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CY5672

PRoC™ BLE Remote Control
Reference Design Kit Guide

Doc. No. 001-97071 Rev. **

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Safety Information



The CY5672 PRoC™ BLE Remote Control Reference Design Kit (RDK) is intended for use as a development, demonstration, and evaluation platform for hardware or software in a laboratory environment. The kit is not intended for general consumer use. It generates, uses, and can radiate radio frequency energy. It has not been tested for compliance with the limits applicable under any standard. Operation of the equipment may cause interference with radio communications, in which case users, at their expense, will be required to take whatever measures may be required to correct this interference. Cypress recommends that the kit be used only in a shielded room.

	<p>The CY5672 PRoC BLE Remote Control RDK boards contain electrostatic discharge (ESD)-sensitive devices. Electrostatic charges readily accumulate on the human body and any equipment, which can cause a discharge without detection. Permanent damage may occur to devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused CY5672 PRoC BLE Remote Control RDK boards in the protective shipping package.</p>
	<p>End-of-Life/Product Recycling</p> <p>The end-of-life cycle for this kit is five years from the date of manufacture mentioned on the back of the box. Contact the nearest recycler to discard the kit.</p>

General Safety Instructions

ESD Protection

ESD can damage boards and associated components. Cypress recommends that the user perform procedures only at an ESD workstation. If an ESD workstation is not available, use appropriate ESD protection by wearing an antistatic wrist strap attached to the chassis ground (any unpainted metal surface) on the board when handling parts.

Handling Boards

The boards provided with CY5672 are sensitive to ESD. This also applies to the boards that are provided with a plastic casing when they are removed from the casing. Hold the boards only by the edges. After removing a board from the box/casing, place it on a grounded, static-free surface. Use a conductive foam pad, if available. Do not slide the board over any surface.

Battery Care and Use

- Use the correct size and type of battery specified in this guide.
- Keep battery contact surfaces and battery compartment contacts clean by rubbing them with a clean pencil eraser or a rough cloth each time you replace the batteries.
- Remove the battery from a device when it is not expected to be used for several months.
- Make sure that you insert the battery into your device properly, with the + (plus) and – (minus) terminals aligned correctly.
- Do not place the battery next to metallic objects such as keys and coins.
- Never throw the battery into a fire.
- Do not open up the battery.
- Do not short the battery.
- Do not subject the battery to high temperatures or high humidity.
- Store the battery in a dry place.
- Do not recharge a battery unless it is marked "rechargeable."

Battery Disposal

Batteries can be safely disposed of with normal household waste. Never dispose of batteries in a fire because they can explode.

It is important not to dispose of large amounts of batteries in a group. Used batteries are often not completely "dead." Grouping used batteries together can bring the "live" batteries into contact with one another, creating safety risks.

Regulatory Compliance Information

This kit contains devices that transmit and receive radio signals in accordance with the spectrum regulations for the 2.4-GHz unlicensed frequency range. This kit has passed precompliance tests for the following regulatory standards:

- CE
- FCC Part 15
- Canadian RSS-210
- EU EN 300 328

Contact Cypress technical support at bleapps@cypress.com for further details.

1. Introduction



Thank you for your interest in the CY5672 P_{RoC}[™] BLE Remote Control Reference Design Kit (RDK). This kit provides an implementation of a Bluetooth LE (BLE), or Bluetooth Smart, remote control using the P_{RoC} BLE single-chip solution. P_{RoC} BLE is a true single-chip solution that integrates Cypress's industry-leading capacitive touch sensing, an energy-efficient ARM[®] Cortex[™]-M0 CPU core, Bluetooth 4.1-compliant Bluetooth Smart connectivity, and a balun to minimize external components for a wide variety of applications.

The kit includes a CySmart[™] USB dongle, which can be used to connect the remote control to devices like PCs, laptops, tablets, and smartphones. The dongle acts as a serial-USB bridge and can either pass data directly to the PC's HID drivers or it can interface with the CySmart tool for more detailed application analysis and debugging. The remote control and the dongle can be programmed, enabling users to customize and evaluate firmware per their requirements. Schematics, layout files, ready-to-use firmware, and source code are provided with the kit to enable PC peripheral designers to build their own remote control designs.

1.1 Kit Contents

The CY5672 P_{RoC} BLE Remote Control RDK includes the following items, as shown in [Figure 1-1](#).

1. P_{RoC} BLE remote control
2. CySmart USB dongle
3. MiniProg3 programmer/debugger
4. 10-pin ribbon cable
5. Two M2 X 5mm screws
6. Two AAA batteries
7. Phillips head screwdriver
8. USB 2.0 standard A to mini-B cable

The kit also includes a quick start guide to enable users to connect the P_{RoC} BLE remote control to a PC using the CySmart USB dongle.

Figure 1-1. Kit Contents



Note: The color of the remote control received as part of the kit may differ from the color shown in Figure 1-1.

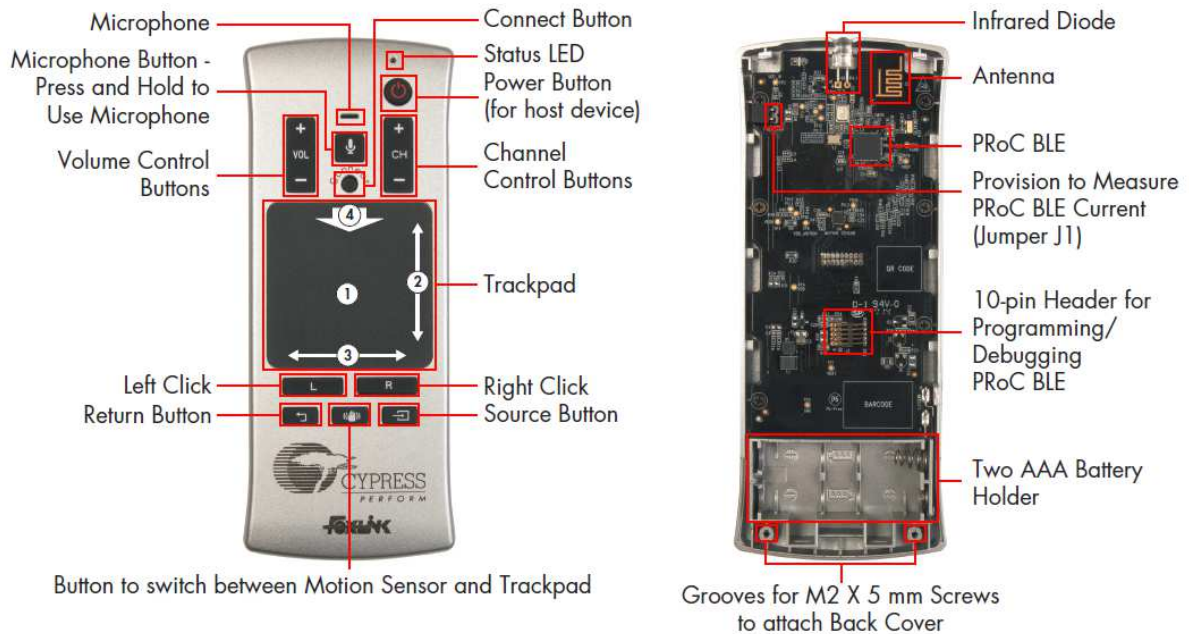
If any part of the kit is missing, contact your nearest Cypress sales office for help: www.cypress.com/go/support.

