# PSoC® Creator™ Release Notes

**Version 3.3, Service Pack 2**

## Overview

PSoC Creator 3.3 Service Pack 2 (SP2) is an upgrade from the PSoC Creator 3.3 SP1 release. This release provides support for the PSoC 4000S, PSoC 4100S, and PSoC Analog Coprocessor device families. It also offers several new and updated components for use with the new devices, including:

- CapSense P4 3.0
- CSD Comp P4 1.0
- Scan_ADC 1.0

This release includes all functionality from previous PSoC Creator version 3.3 releases. If you already have a version of PSoC Creator 3.3 installed, then your version will be updated to include this service pack release. If you do not already have version 3.3, then the complete PSoC Creator 3.3 Service Pack 2 release will be installed.

This release does not replace existing installed versions of PSoC Creator (e.g., 3.1 or 3.2); it installs alongside them. This enables you to move designs to the new version at your own pace. We guarantee that your existing designs can be opened in the new software, but please upgrade your components to the latest version. To ensure that you can always return to your previous setup, a backup of your project is automatically created when opening a project in a new version of the tool. It is stored in a folder named "backup" in the project's folder.

If you have technical questions, visit www.cypress.com/go/support or call 1-800-541-4736 and select 8.

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## Service Pack 2 Features

This release provides support for the following devices and components.

### *PSoC 4000S and PSoC 4100S Support*

The PSoC 4000S and PSoC 4100S product families are members of the PSoC 4 platform architecture. They are a combination of a microcontroller with standard communication and timing peripherals, a capacitive touch-sensing system (CapSense) with best-in-class performance, programmable general-purpose continuous-time and switched-capacitor analog blocks, and programmable connectivity. These products are upward compatible with members of the PSoC 4 platform for new applications and design needs.

### *PSoC Analog Coprocessor Support*

The PSoC Analog Coprocessor is a scalable and reconfigurable platform architecture of programmable analog coprocessors that simplify designing embedded systems with multiple sensors. The PSoC Analog Coprocessor device combines PSoC's flexible Analog Front Ends, programmable analog filters, and high-resolution analog-to-digital converters along with an efficient yet powerful 32-bit ARM® Cortex®-M0+

based signal processing engine – enabling host processors to easily fetch aggregated, pre-processed, and formatted complex sensor data over serial communication interfaces

### *New Components*

The following new components have been added to the PSoC Creator component library for this release:

- CSD_Comp_P4 1.0 – This component uses the comparator in the CapSense® Capacitive Sigma-Delta Modulator (CapSense CSD) block to provide a comparator with adjustable reference voltage.
- IDAC7_P4 1.0 – This component provides a programmable current with a resolution of 7 bits.
- PGA_P4 1.0 – This component implements an opamp-based, non-inverting amplifier with user-programmable gain.
- PVREF_P4 1.0 – This component provides an adjustable stable reference voltage for the analog resources in your design.
- Scan_ADC 1.0 – This component is a scanning SAR ADC that can carry out one of up to four complete, pre-defined, accurately-timed scans covering up to 16 flexibly-defined signal channels, without CPU intervention.
- SmartIO 1.0 – This component provides a programmable logic fabric interposed between a General Purpose Input/Output (GPIO) port and the connections to it from various peripherals and UDB sources.
- UAB_VDAC 1.0 – This component is a general-purpose digital-to-analog converter which is monotonic to 11 bits.

### *Updated Components*

The following components are being updated for one or more of the new devices. Refer to the component datasheet for more information.

- ADC_SAR_SEQ_P4 2.40
- CapSense_P4 3.0 (see description under Service Pack 2 Design Impact)
- Comp_P4 1.20
- cy_boot 5.40
- cy_vref 1.70
- CyLfClk 1.10
- LIN 3.40
- OpAmp_P4 1.20
- RTC_P4 1.10
- SCB_P4 3.20
- SMBusSlave 5.20

### *Migration Issues*

#### PSoC 4 Sequencing ADC SAR Configuration

Nominal voltage for the SAR ADC in the PSoC 4100S device has changed from 1.024 V to 1.2 V. If you switch to the PSoC 4100S device, an error will display. So for the PSoC 4100S device, use the Vref Select = "Internal Vref" option; for all others devices, use the Vref Select = "Internal 1.024 volts" option.

