THIS SPEC IS OBSOLETE

Spec No: 002-14840

Spec Title: AN214840 - CYW20733: OVER-THE-AIR THROUGHPUT TEST SETUP USING CYPRESS BLUETOOL(TM) SOFTWARE

Replaced by: None

AN214840

CYW20733: Over-The-Air Throughput Test Setup Using Cypress BlueTool™ Software

Associated Part Family: CYW20733

This application note contains instructions for using Cypress BlueTool™ software to prepare two CYW20733-equipped devices for Bluetooth throughput testing.

OBSOLETE

Contents

1 Introduction 1
2 Cypress Part Numbering Scheme 1
3 IoT Resources 1
4 System Requirements 2
4.1 Host System Requirements 2
4.2 Hardware Requirements 2
4.3 Software Requirements 2
5 System Connections 2
6 Launching BlueTool 2
7 Configuring BlueTool for Throughput Testing 3
7.1 Setting Up the HCI Control Transport 3
7.2 Setting Up HCI Control 5
8 Setting Up HCI Control for Device 2 7
8.1 Setting Up for Throughput Testing 9
9 BlueTool Support for Perl Scripts 11
9.1 References 12
Document History Page 13

1 Introduction

This application note contains instructions for using Cypress BlueTool™ software to prepare two CYW20733-equipped devices for Bluetooth throughput testing.

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.

2 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

3 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/).

4 System Requirements

4.1 Host System Requirements

A personal computer running the Microsoft® Windows® operating system is required to use BlueTool. Cypressrecommends 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.

4.2 Hardware Requirements

The following hardware is required to use BlueTool:

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

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

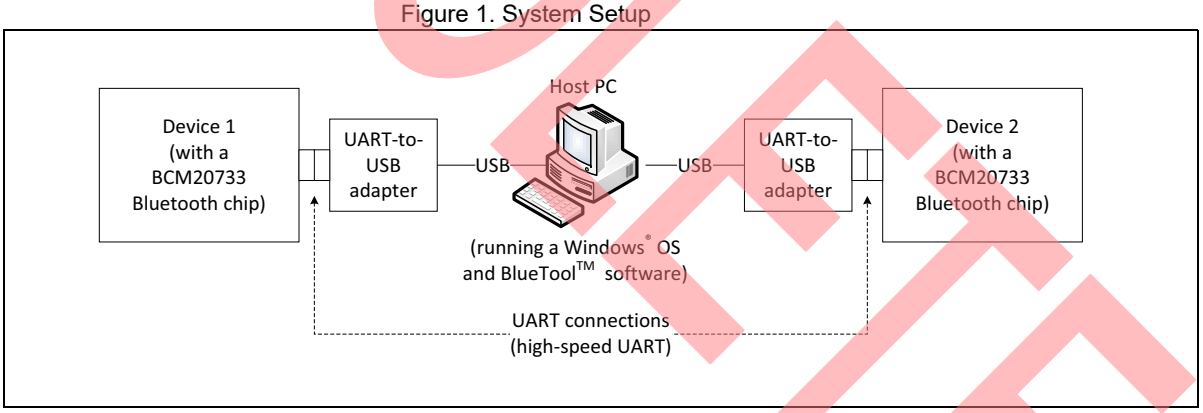
4.3 Software Requirements

BlueTool provides support for Perl® scripting. If this feature is being used to automate throughput testing (see BlueTool Support for Perl Scripts on page 11), a Win32® version of ActivePerl (5.8.4 or higher) must be installed on the host computer. Earlier versions of ActivePerl are not supported.

Note: ActivePerl is available from ActiveState at www.activestate.com.

5 System Connections

Figure 1. System Setup



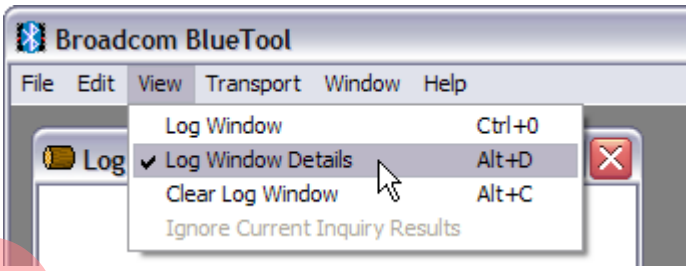
6 Launching BlueTool

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

1. Click **Start>All Programs>Cypress BlueTool>BlueTool** to open the BlueTool application.
2. In BlueTool, click **View>Log Window** to display the log window.