1.2 ProC BLE Remote Control Details

This section details the blocks and explains the features of the ProC BLE remote control.

Note: Figure 1-2 shows the ProC BLE remote control without the back cover, so you can see all its features.

Figure 1-2. PRoC BLE Remote Control Features



The PRoC BLE remote control can be connected to a host device like a PC, a smart TV, a tablet, or a smartphone using Bluetooth Smart or USB (using the CySmart USB dongle). The quick start guide provided with the kit details the procedure to connect the PRoC BLE remote control to a PC using the CySmart USB dongle. You can connect the PRoC BLE remote control to any Bluetooth Smart or Bluetooth Smart Ready host device. Details for this procedure are available in the [Connecting PRoC the BLE Remote Control with a Bluetooth Smart Ready Device](#) section.

Once connected (via Bluetooth Smart or via USB), the PRoC BLE remote control provides features that can be directly used with a PC, smart TV, tablet, or smartphone.

Features supported on a PC or smart TV include the following:

- Gestures on trackpad
 - Single-finger tracking for mouse cursor movement
 - Single-finger tap for left-click and double-tap for double-click
 - Two-finger tap for right-click
 - Two-finger pinch in/out for zoom out/in
 - Single-finger swipe at right and bottom edges for vertical and horizontal scrolling respectively
 - Single-finger swipe down on top edge to navigate to Start screen in Windows 8 or later and to open Start menu in previous Windows versions

Note: The behavior of this gesture on a smart TV, tablet, or smartphone varies based on the model and operating system)

- Buttons for left-click and right-click
- Volume control buttons to adjust the volume

Advanced features supported on a smart TV or supported via the CySmart tool on a PC include the following:

- Power button to switch on or switch off the smart TV
- Channel control buttons to change channels
- Source button to switch across audio-video inputs
- Return button for going back to previous view on a smart TV

When used with the CySmart USB dongle, the onboard microphone can be used to stream voice data to the PC, smart TV, and so on. The CySmart USB dongle enumerates as a USB microphone. A tool like a sound recorder can be used on the PC to record the voice data coming from the remote. This feature cannot be used when directly connected to a Bluetooth Smart Ready device since Bluetooth 4.0/4.1 does not specify standard audio profiles. The audio data is transmitted from the remote to the dongle using the HID Over GATT Profile (HOGP).

Note: When using the CySmart USB dongle, these features are dependent upon the operating system supporting the generic desktop and consumer usage pages of the human interface device (HID) class as well as the audio device class, over USB. When the PProC BLE remote control is directly connected to a Bluetooth Smart Ready device, these features depend on the support available for the HOGP over Bluetooth Smart.

The PProC BLE remote control also provides IR-based wireless connectivity. IR enables the PProC BLE remote control to be backward compatible with legacy host devices such as TVs that do not support Bluetooth Smart or USB. The following features are supported over IR:

- Power button to switch on or switch off the TV
- Volume control buttons to adjust the volume
- Channel control buttons to change channels
- Source button to switch across audio-video inputs
- Return button for going back to previous view on a smart TV

The remote control also provides LED-based notifications:

- Red LED is on when remote control is advertising over Bluetooth Smart. It blinks three times and then switches off after successful connection.
- Red LED blinks on user activity when the remote control has lost the BLE link and it is trying to connect back to the previously connected host such as a PC or smart TV. This typically occurs when the remote control goes out of range.
- Red LED shows a slow breathing effect on user activity when the battery level is low (that is, the battery voltage is below 2.0 V).
- Red LED shows a fast breathing effect on user activity if the remote control is not connected to the CySmart USB dongle or a Bluetooth Smart Ready host device.

Moreover, the remote control offers the ability to:

- Debug and program the onboard PProC BLE device using the 10-pin header
- Measure the current consumed by PProC BLE

1.3 PSoC Creator

PSoC Creator™ is a state-of-the-art, easy-to-use integrated design environment (IDE). It introduces a revolutionary hardware and software co-design platform, powered by a library of verified and characterized PSoC Components™.

With PSoC Creator, you can:

- Drag and drop PSoC Components to build a schematic of your custom design
- Automatically place and route Components and configure GPIOs
- Develop and debug firmware using the included Component APIs

PSoC Creator also enables you to tap into an entire tool ecosystem, including integrated compiler chains and production programmers for PSoC® devices. For more information, visit www.cypress.com/creator.

1.4 Getting Started

This guide will help you get acquainted with the CY5672 PProC BLE Remote Control RDK.

- The [Kit Contents](#) section details the contents of the kit.
- The quick start guide shipped with the kit provides instructions on how to start using the PProC BLE remote control.
- The [PProC BLE Remote Control Details](#) section details the features of the remote control.
- The [Installation](#) chapter describes the installation of the kit software. This includes the PSoC Creator IDE for development, programming, and debugging; PSoC Programmer for programming hex files; and the CySmart tool for Bluetooth LE host emulation
- The [Kit Operation](#) chapter describes common procedures like programming and debugging the PProC BLE remote control and the CySmart USB dongle. It also introduces the CySmart tool for Bluetooth LE host emulation.
- The [Hardware](#) chapter describes the hardware contents of the kit.
- The [Firmware](#) chapter describes the firmware on the PProC BLE remote control and the CySmart USB dongle.
- The [Advanced Topics](#) chapter explains topics like connecting the remote control to Bluetooth Smart Ready devices, assembling and disassembling the remote control, and measuring current/voltage on the remote control.
- [Appendix A. Schematics and FAQ](#) provides schematics and a list of frequently asked questions (FAQs) for troubleshooting.

1.5 Additional Learning Resources

Visit www.cypress.com/PProCBLE for additional learning resources in the form of datasheets, technical reference manuals, and application notes.

