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Replaced by: None

AN214839

RSSI Measurement Setup Using BlueTool™ Software

Associated Part Family: CYW20733/CYW20734

This application note contains instructions for using Cypress BlueTool™ software to prepare two devices equipped with CYW20733/CYW20734 single-chip Bluetooth transceivers to get received signal strength indication (RSSI) measurements.This application note is for engineers responsible for conducting Bluetooth RSSI testing on devices equipped with the CYW20733/CYW20734.

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1 Introduction

BlueTool is a proprietary Cypress software tool for exercising, testing, scripting, debugging, and programming devices that use Cypress Bluetooth chips. BlueTool runs on a standard PC running the Microsoft® Windows® operating system. BlueTool interfaces with the Cypress Bluetooth chips at the HCI protocol layer. The HCI UART is supported.

1.1 Cypress Part Numbering Scheme

Cypress is converting the acquired IoT part numbers from Broadcom to the Cypress part numbering scheme. Due to this conversion, there is no change in form, fit, or function as a result of offering the device with Cypress part number marking. The table provides Cypress ordering part number that matches an existing IoT part number.

Table 1. Mapping Table for Part Number between Broadcom and Cypress

Broadcom Part Number	Cypress Part Number
BCM20733	CYW20733
BCM20734	CYW20734

1.2 Acronyms and Abbreviations

In most cases, acronyms and abbreviations are defined upon first use. For a more complete list of acronyms and other terms used in Cypress documents, go to: http://www.cypress.com/glossary.

2 IoT Resources

Cypress provides a wealth of data at http://www.cypress.com/internet-things-iot to help you to select the right IoT device for your design, and quickly and effectively integrate the device into your design. Cypress provides customer access to a wide range of information, including technical documentation, schematic diagrams, product bill of materials, PCB layout information, and software updates. Customers can acquire technical documentation and software from the Cypress Support Community website (http://community.cypress.com/).

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3 System Requirements

3.1 Host System Requirements

A personal computer running the Microsoft® Windows® operating system is required to use BlueTool. Cypress recommends running Windows XP; however, other versions of Windows are supported.

Note: BlueTool is constantly being revised, resulting in operational and other changes to the graphical user interface. Consequently, this document only contains basic instructions on using BlueTool. These instructions should remain the same for all BlueTool releases. If discrepancies exist between this document and the version of BlueTool you are using, contact your Cypress technical representative or visit Cypress's CSP (see also IoT Resources).

3.2 Hardware Requirements

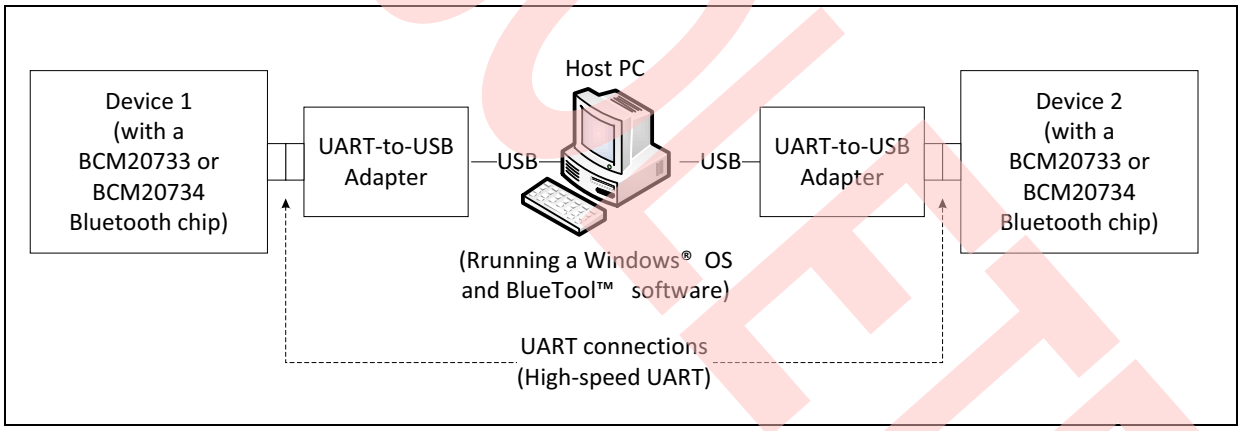
The following hardware is required to use BlueTool:

- Two USB cables.
- Two Bluetooth CYW20733/CYW20734-based devices.
- Two UART-to-USB adapter boards.