OBSOLETE

3. Click **View>Log Window Details** to enable the log window to display detailed log information.



7 Configuring BlueTool for Throughput Testing

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

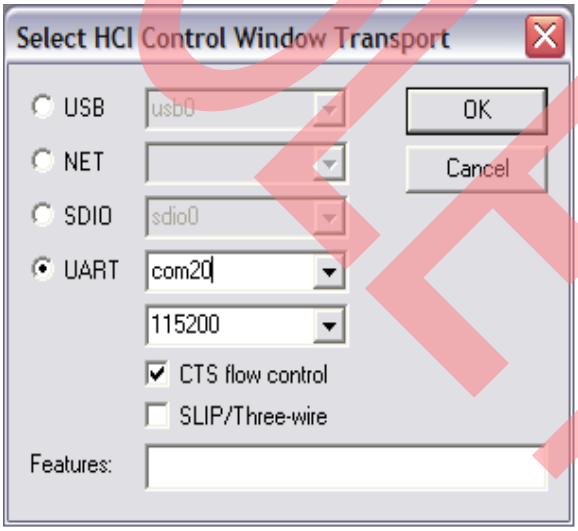
- Setting Up the HCI Control Transport on page 3
- Setting Up HCI Control on page 5
- Setting Up for Throughput Testing on page 9

Note: As shown in Figure 1 on page 2, 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.

7.1 Setting Up the HCI Control Transport

7.1.1 Setting Up the HCI Control Transport for Device 1

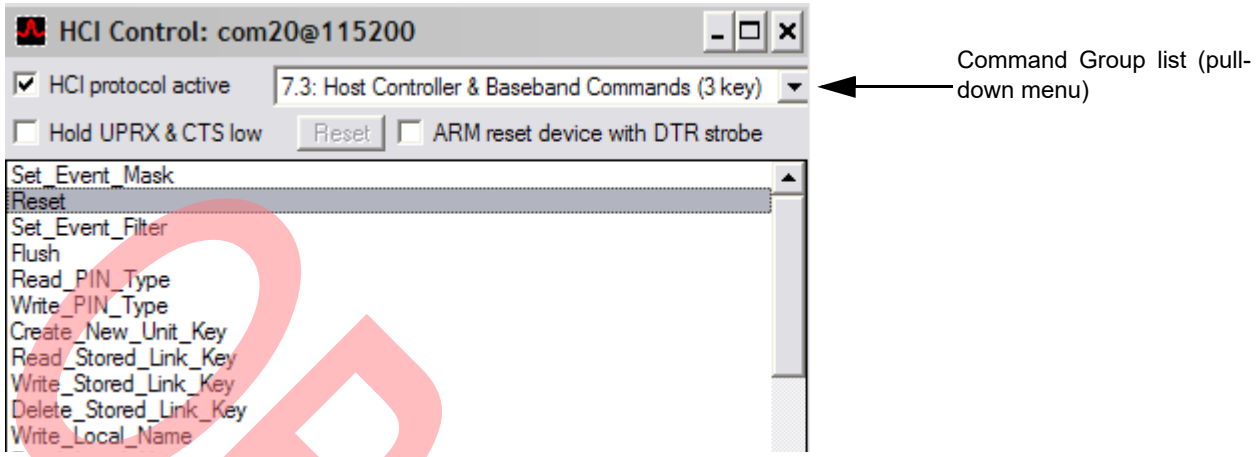
1. Click **Transport>HCI Control** (keyboard shortcut **CTRL+1**) to display the Select HCI Control Window Transport window.



2. Select the **UART** option and select or type the Device 1 COM port, and then click **OK**.

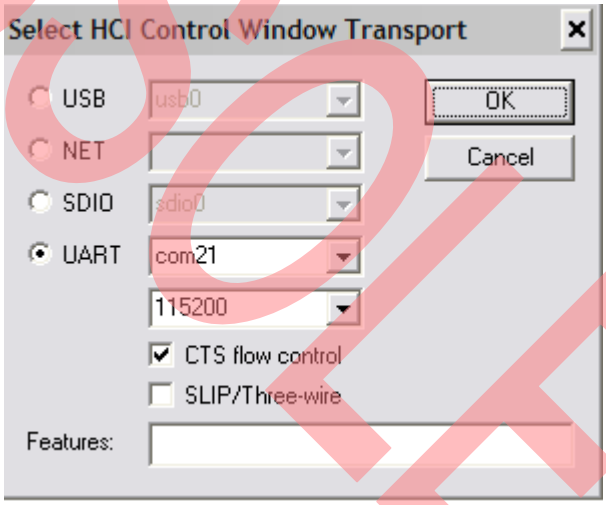
OBSOLETE

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.



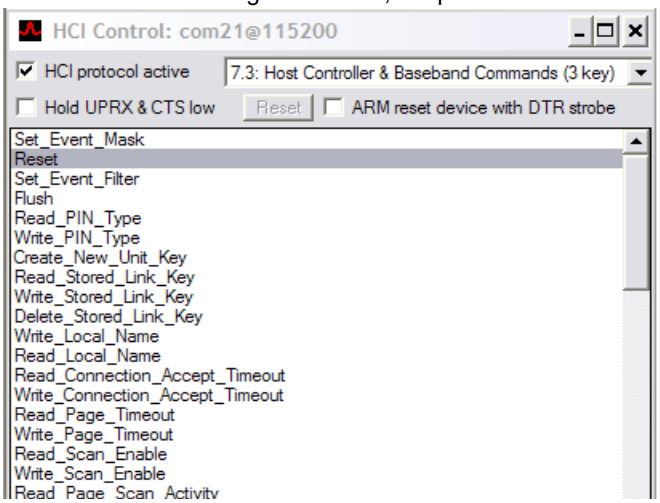
7.1.2 Setting Up the HCI Control Transport for Device 2

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.

