



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





CY8CKIT-042

# PSoC<sup>®</sup> 4 Pioneer Kit Guide

Doc. # 001-86371 Rev. \*G

Cypress Semiconductor  
198 Champion Court  
San Jose, CA 95134-1709  
Phone (USA): 800.858.1810  
Phone (Intl): +1.408.943.2600  
<http://www.cypress.com>

## Copyrights

© Cypress Semiconductor Corporation, 2013-2016. 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) (1) 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, 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](http://cypress.com). Other names and brands may be claimed as property of their respective owners.

PSoC Designer, PSoC Creator, SmartSense, and CapSense Express are trademarks of Cypress Semiconductor Corporation.



# Contents



## Safety Information 5

<b>1. Introduction</b>	<b>7</b>
1.1 Kit Contents .....	7
1.2 PSoC Creator™ .....	9
1.3 Getting Started.....	9
1.4 Additional Learning Resources .....	10
1.4.1 PSoC Creator.....	11
1.4.2 PSoC Creator Code Examples .....	12
1.4.3 PSoC Creator Help .....	13
1.4.4 Technical Support.....	14
1.5 Documentation Conventions.....	14
<b>2. Software Installation</b>	<b>15</b>
2.1 Install Kit Software .....	15
2.2 Install Hardware.....	16
2.3 Install Software .....	16
2.4 Uninstall Software .....	17
2.5 Develop Code Fast and Easy with Code Examples .....	17
2.6 Open an Example Project in PSoC Creator.....	19
<b>3. Kit Operation</b>	<b>21</b>
3.1 Pioneer Kit USB Connection.....	22
3.2 Programming and Debugging PSoC 4 .....	23
3.2.1 Using the Onboard PSoC 5LP Programmer and Debugger .....	23
3.2.2 Using CY8CKIT-002 MiniProg3 Programmer and Debugger.....	25
3.3 USB-UART Bridge .....	26
3.4 USB-I2C Bridge .....	28
3.5 Updating the Onboard Programmer Firmware .....	29
<b>4. Hardware</b>	<b>31</b>
4.1 Board Details .....	31
4.2 Theory of Operation.....	33
4.3 Functional Description .....	34
4.3.1 PSoC 4.....	34
4.3.2 PSoC 5LP .....	35
4.3.3 Power Supply System.....	37
4.3.4 Programming Interface.....	39
4.3.5 Arduino Compatible Headers (J1, J2, J3, J4, and J12 - unpopulated).....	40
4.3.6 Digilent Pmod Compatible Header (J5 - unpopulated).....	42
4.3.7 PSoC 5LP GPIO Header (J8) .....	43
4.3.8 CapSense Slider .....	44

4.3.9	Pioneer Board LEDs .....	45
4.3.10	Push Buttons .....	46
<b>5.</b>	<b>Code Examples</b>	<b>47</b>
5.1	Project: Blinking LED .....	50
5.1.1	Project Description .....	50
5.1.2	Hardware Connections .....	50
5.1.3	Flow Chart .....	51
5.1.4	Verify Output .....	51
5.2	Project: PWM .....	52
5.2.1	Project Description .....	52
5.2.2	Hardware Connections .....	52
5.2.3	Flow Chart .....	53
5.2.4	Verify Output .....	53
5.3	Project: Deep Sleep .....	54
5.3.1	Project Description .....	54
5.3.2	Hardware Connections .....	54
5.3.3	Flow Chart .....	55
5.3.4	Verify Output .....	55
5.4	Project: CapSense .....	56
5.4.1	CapSense (Without Tuning) .....	56
5.4.2	CapSense (With Tuning) .....	59
<b>6.</b>	<b>Advanced Topics</b>	<b>66</b>
6.1	Using PSoC 5LP as USB-UART Bridge .....	66
6.2	Using PSoC 5LP as USB-I2C Bridge .....	79
6.3	Developing Applications for PSoC 5LP .....	88
6.3.1	Building a Bootloadable Project for PSoC 5LP .....	88
6.3.2	Building a Normal Project for PSoC 5LP .....	96
6.4	PSoC 5LP Factory Program Restore Instructions .....	97
6.4.1	PSoC 5LP is Programmed with a Bootloadable Application .....	97
6.4.2	PSoC 5LP is Programmed with a Standard Application .....	102
6.5	Using $\mu$ C/Probe Tool .....	104
6.5.1	CapSense Example Project .....	105
6.5.2	PWM Example project .....	111
<b>A.</b>	<b>Appendix</b>	<b>113</b>
A.1	CY8CKIT-042 Schematics .....	113
A.2	Pin Assignment Table .....	116
A.3	Program and Debug Headers .....	119
A.4	Use of Zero-ohm Resistors and No Load .....	120
A.5	Error in Firmware/Status Indication in Status LED .....	120
A.6	Bill of Materials (BOM) .....	121
A.7	Regulatory Compliance Information .....	123
A.8	Migrating projects across different Pioneer series kits .....	124
	<b>Revision History</b>	<b>128</b>

# Safety Information



## Regulatory Compliance

The CY8CKIT-042 PSoC<sup>®</sup> 4 Pioneer Kit is intended for use as a development platform for hardware or software in a laboratory environment. The board is an open system design, which does not include a shielded enclosure. Due to this reason, the board may cause interference to other electrical or electronic devices in close proximity. In a domestic environment, this product may cause radio interference. In such cases, the user may be required to take adequate preventive measures. Also, this board should not be used near any medical equipment or RF devices.

Attaching additional wiring to this product or modifying the product operation from the factory default may affect its performance and cause interference with other apparatus in the immediate vicinity. If such interference is detected, suitable mitigating measures should be taken.

The CY8CKIT-042 as shipped from the factory has been verified to meet with requirements of CE as a Class A product.



The CY8CKIT-042 contains electrostatic discharge (ESD) sensitive devices. Electrostatic charges readily accumulate on the human body and any equipment, and can discharge without detection. Permanent damage may occur on devices subjected to high-energy discharges. Proper ESD precautions are recommended to avoid performance degradation or loss of functionality. Store unused CY8CKIT-042 boards in the protective shipping package.



### End-of-Life/Product Recycling

This kit has an end-of-life cycle five years from the date of manufacturing mentioned on the back of the box. Contact your nearest recycler for discarding the kit.



## 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

CY8CKIT-042 boards are sensitive to ESD. Hold the board only by its edges. After removing the board from its box, place it on a grounded, static free surface. Use a conductive foam pad if available. Do not slide board over any surface.

# 1. Introduction



Thank you for your interest in the PSoC<sup>®</sup> 4 Pioneer Kit. The kit is designed as an easy-to-use and inexpensive development kit, showcasing the unique flexibility of the PSoC 4 architecture. Designed for flexibility, this kit offers footprint-compatibility with several third-party Arduino<sup>™</sup> shields. This kit has a provision to populate an extra header to support Digilent<sup>®</sup> Pmod<sup>™</sup> peripheral modules. In addition, the board features a CapSense<sup>®</sup> slider, an RGB LED, a push button switch, an integrated USB programmer, a program and debug header, and USB-UART/I2C bridges. This kit supports either 5 V or 3.3 V as power supply voltages.