Note: Contact your Cypress sales representative for the UART-to-USB adapter boards.

4 System Connections

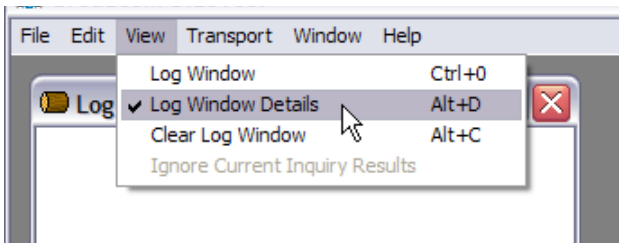
Figure 1. System Setup



5 Launching BlueTool

Complete these steps to launch BlueTool and display the log window:

1. Click **Start>All Programs>Broadcom BlueTool>BlueTool** to open the BlueTool application.
2. In BlueTool, click **View>Log Window** to display the log window.
3. Click **View>Log Window Details** to enable the log window to display detailed log information.



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6 Configuring BlueTool for RSSI Measurements

This section contains instructions on configuring BlueTool for over-the-air throughput testing.

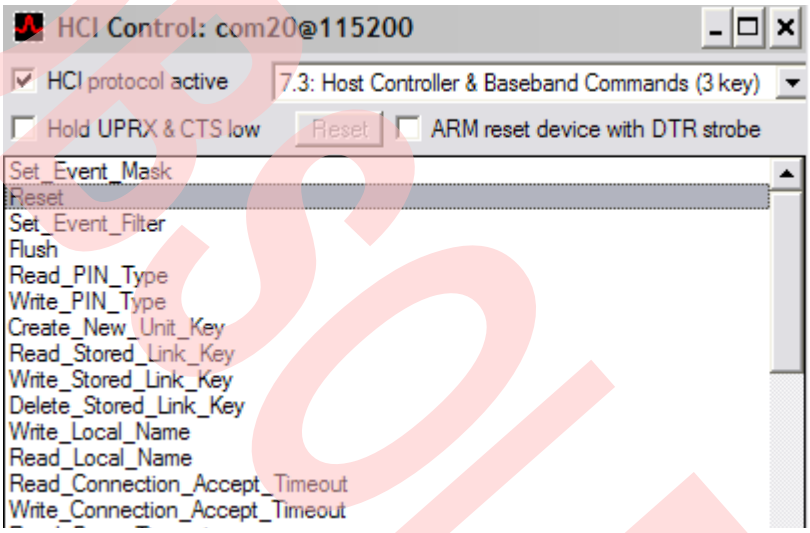
- Setting Up the HCI Control Transport
- Setting Up HCI Control

Note: As shown in Figure 1 , the host PC has two UART connections. The associated COM ports displayed in the screenshots of this section are com20 and com21. These COM ports can vary among different test setups.

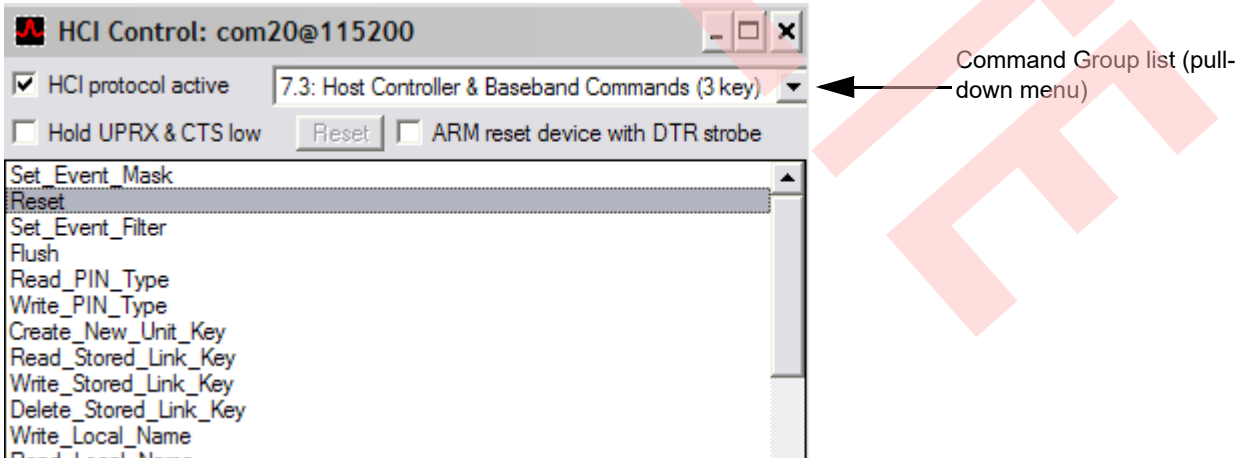
6.1 Setting Up the HCI Control Transport

