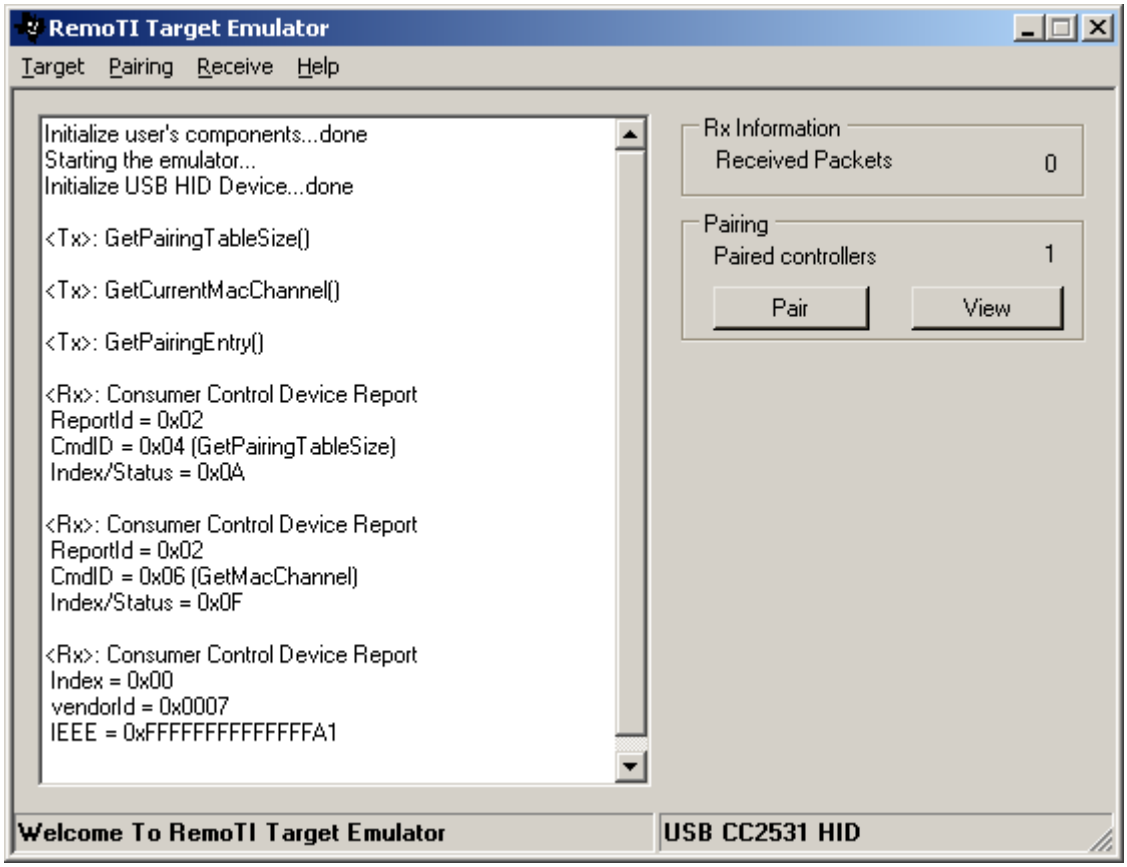


Figure 6: USB HID Target Started

Figure 7: RemoTI Controller Simulation GUI

4.2.2 Starting - Serial Port Target

When the Serial Port target is selected, the Target Emulator asks for the COM port to which the target node network processor is connected. The user must know ahead which COM port is connected to the RemoTI Target Board. For example, RemoTI CC253x development kit quick start guide has an instruction with regard to installing the virtual COM port driver, through which the COM port number should have already been identified. Select the correct COM port by double clicking on it or by single clicking the COM port (which highlights the selection) and clicking the OK button.

Figure 8 : COM Port selection

If the connected RemoTI Target Board has not been assigned a device type before, the Target Emulator will ask for the device type that the Target Emulator will simulate. If the RemoTI Target Board already had a device type assigned to it, it will not prompt the user to select a device type until the RemoTI Target Board is re-programmed. Select a device type that the RF4CE-compliant remote control supports by double clicking on it.

Figure 9 : Device Type selection

The user will see the confirmation that the RemoTI Target Board has been initialized. The user also sees the RemoTI Controller Simulation GUI.

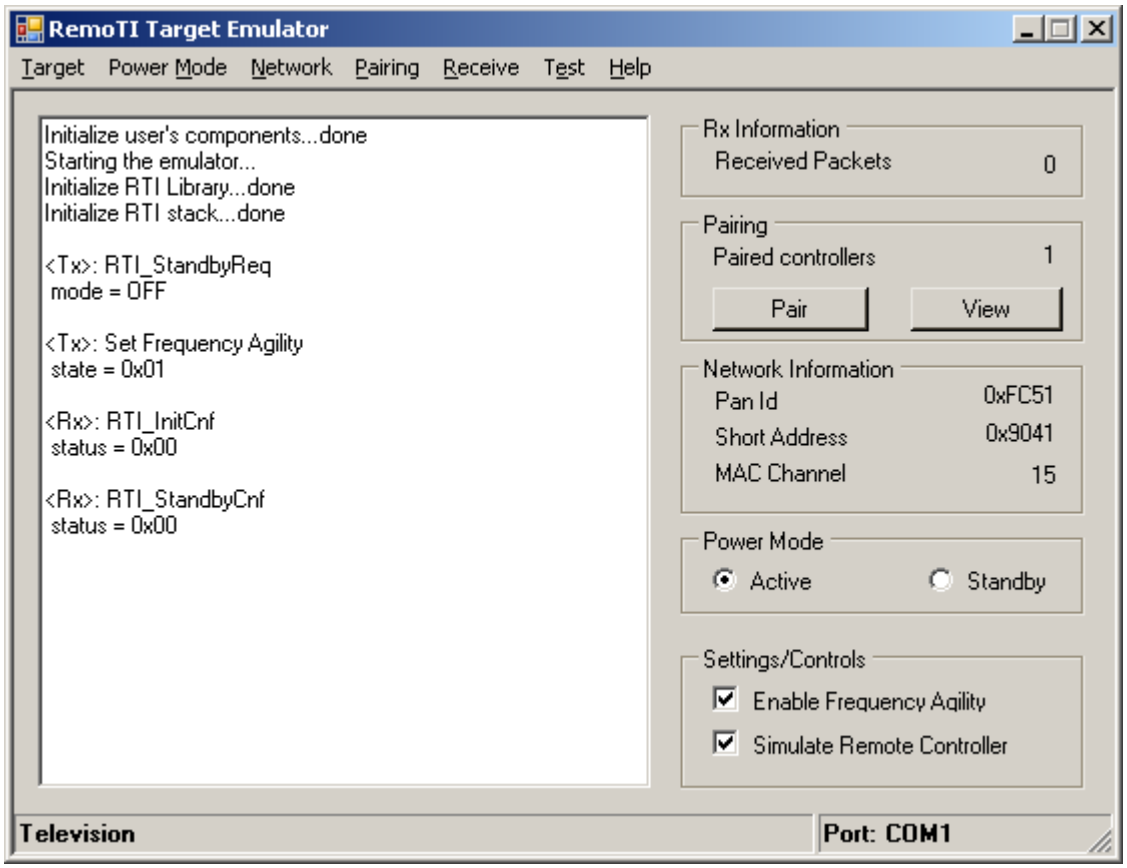


Figure 10 : Target Emulator started

Figure 11 : Remote Controller GUI

4.3 Pairing the Target and Controller

The user can pair the target and controller by pressing the “Pair” button on the application.