The PSoC 4 Pioneer Kit is based on the PSoC 4200 device family, delivering a programmable platform for a wide range of embedded applications. The PSoC 4 is a scalable and reconfigurable platform architecture for a family of mixed-signal programmable embedded system controllers with an ARM<sup>®</sup> Cortex<sup>™</sup>-M0 CPU. It combines programmable and reconfigurable analog and digital blocks with flexible automatic routing.

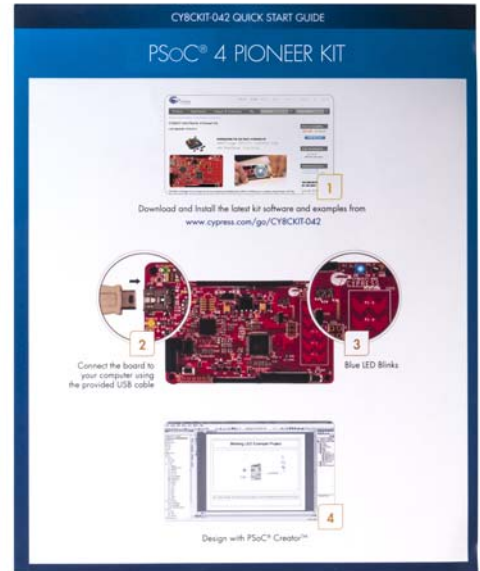
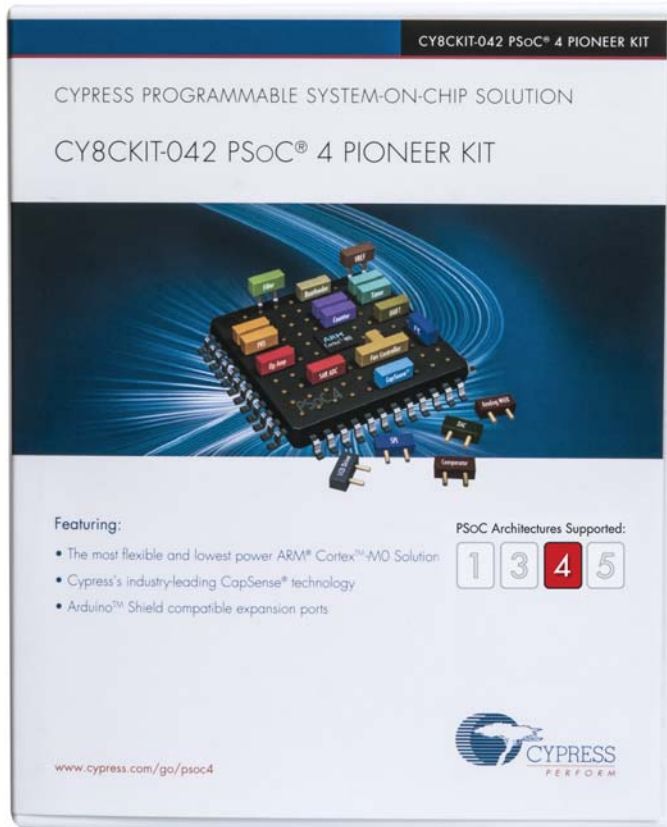
## 1.1 Kit Contents

The PSoC 4 Pioneer kit contains:

- PSoC 4 Pioneer board
- Quick Start Guide
- USB Standard-A to Mini-B cable
- Six jumper wires



Figure 1-1. Kit Contents



Inspect the contents of the kit; if you find any part missing, contact your nearest Cypress sales office for help: [www.cypress.com/go/support](http://www.cypress.com/go/support).

## 1.2 PSoC Creator™

PSoC Creator is a state-of-the-art, easy-to-use integrated design environment (IDE). It introduces revolutionary hardware and software co-design, powered by a library of pre-verified and pre-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 tools ecosystem with integrated compiler chains and production programmers for PSoC devices.

For more information, visit [www.cypress.com/Creator](http://www.cypress.com/Creator).

## 1.3 Getting Started

This guide helps you to get acquainted with the PSoC 4 Pioneer Kit. The [Software Installation chapter on page 15](#) describes the installation of the kit software. The [Kit Operation chapter on page 21](#) explains how to program the PSoC 4 with a programmer and debugger – either the onboard PSoC 5LP or the external MiniProg3 (CY8CKIT-002). The [Hardware chapter on page 31](#) details the hardware operation. The [Code Examples chapter on page 47](#) describes the code examples. The [Advanced Topics chapter on page 66](#) deals with topics such as building projects for PSoC 5LP, USB-UART functionality, and USB-I2C functionality of PSoC 5LP. The [Appendix on page 113](#) provides the schematics, pin assignment, use of zero-ohm resistors, troubleshooting, and the bill of materials (BOM).

## 1.4 Additional Learning Resources

Cypress provides a wealth of data at [www.cypress.com](http://www.cypress.com) to help you to select the right PSoC device for your design, and to help you to quickly and effectively integrate the device into your design. For a comprehensive list of resources, see [KBA86521](#), [How to Design with PSoC 3](#), [PSoC 4](#), and [PSoC 5LP](#). The following is an abbreviated list for PSoC 4:

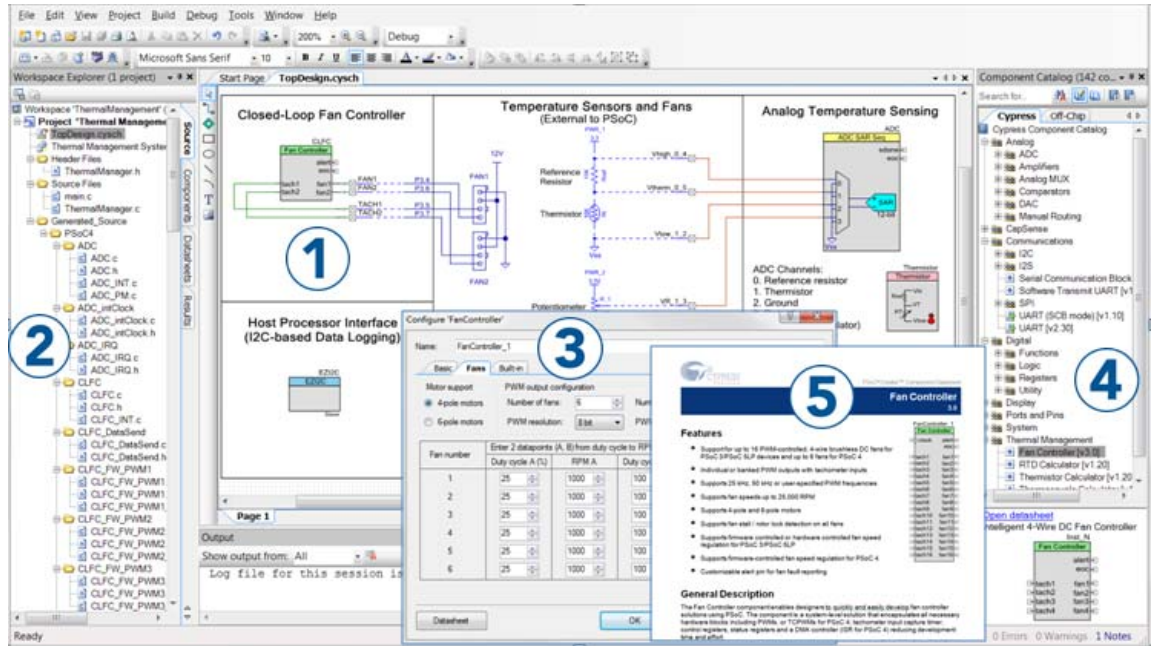
- **Overview:** [PSoC Portfolio](#), [PSoC Roadmap](#)
- **Product Selectors:** [PSoC 1](#), [PSoC 3](#), [PSoC 4](#), or [PSoC 5LP](#). In addition, PSoC Creator includes a device selection tool.
- **Datasheets:** Describe and provide electrical specifications for the [PSoC 4000](#), [PSoC 4100](#), and [PSoC 4200](#) device families.
- **CapSense Design Guide:** Learn how to design capacitive touch-sensing applications with the PSoC 4 family of devices.
- **Application Notes and Code Examples:** Cover a broad range of topics, from basic to advanced level. Many of the application notes include code examples. Visit the [PSoC 3/4/5 Code Examples](#) webpage for a list of all available PSoC Creator code examples. For accessing code examples from within PSoC Creator – see [PSoC Creator Code Examples on page 12](#).
- **Technical Reference Manuals (TRM):** Provide detailed descriptions of the architecture and registers in each PSoC 4 device family.
- **Development Kits:**
  - [CY8CKIT-042](#) and [CY8CKIT-040](#), PSoC 4 Pioneer Kits, are easy-to-use and inexpensive development platforms. These kits include connectors for Arduino compatible shields and Digilent Pmod daughter cards.
  - [CY8CKIT-049](#) is a very low-cost prototyping platform for sampling PSoC 4 devices.
  - [CY8CKIT-001](#) is a common development platform for all PSoC family devices.
- The [MiniProg3](#) device provides an interface for flash programming and debug.
- **Knowledge Base Articles (KBA):** Provide design and application tips from experts on the devices/kits. For instance, [KBA93541](#), explains how to use [CY8CKIT-049](#) to program another PSoC 4.