6.1.1 Setting Up the HCI Control Transport for Device 1

1. Click **Transport>HCI Control** (keyboard shortcut **CTRL+1**) to display the Select HCI Control Window Transport window.



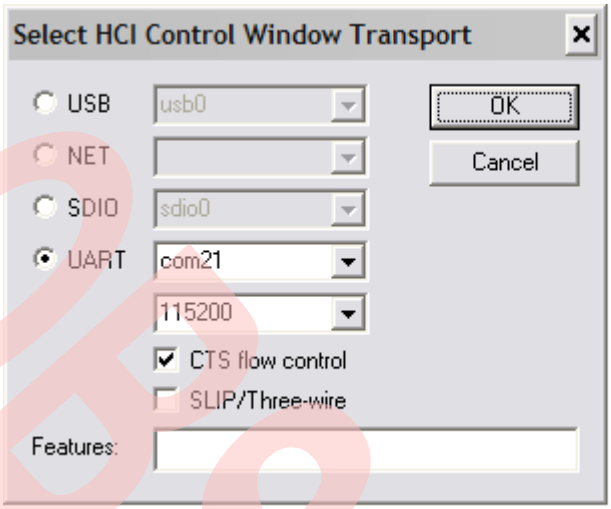
2. Select the **UART** option and select or type the Device 1 COM port, and then click **OK**.
   BlueTool displays an HCI Control window with the selected COM port and rate displayed in the window title. For the case of the following screenshot, the port and rate are shown as com20@115200.



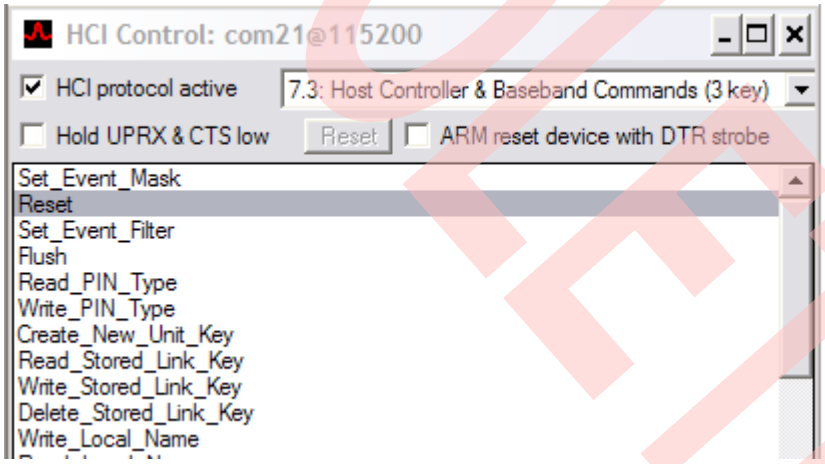
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6.1.2 Setting Up the HCI Control Transport for Device 2

1. Click **Transport>HCI Control** (keyboard shortcut **CTRL+1**) to display the Select HCI Control Window Transport window.



2. Select the **UART** option and select or type the Device 2 COM port, and then click **OK**.
   BlueTool displays an HCI Control window with the selected COM port and rate displayed in the window title. For the case of the following screenshot, the port and rate are shown as com21@115200.