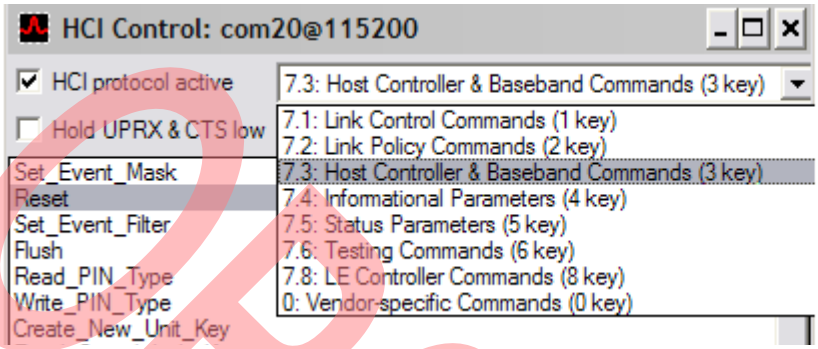


OBSOLETE

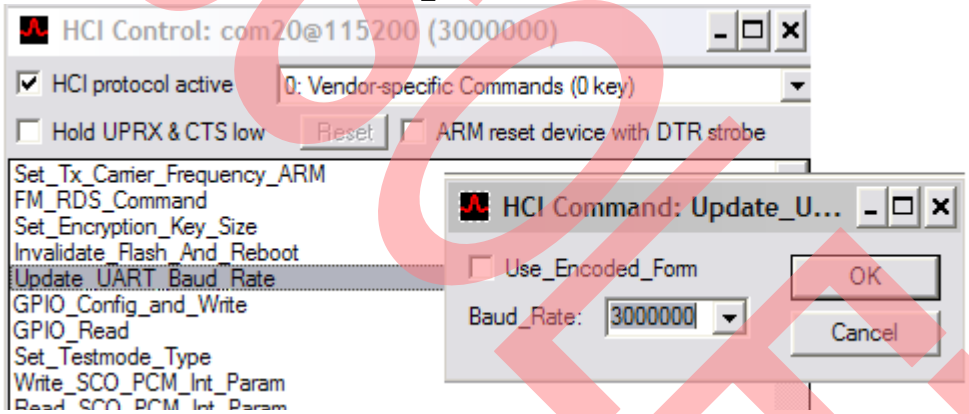
7.2 Setting Up HCI Control

7.2.1 Setting Up HCI Control for Device 1

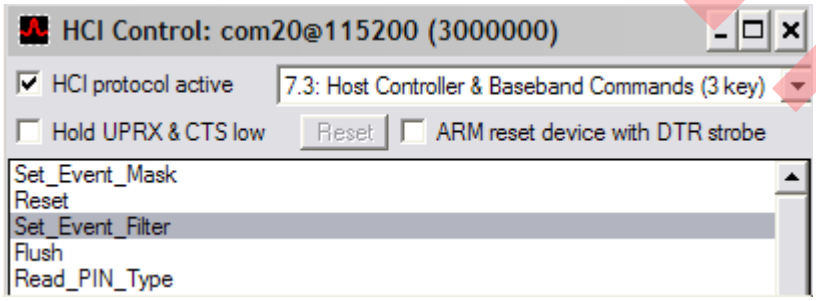
1. In the HCI Control window, do the following to reset the device:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Reset** to reset the device (reset status will be available in the log window)



2. In the HCI Control window, do the following to update the UART baud rate:
   a. Select **0: Vendor-specific Commands (0 key)** from the Command Group list.
   b. Double-click **Update_UART_Baud_Rate**.
   c. Select **3000000** from the Baud_Rate list and click **OK**.