### 1.4.1 PSoC Creator

**PSoC Creator** is a free Windows-based integrated design environment (IDE). It enables concurrent hardware and firmware design of systems based on PSoC 3, PSoC 4, and PSoC 5LP. See [Figure 1-2](#) – with PSoC Creator, you can:

1. Drag and drop Components to build your hardware system design in the main design workspace
2. Codesign your application firmware with the PSoC hardware
3. Configure Components using configuration tools
4. Explore the library of 100+ Components
5. Access Component datasheets

Figure 1-2. PSoC Creator Features



Visit [PSoC Creator training page](#) for video tutorials on learning and using PSoC Creator.

## 1.4.2 PSoC Creator Code Examples

PSoC Creator includes a large number of code example projects. These projects are accessible from the PSoC Creator Start Page, as [Figure 1-3](#) shows.

Example projects can speed up your design process by starting you off with a complete design, instead of a blank page. The example projects also show how PSoC Creator Components can be used for various applications. Code examples and datasheets are included, as [Figure 1-4 on page 13](#) shows.

In the Find Example Project dialog shown in [Figure 1-4 on page 13](#), you have several options:

- Filter for examples based on device family or keyword
- Select from the menu of examples offered based on the Filter Options
- View the datasheet for the selection (on the **Documentation** tab)
- View the code example for the selection. You can copy and paste code from this window to your project, which can help speed up code development, or
- Create a new workspace for the example project. This can speed up your design process by starting you off with a complete, basic design. You can then adapt that design to your application.

Figure 1-3. Code Examples in PSoC Creator

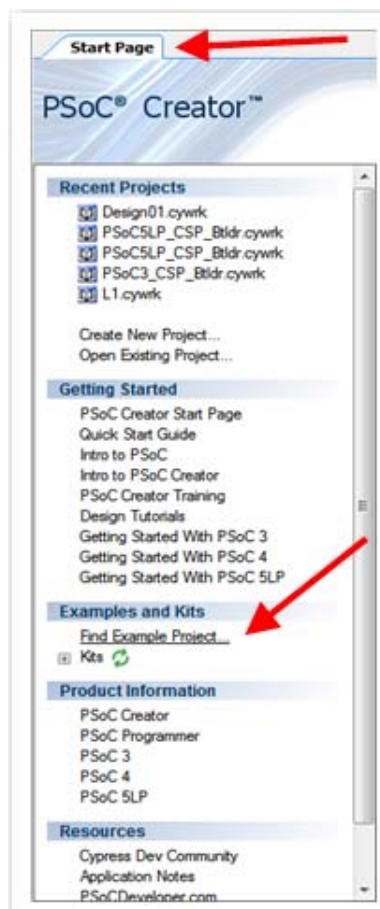
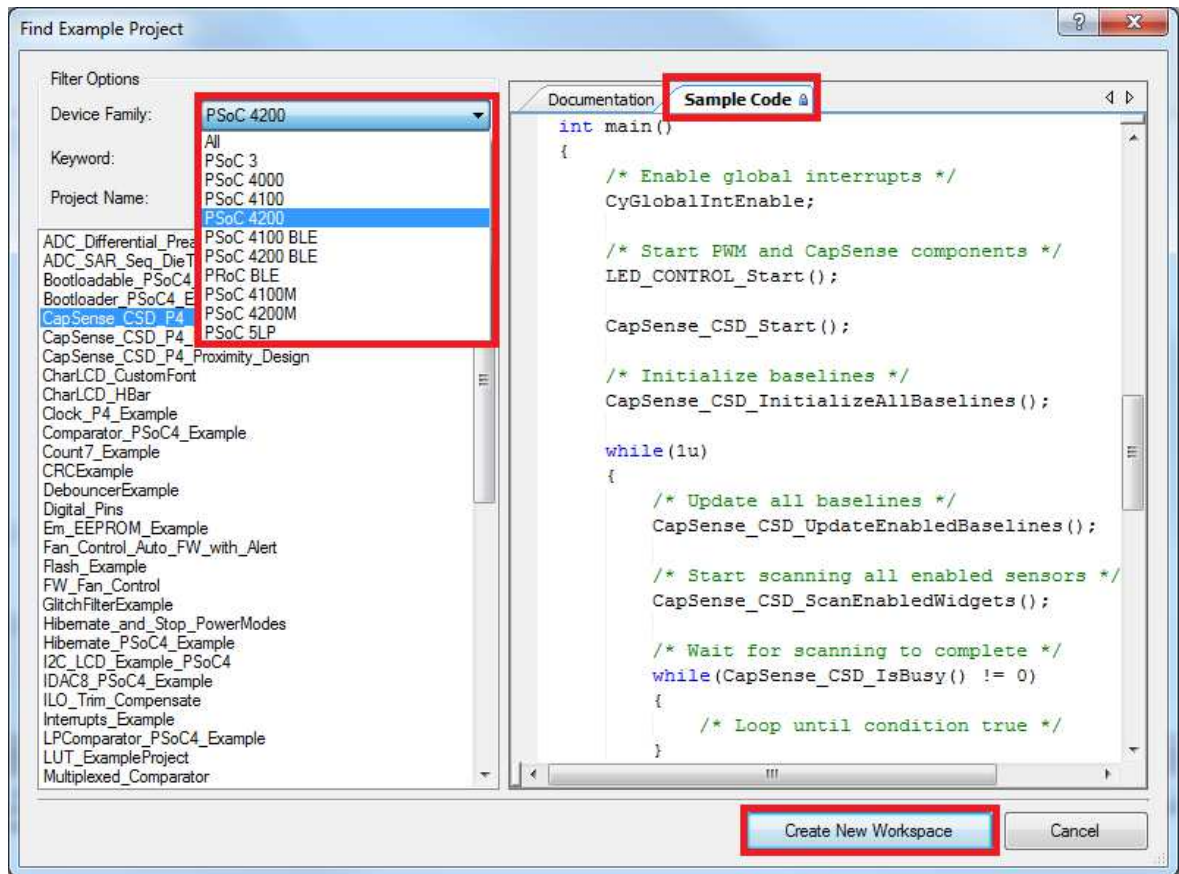