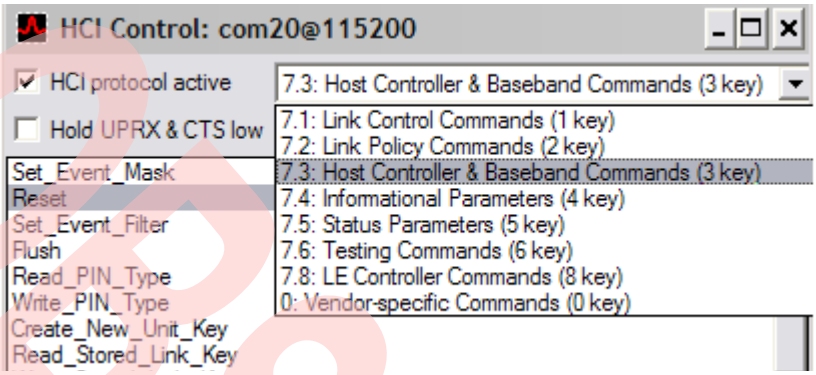


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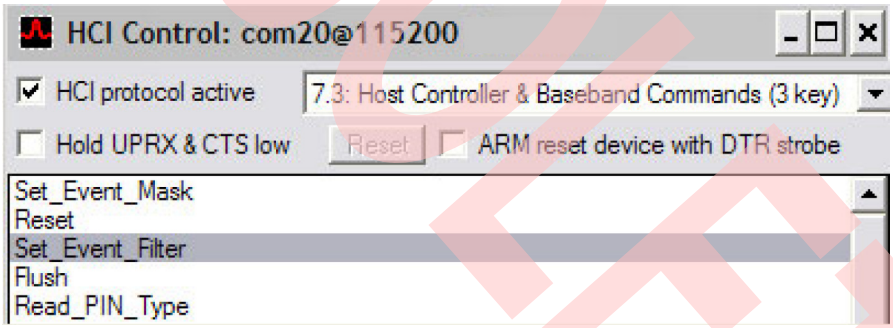
Setting Up HCI Control

6.1.3 Setting Up HCI Control for Device 1

1. In the HCI Control window, do the following to reset the device:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Reset** to reset the device (reset status will be available in the log window).

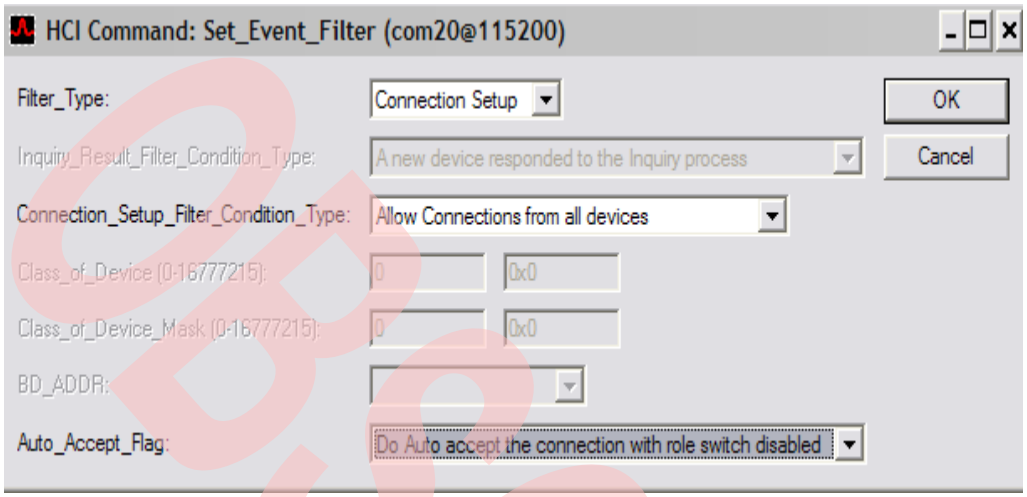


2. In the HCI Control window, do the following to evoke the HCI Command window for setting the event filter:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Set_Event_Filter**.