4.3.1 Pairing - USB HID Target

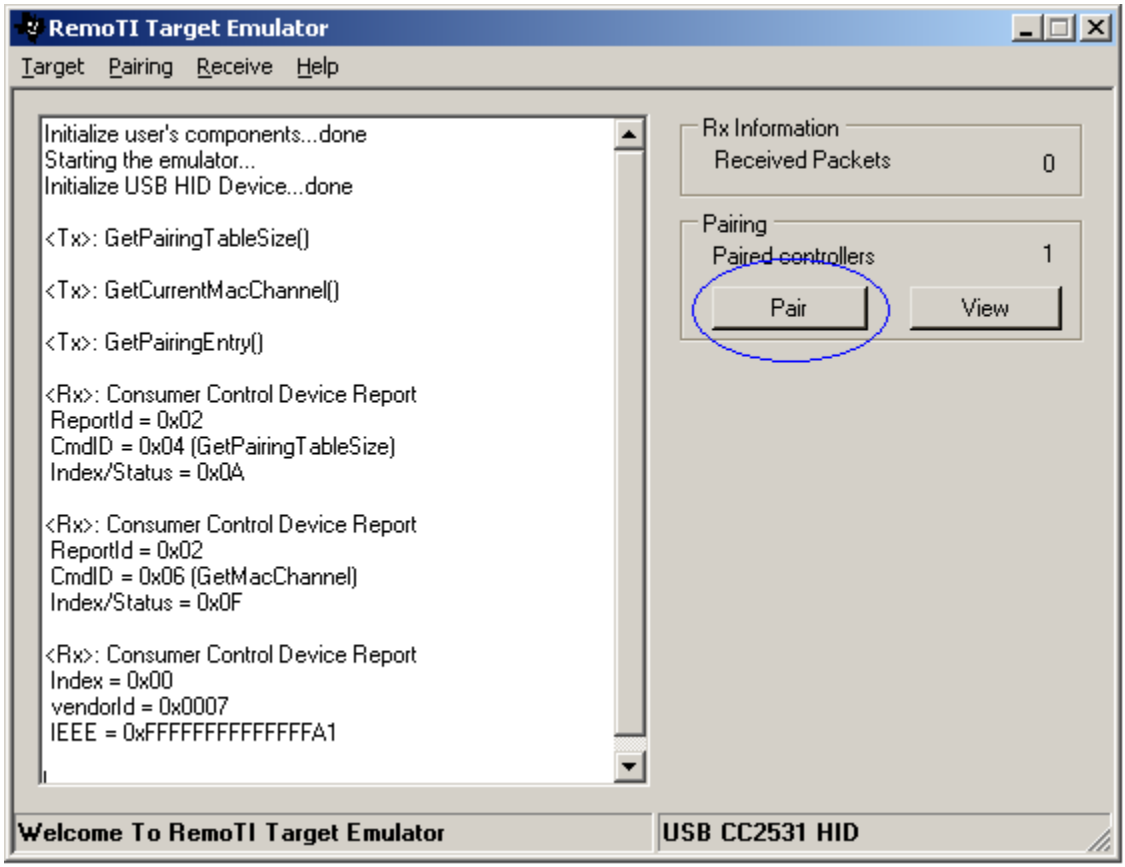
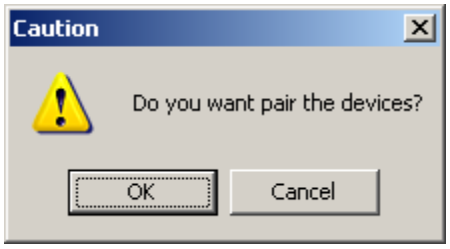


Figure 12: Pairing Button (USB HID Target)

The user will be asked if he/she wants to pair the devices or not. Click “**OK”** to proceed.



Then within the next thirty seconds, trigger pairing on the remote controller in the implementation-specific way. For example, pressing the 'zoom' key triggers pairing for the RemoTI CC253x remote.

Note the pairing can be triggered from the remote controller first, in which case the pair button on the Target Emulator must be pressed within the next thirty seconds.

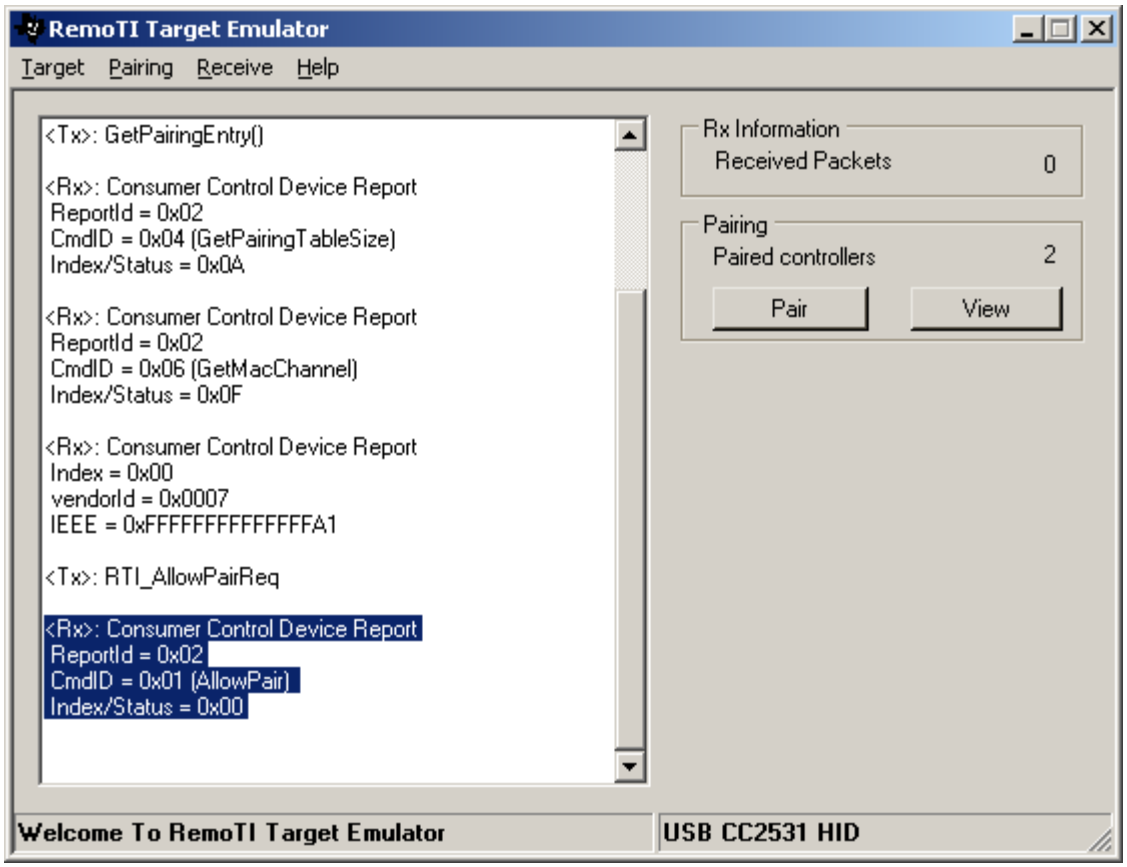


Figure 13: Pairing traffic (USB HID Target)

4.3.2 Pairing - Serial Port Target

The user can pair the target and controller by pressing the “Pair” button the on the application.