## *Service Pack 2 Design Impact*

### Bootloader Host Tool Incompatible with CySmart v1.2 Dongle

Over-the-Air (OTA) bootloading over Bluetooth Low Energy (BLE) using the Bootloader Host tool is not supported with the latest version of CySmart Dongle/Desktop Application 1.2. Attempts to use the Bootloader Host tool on any PSoC Creator version with BLE and CySmart Dongle/Desktop Application 1.2 will generate the following error message:

```
Communication port reported error 'Unable to open communication port'.
```

OTA bootloading remains fully supported directly through the CySmart Dongle/Desktop Application 1.2 tool. PSoC Creator 3.3 SP2 continues to support CySmart Dongle/Desktop Application 1.1.

### Usability Defect in Smart IO Component

The Smart IO v1.0 component is marked as a prototype because of a defect in the Configure dialog. This defect causes the PSoC Creator window and fonts to automatically resize (or, in extreme cases, disappear) when the Configure dialog is opened. This makes interaction with the tool difficult until you save the workspace and restart PSoC Creator. The problem occurs when the Windows system desktop scaling factor is set above 100%. On Windows 10 machines, this happens automatically when one or more high resolution monitors are connected to the PC. The workaround is to change the Windows desktop scaling factor by entering the Windows 10 Settings dialog. Under **Display Settings**, slide the **Change the size of text, apps and other items:** setting down to 100% and click **Apply**. Windows 10 will ask you to sign out of the current session in order for these changes to take effect. It is important to save all work before doing so.

The component implementation is unaffected by this defect. So, if you do not experience the resizing problem, it is safe to use Smart IO in your projects. Cypress is working on a fix to the component and will offer a new version in a subsequent component pack.

### Updated PSoC 4 CapSense 3.0 Component

The updated PSoC 4 CapSense component, CapSense_P4, adds a new sensing method (CSX), an improved CapSense Tuner GUI, and an improved configuration dialog. This component is not backward compatible with previous PSoC 4 CapSense components, but the component datasheet includes a porting/migration guide.

CSX is a Cypress patented method of performing mutual capacitance measurements for capacitive sensing applications. In CSX mode, the capacitance between two electrodes (Tx and Rx) is measured by the sensing system and the change in mutual capacitance is detected to identify the presence or absence of a finger.

**Note** This component will also include Gestures and SmartSense, based on the new CapSense IP, in a future release of this software.

### SCB0 is not Selectable for CYBL10161

PSoC Creator 3.3 SP1 incorrectly allowed designs to use the non-existent SCB0 in the CYBL10161 device. PSoC Creator 3.3 SP2 now correctly displays an error condition when this usage is detected.

## Component Pack 2 (CP2) Features

PSoC Creator 3.3 Component Pack 2 added components to PSoC Creator 3.3 SP1. This includes the Bluetooth Low Energy (BLE) 3.10 component, which provides production-level support for the Bluetooth 4.2 protocol.

### *BLE Component Update*

The BLE component was updated to provide production-level support for PSoC 4 BLE devices and PRoC BLE devices using Bluetooth 4.2, as well as EZ-BLE modules.

### *Other Updated Components*

The following components have been updated to new versions as part of this release to address various component defects and feature updates. Refer to the component datasheet for specific details.

- TrimMargin 3.0
- LPComp_P4 2.20
- WaveDAC8 2.10

## Service Pack 1 Features

PSoC Creator 3.3 SP1 provided support for the PSoC 4200L family of devices, as well as support for the following products:

- PSoC 4 BLE devices using Bluetooth 4.2 (MPN: CY8C4xx8-BL5xx)
- PRoC BLE devices using Bluetooth 4.2 (MPN: CYBL11x7x)
- EZ-BLE modules (MPN: CYBLE-01201x-00, CYBLE-222005-00, CYBLE-014008-00, CYBLE-214009-00).