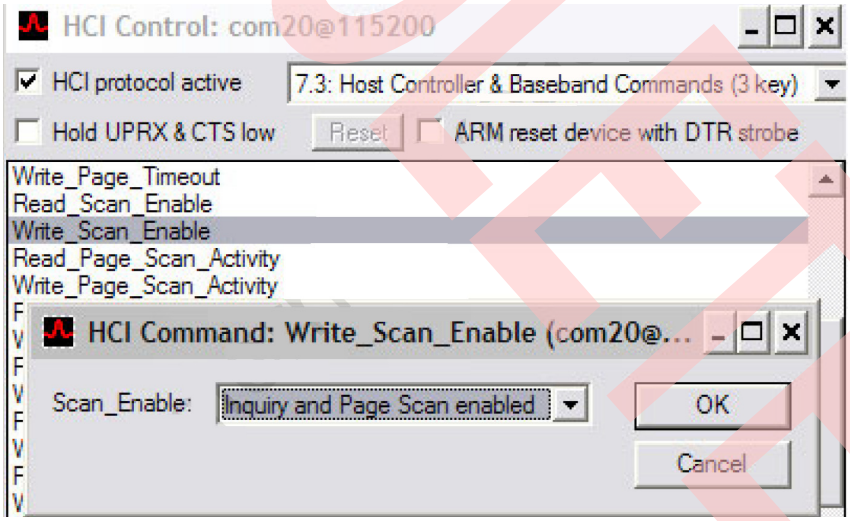


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3. In the HCI Command window, do the following to set the event filter:
   a. Set Filter_Type to **Connection Setup**.
   b. Set Connection_Setup_Filter_Condition_Type to **Allow connections from all devices**.
   c. Set Auto_Accept_Flag to **Do Auto accept the connection with role switch disabled**.
   d. Click **OK**.

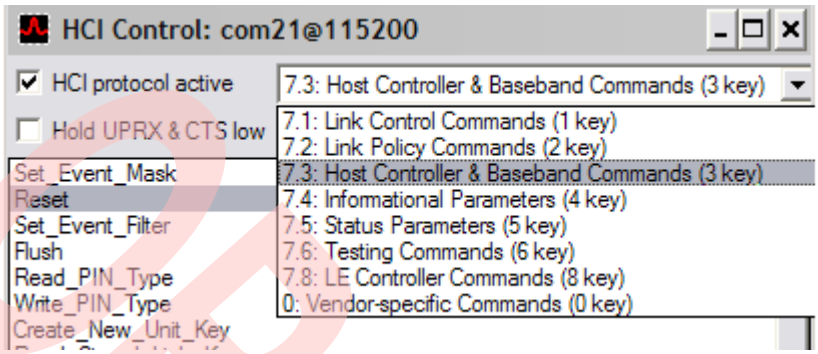


4. Do the following to enable inquiry and page scanning:
   a. In the HCI Control window, double-click **Write_Scan_Enable**
   b. In the HCI Command: Write_Scan_Enable window, select **Inquiry and Page Scan enabled** and click **OK**.

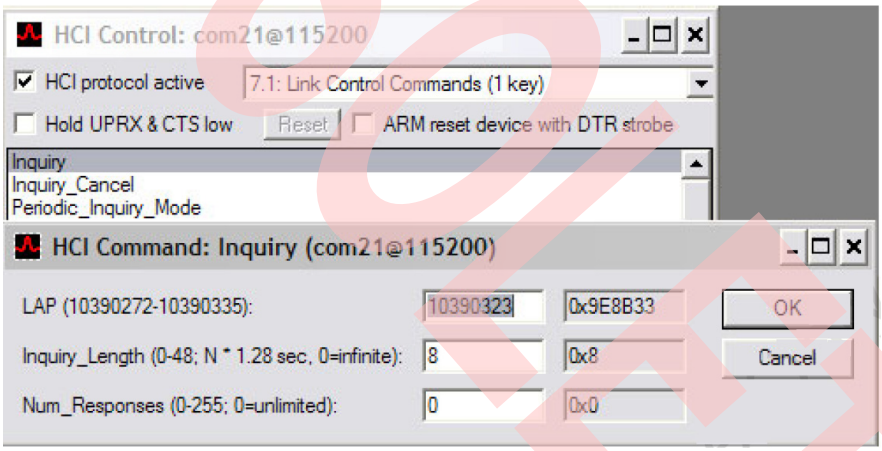


6.1.4 Setting Up HCI Control for Device 2

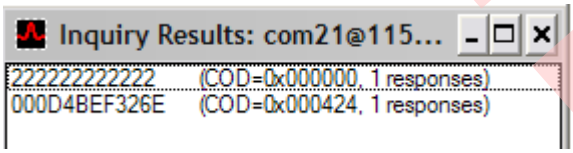
1. In the HCI Control window, do the following to reset the device:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Reset** to reset the device (check for Success status in the log window).



2. Do the following to enter the Inquiry scan state:
   a. In the HCI Control window, select **7.1: Link Control Commands (1 key)**, then double-click **Inquiry**.
   b. In the HCI Command: Inquiry window, click **OK**.