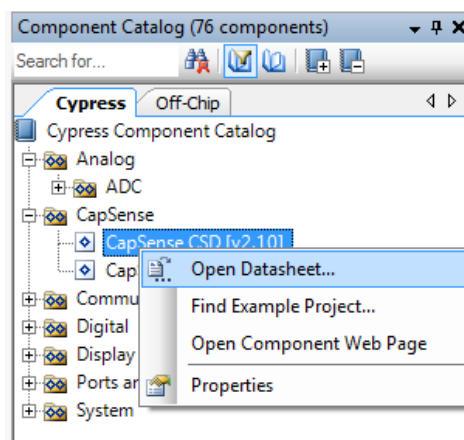
1.5.1 Beginner Resources

PSoC Creator Training: www.cypress.com/go/creatorstart/creatortraining

1.5.2 Component Datasheets

To view the datasheet of a Component from PSoC Creator, right-click on the Component and select **Open Datasheet** (see [Figure 1-3](#)).

Figure 1-3. Opening Component Datasheet



1.5.3 Learning from Peers: Cypress Developer Community Forums

Visit www.cypress.com/forums to interact with Cypress applications support teams.

1.5.4 Other Kits

Other kits available for PProC BLE include the following.

- CY8CKIT-042-BLE Bluetooth Low Energy Pioneer Kit (www.cypress.com/CY8CKIT-042-BLE)
- CY5682 PProC BLE Touch Mouse RDK (www.cypress.com/CY5682)
- CY5671 PProC BLE Module (www.cypress.com/CY5671)
- CY5670 CySmart USB Dongle (www.cypress.com/CY5670)
- CY5674 PProC BLE SMA Module (www.cypress.com/CY5674)

1.6 Technical Support

For assistance, visit [Cypress Support](#) or contact customer support at +1(800) 541-4736 Ext. 2 (in the USA) or +1 (408) 943-2600 Ext. 2 (International).

1.7 Document Conventions

Table 1-1. Document Conventions for Guides

Convention	Usage
Courier New	Displays file locations, user-entered text, and source code: C:\ ...cd\icc\
<i>Italics</i>	Displays file names and reference documentation: Read about the <i>sourcefile.hex</i> file in the <i>PSoC Designer User Guide</i> .
[Bracketed, Bold]	Displays keyboard commands in procedures: [Enter] or [Ctrl] [C]
File > Open	Represents menu paths: File > Open > New Project
Bold	Displays commands, menu paths, and icon names in procedures: Click the File icon and then click Open .
Times New Roman	Displays an equation: $2 + 2 = 4$
Text in gray boxes	Describes Cautions or unique functionality of the product.

1.8 Acronyms

Table 1-2. Acronyms Used in This Document

Acronym	Definition
ADC	Analog-to-digital converter
AML	Air Motion Library
API	Application programming interface
BD address	Bluetooth device address
BLE	Bluetooth Low Energy
CDC	Communications Device Class
ESD	Electrostatic discharge
GAP	Generic Access Profile
GATT	Generic Attribute Profile
GPIO	General-purpose I/O
GUI	Graphical user interface
HID	Human-interface device
HOGP	HID over GATT Profile
I ² C	Inter-integrated circuit
IAS	Immediate Alert Service
IDAC	Interconnecting digital-analog converter
IDE	Integrated development environment
LED	Light-emitting diode
MTU	Maximum transmission unit
PHY	Physical layer
PrISM	Precise Illumination Signal Modulation
PRoC	Programmable Radio-on-Chip
PSoC	Programmable System-on-Chip
PWM	Pulse-width modulator
QFN	Quad flat no-lead (package)
SAR	Successive approximation register (ADC)
SWD	Serial wire debug
UART	Universal asynchronous receiver transmitter
UUID	Universally Unique Identifier

2. Installation



This chapter describes the steps to install the software tools and packages on a PC for the CY5672 PSoC BLE Remote Control RDK. The kit installer will install the following software tools and associated documentation on your PC.

- PSoC Creator: IDE used to view, develop, and build firmware for PSoC BLE based devices.
- PSoC Programmer: Software used to download a hex file to the PSoC BLE device.
- CySmart: A Bluetooth LE host emulation tool for windows PCs. The tool works with the CySmart USB dongle and provides an easy-to-use GUI to enable customers to evaluate and debug Bluetooth LE peripheral applications. Refer to the section [Connecting the CY5672 Remote Control RDK to CySmart Software](#) for more details on how to use the CySmart tool.
- Documentation: Includes kit documentation files, hardware schematics, layout, and BOM.

2.1 Before You Begin

All Cypress software installations require administrator privileges. Administrator privileges are not required to execute the software after installation. Before you install the kit software, close any other Cypress software that is currently running.

2.2 Install Software

Follow these steps to install the CY5672 PSoC BLE Remote Control RDK software:

1. Download the CY5672 PSoC BLE Remote Control RDK software from www.cypress.com/CY5672. The kit software is available in three formats for download:
 - a. **CY5672 Kit Setup:** This installation package contains all files related to the kit as well as PSoC Creator, PSoC Programmer, and CySmart software. However, it does not include the Windows Installer or Microsoft .NET framework packages. If these packages are not on your computer, the installer directs you to download and install them from the Internet.
 - b. **CY5672 Kit Only:** This executable file installs only the kit contents, which include kit source code and firmware, hardware files, and user documents. This package can be used if all the software prerequisites (PSoC Creator, PSoC Programmer, and CySmart) are installed on your PC.
 - c. **CY5672 DVD ISO:** This file is a complete package, stored in a DVD-ROM image format, that can be used to create a DVD or extract using an ISO extraction program such as WinRAR. The file can also be mounted like a virtual DVD using virtual drive programs such as Virtual CloneDrive and MagicISO. This file includes all the required software, utilities, drivers, hardware files, and user documents.
2. If you have downloaded the ISO file, mount it in a virtual drive. Extract the ISO contents if you do not have a virtual drive to mount. Double-click *cyautorun.exe* in the root directory of the extracted content or mounted ISO if “Autorun from CD/DVD” is not enabled on the PC. The installation window will appear automatically.

Note: If you are using the CY5672 Kit Setup or CY5672 Kit Only file, then double-click on the file and go to step 4.