### *PSoC 4200L Support*

PSoC 4200L devices combine a microcontroller with digital programmable logic, programmable analog, programmable interconnect, secure expansion of memory off-chip, high-performance analog-to-digital conversion, opamps with comparator mode, and standard communication and timing peripherals. PSoC 4200L devices are fully compatible with members of the PSoC 4 platform for new applications and design needs. The programmable analog and digital subsystems allow flexibility and in-field tuning of designs.

### *BLE Component Update*

The BLE component was updated to support PSoC 4 BLE devices and PRoC BLE devices using Bluetooth 4.2, as well as EZ-BLE modules. The BLE v3.0 component supporting BLE 4.2 is provided at Beta Level for early design starts. If you are developing a Bluetooth application, do not use this release. Instead, use the Component Pack 2 release. See this link for more information:

PSoC Creator Web Page

**IMPORTANT** All BLE component versions 1.x have been removed from this release to reduce the size of the installed software. If you need an earlier version, please contact technical support.

### *Other Updated Components*

The following components have been updated to new versions as part of this release to address various component defects and feature updates. Refer to the component datasheet for specific details. The implementations for these components may change in the production release of PSoC Creator 3.3 SP1 without revision changes.

- ADC_SAR_SEQ_P4 2.30
- CapSense_CSD_P4 2.40
- Bootloader/Bootloadable 1.50
- CharLCD 2.20
- cy_boot 5.30
- cy_dmac 1.10
- cy_pins 2.20
- I2S 2.70
- LIN 3.30
- SCB_P4 3.10
- SegLCD_P4 1.30
- SMBusSlave 5.10
- SW_Tx_UART 1.50
- TCPWM 2.10
- USBFS 3.0

Many of the Code Examples in PSoC Creator 3.3 SP1 have already been updated to use the new versions of these components. If you need an earlier version of a Code Example, please contact technical support.

## Component Pack 1 (CP1) Features

CP1 contained an updated BLE component to version 2.30. The major change to this component included fixing the generated Passkey limitation. The Passkey range is extended to 000000-999999.

For more information, refer to the Component Change section in the BLE component datasheet.

## PSoC Creator 3.3 Features

PSoC Creator 3.3 is an upgrade from the PSoC Creator 3.2 release. It included the following features:

- Guided Pin Selection
- Resource Meter
- Enhanced Example Project Browser
- New Project Wizard
- Macro Callbacks
- Device Packs
- Updated Components

### *Guided Pin Selection*

This feature helps the user make optimal decisions when choosing physical pins in the Pins DWR editor for PSoC 4 devices. Ideal selections are highlighted in green while legal, but resource-consuming, options in yellow.

### *Resource Meter*

This is a new tool window, showing a convenient bar graph of resource utilization.

### *Enhanced Example Project Browser*

This is an updated dialog that supports workspaces (multi-project examples) and can display component examples, kit projects and starter designs.

### *New Project Wizard*

This replaces the existing, complex New Project dialog with a multi-step wizard, enabling the use of code examples, kit projects and templates as start-points for a new design.

### *Macro Callbacks*

Macro callbacks are means of calling user code from generated files without modifying the generated source code. These replace the merge regions, which are preserved for backward compatibility reasons.

### *Device Packs*

This feature enables the addition of new device support to future releases of PSoC Creator without impacting the user experience with existing devices.

### *Updated Components*

The following components have been updated to new versions as part of this release to address various component defects and feature updates. Refer to the component datasheet for specific details.

- BLE 2.20
- Bootloader/Bootloadable 1.40
- cy_boot 5.20
- PSoC 4 CapSense CSD/Gestures 2.30

## Design Impact

### *BLE Component Generated Passkey Limitation*

| Cypress ID | Component Version | Problem | Workaround |
|---|---|---|---|
| 210683 | All versions | When using the pairing method with a Passkey Entry, and when the BLE component of a device has a display and generates the passkey, then the generated passkey is limited to the range 000000-065535. | No workaround. The range will be extended to 000000-999999 in an upcoming version of the component. |

### *Removing Older Component Versions*

A number of old versions of components were re-classified as obsolete for all devices in this release. These components are not shipped with the PSoC Creator 3.3 software. In all cases there are newer versions of the component that are of a higher quality. You should update your designs to use these newer components.