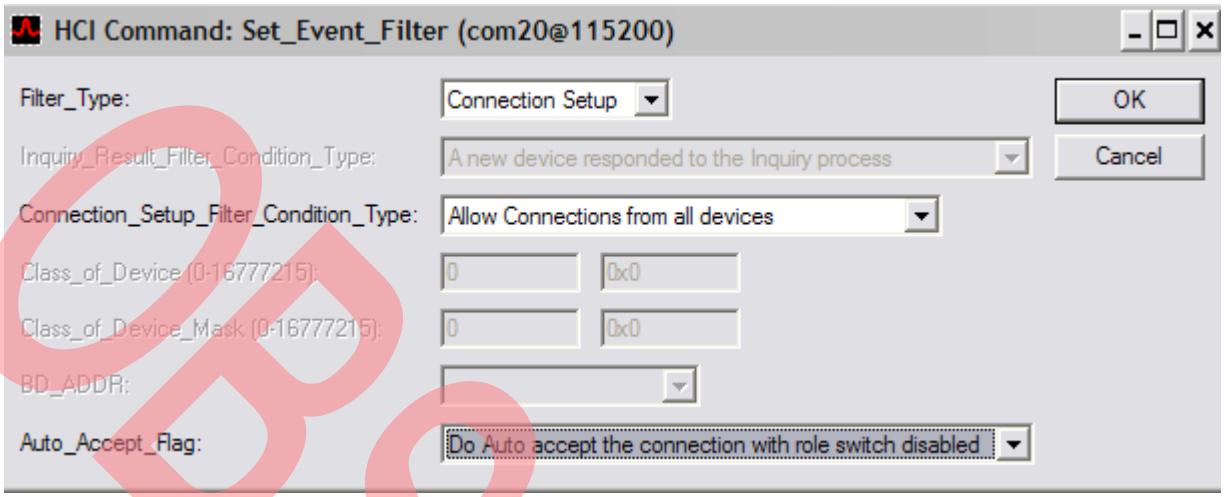


3. In the HCI Control window, do the following to evoke the HCI Command window for setting the event filter:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Set_Event_Filter**.

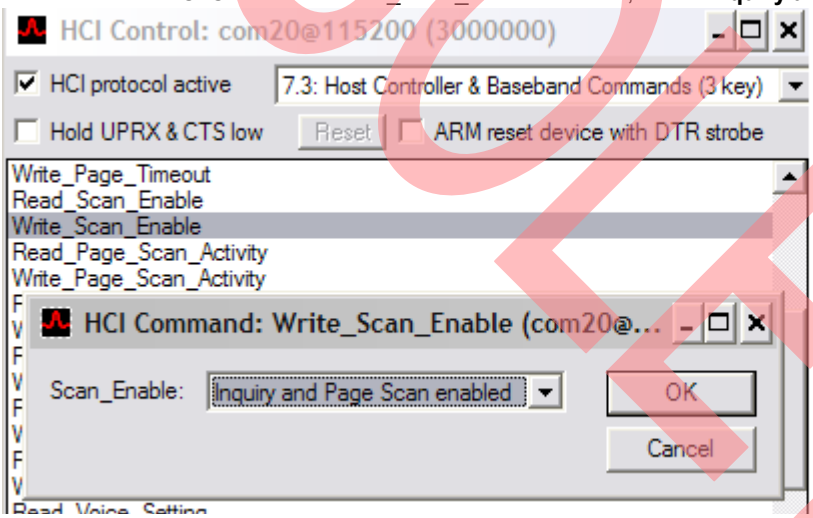


OBSOLETE

4. 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**.



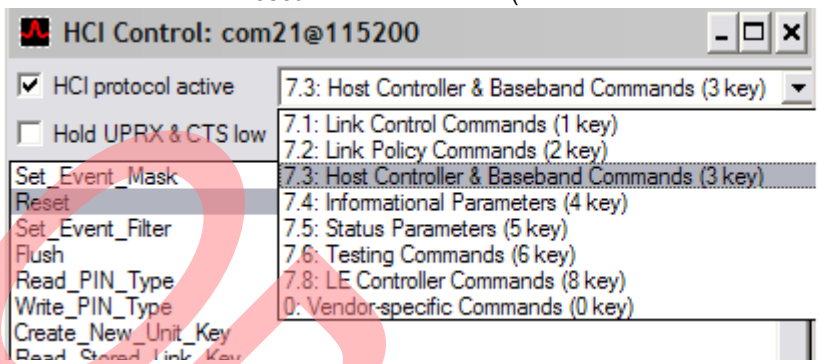
5. Do the following to enable inquiry and page scanning:
   a. In the HCI Control window, double-click **Write_Scan_Enable**
   b. In the HCI Command: Write_Scan_Enable window, select **Inquiry and Page Scan enabled** and click **OK**.