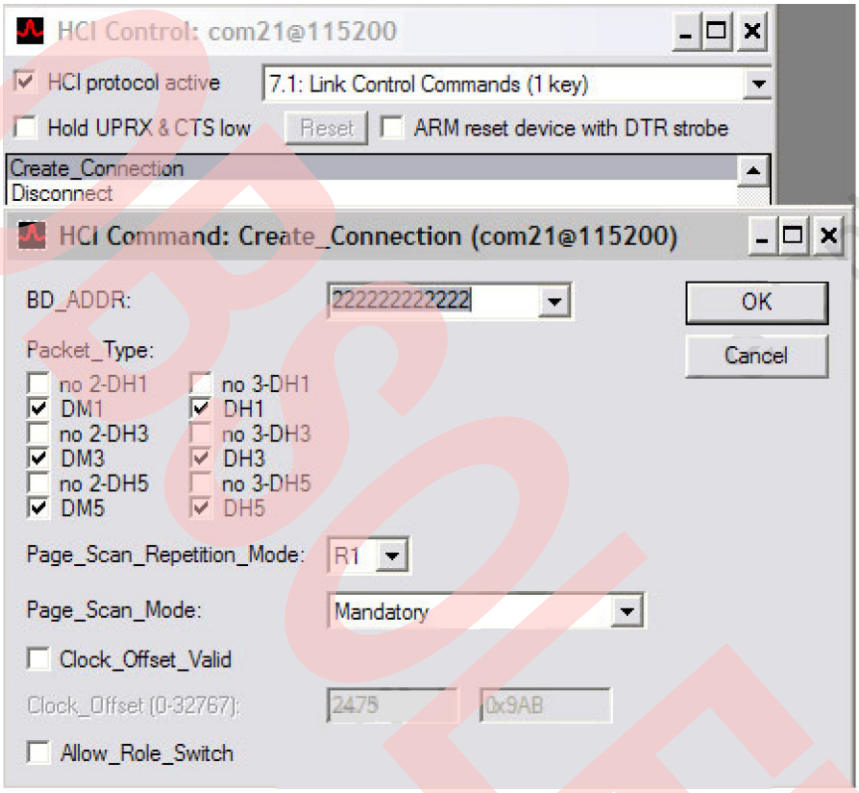


BlueTool displays the Inquiry Results window, which shows the Bluetooth device address (BD ADDR) of nearby Bluetooth devices.

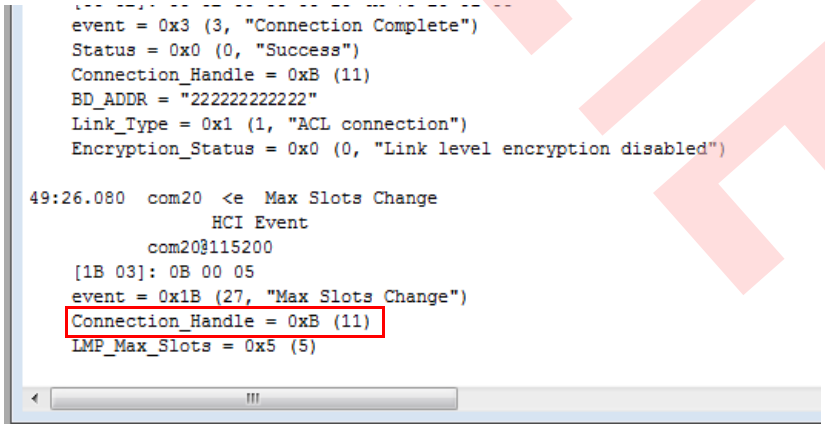


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3. Do the following to create a Bluetooth link between Device 1 and Device 2:
   a. In the HCI Control window, double-click **Create_Connection**.
   b. In the HCI Command: Create Connection window:
      - From the BD_ADDR list, select the Bluetooth device to which a connection is to be made.
      - Under Packet_Type select the packet types to be used.
      - Click **OK**.