Figure 1-4. Code Example Projects with Sample Code



### 1.4.3 PSoC Creator Help

Visit the [PSoC Creator home page](#) to download the latest version of PSoC Creator. Then, launch PSoC Creator and navigate to the following items:

- **Quick Start Guide:** Choose **Help > Documentation > Quick Start Guide**. This guide gives you the basics for developing PSoC Creator projects.
- **Simple Component example projects:** Choose **File > Open > Example projects**. These example projects demonstrate how to configure and use PSoC Creator Components.
- **Starter designs:** Choose **File > New > Project > PSoC 4100 / PSoC 4200 Starter Designs**. These starter designs demonstrate the unique features of PSoC 4.
- **System Reference Guide:** Choose **Help > System Reference > System Reference Guide**. This guide lists and describes the system functions provided by PSoC Creator.
- **Component datasheets:** Right-click a Component and select "Open Datasheet." Visit the [PSoC 4 Component Datasheets](#) page for a list of all PSoC 4 Component datasheets.
- **Document Manager:** PSoC Creator provides a document manager to help you to easily find and review document resources. To open the document manager, choose the menu item **Help > Document Manager**.

### 1.4.4 Technical Support

If you have any questions, our technical support team is happy to assist you. You can create a support request on the [Cypress Technical Support](#) page.

If you are in the United States, you can talk to our technical support team by calling our toll-free number: +1-800-541-4736. Select option 2 at the prompt.

You can also use the following support resources if you need quick assistance.

- [Self-help](#)
- [Local Sales Office Locations](#)

## 1.5 Documentation 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 Creator User Guide</i> .
[Bracketed, Bold]	Displays keyboard commands in procedures: [Enter] or [Ctrl] [C]
File > Open	Represents menu paths: File > Open > New Project
<b>Bold</b>	Displays commands, menu paths, and icon names in procedures: Click the <b>File</b> icon and then click <b>Open</b> .
Times New Roman	Displays an equation: 2 + 2 = 4
Text in gray boxes	Describes cautions or unique functionality of the product.

## 2. Software Installation

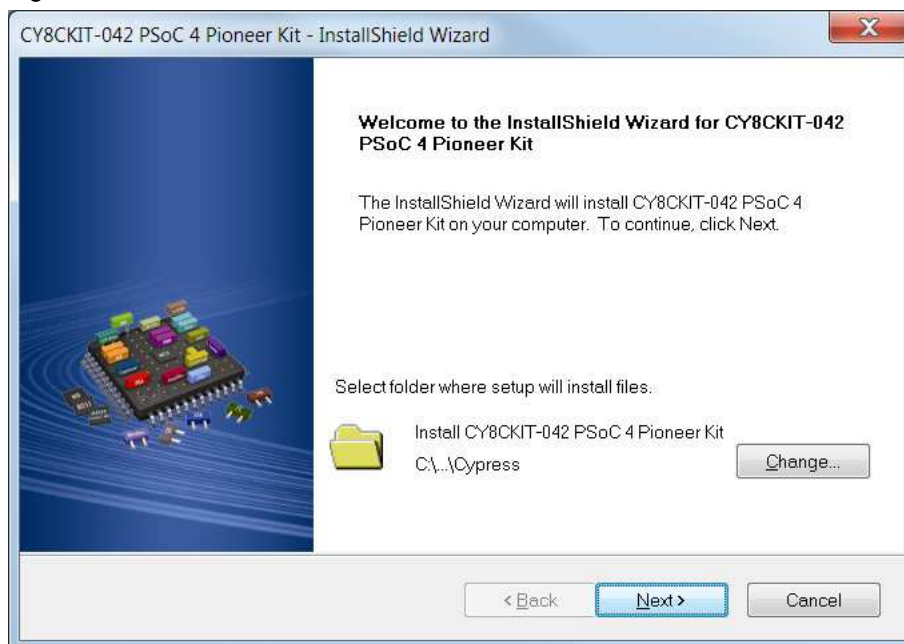


### 2.1 Install Kit Software

Follow these steps to install the PSoC 4 Pioneer Kit software:

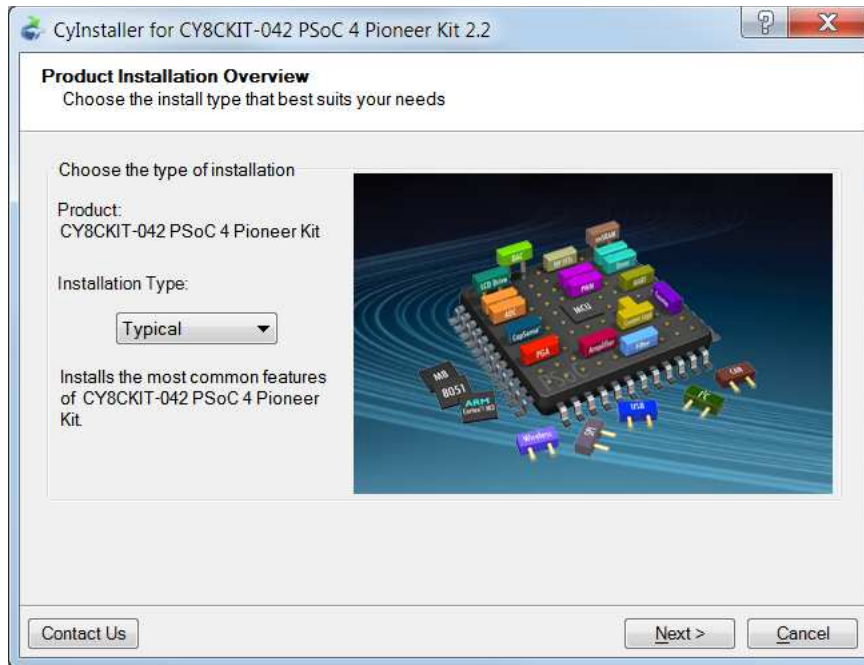
1. Download and install the PSoC 4 Pioneer Kit software from [www.cypress.com/go/CY8CKIT-042](http://www.cypress.com/go/CY8CKIT-042).
2. Select the folder to install the CY8CKIT-042 related files. Choose the directory and click **Next**.

Figure 2-1. Installation Folder



3. Select the installation type and click **Next**.

Figure 2-2. Installation Type Options



4. Read and accept the End-User Licence Agreement and click **Next** to proceed with the installation.

After the installation is complete, the kit contents are available at the following location:  
`<Install_Directory>\CY8CKIT-042 PSoC 4 Pioneer Kit\<version>`

**Note** For Windows 7 users, the installed files and the folder are read-only. To change the property, right-click the folder and select **Properties > Attributes**; disable the **Read-only** radio button. Click **Apply** and **OK** to close the window.