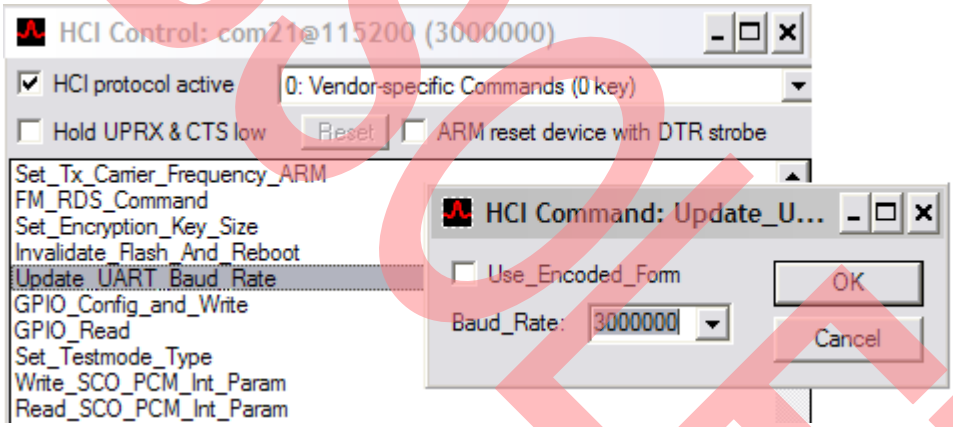
OBSOLETE

8 Setting Up HCI Control for Device 2

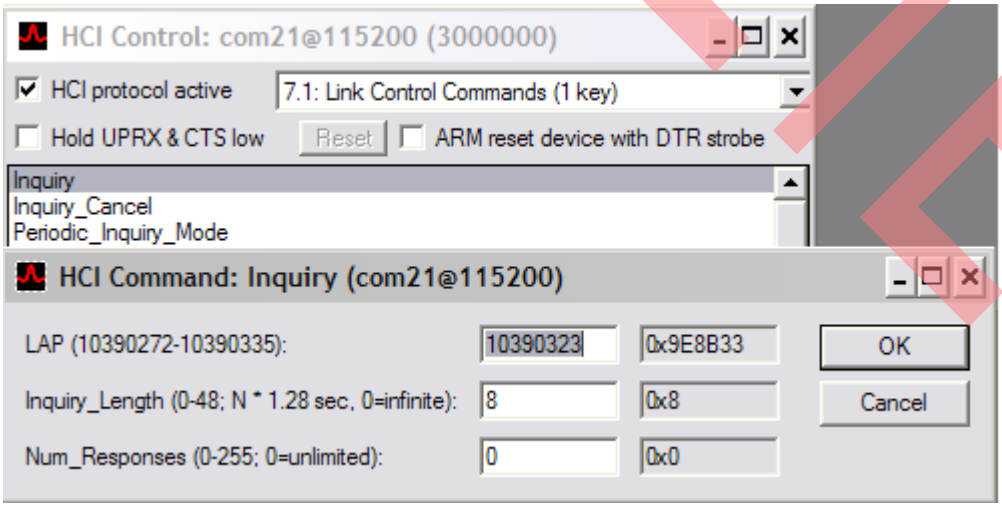
1. In the HCI Control window, do the following to reset the device:
   a. Select **7.3: Host Controller & Baseband Commands (3 key)** from the Command Group list.
   b. Double-click **Reset** to reset the device (check for Success status in the log window)



2. In the HCI Control window, do the following to update the UART baud rate:
   a. Select **0: Vendor-specific Commands (0 key)** from the Command Group list.
   b. Double-click **Update_UART_Baud_Rate**.
   c. Select **3000000** from the Baud_Rate list and click **OK**.

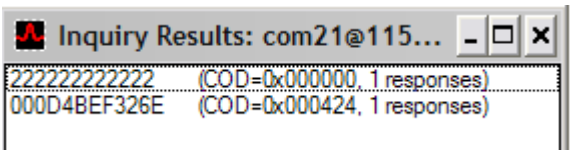


3. Do the following to enter the Inquiry scan state:
   a. In the HCI Control window, select **7.1: Link Control Commands (1 key)**, then double-click **Inquiry**.
   b. In the HCI Command: Inquiry window, click **OK**.

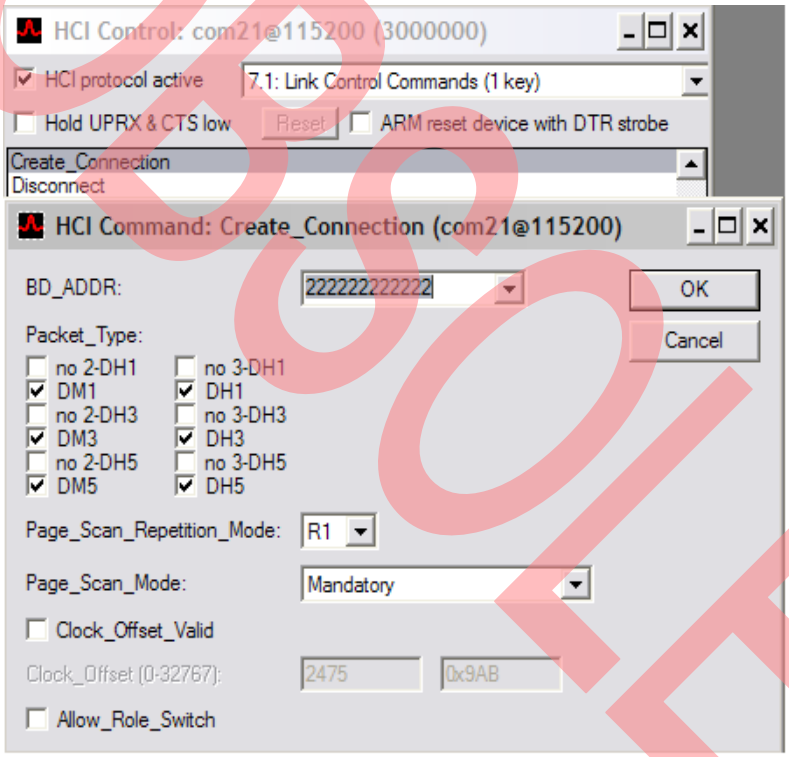


OBSOLETE

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



4. 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**.