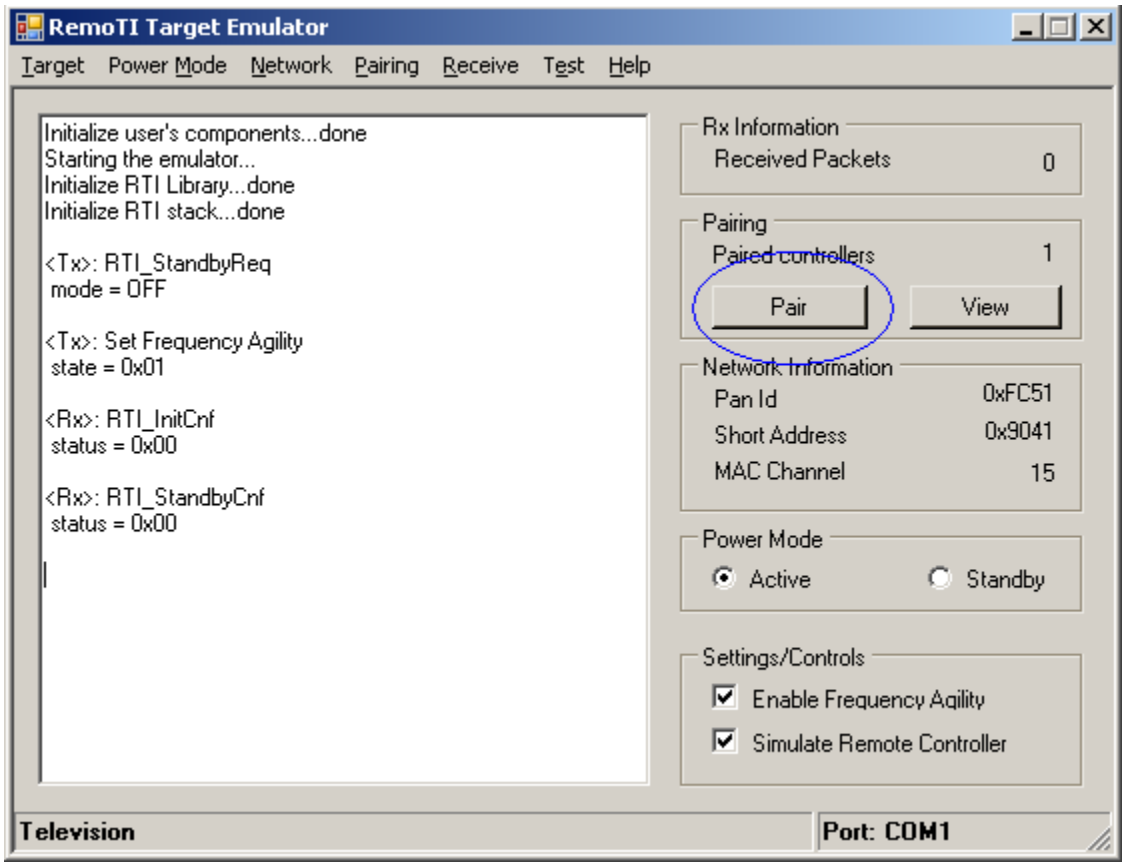
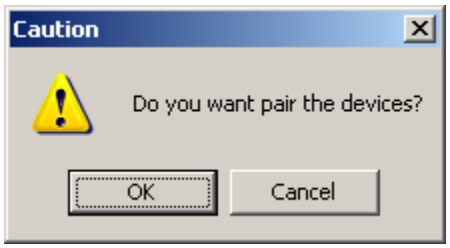


Figure 14 : Pairing Button (Serial Port Target)

The user will be asked if he/she wants to pair the devices or not. Click “**OK”** to proceed.



Then within the next thirty seconds, trigger pairing on the remote controller in the implementation-specific way. For example, pressing the 'zoom' key triggers pairing for the RemoTI CC253x remote.

Note the pairing can be triggered from the remote controller first, in which case the pair button on the Target Emulator must be pressed within the next thirty seconds.

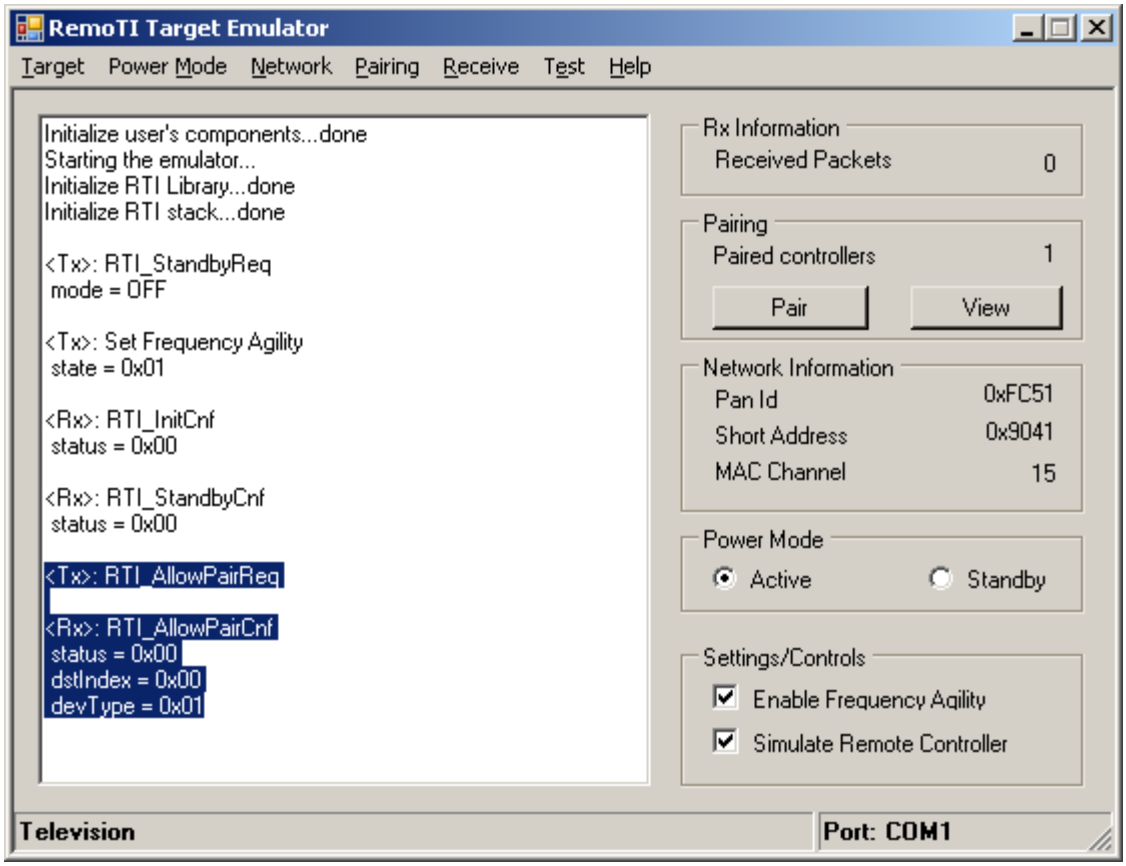


Figure 15 : Pairing Traffic (Serial Port Target)