Using the obsolete components in PSoC Creator 3.3 will cause a design-rule error to be output to the Notice List window. This message requests that you update the component version or take alternative actions to get onto supported implementations. The following are the affected components:

| Component | Removed Version(s) | Current Version |
|---|---|---|
| ADC SAR | 1.80 | 3.0 |
| AMux Sequencer | 1.60 | 1.80 |
| Bluetooth Low Energy (BLE) | 1.x | 2.30 Production<br>3.0 Beta |
| Boost Converter | 2.10 | 5.0 |
| Bootloader/Bootloadable | 1.0 | 1.40 |
| CAN | 2.10, 2.20 | 3.0 |
| CapSense CSD (non PSoC 4) | 3.20 | 3.50 |
| Character LCD | 1.60 | 2.10 |
| Counter | 2.20 | 3.0 |
| CRC | 2.20 | 2.40 |
| cy_boot | 3.0, 3.10 | 5.20 |
| DFB | 1.10 | 1.40 |
| D Flip Flop | 1.0, 1.10 | 1.30 |
| Die Temp | 1.80 | 2.0 |
| EEPROM | 2.0 | 3.0 |
| File System Library (emFile) | 1.10 | 1.20 |
| EMIF | 1.10 | 1.30 |
| EZI2C | 1.70 | 2.0 |

| Component | Removed Version(s) | Current Version |
|---|---|---|
| Fan Controller | 2.10 | 4.0 |
| Filter | 2.10 | 2.0 |
| I2C | 3.10 | 3.50 |
| I2S | 2.30 | 2.60 |
| IDAC8 | 1.90 | 2.0 |
| LIN | 1.10 | 3.20 |
| Mixer | 1.90, 1.91 | 2.0 |
| Opamp | 1.80 | 1.90 |
| PGA | 1.80 | 2.0 |
| PGA Inverting | 1.80, 1.90 | 2.0 |
| Power Monitor | 1.10 | 1.60 |
| PrISM | 2.10 | 2.20 |
| PRS | 2.10 | 2.40 |
| PWM | 2.20 | 3.30 |
| Quadrature Decoder | 2.10 | 3.0 |
| Resistive Touch | 1.10 | 2.0 |
| RTC | 1.70 | 2.0 |
| Sample Track and Hold | 1.20, 1.30 | 1.40 |
| Segment LCD | 3.10 | 3.40 |
| Shift Register | 2.10 | 2.30 |
| Sleep Timer | 3.0 | 3.20 |
| SPDIF_Tx | 1.10 | 1.20 |
| SPI Master | 2.30 | 2.50 |
| SPI Slave | 2.30 | 2.70 |
| Static Segment LCD | 2.10 | 2.30 |
| Status Register | 1.70 | 1.90 |
| TIA | 1.90, 1.91 | 2.0 |
| Timer | 2.30 | 2.70 |
| Trim and Margin | 1.0 | 2.0 |
| USBFS | 2.20, 2.30 | 2.80 |
| Vector CAN | 1.0 | 1.10 |
| Voltage Fault Detector | 1.0 | 3.0 |
| Voltage Sequencer | 2.0 | 3.40 |

## Supported Devices

The design flow and tools available in this release of PSoC Creator support the following:

| Family | Part Numbers | | | |
|---|---|---|---|---|
| PSoC 4000, PSoC 4000S | CY8C40* | CY8C40*S | | |
| PSoC 4100, PSoC 4100 BLE, PSoC 4100M, PSoC 4100S | CY8C41* | CY8C41*BL | CY8C41*M | CY8C41*S |
| PSoC 4200, PSoC 4200 BLE, PSoC 4200L, PSoC 4200M | CY8C42* | CY8C42*BL | CY8C42*L | CY8C42*M |
| PSoC Analog Coprocessor | CY8C4A* | | | |
| PRoC BLE | CYBL1* | | | |
| EZ-BLE modules | CYBLE* | | | |
| PSoC 3 | CY8C32* | CY8C34* | CY8C36* | CY8C38* |
| PSoC 5LP | CY8C52*LP | CY8C54*LP | CY8C56*LP | CY8C58*LP |