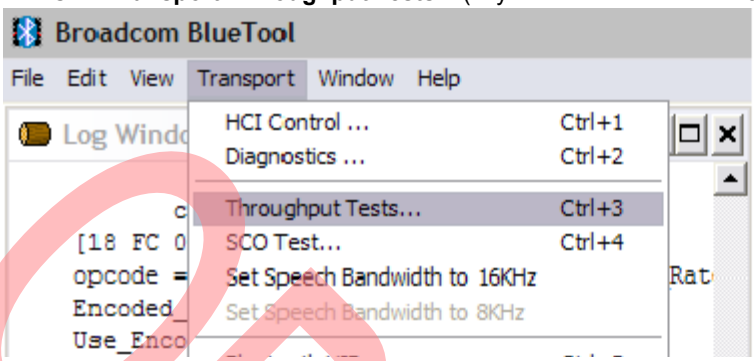


OBSOLETE

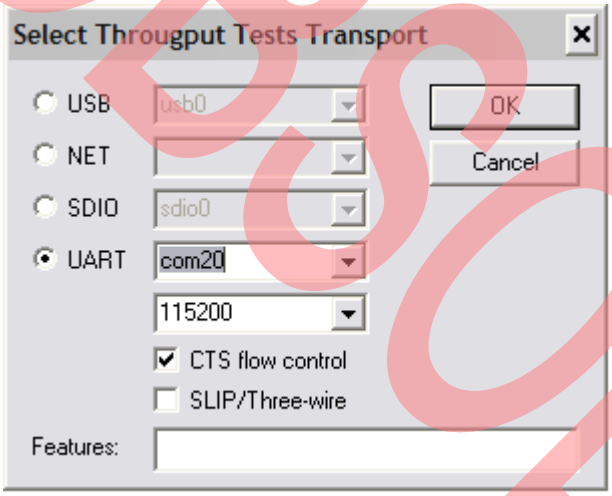
8.1 Setting Up for Throughput Testing

8.1.1 Setting Up Device 1 for Throughput Testing

1. Click **Transport>Throughput Tests...** (keyboard shortcut **CTRL+3**).



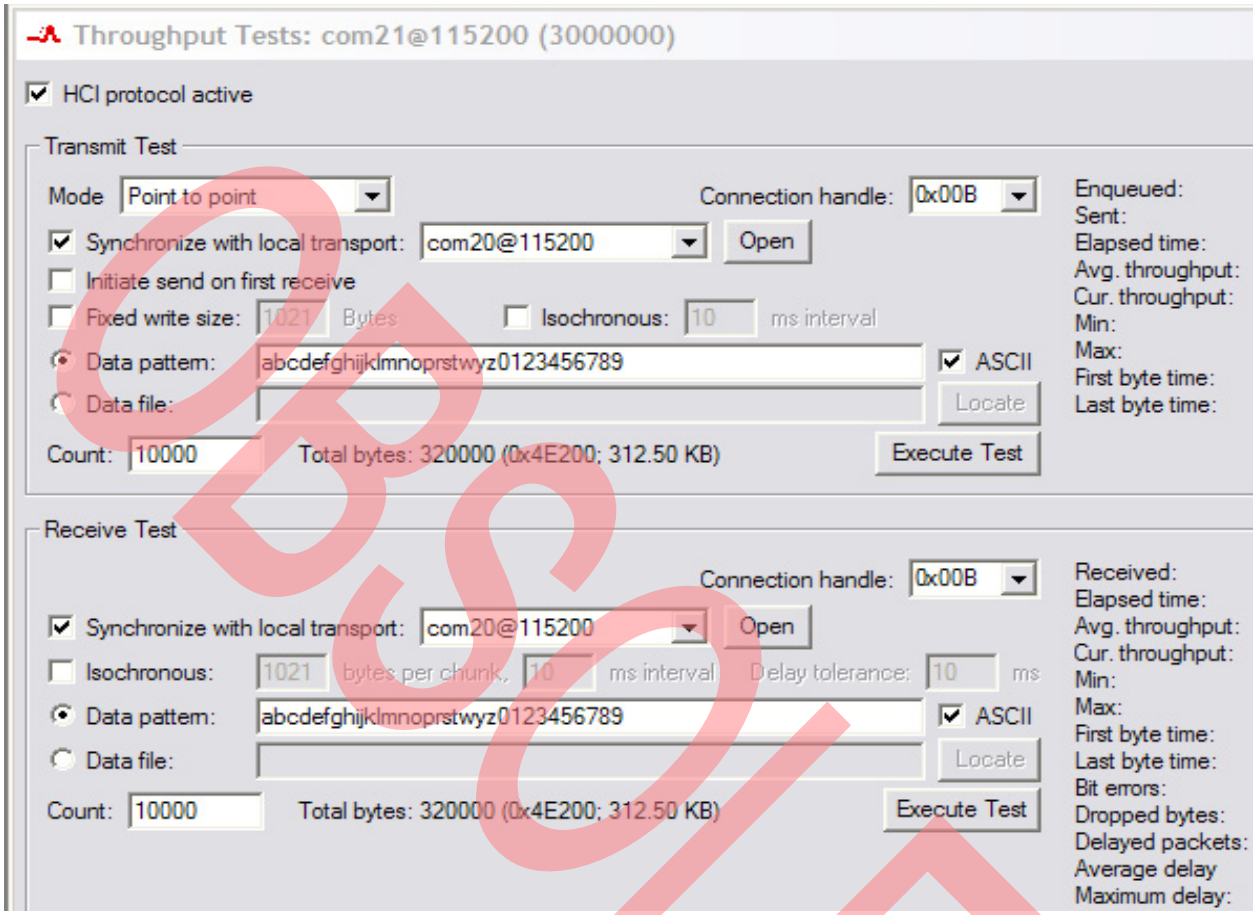
2. In the Select Throughput Tests Transport window, choose **UART**, select or type the Device 1 COM port, and then click **OK**.