4.4 Clearing Pair Info and Viewing Pair Info

4.4.1 Clearing/Viewing Pair Info - USB HID Target

At any time after starting, the user can clear the pairing information by selecting **Pairing → Clear Pairing Info**

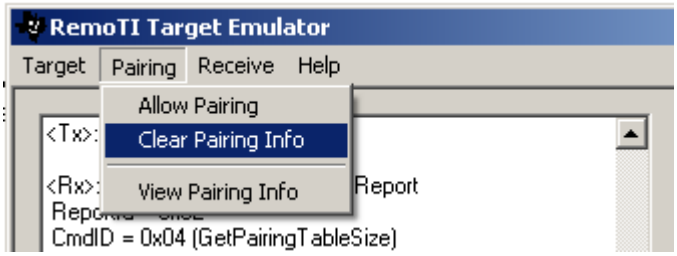


Figure 16: Clear Pairing Info (USB HID Target)

To view pairing info, select **Pairing → View Pairing Info**. The user can also view the pairing info by pressing "**View**" button.

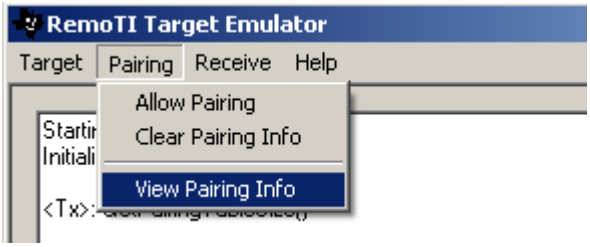


Figure 17: Viewing Pairing Info (USB HID Target)

The information of the current pairing will be displayed on the log area.

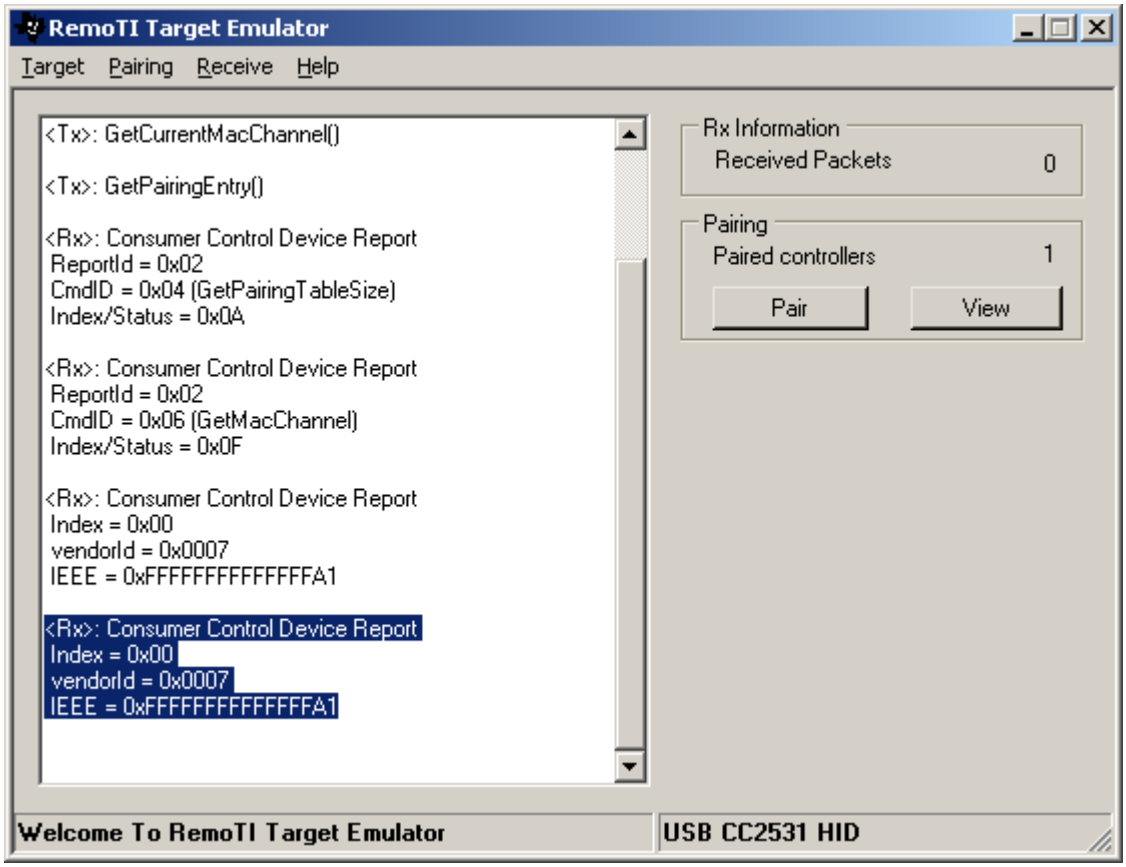


Figure 18: Pairing Info Display (USB HID Target)

4.4.2 Clearing/Viewing Pair Info - Serial Port Target

At any time after starting, the user can clear the pairing info by selecting **Pairing → Clear Pairing Info**

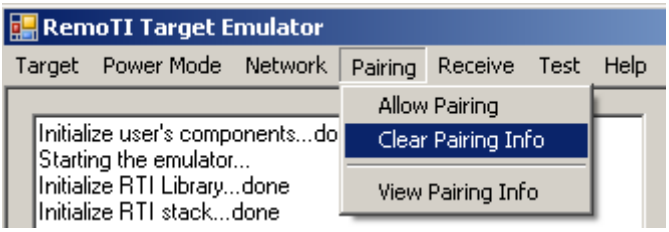


Figure 19 : Clear Pairing Info (Serial Port Target)

To view pairing info, select **Pairing → View Pairing Info**. The user can also view the pairing info by pressing "**View**" button.

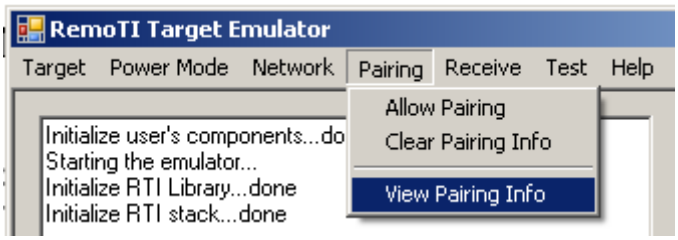


Figure 20 : View Pairing Info (Serial Port Target)

The information of the current pairing will be displayed on the log area.