## 2.2 Install Hardware

There is no additional hardware installation required for this kit.

## 2.3 Install Software

When installing the PSoC 4 Pioneer Kit, the installer checks if the required software is installed in the system. If the required applications are not installed, then the installer prompts you to download and install them.

The following software is required:

- PSoC Creator 3.2 Service Pack 1 or later: Download the latest software from [www.cypress.com/go/Creator](http://www.cypress.com/go/Creator).
- PSoC Programmer 3.23.1 or later: Download the latest software from [www.cypress.com/go/Programmer](http://www.cypress.com/go/Programmer).
- Code examples: After the kit installation is complete, the code examples are available in the kit firmware folder. Download the CD ISO image or the setup files to install the kit from [www.cypress.com/go/CY8CKIT-042](http://www.cypress.com/go/CY8CKIT-042).

## 2.4 Uninstall Software

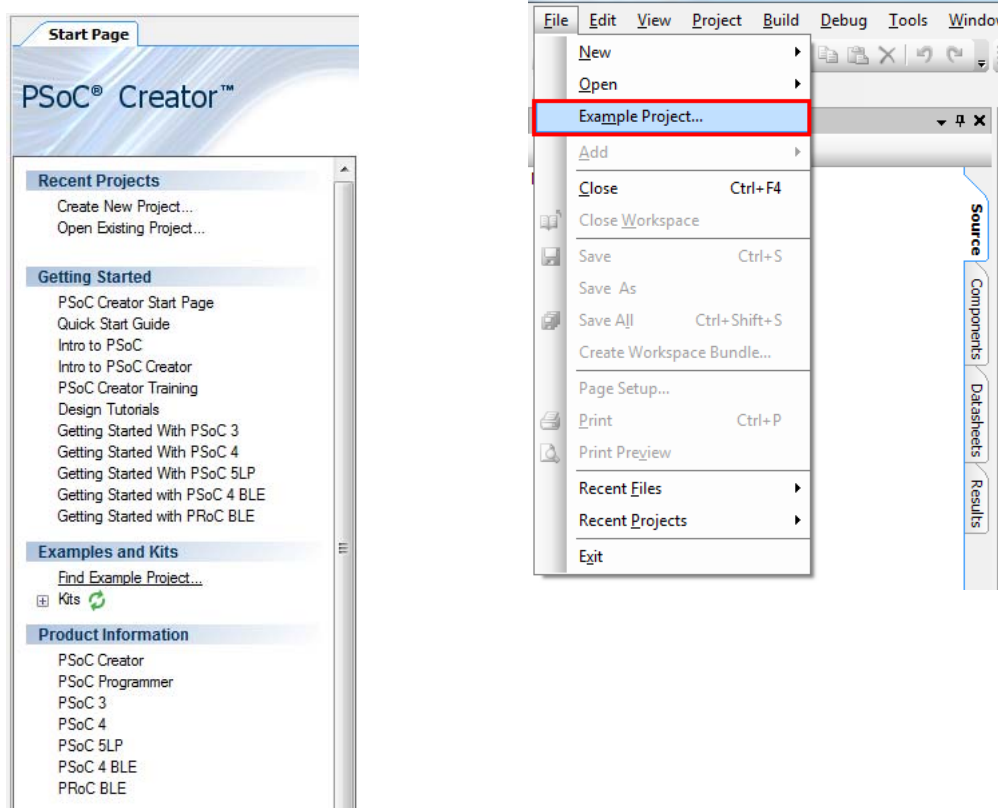
The software can be uninstalled using one of the following methods:

- Go to **Start > All Programs > Cypress > Cypress Update Manager > Cypress Update Manager**; select the **Uninstall** button.
- Go to **Start > Control Panel > Programs and Features**; select the **Uninstall/Change** button.

## 2.5 Develop Code Fast and Easy with Code Examples

PSoC Creator provides several example projects that make code development fast and easy. To access these projects, click **Find Example Project...** under the **Example and Kits** section in the **Start Page** of PSoC Creator or navigate to the Creator tool bar and select **File > Example Project**.

Figure 2-3. Find Example Project

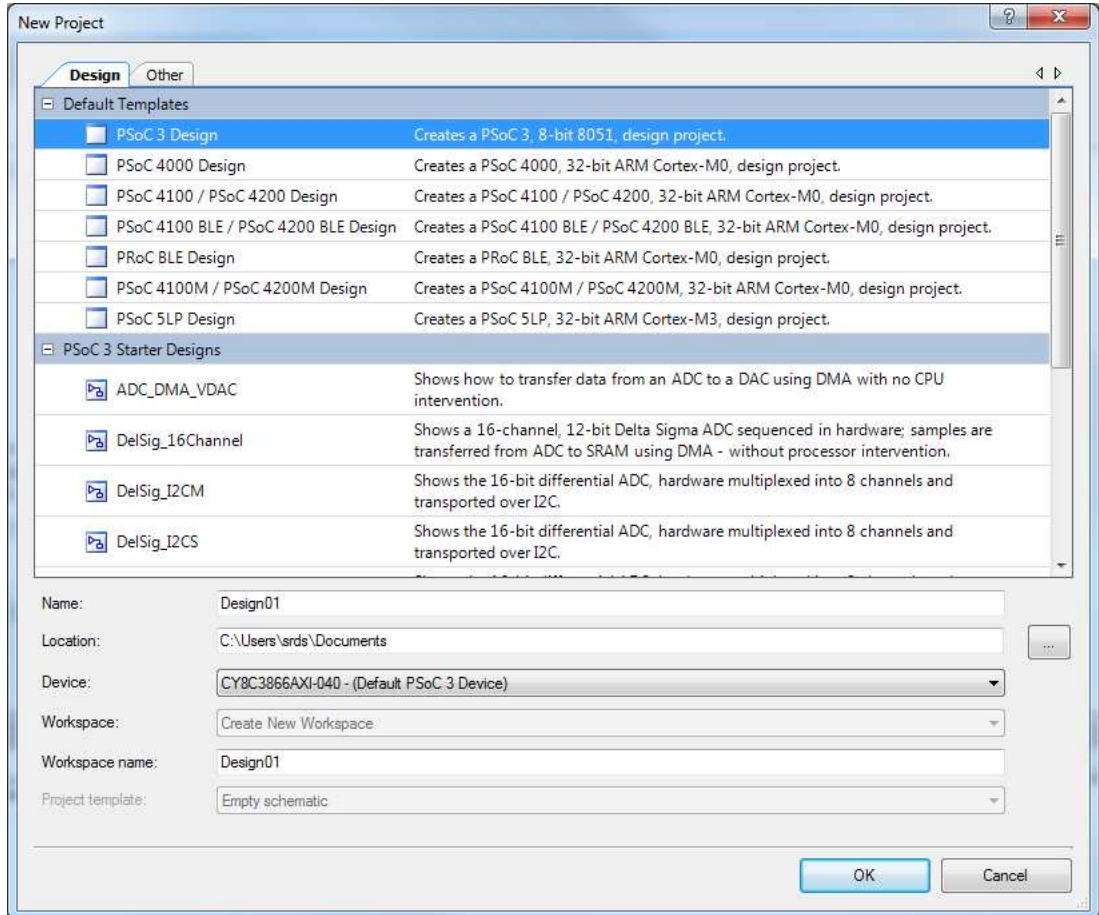


The **Find Example Project** section has various filters that help to locate the most relevant project.