3. In the Throughput Tests window, do the following in both the Transmit Test and Receive Test panes:
   a. Verify that a value is generated for the connection handle.
   b. Select the **Data pattern** option.
   c. If not already selected, select **ASCII**, and then enter the desired data pattern (a typical ASCII data pattern is a string of alphanumeric characters).
   d. In the Count field, enter the number of bytes to be sent, being sure not to exceed the total byte limitations of the host PC.

OBSOLETE

e. Select **Synchronize with local transport**, and then select the communications port for Device 2 from the list (in the example screenshot, the communications port for Device 2 is com21@115200).



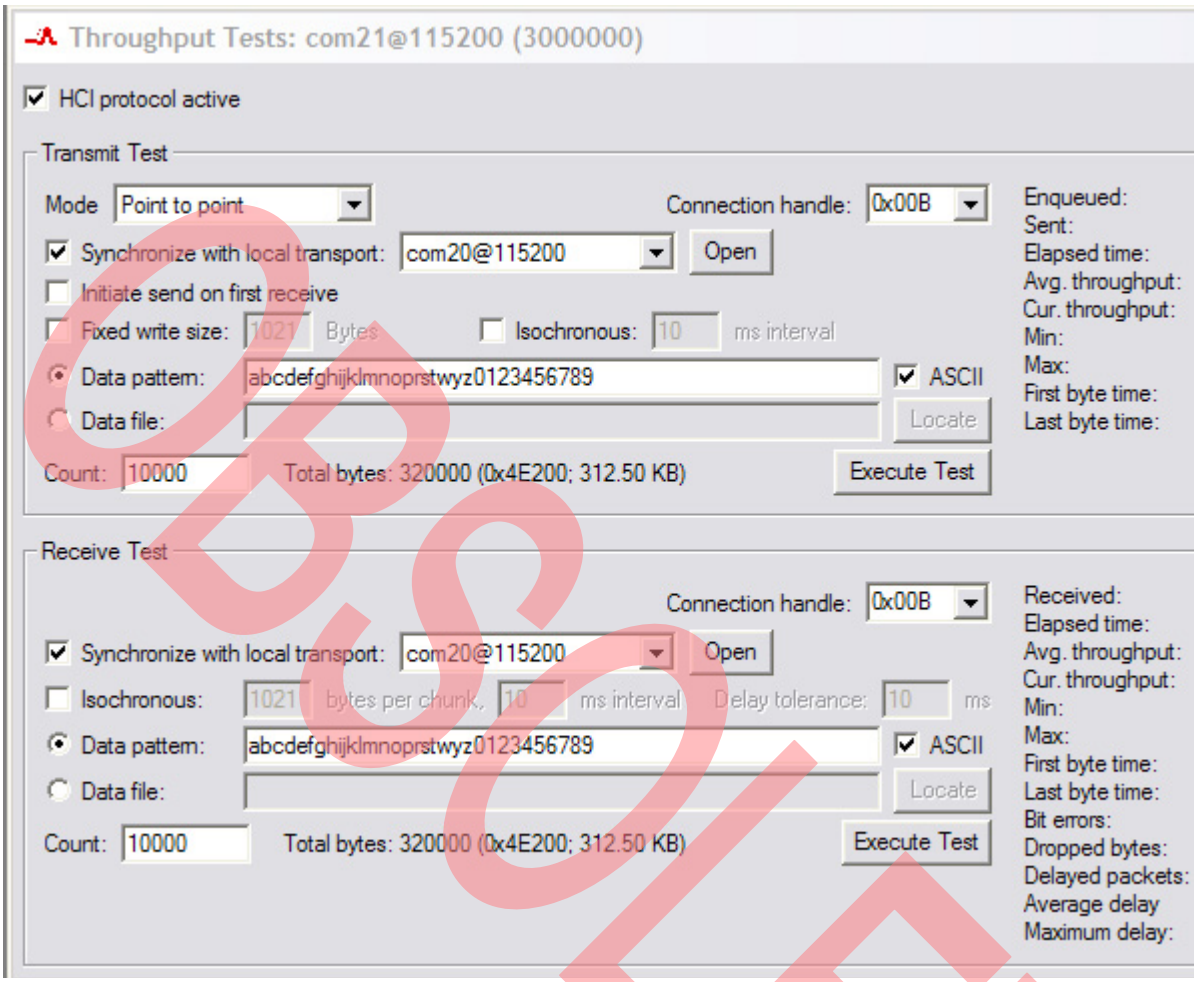
Note: Clicking the **Execute Test** button in the Transmit Test pane automatically selects the Receive Test settings for the Device 2 communications port (that is, com21@115200 in the above screenshot).