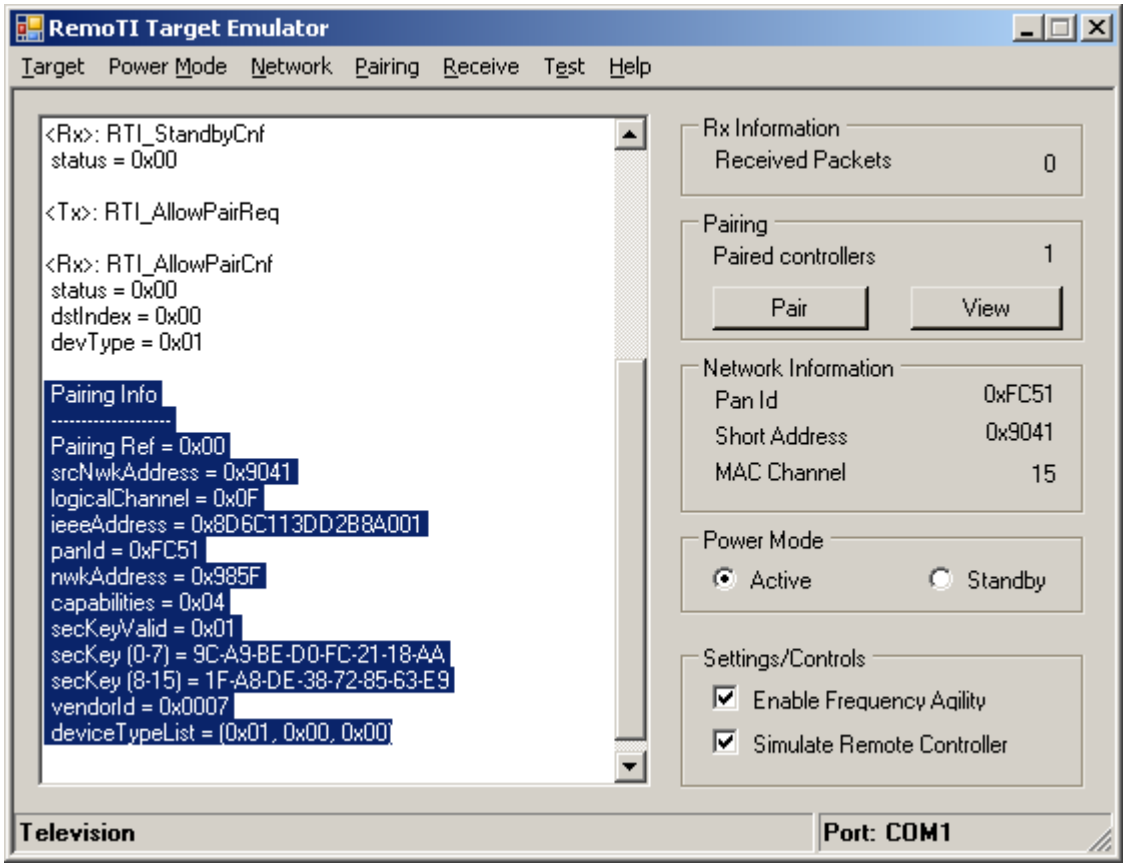


Figure 21 : Pairing Info Display (Serial Port Target)

4.5 Operations

Target will flash a key on RemoTI Controller Simulator window when the target receives a CERC command from the paired remote controller.
RemoTI CC253x remote sends CERC commands for most of its keys except for those used for special functions such as pairing triggering, test mode toggle and target device toggle and selection.

Figure 22 : Controller Simulation

4.6 Stopping the Target Emulator

To stop the Target Emulator, select **Target → Stop Target Emulator**. The emulator will close the connection with the RemoTI Target Board and shut down all the internal modules.

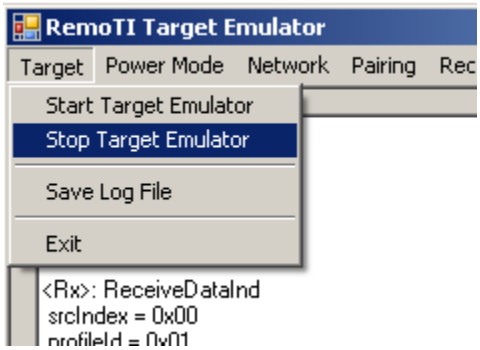


Figure 23 : Stopping Target Emulator

4.7 Saving Messages Log

To save the current log, select **Target → Save Log File**. The log will be saved in "**log.txt**" under the same directory.

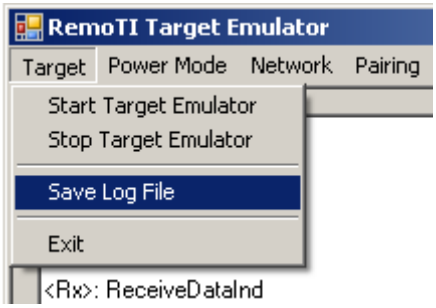


Figure 24 : Saving Message Log

4.8 Changing power mode (Serial Port Target Only)

Power mode can be changed by going to **Power** and select "**Active**" or "**Standby**".

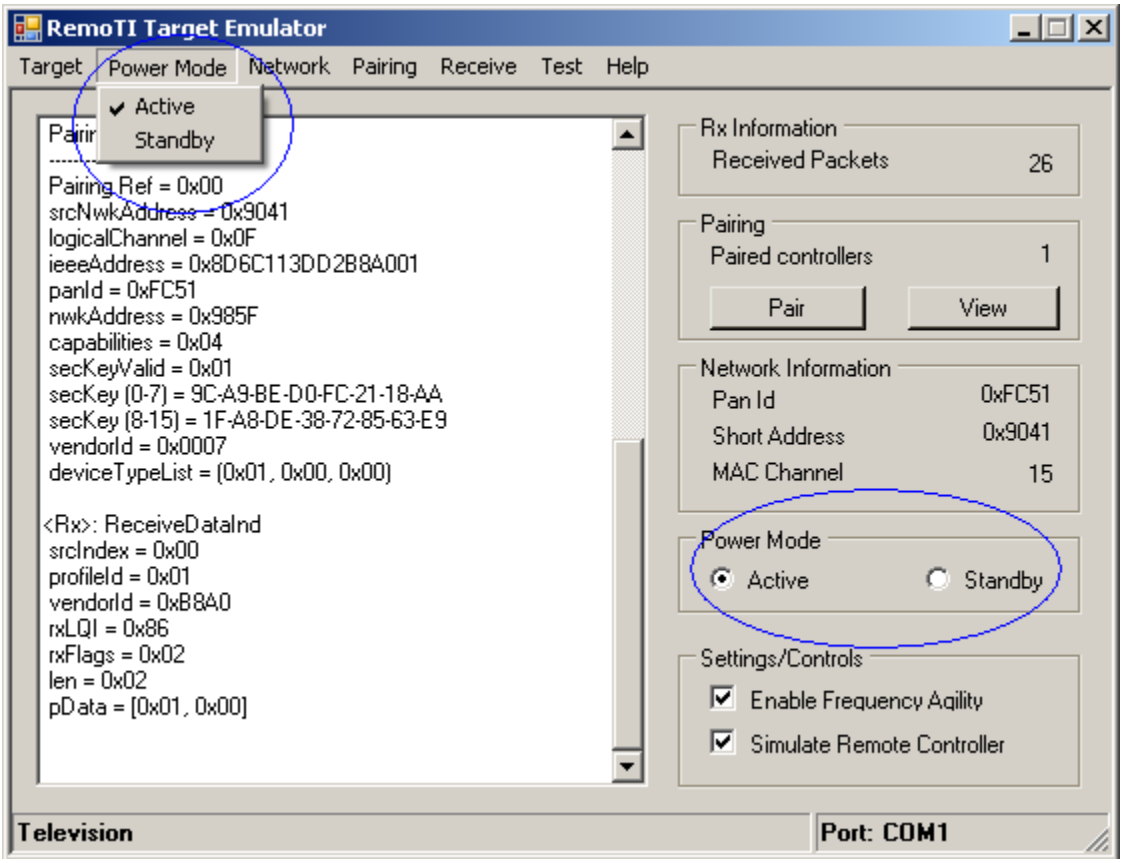


Figure 25 : Changing Power Mode

4.9 Changing MAC channel (Serial Port Target Only)

MAC channel can be changed by selecting **Network → Change MAC Channel**.