PSoC Creator also provides several starter designs for each device family. These designs highlight features that are unique to each PSoC family. They provide users with a starting place instead of creating a new empty design. These starter projects come loaded with various pre-selected components. To use a starter design, navigate to **File > New > Project** and select the design required.

Figure 2-4. Starter Designs

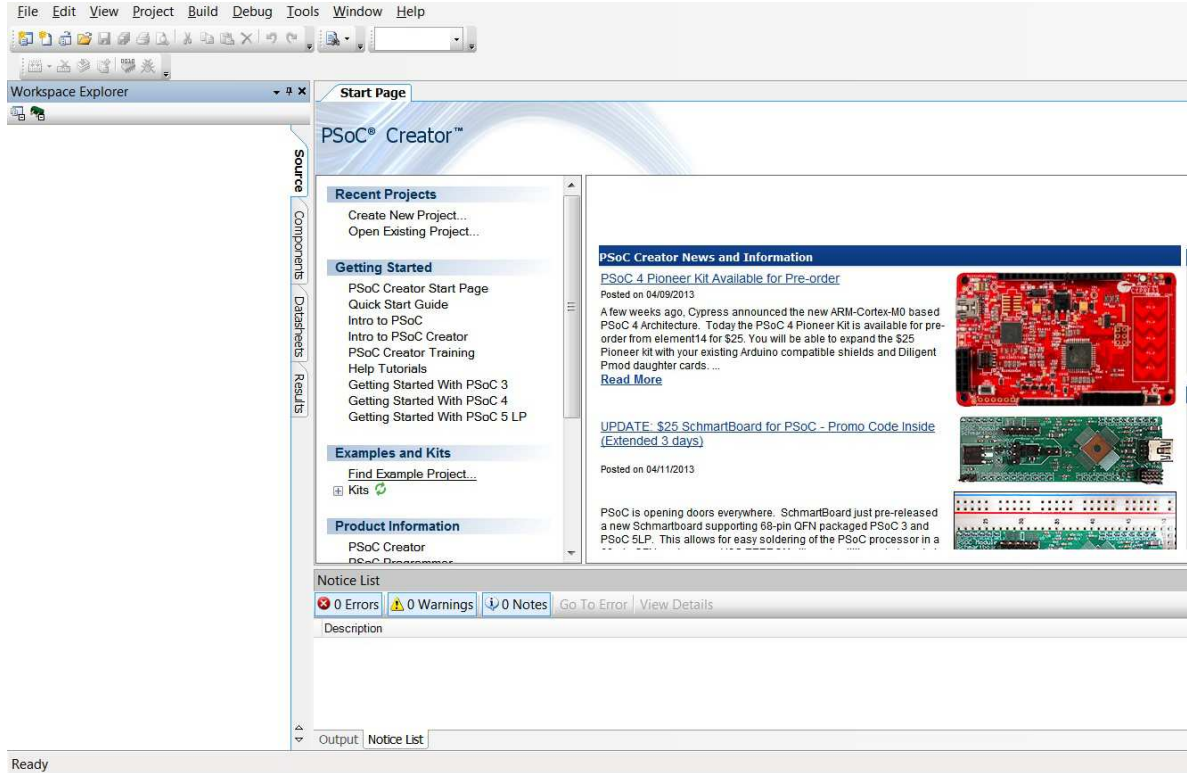


In addition to the example projects and starter designs that are available within PSoC Creator, Cypress continuously strives to provide the best support. Click [here](#) to view a growing list of application notes for PSoC 3, PSoC 4, and PSoC 5LP.

## 2.6 Open an Example Project in PSoC Creator

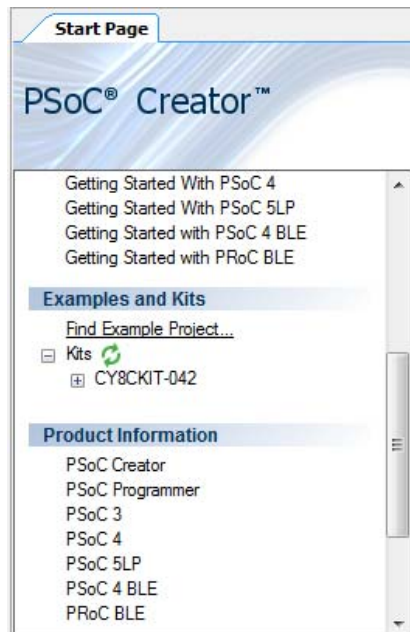
1. Launch PSoC Creator from the Start menu.

Figure 2-5. PSoC Creator Start Page



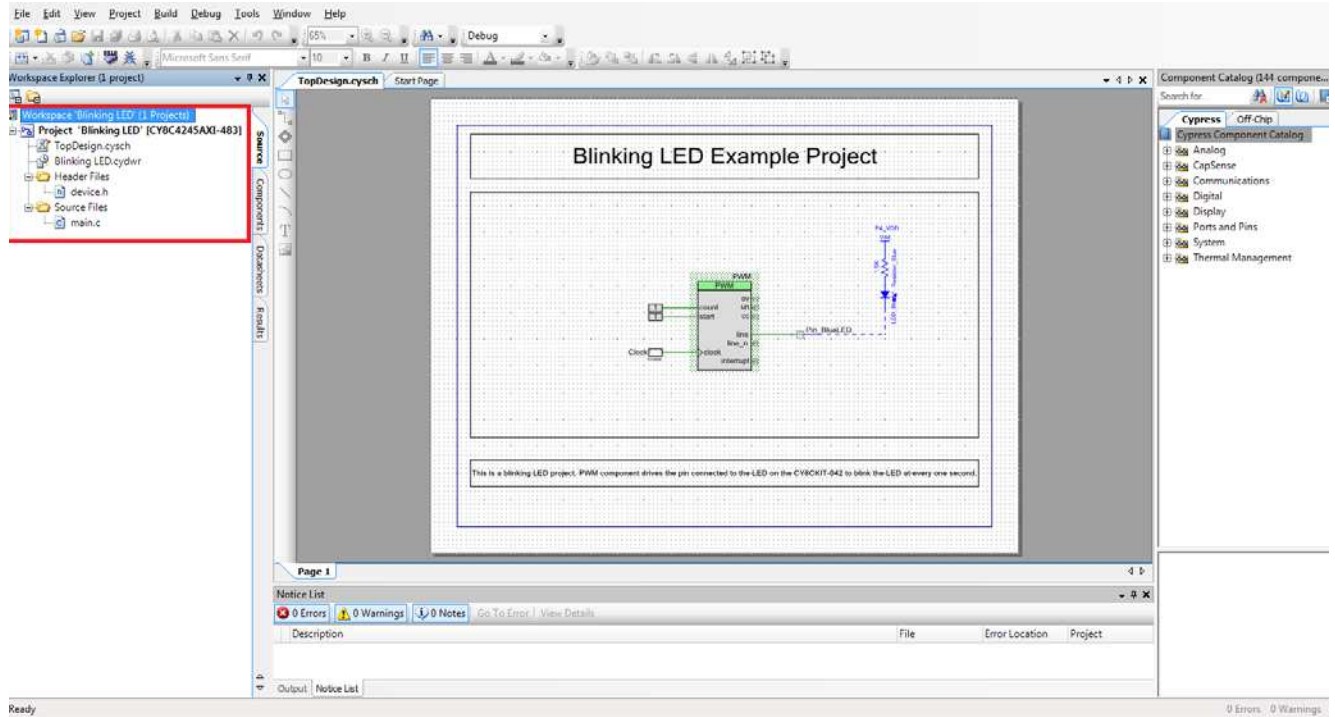
2. Open the example project from the Start Page by clicking <Project.cywrk> present under **Examples and Kits** > **Kits** > **CY8CKIT-042**.