3. Click **Install CY5672 PSoC BLE RDK**, shown in [Figure 2-1](#), to start the kit installation.

Figure 2-1. Kit Installer Screen



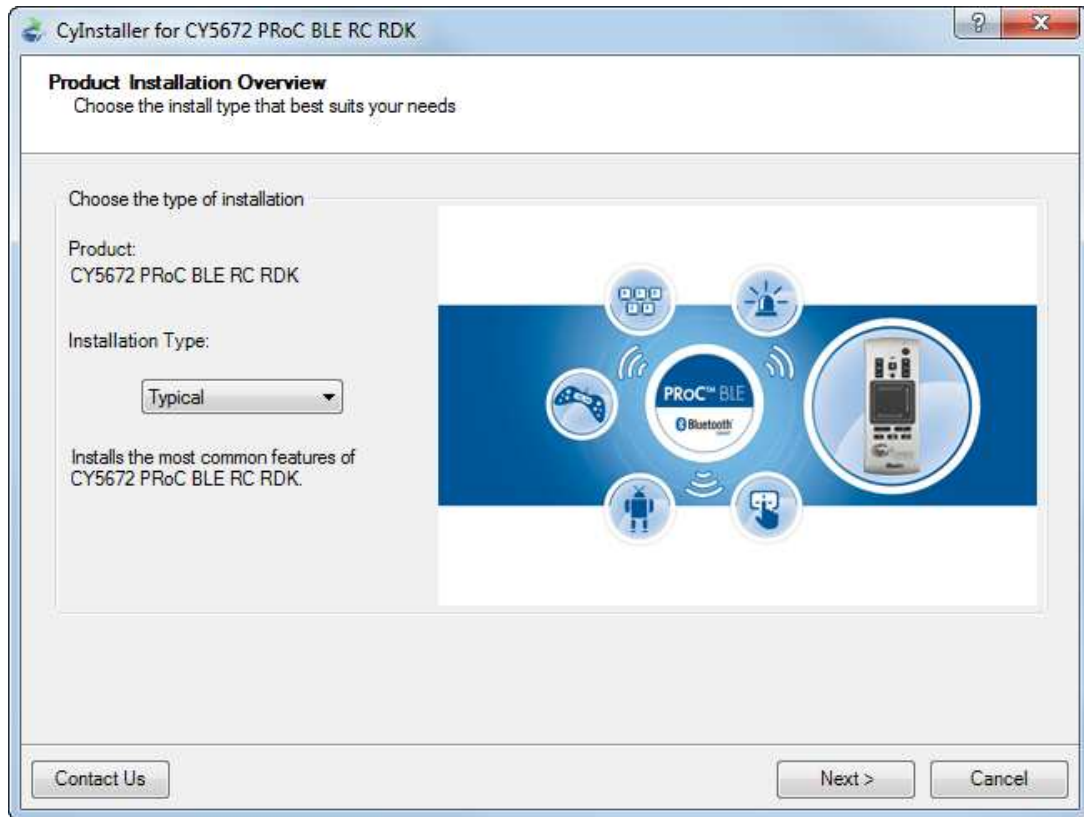
4. Select the folder in which you want to install the kit-related files by clicking **Change**, as shown in Figure 2-2. Choose the directory and click **Next**.

Figure 2-2. CY5672 PRoC BLE RDK – InstallShield Wizard



5. Choose the “Typical,” “Custom,” or “Complete” installation type in the **Product Installation Overview** window, as shown in Figure 2-3. Click **Next** after you select the installation type.

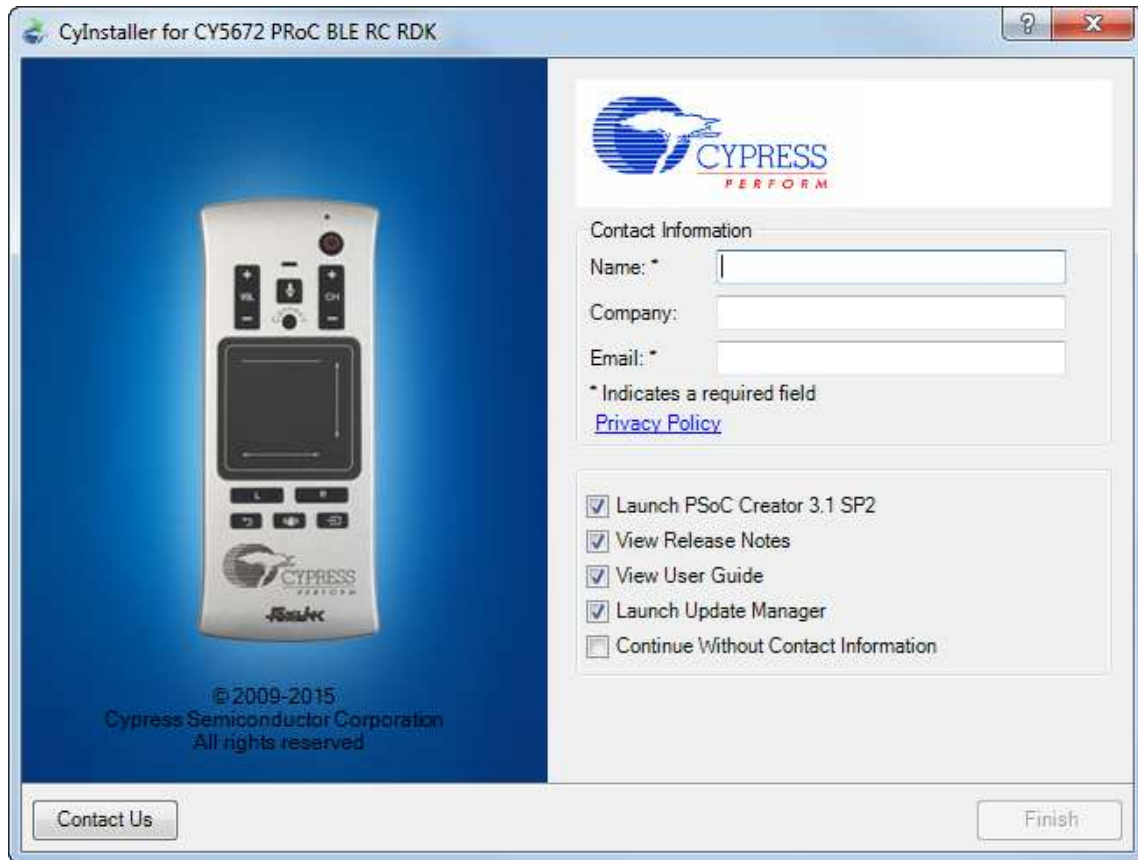
Figure 2-3. Product Installation Overview



6. Read the license agreement and select **I accept the terms in the license agreement** to continue with the installation. Click **Next**. When you click **Next**, the installer automatically installs the required software, if it is not present on your computer. Following are the required software:
 - PSoC Creator 3.1 or later: Download from www.cypress.com/psoccreator.
 - PSoC Programmer 3.22 or later: Download from www.cypress.com/programmer.
 - CySmart 1.0 or later: Download from www.cypress.com/CySmart.