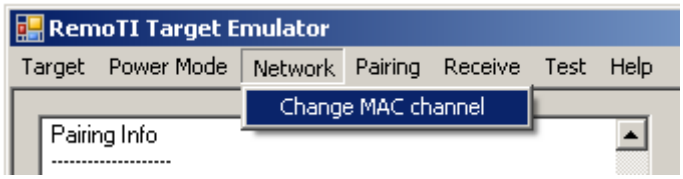
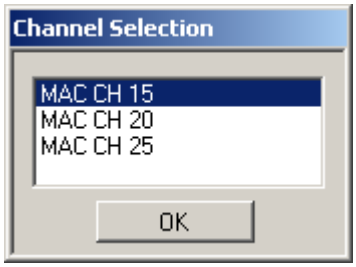


Figure 26 : Mac Channel Selection

A dialog will pop up and ask the user to select the channel. Double click on the channel to select it.



4.10 Resetting the received packet count

To reset the received packet count, select **Receive → Clear Received Packet Counter**

Figure 27: Clear Rx Count (USB HID Target)

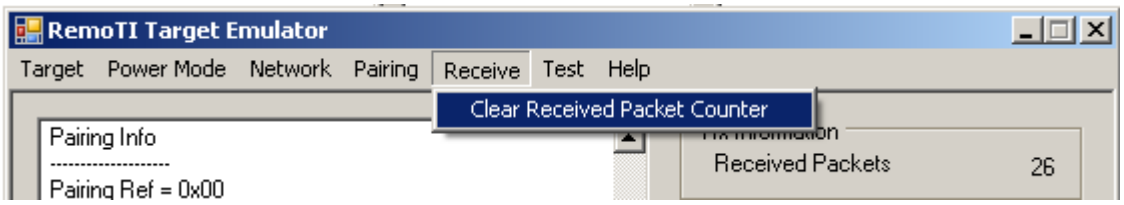


Figure 28 : Clear Rx Count (Serial Port Target)

4.11 Changing frequency agility (Serial Port Target Only)

To enable or disable the frequency agility, check or uncheck the box for '**Enable Frequency Agility**'.

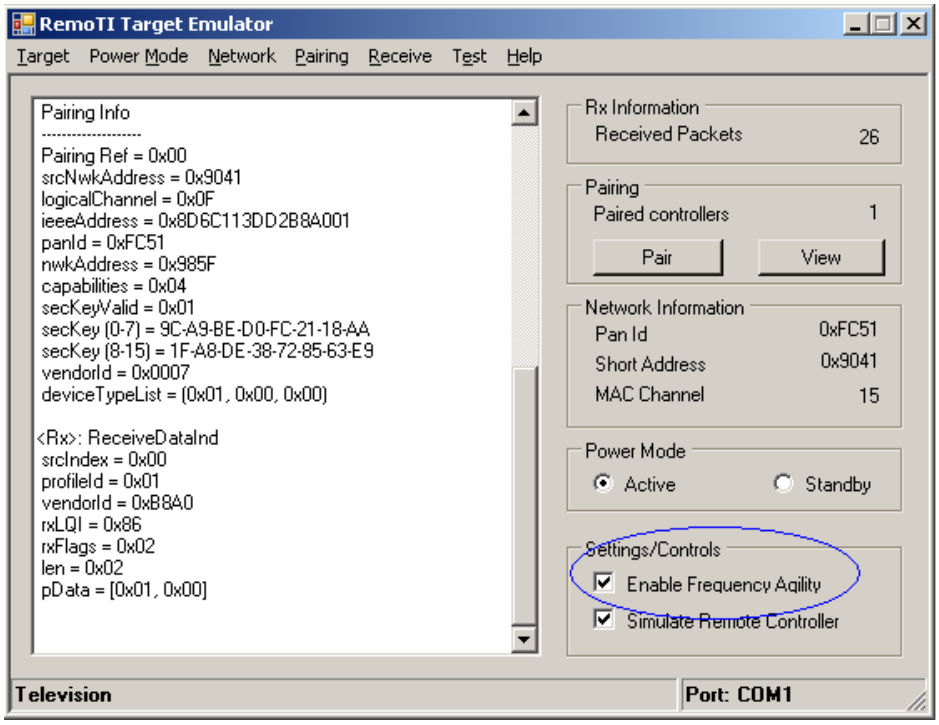


Figure 29 : Enable/Disable Frequency Agility

4.12 Toggle displaying the remote control simulation (Serial Port Target Only)

To toggle the display of the remote, check or uncheck the box for '**Simulate Remote Controller**'

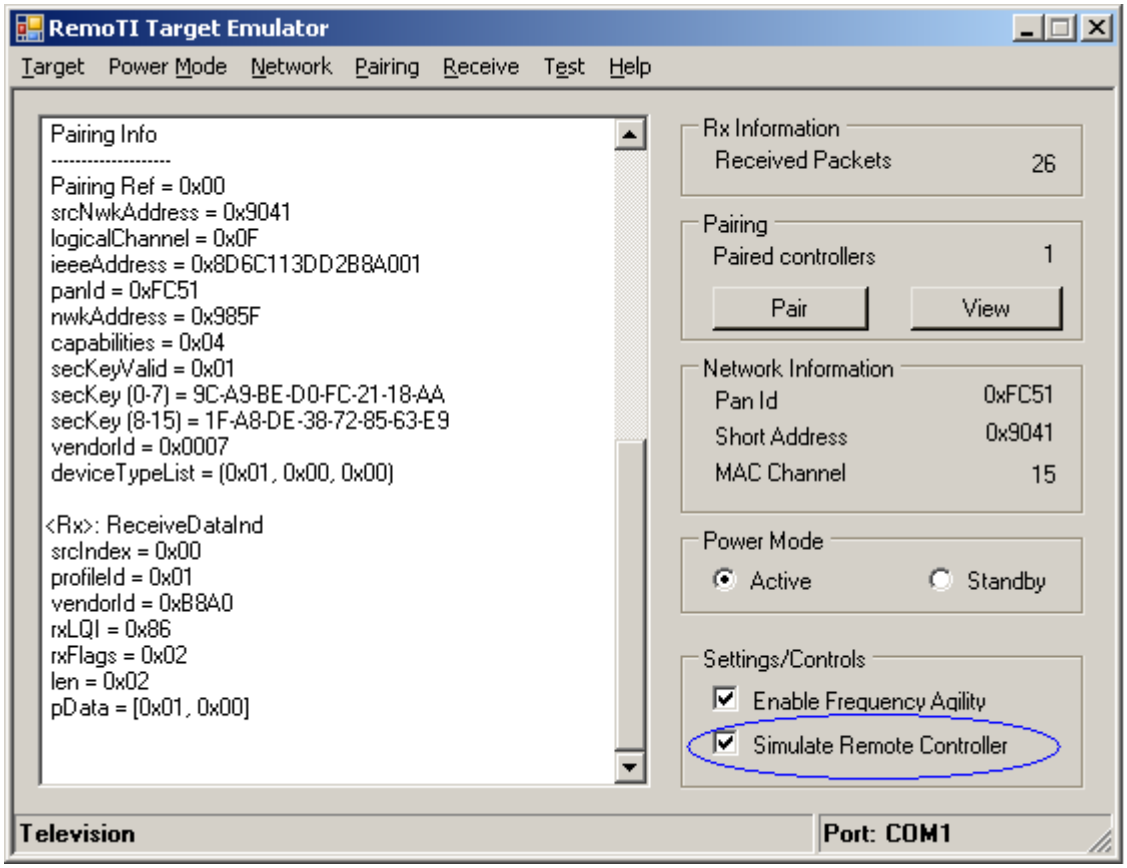


Figure 30 : Enable/Disable Remote Controller GUI

4.13 Test Mode (Serial Port Target Only)

Test mode feature in Target Emulator works with an RF4CE remote that supports TI vendor specific commands for test mode. See [1] for details of how to configure and execute the test and how to interpret the test results.