## Supported Tool Chains

### *Toolchains for PSoC 3 (8051)*

#### DP8051 Keil™ 9.51a

The Keil PK51 Professional Developers Kit for PSoC is installed with PSoC Creator. It supports optimization levels 0 through 5. If you would like to use the compiler optimization levels above level 5, you should purchase the standard PK51 product by contacting Keil.

- In North, Central, or South America... sales.us@keil.com
- In Europe, Asia, Africa, or Australia... sales.intl@keil.com

The free Keil toolchain comes with a 30 day evaluation license. You can extend the license, without cost, by registering the product from within PSoC Creator (**Help > Register > Keil…**). Note that the extended license is for one year and that you will need to re-register it each year.

#### DP8051 Keil Generic

This option can be used to select a separately-installed version of the Keil toolchain. While any version can be selected, the only officially supported versions are 8.16, 9.03, and 9.51a.

### *Toolchains for PSoC 4 and PSoC 5LP (ARM)*

- **ARM GCC –** The GCC ARM Embedded toolchain GCC 4.9-2015-q1-update is installed with PSoC Creator. This toolchain has no use restrictions and does not require license activation (it is distributed under the terms of the GNU Public License).
- **ARM GCC Generic –** This option can be used to select a separately-installed version of the ARM GCC toolchain.
- **ARM MDK Generic –** This option can be used to select a separately-installed version of the ARM Microcontroller Development Kit. The officially supported version is 4.72a.

# Installation

## *Minimum and Recommended System Requirements*

The following are system requirements to install and use PSoC Creator. Each requirement specifies a minimum that your system must meet or exceed.

PSoC Creator will execute correctly in highly resource-constrained systems. However, performance (startup time, project creation and opening, build times, and so on) may be impacted when resources are scarce. The most directly impacted performance metric is build time. The following sections provide examples of the resource scarcity impact.

**Note** During initial startup, PSoC Creator builds and caches component DLL files used to display the component parameter editors. As a result, the tool will launch less quickly the first time after a new installation or a Windows® reboot.

### Summary

| Hardware/Operation System Requirements | Minimum |
|---|---|
| ▪ Processor | 1 GHz or faster 32-bit (x86) or Intel 64/ AMD64 64-bit |
| ▪ RAM | 1 GB |
| ▪ Free Hard Drive Space | 5 GB |
| ▪ Screen Resolution | 1024x768 |
| ▪ USB | 2.0 |

| Software Prerequisites * | Minimum Version |
|---|---|
| ▪ Microsoft Internet Explorer (not IE8 beta) | 7 |
| ▪ .NET Framework | 4.0 |
| ▪ Adobe Reader (for viewing PDF Documentation) | 9.2 ** |
| ▪ Windows Installer | 3.1 |
| ▪ PSoC Programmer | 3.24.2 |
| ▪ Keil Compiler | 8.16 (9.51a provided) |

* To install and run PSoC Creator, you may also need to install additional software. The Cypress Installer will guide you through the process if the additional programs are not already installed.

** For Windows 7, the minimum required version of Adobe Reader is version 9.2. You can download the latest version here: http://get.adobe.com/reader/. You can also use a non-Adobe PDF reader if you prefer; however, Cypress has no recommendations for any particular non-Adobe reader or version.

### Processor

1 GHz or faster 32-bit (x86) or Intel 64/AMD64 64-bit processor is required.

PSoC Creator exhibits a predictable relationship between CPU speed and build time above 1 GHz. Doubling the CPU speed, e.g., from 1 GHz to 2 GHz or 1.5 GHz to 3 GHz, almost halves the build time.