Figure 2-6. Open Example Project



- The example project opens and displays the project files in the Workspace Explorer. Subsequent sections of this user guide describe how to build, program, and understand the example projects supported in this kit.

Figure 2-7. Workspace Explorer

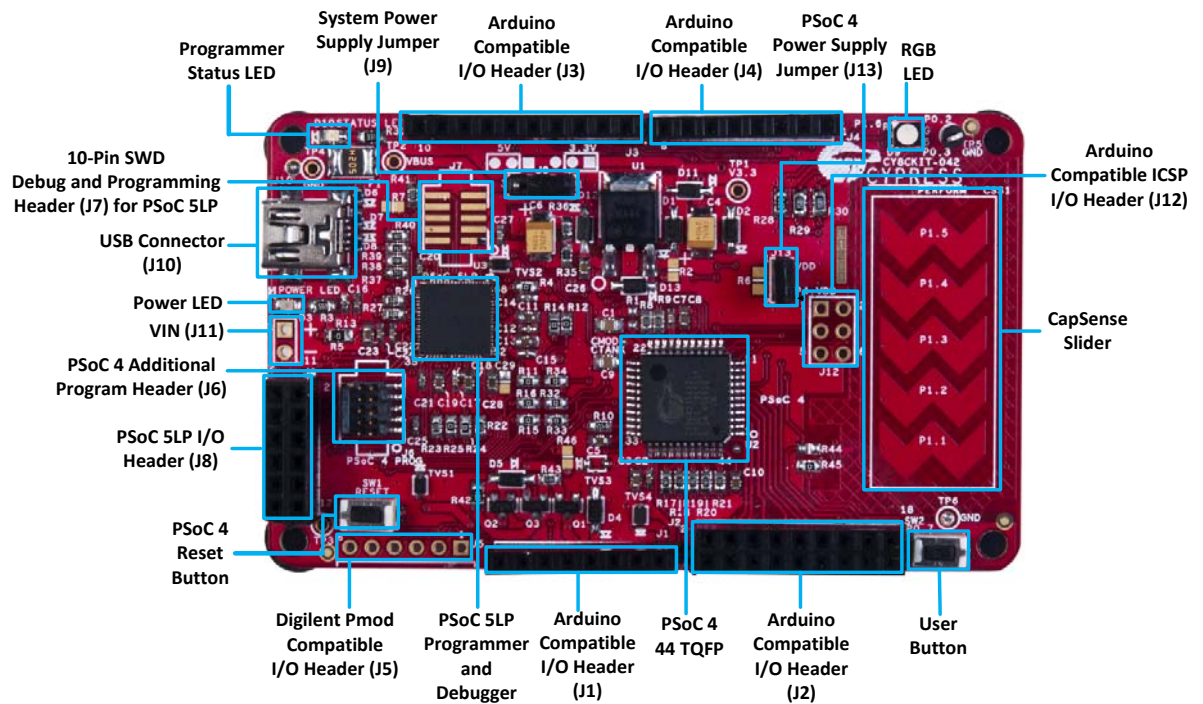


# 3. Kit Operation



The PSoC 4 Pioneer Kit can be used to develop applications using the PSoC 4 family of devices and the Arduino shields and Digilent Pmod daughter cards. Figure 3-1 is an image of the PSoC 4 Pioneer board with a markup of the onboard components.

Figure 3-1. PSoC 4 Pioneer Board



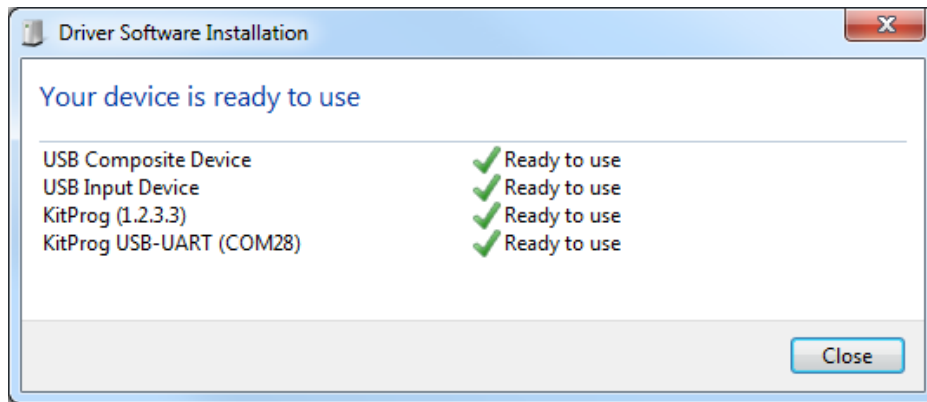
### 3.1 Pioneer Kit USB Connection

The PSoC 4 Pioneer Kit connects to the PC over a USB interface. The kit enumerates as a composite device and three separate devices appear under the Device Manager window in the Windows operating system.

Table 3-1. PSoC 4 Pioneer Kit in Device Manager After Enumeration

Port	Description
USB Composite Device	Composite device
USB Input Device	USB-I <sup>2</sup> C bridge, KitProg command interface
KitProg	Programmer and debugger
KitProg USB-UART	USB-UART bridge, which appears as the COM# port

Figure 3-2. KitProg Driver Installation





### 3.2 Programming and Debugging PSoC 4

The kit allows programming and debugging of the PSoC 4 device in two modes:

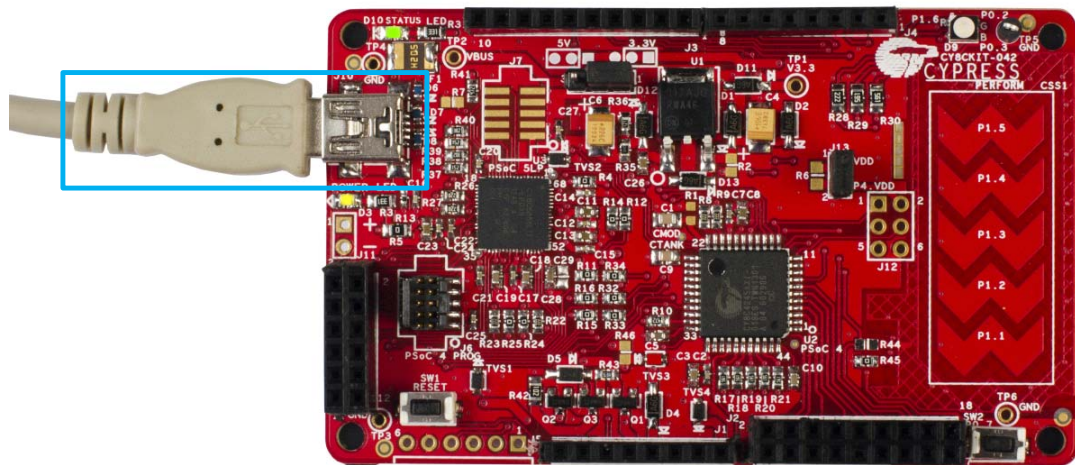
- Using the onboard PSoC 5LP programmer and debugger
- Using a CY8CKIT-002 MiniProg3 programmer and debugger

#### 3.2.1 Using the Onboard PSoC 5LP Programmer and Debugger

The default programming interface for the kit is a USB-based, onboard programming interface. Before trying to program the device, PSoC Creator and PSoC Programmer must be installed. See [Install Software on page 16](#) for information on installing the kit software.