To start test mode, go to **Test** and select **Settings**

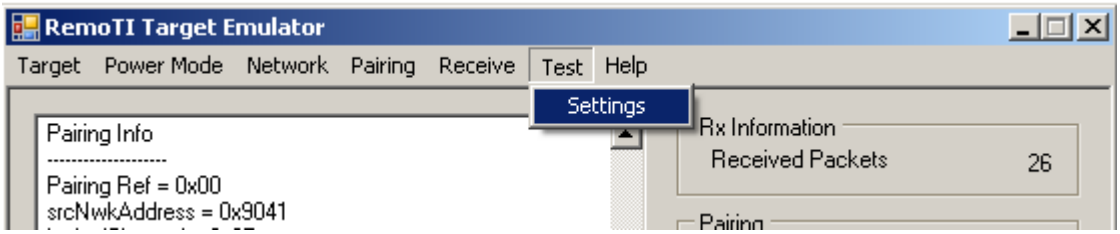


Figure 31 : Test Mode Selection

Select appropriate parameters for Test Mode and press ‘OK’

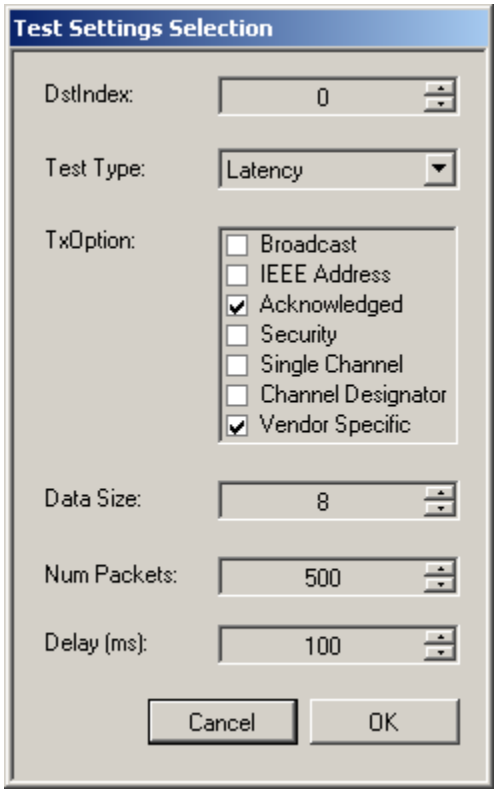


Figure 32 : Test Mode Parameters

The GUI will ask the user to put the remote controller in Test Mode. For CC253x remote, it would be the ‘**freeze’** key (Check appropriate document on how to put the remote controller in Test Mode). Press ‘OK’ when ready. The test parameters will be sent to the remote controller

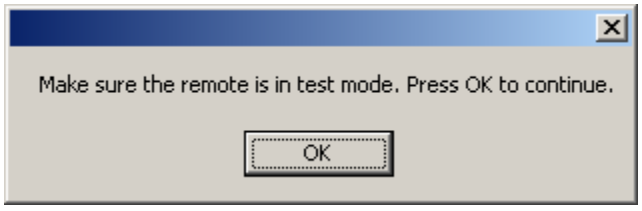


Figure 33 : Setting Remote Test Mode

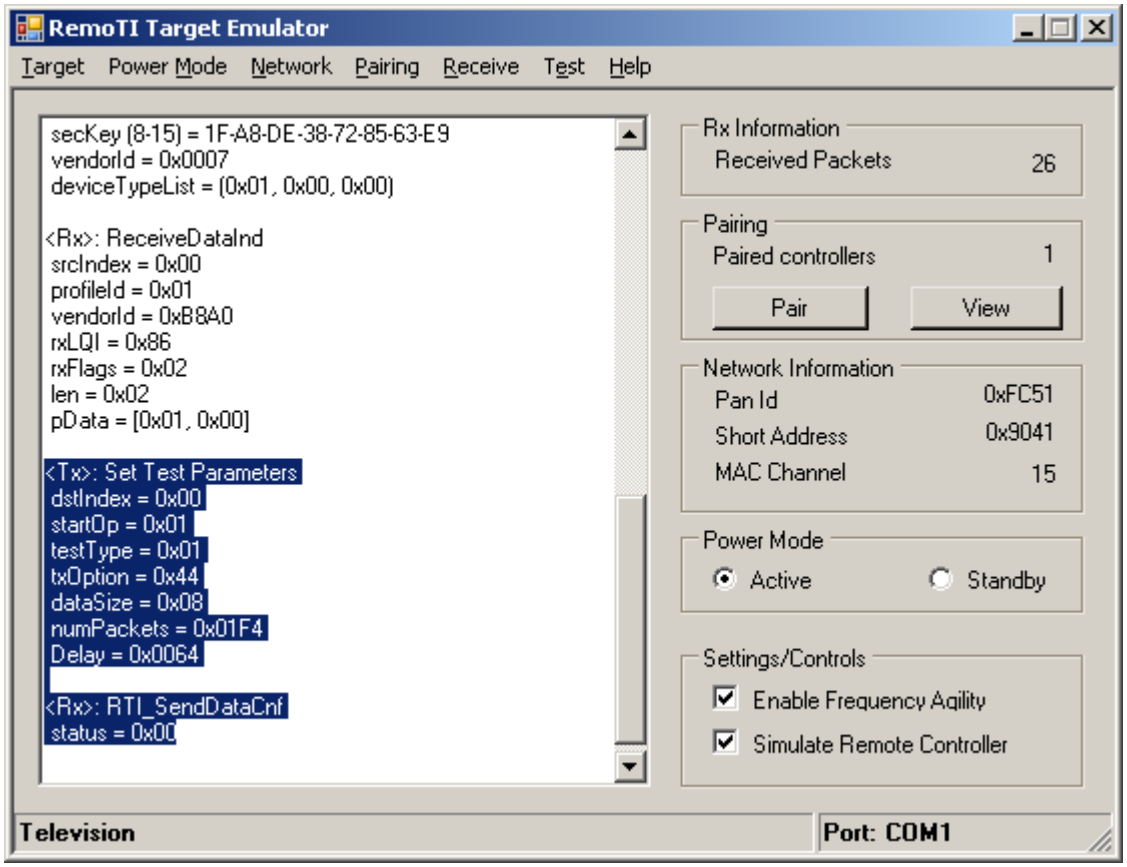


Figure 34 : Set Test Parameters Packet

Start the test on the remote (Follow [1] for test mode appropriate procedure).