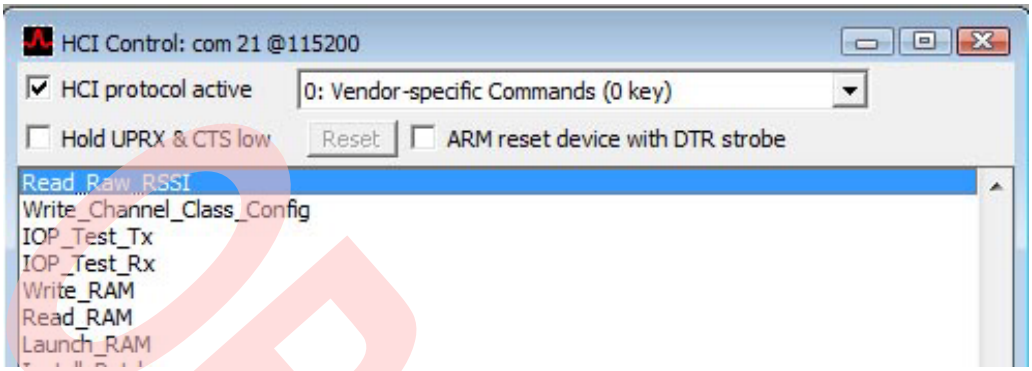


4. Check the log window to ensure a connection handle is present.

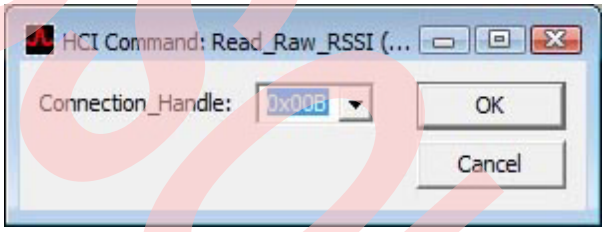


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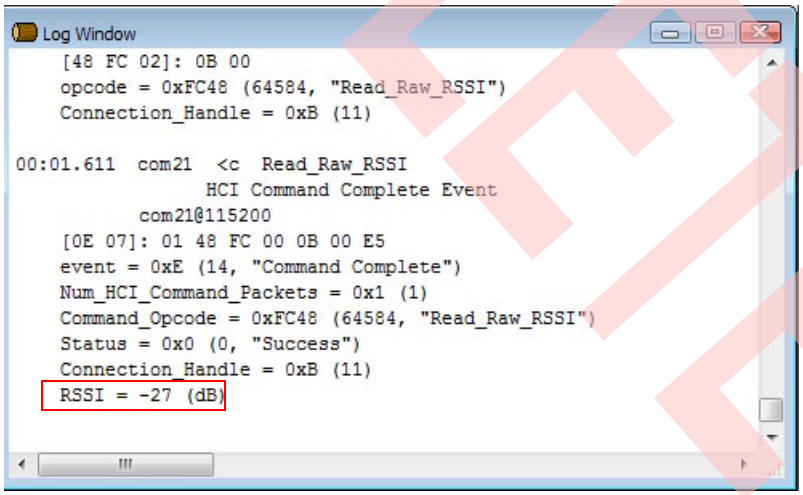
5. In the HCI Control window, do the following to measure received signal strength indication (RSSI) throughput:
   a. Select **0: Vendor-specific Commands (0 key)** from the Command Group list.
   b. Double-click **Read_Raw_RSSI**.



6. The HCI Command window will open displaying the connection handle. Click **OK**.



7. Check the Log Window and verify that RSSI has been measured.



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7 References

This section lists documents and resources that may be useful to understanding the information contained in this document. The information contained in the listed references is optional and is not required to successfully complete the tasks described in this application note. In some cases, links to key third-party web sites are provided.

Document Name	Document Number	Source
[1] Single-Chip Bluetooth Transceiver for Wireless Input Devices Data Sheet	20733-DS1xx-R	community.cypress.com
[2] Single-Chip Bluetooth Transceiver for Wireless Input Devices Data Sheet	20734-DS1xx-R	community.cypress.com
[3] Software for Exercising, Testing, Scripting, Debugging, and Programming Devices	BlueTool-QSG1xx-R	community.cypress.com
[4] BTSP User's Guide	–	Bundled with the BlueTool software package

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Document History Page

Document Title: AN214839 - RSSI Measurement Setup Using BlueTool™ Software Document Number: 002-14839				
Rev.	**ECN No.**	**Orig. of Change**	**Submission Date**	**Description of Change**
**	-	-	12/17/2014	20733_20734-AN100-R Initial Release
*A	5460152	UTSV	10/03/2016	Added Cypress Part Numbering Scheme. Updated to Cypress template
*B	5836604	AESATMP9	07/28/2017	Updated logo and copyright.
*C	6352268	SELE	10/16/2018	Obsoleted

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