Note: If you are using the CY5672 Kit Only package, you must download and install the software manually.
7. The installation begins by presenting the list of packages on the installation page. A green check mark appears next to each package after successful installation.
8. Enter your contact information or select the option **Continue Without Contact Information**, as shown in [Figure 2-4](#). Click **Finish** to complete the kit installation.

Figure 2-4. Installer Asking for Contact Information



Note: The PSoC Creator version number displayed in the figure may vary depending upon the latest PSoC Creator packaged in the installer.

9. After the installation is complete, the kit contents are available at the following location:

<Install_Directory>\CY5672 PRoC BLE RC RDK

Default location:

Windows 7 (64-bit):

C:\Program Files (x86)\Cypress

Windows 7 (32-bit):

C:\Program Files\Cypress

Note: For Windows 7/8/8.1 users, the installed files and the folder are read only.

2.3 Uninstall Software

The software can be uninstalled using one of the following methods:

- Go to **Start > All Programs > Cypress > Cypress Update Manager > Cypress Update Manager**; click the **Uninstall** button for the appropriate software package.
- Go to **Start > Control Panel > Programs and Features**; click the **Uninstall/Change** button for the appropriate software package.

3. Kit Operation



This chapter introduces the features of the CY5672 PProC BLE Remote Control RDK that will be used as part of the kit operation. Topics include:

- [Connecting the PProC BLE Remote Control with the CySmart USB Dongle](#)
- [Connecting the PProC BLE Remote Control with the CySmart USB Dongle to Communicate with the CySmart Software](#)
- [Programming and Debugging](#)

3.1 Connecting the PProC BLE Remote Control with the CySmart USB Dongle to Communicate with PC

The first use for the dongle is to allow the remote control to interact with a PC, which may not necessarily have the built-in Bluetooth Smart capability. In such a case, the dongle receives the BLE packets from the remote control, converts them to standard USB HID packets, and sends them to the PC.

In this document, “connecting” refers to establishing a Bluetooth Smart wireless link between the PProC BLE remote control and the CySmart USB dongle. The process of establishing the connection for the first time involves “bonding,” which refers to storing encryption information from the remote control in the nonvolatile memory of the CySmart USB dongle. This stored information forms the “whitelist,” which is used by Bluetooth Smart and Bluetooth Smart Ready devices to scan and search for subsequent connections.

The PProC BLE remote control is factory-bonded with the CySmart USB dongle. Therefore, when the dongle is plugged in, it begins to search for the bonded remote control (that is, remote control unit that is present in the dongle’s whitelist). After both AAA batteries are inserted, any user activity on the PProC BLE remote control connects it to the dongle. Refer to step 1 in the [Assembling and Disassembling the Remote Control](#) section for instructions on removing the back cover to insert the two AAA batteries.

The remote control needs to be reconnected to the CySmart USB dongle whenever the remote control or the dongle is reprogrammed. The steps to reconnect the PProC BLE remote control with the CySmart USB dongle are as follows.

Note: Making changes to the remote control firmware or CySmart USB dongle firmware that impact the connection establishment behavior may invalidate the following steps.

Ensure that the two AAA batteries provided with the kit are inserted into the battery holder at the back of the remote control before following these steps.

1. Insert the dongle into a USB port on the PC. The red power LED on the dongle glows to show that the dongle is powered on, and the green status LED on the dongle glows to show that enumeration is complete on the dongle side. The blue user LED on the dongle shows a slow breathing effect to indicate that the dongle is scanning for bonded devices.

Notes:

- The time taken to complete enumeration on the PC side for the first time can vary based on driver installation time.
 - The blue user LED on the CySmart USB dongle does not show a slow breathing effect if the dongle is reprogrammed. In this case, press the user button (SW2) on the CySmart USB dongle to start scanning. The blue LED shows the fast breathing effect.
2. Press the connect button on the remote control. The red LED on the remote control glows to show that the remote control is now in advertising mode. The remote control will try connecting to the CySmart USB dongle for a maximum interval of 30 seconds.

- When a successful connection is established, the red LED on the remote control blinks three times and then switches off, while the blue user LED on the CySmart USB dongle glows continuously. When the connection is unsuccessful, the LED switches off after a 30-second timeout. In this event, repeat the sequence starting from step 2 to establish a connection.

Note: Do not turn off the remote control while the red LED is blinking after a successful connection is established.

- Place and move your finger on the trackpad surface. If the connection is successful, the mouse cursor on the PC will follow your finger movement.

3.2 Connecting the PProC BLE Remote Control with the CySmart USB Dongle to Communicate with the CySmart Software

The second use for the dongle is as an interface to the CySmart software. CySmart is a Bluetooth LE host emulation tool for Windows PCs. This tool provides an easy-to-use GUI that enables you to test and debug your Bluetooth LE peripheral applications. It supports device discovery, connection establishment, and pairing and bonding. It also provides the ability to access the Generic Attribute Profile (GATT) server database for the PProC BLE remote control.

When plugged into a USB port, the CySmart USB dongle enumerates, exposing the USB interfaces. [Figure 3-1](#) and [Figure 3-2](#) show the drivers for the CySmart USB dongle installation on a Windows 7 PC.