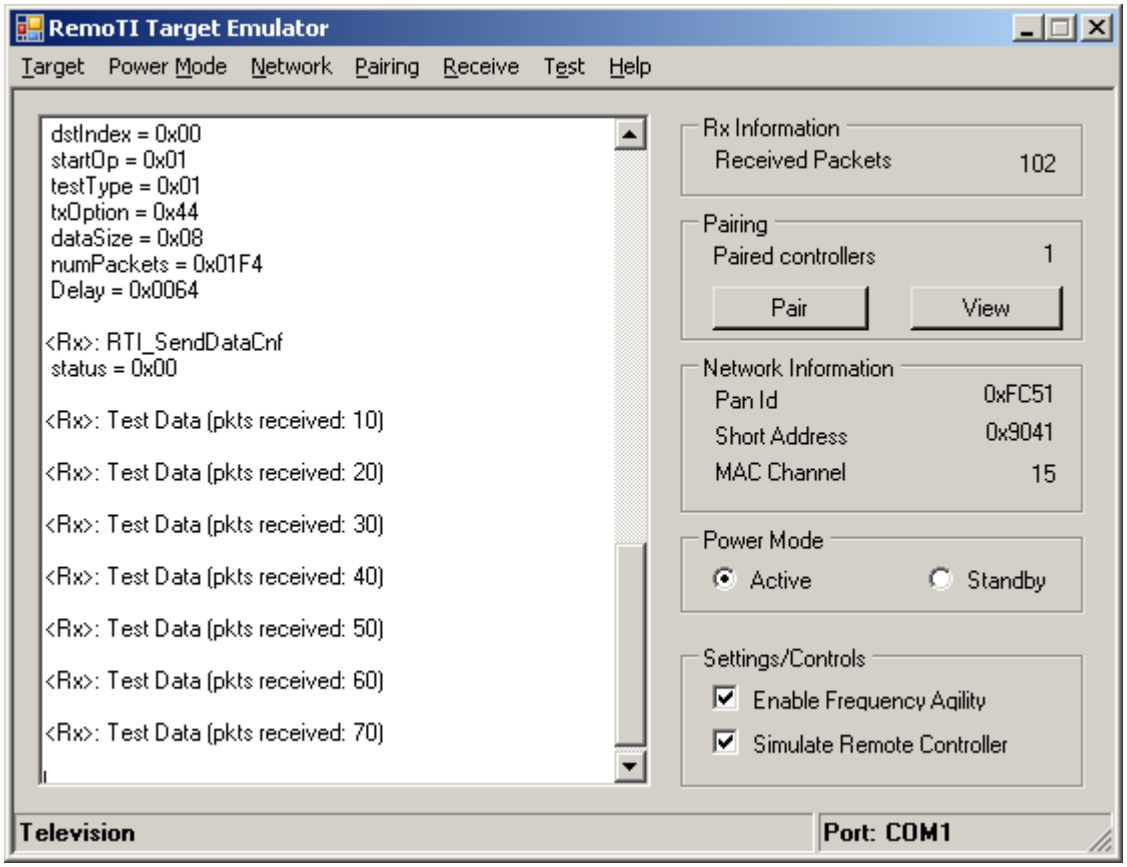


Figure 35 : Test Data

Follow [1] to get the result of the test.

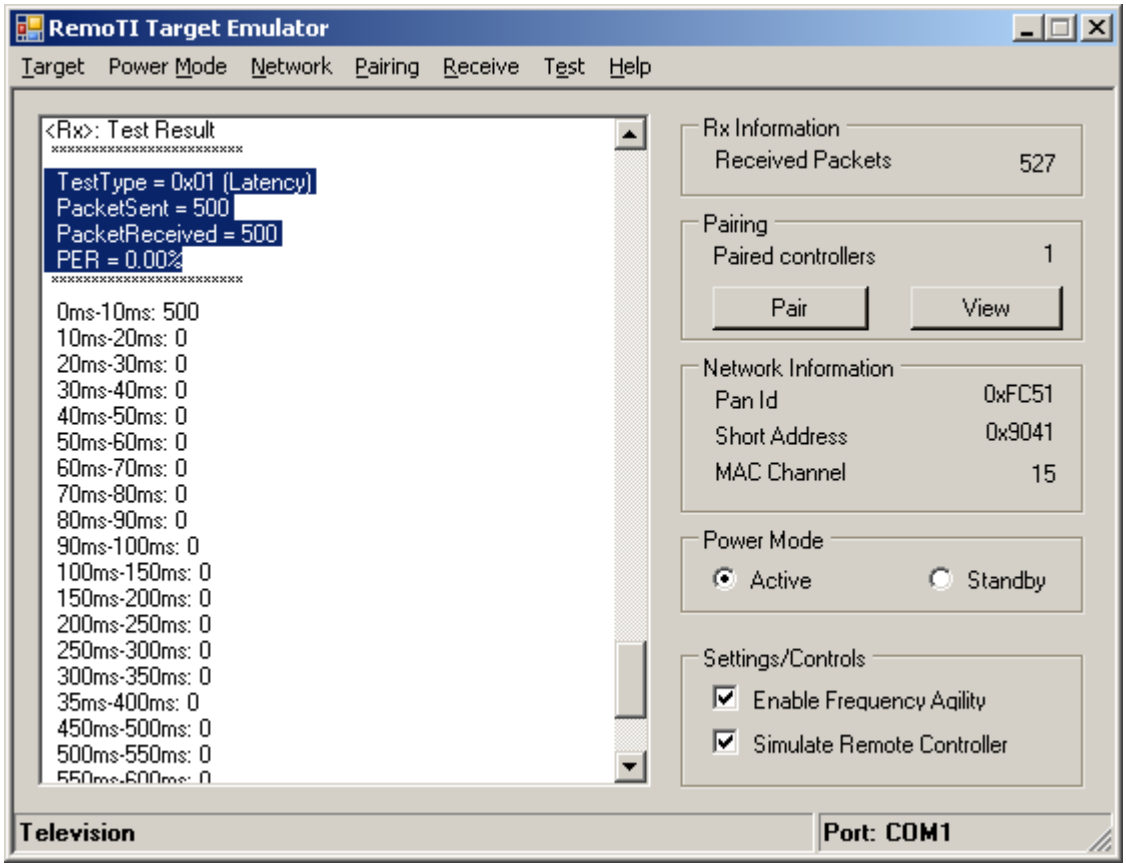


Figure 36 : Test Result

5 General Information

5.1 Document History

Table 1: Document History

Revision	Date	Description/Changes
1.0	2009-04-17	Initial release.
swru202a	2009-09-21	Updated to RTI 1.1 (Support USB HID) and fixed invalid references to an obsolete remote and an obsolete document each in section 4.5 and section 4.13.
swru202b	2010-04-06	Fixed typo in 4.2.1 stating CC2531 Product ID 5805 vice 5808 and minor grammatical touch-ups.

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	Domestic	www.tij.co.jp/pic

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	Indonesia	001-803-8861-1006
	Korea	080-551-2804
	Malaysia	1-800-80-3973
	New Zealand	0800-446-934
	Philippines	1-800-765-7404
	Singapore	800-886-1028
	Taiwan	0800-006800
	Thailand	001-800-886-0010
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