On a fast (3 GHz) PC, simple designs can build in about one minute. At low speeds even designs that fill the device and generate complex routing solutions will build in under 5 minutes.

### Operating System

One of the following Windows platforms is required:

- Windows XP SP3 (32-bit supported)
- Windows Vista SP2 (32- and 64-bit supported)
- Windows 7 and Windows 7 SP1 (32- and 64-bit supported)
- Windows 8 and Windows 8.1 (32- and 64-bit supported)
- Windows 10 (32- and 64-bit supported)
- Mac OS X Yosemite on VMware Fusion 7 running Windows 7 SP1
- Mac OS X Yosemite on Parallels Desktop 10 running Windows 8.1

### Memory

A minimum of 1 GB of RAM is required.

### Free Disk Space

PSoC Creator requires 5 GB of free disk space. PSoC Creator will install and run with just 1 GB of free disk space. However, in order to allow Windows to do memory paging, we recommend a minimum free disk space requirement of 5 GB.

If your disk is highly fragmented it will severely impact memory paging time and can result in very long build times. Disks that are nearly full are particularly prone to fragmentation. We recommend de-fragmenting your disk if you experience excessively long build times (10 minutes or more).

### USB

PSoC Creator requires a USB 2.0-compliant host to program and debug.

### Screen

A resolution of 1024x768 pixels or higher is required.

**Note** The build time examples given above were obtained with new product installations on minimally fragmented disks with no other applications running. If your build times exceed these expectations we recommend closing unnecessary applications, adding RAM to the system (to reduce paging) and ensuring that there is sufficient free and unfragmented disk space.

## *Software Update Instructions*

As part of the installation process, the Cypress Update Manager utility will also be installed and located on the Start menu. You can use this utility to update all Cypress programs you have installed when updates for them become available.

## Open Source

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## Installation Notes

The installation process is a set of wizards that walk you through installing various components. You can install PSoC Creator and various prerequisites from the web or from a DVD. There are slight differences in the process based on the medium used to install the software.

The DVDs provide the necessary prerequisites and the wizards to guide you through installing the appropriate software. The following sections contain more specific installation details.

**Note** Do NOT plug in your Miniprog3 until all software installation is complete AND the PSoC Creator application has been opened.

### PSoC Creator DVD Installation

The PSoC Creator DVD contains PSoC Creator and PSoC Programmer, as well as various prerequisites.

1. Load the DVD. The main installer program should run automatically. If not, double-click the cyautorun.exe file to launch it.
2. On the main installer, click the **Install PSoC Creator <version>** button to launch the PSoC Creator InstallShield Wizard.
3. Follow the prompts on the wizard. The CyInstaller for PSoC Creator opens and displays steps to install PSoC Creator.
4. Click the hyperlink for any software that is not installed as indicated (such as, Acrobat Reader, etc.). Run the installer for that program as needed.
5. Continue following the prompts to install PSoC Creator.

### Cypress PSoC Kit DVD Installation

A kit DVD contains PSoC Creator and PSoC Programmer, as well as projects, documentation, and prerequisites needed for the associated kit. Refer to kit instructions.

### Web Installation

If you are downloading the software from the web (www.cypress.com/creator), run the PSoC Creator single package executable.

1. Double-click the PSoC Creator executable file to launch the installer.
2. Follow the prompts to install PSoC Creator. The CyInstaller for PSoC Creator opens and displays a series of steps to install PSoC Creator, and it will perform pre-requisite checks and install the prerequisites.
3. When complete, close the installer.

## Further Reading

The primary documentation for PSoC Creator is provided in the Help, which you can open from the **Help** menu or by pressing [**F1**]. Other documents included with this release are also available from the **Help** menu, under **Documentation**. These documents include (but are not limited to):

- Quick Start Guide
- System Reference Guide
- Component Author Guide

Cypress provides a web page specifically for PSoC Creator at www.cypress.com/creator. Other documentation includes (but is not limited to):

- Device Datasheets
- Device Architecture Technical Reference Manual (TRM)
- Device Registers TRM
- Application Notes
- Training

Contact your Cypress representative, as needed.

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