Figure 3-1. Driver Installation in Progress for CySmart USB Dongle on Windows 7

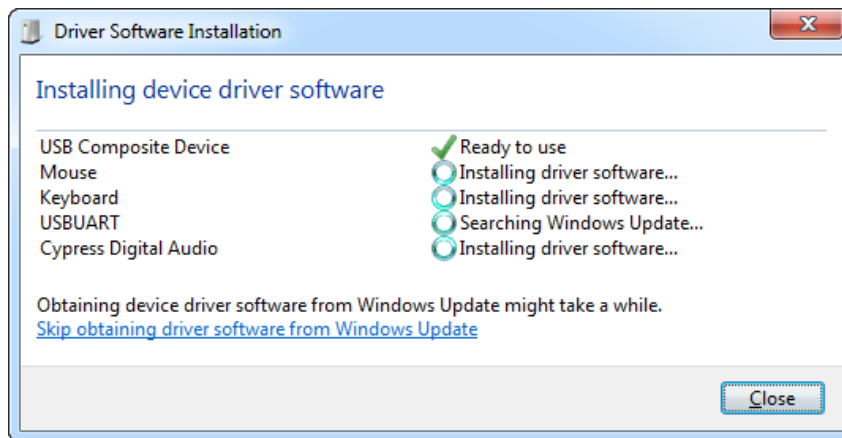
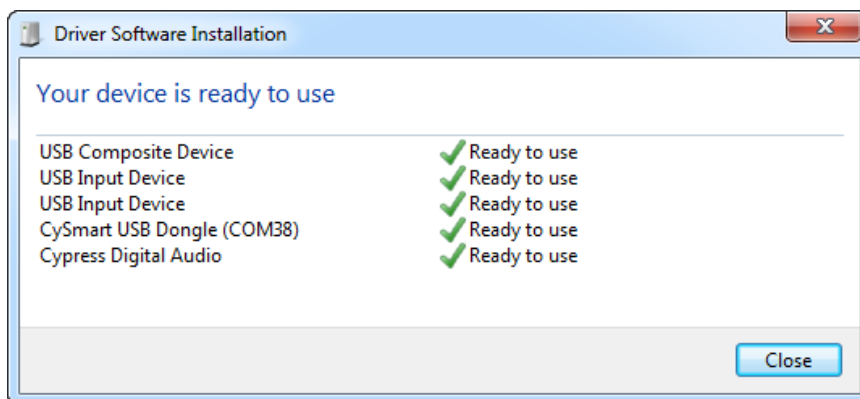


Figure 3-2. Driver Installation Complete for CySmart USB Dongle on Windows 7



Note: The appearance of the windows shown in [Figure 3-1](#) and [Figure 3-2](#) may differ across operating systems and based on settings.

3.2.1 Connecting the CY5672 Remote Control RDK to CySmart Software

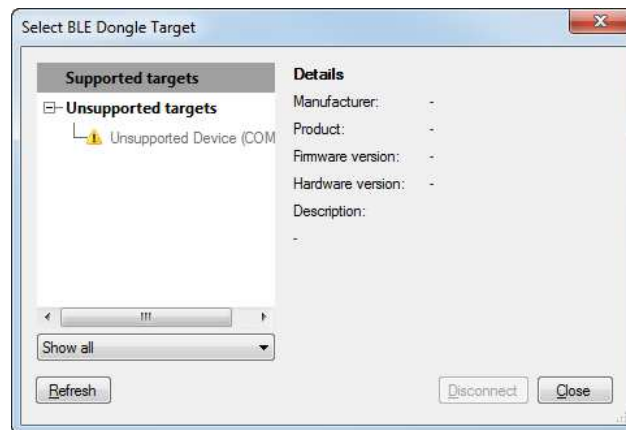
1. Plug the CySmart USB dongle into the PC, as shown in Figure 3-3.

Figure 3-3. CySmart USB Dongle Connected to Laptop



2. Open CySmart and click the **Select Dongle** button. A window appears, as shown in Figure 3-4.

Figure 3-4. BLE Dongle Target Window



3. Click the **Refresh** button and verify that the Cypress BLE HID dongle is listed, as shown in Figure 3-5. Click on **Cypress BLE HID Dongle (...)**, and click the **Connect** button. The CySmart tool appears as shown in Figure 3-6.

Figure 3-5. BLE Dongle Target Window

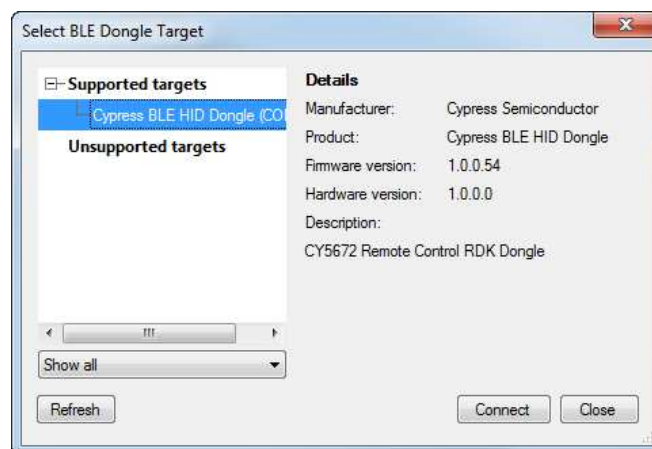
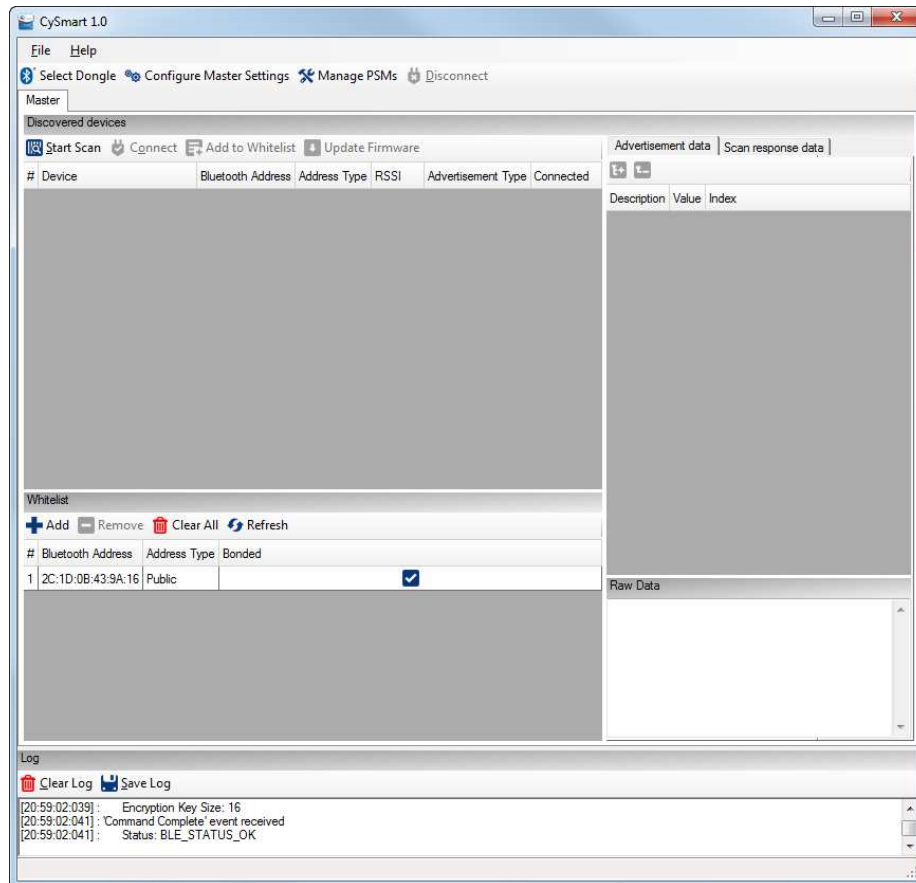