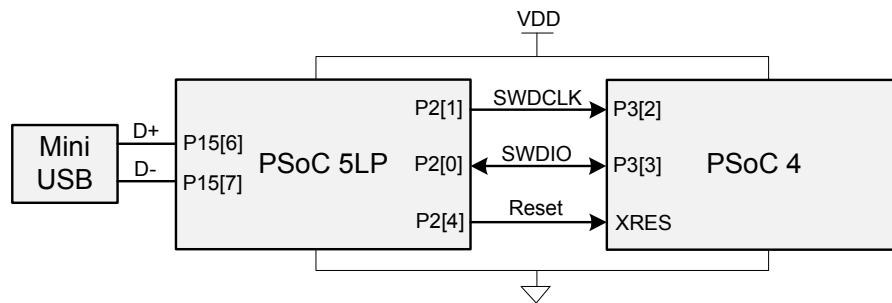
1. To program the device, plug the USB cable into the programming USB connector J10, as shown in [Figure 3-3](#). The kit will enumerate as a composite device. See [Pioneer Kit USB Connection on page 22](#) for details.

Figure 3-3. Connect USB Cable to J10



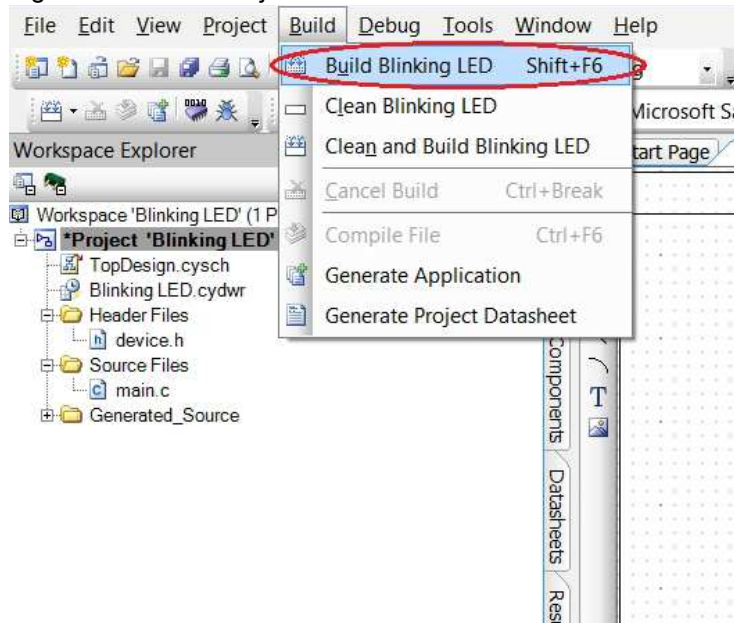
2. The onboard PSoC 5LP uses serial wire debug (SWD) to program the PSoC 4 device. See [Figure 3-4](#) for this implementation.

Figure 3-4. SWD Programming PSoC 4 Using PSoC 5LP



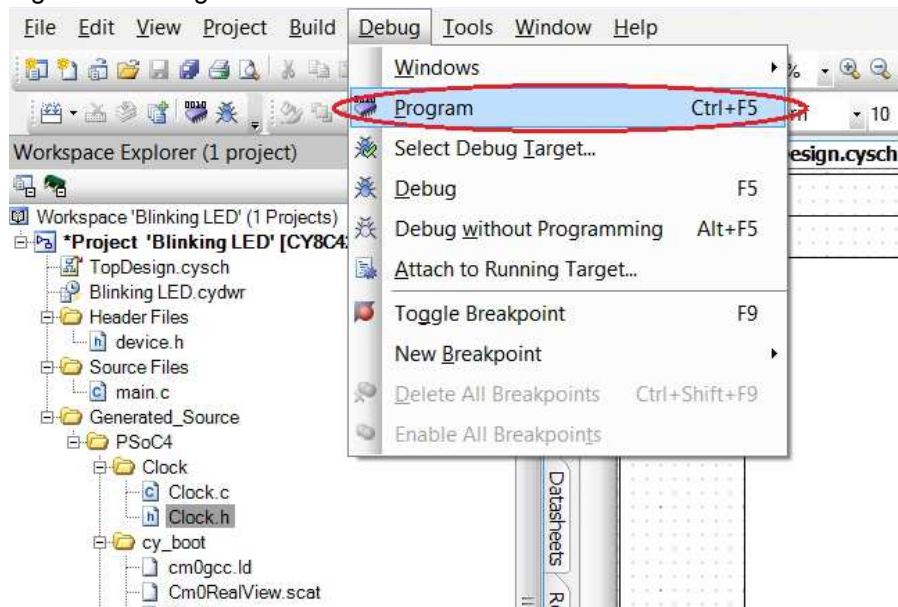
- The Pioneer Kit's onboard programmer will enumerate on the PC and in the software tools as **KitProg**. Load an example project in PSoC Creator (such as the project described in [Install Software on page 16](#)) and initiate the build by clicking **Build > Build Project** or **[Shift]+[F6]**.

Figure 3-5. Build Project in PSoC Creator



- After the project is built without errors and warnings, select **Debug > Program** or **[Ctrl]+[F5]** to program the device.

Figure 3-6. Program Device from PSoC Creator



The onboard programmer supports only the RESET programming mode. When using the onboard programmer, the board can either be powered by the USB (VBUS) or by an external source such as an Arduino shield. If the board is already powered from another source, plugging in the USB programmer does not damage the board.

### 3.2.2 Using CY8CKIT-002 MiniProg3 Programmer and Debugger

The PSoC 4 on the Pioneer Kit can also be programmed using a MiniProg3 (CY8CKIT-002). To use MiniProg3 for programming, use the J6 connector on the board, as shown in [Figure 3-7](#). With MiniProg3, programming is similar to the onboard programmer; however, the setup enumerates as a MiniProg3. Only the RESET programming mode is available.

The board can also be powered from the MiniProg3. To do this, select **Tool > Options**. In the Options window, expand **Program and Debug > Port Configuration**; click **MiniProg3** and select the settings shown in [Figure 3-8](#). Click **Debug > Program** to program and power the board.

**Note:** The CY8CKIT-002 MiniProg3 is not part of the PSoC 4 Pioneer Kit contents. It can be purchased from the [Cypress Online Store](#).

Figure 3-7. PSoC 4 Programming/Debug Using MiniProg3