8.1.2 Setting Up Device 2 for Throughput Testing

1. Click **Transport>Throughput Tests...** (keyboard shortcut **CTRL+3**).
2. In the Select Throughput Tests Transport window, choose **UART**, select or type the Device 2 COM port, and then click **OK**.
3. In the Throughput Tests window, do the following in both the Transmit Test and Receive Test panes:
   a. Verify that a value is generated for the connection handle.
   b. Select the **Data pattern** option.
   c. If not already selected, select **ASCII**, and then enter the desired data pattern (a typical ASCII data pattern is a string of alphanumeric characters).
   d. In the Count field, enter the number of bytes to be sent, being sure not to exceed the total byte limitations of the host PC.

OBSOLETE

e. Select **Synchronize with local transport**, and then select the communications port for Device 1 from the list (in the example screenshot, the communications port for Device 1 is com20@115200).



Note: Clicking the **Execute Test** button in the Transmit Test pane automatically selects the Receive Test settings for the Device 1 communications port (that is, com20@115200 in the above screenshot).

9 BlueTool Support for Perl Scripts

The BlueTool application Bluetooth support (BTSP) Perl module provides an interface for automating BlueTool operations using Perl scripts. To use BlueTool scripting capabilities, ActivePerl 5.8.4 (or higher) must be installed on the host PC prior to installing BlueTool.

Sample scripts are included with BlueTool installation software. These files are saved to the following folder during BlueTool installation:(\\Broadcom BlueTool\Scripts).

During installation, the *BTSP User Guide* is saved to the Broadcom\BlueTool folder. This user guide describes the fundamentals of automating BlueTool with Perl. A PDF file reader is required to view this guide.

Note: ActivePerl software is available from ActiveState at www.activestate.com.

Note: References to general information on using Perl are provided in References on page 12.

OBSOLETE

9.1 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.

Note: The “xx” suffix applied to Cypress document numbers represents the revision. When downloading Cypress documents, select the document number with the highest revision number to ensure that you have the most current version of the document.

Document Name	Document Number	Source
[1] Cypress Documents		
[2] BTSP User’s Guide	–	Bundled with the BlueTool software package
[3] Software for Exercising, Testing, Scripting, Debugging, and Programming Devices	BlueTool-QSG1x*x*-R	Cypress CSP
[4] Other Documents		
[5] ActivePerl Documentation	–	ActiveState Docs @ http://docs.activestate.com
[6] General information on Perl	–	http://www.perl.org http://www.activestate.com http://perl.oreilly.com

OBSOLETE

Document History Page

Document Title: AN214840 - CYW20733: Over-The-Air Throughput Test Setup Using Cypress BlueTool™ Software Document Number: 002-14840				
Rev.	**ECN No.**	**Orig. of Change**	**Submission Date**	**Description of Change**
**	–	–	01/18/2012	20733-AN100-R: Initial release.
*A	5460081	UTSV	10/21/2016	Updated to Cypress template.
*B	5879830	AESATMP8	09/11/2017	Updated logo and Copyright.
*C	6438969	SELE	01/11/2019	Obsolete document. Completing Sunset Review.

OBSOLETE

Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at Cypress Locations.

Products

ARM® Cortex® Microcontrollers	cypress.com/arm
Automotive	cypress.com/automotive
Clocks & Buffers	cypress.com/clocks
Interface	cypress.com/interface
Internet of Things	cypress.com/iot
Memory	cypress.com/memory
Microcontrollers	cypress.com/mcu
PSoC	cypress.com/psoc
Power Management ICs	cypress.com/pmic
Touch Sensing	cypress.com/touch
USB Controllers	cypress.com/usb
Wireless Connectivity	cypress.com/wireless

PSoC® Solutions

PSoC 1 | PSoC 3 | PSoC 4 | PSoC 5LP | PSoC 6

Cypress Developer Community

Forums | WICED IOT Forums | Projects | Video | Blogs | Training | Components

Technical Support

cypress.com/support

OBSOLETE

All other trademarks or registered trademarks referenced herein are the property of their respective owners.

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

© Cypress Semiconductor Corporation, 2012–2019. This document is the property of Cypress Semiconductor Corporation and its subsidiaries, including Spansion LLC ("Cypress"). This document, including any software or firmware included or referenced in this document ("Software"), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, then Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1s) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress's patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Cypress products are not designed, intended, or authorized for use as critical components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or system could cause personal injury, death, or property damage ("Unintended Uses"). A critical component is any component of a device or system whose failure to perform can be reasonably expected to cause the failure of the device or system, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from or related to all Unintended Uses of Cypress products. You shall indemnify and hold Cypress harmless from and against all claims, costs, damages, and other liabilities, including claims for personal injury or death, arising from or related to any Unintended Uses of Cypress products.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, WICED, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit cypress.com. Other names and brands may be claimed as property of their respective owners.