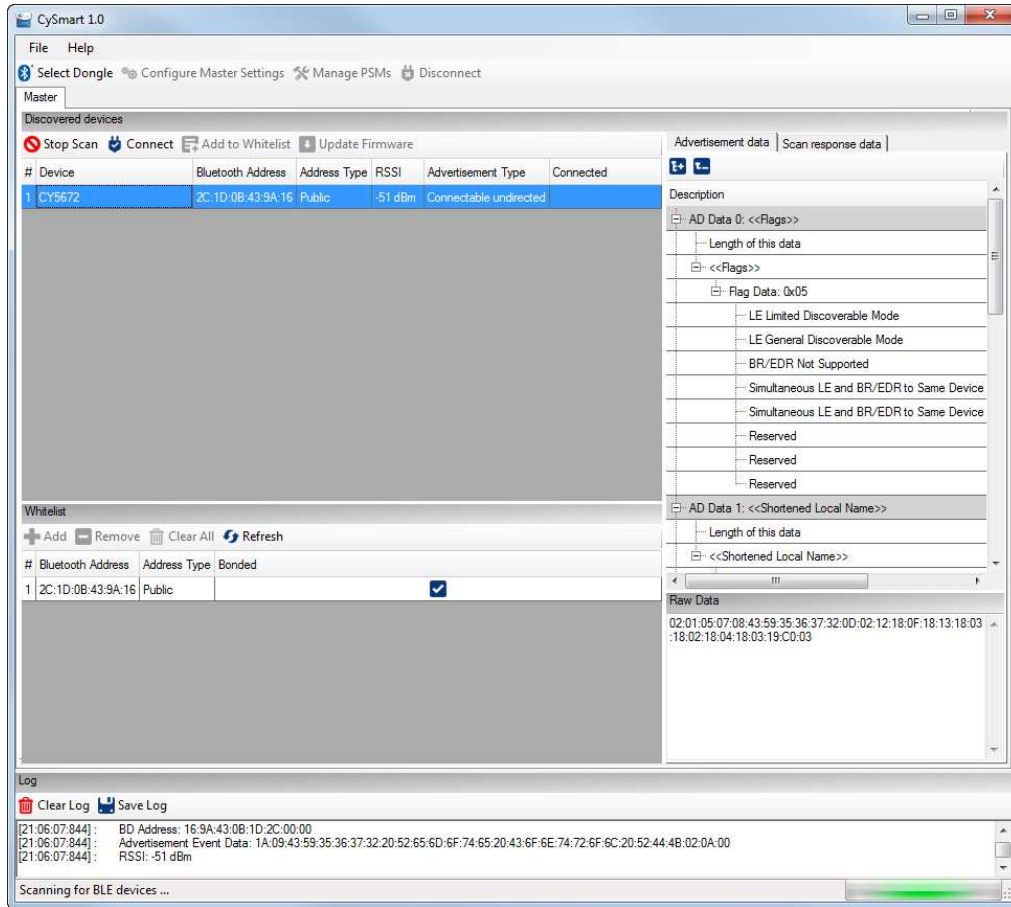
Figure 3-6. CySmart Window



Note: The Blue LED on the dongle turns OFF once the connection with CySmart tool is established. It will remain in the OFF state as long as the communication with the CySmart tool is active.

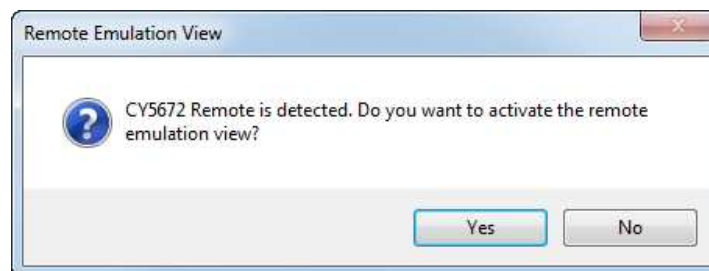
4. Insert two AAA batteries into the battery holder of the remote control.
5. Press the **Connect** button on the remote control. The red LED glows to indicate that the remote control is now in advertising mode.
6. Click the **Start Scan** button on the CySmart tool to start scanning for BLE devices that are advertising. Verify that "CY5672" is listed under **Discovered Devices**, as shown in [Figure 3-7](#).

Figure 3-7. CySmart Discovered Devices Window



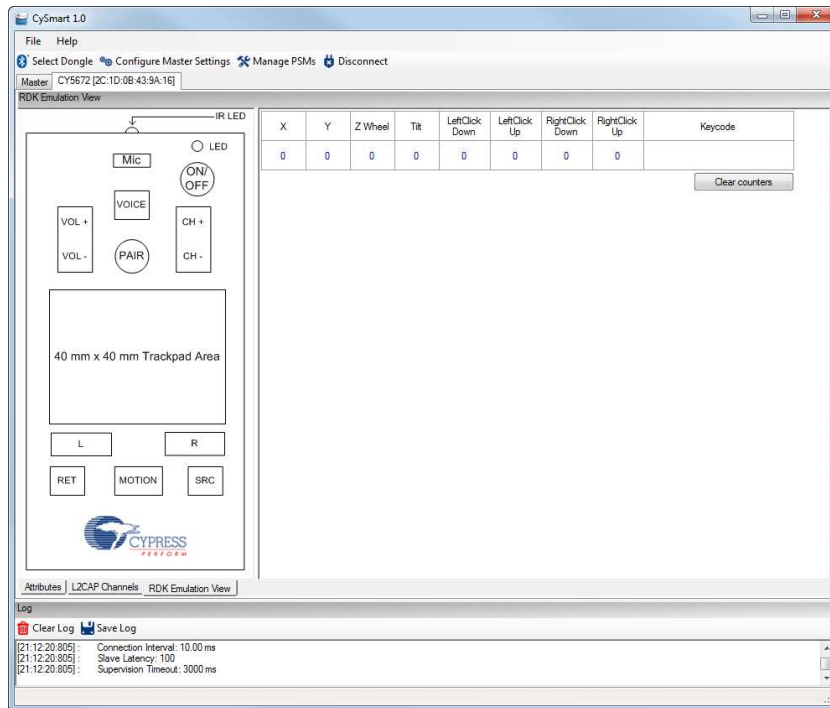
7. Double-click on "CY5672." Click **Yes** in the dialog box to activate the remote emulator tab.

Figure 3-8. CySmart Remote Emulation View Dialog Box



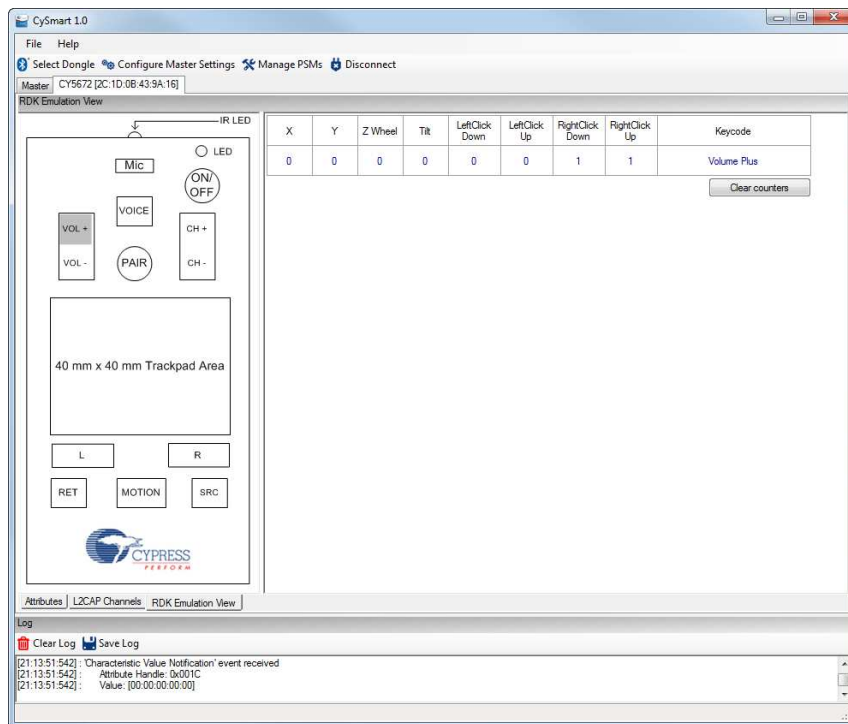
8. The remote emulator tab is displayed on the CySmart tool, as shown in [Figure 3-9](#). This will take several seconds as the attributes are read from the remote. This tab allows you to test the features of the PRoC BLE remote control described in the [PRoC BLE Remote Control Details](#) section.

Figure 3-9. RDK Emulator in CySmart



- Invoke the remote control features. The invoked features are highlighted on the emulator tab. For example, when you press VOL + on the remote control, the VOL + button on the remote control emulator is highlighted, as shown in Figure 3-10 as long as the VOL + button remains pressed on the remote control.

Figure 3-10. Testing Remote Control Features Using RDK Emulator



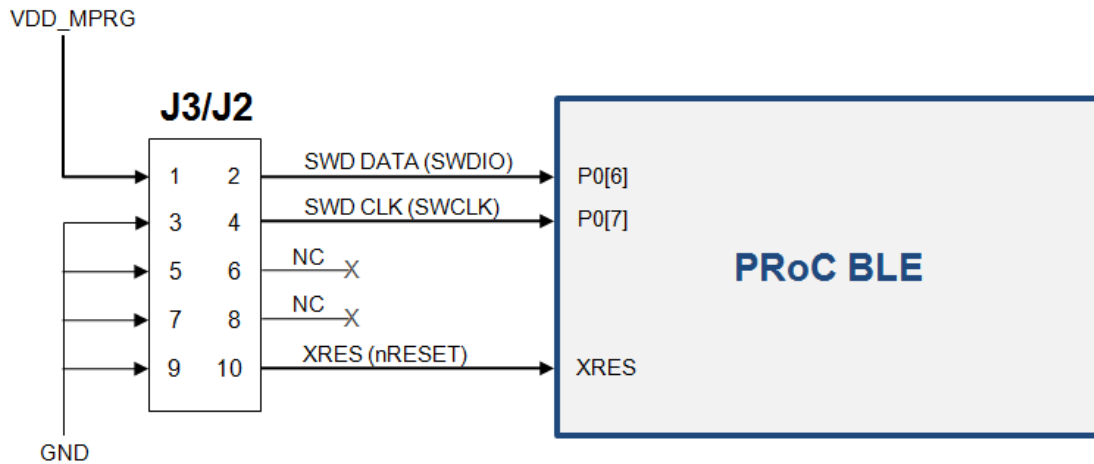
For more information on using the CySmart tool and the RDK Emulation View, download the guide for the CySmart tool from www.cypress.com/go/CySmartUserGuide.

3.3 Programming and Debugging

3.3.1 Programming and Debugging PRoC BLE on the Remote Control and Dongle

The PRoC BLE remote control and the CySmart USB dongle support programming and debugging using the MiniProg3 programmer/debugger provided with the kit. Both expose a 10-pin connector. Figure 3-11 is a block diagram showing the header and associated connections.

Figure 3-11. Programming/Debugging PRoC BLE



To program PRoC BLE on the touch mouse use the J3 connector on the touch mouse PCBA
 To program PRoC BLE on the CySmart USB dongle use the J2 connector on the dongle

Notes:

- Remove the warning sticker before using MiniProg3.
- Before trying to program or debug the device, make sure that PSoC Creator and PSoC Programmer are installed on the PC.

You can program the remote control either with PSoC Programmer or directly from PSoC Creator.

3.3.2 Programming PRoC BLE on the Remote Control and Dongle Using PSoC Programmer

To program the remote control using PSoC Programmer, follow these steps.

1. Connect MiniProg3 to the PC using the USB A to mini-B cable provided with the kit. When it is properly connected, the four LEDs on the MiniProg3 turn on for a few seconds.
2. Connect one end of the 10-pin ribbon cable, provided with the kit, to the 10-pin header on the MiniProg3.
3. Connect the other end of the 10-pin ribbon cable to the 10-pin connector (J3 on the remote control or J2 on the CySmart USB dongle). Programming headers on both the remote control and the CySmart USB dongle (J3 and J2 respectively) are polarized. Do not apply excessive force; instead, ensure that the connectors are plugged in the correct orientation.
4. Run PSoC Programmer by choosing **Start > All Programs > Cypress > PSoC Programmer**.
Note: Ensure that only one instance of PSoC Programmer is running on the PC.
5. To establish the connection with a programmer, select either the “MiniProg3” device from the **Port Selection** list box or the **Connect/Disconnect** icon, as shown in Figure 3-12.