# PSoC Designer Release Notes

**Version 5.1, Beta 2**

Release Date: June 22, 2010

Thank you for your interest in PSoC® Designer™ 5.1, Beta 2. PSoC Designer is a complete Integrated Development Environment (IDE) for designing with PSoC 1 devices. This release is an update to Beta 1. It is also a complete release for new users.

This document describes new features and changes since the previous release.

## Contents

New Features, User Modules, and Device Support ..... 1
User Module Versioning ..... 1
Project Update ..... 1
More Status Indication for Long Operations ..... 2
User Feedback Mechanism ..... 2
Support for ImageCraft Pro Compiler ..... 2
USB Bootloader (BootLdrUSBFSe) User Module (beta) ..... 2
Segment LCD Driver User Module (beta) ..... 2
LIN Slave User Module (beta) ..... 2
TS2000 User Module (beta) ..... 2
New Members of the CY8C20x36 Family. ..... 3
New Members of the CY8C20x34 Family ..... 3
New Version! CSD2X User Module for CY8C21x45 and CY8C22x45 PSoC Devices ..... 4
Design Impact ..... 5
Open Source ..... 5
Supported Tool Chains ..... 5
ImageCraft Compiler (Standard and Pro versions) ..... 5
Installation ..... 6
Minimum and Recommended Requirements ..... 6
Update Instructions ..... 6
Installation Notes ..... 6
Note to HI-TECH Compiler Users ..... 7
Known Problems and Limitations for PSoC Designer 5.1 Beta 2 ..... 8
Further Reading ..... 8
Defects Fixed ..... 8

## New Features, User Modules, and Device Support

The primary purpose of this release is to fix defects found in PSoC Designer 5.1 Beta 1 (PD5.1). This release also provides a new feature and fixes some defects, as follows:

### User Module Versioning

This release provides the capability of supporting multiple versions of a user module so that you have the choice of continuing to use an older version or updating to the latest version. Additional information about the differences between user module versions is also provided.

### Project Update

A new user interface simplifies updates such as the release of new user modules or boot.tpl files.

### More Status Indication for Long Operations

In PSoC Designer 5.1 beta 2, new status messages have been added during project open/save/generate, and user module placement/next shape/delete.

### User Feedback Mechanism

Have a quick comment about PSoC Designer? Just go to the Help menu in PSoC Designer and send us a comment.

### Support for ImageCraft Pro Compiler

PD5.1 introduces native support for the ImageCraft Pro compiler, available for purchase at http://imagecraft.com (click on Cypress PSoC1 Compiler Tools).

### USB Bootloader (BootLdrUSBFSe) User Module (beta)

A new version of the USB bootloader (BootLdrUSBFSe) user module is available. The BootLdrUSBFSe User Module is an enhanced version of the original USB bootloader.

- Support for interchangeable compilers. The original USB bootloader required a single compiler to be used for the life of the bootloader. A jump table has been implemented to allow multiple compilers to be used in the lifespan of a single bootloader.
- Allows updates to be applied seamlessly to the bootloader without impacting performance.
- Ability to use the USBUART User Module as the communication interface. The original bootloader predated the USBUART User Module.
- Ability to implement custom code into bootloader.
- Multiple flash programming options with either fixed or dynamic temperature parameters.
- Ability to disable the startup checksum for rapid entry into application code.
- A simplified interface that reduced the number of parameters from 12 to 7.

See the BootLdrUSBFSe User Module datasheet for more information.

### Segment LCD Driver User Module (beta)

The SLCD Driver User Module drives the LCD glass directly without using any external components. The module demonstrates two techniques of LCD drive that are selectable from the wizard. It is supported in a number of PSoC families. See the user module datasheet for further information.

### LIN Slave User Module (beta)

The LINS User Module implements a LIN 2.1 slave node on a PSoC device. In addition, options for LIN 2.0 or SAE J2602-1 compliance are available. This user module consists of the hardware blocks necessary to communicate on the LIN bus and an API to allow the application code to easily interact with the LIN bus communication. The user module provides an API that conforms to the API specified by the LIN 2.1 specification. This is supported for the automotive versions of CY8C21x45 and CY8C22x45 devices.

### TS2000 User Module (beta)

The user module enables the user to create haptics effects using the Immersion TS2000 technology. Haptics is a tactile sensation effect that aids in the equipment user knowing that a touch event has been detected. This improves the input accuracy and user satisfaction with the equipment. The user module will only be visible in the catalog for the special part numbers, specifically the following:

CY8C20336H-24LQXI, CY8C20446H-24LQXI, CY8C22345H-24PVXA, CY8C20346H-24LQXI

See the User Module datasheet for more information.

**New Members of the CY8C20x36A Family.**

The following new parts are supported in PSoC Designer 5.1 Beta 2.

CY8C20336AN-24LQXI, CY8C20436AN-24LQXI, CY8C20636AN-24LTXI

These parts do not have support for the ADC user module. The table below shows further details

| Krypton Features | CY8C20336AN-24LQXI | CY8C20436AN-24LQXI | CY8C20636AN-24LTXI |
|---|---|---|---|
| Flash Size | 8K | 8K | 8K |
| RAM Size | 1K | 1K | 1K |
| ADC | **No** | **No** | **No** |
| CapSense | Yes | Yes | Yes |
| Comparators | Yes | Yes | Yes |
| 32KHz Oscillator | Yes | Yes | Yes |
| USB | No | No | No |
| XRES | Yes | Yes | Yes |
| I2C | Yes | Yes | Yes |
| Package | 24 QFN | 32 QFN | 48 QFN |

**New Members of the CY8C20x34 Family**

The following table shows an overview of the two parts added. These parts are targeted at the Small Home Appliances and White Goods market. For details, please see the datasheet.

| Part Number | CY8C20134-12SXI | CY8C20234-12SXI |
|---|---|---|
| **Flash Size** | 8K | 8K |
| **Ram Size** | 512 | 512 |
| **XRES** | Yes | Yes |
| **I2C** | Yes | Yes |

| Part Number | CY8C20134-12SXI | CY8C20234-12SXI |
|---|---|---|
| **Package** | 8 SOIC | 16 SOIC |

**New Version! CSD2X User Module for CY8C21x45 and CY8C22x45 PSoC Devices**

With PSoC Designer 5.1, there is a new version (v2.1) of the CSD2X User Module for CY8C21x45 and CY8C22x45 PSoC devices only. The new version of this user module has the following new or improved features.

- Ability to change most scan settings at run-time (new API functions have been added). This enables easy and flexible CapSense tuning.
- Ability to gang multiple sensors together to scan them at the same time with unique scan settings.
- The resolution of the Reference scan setting has been improved. Now 5-bit reference resolution is available when the UM is placed in analog columns 2 and/or 3 and 4-bit reference resolution is available when the UM is placed in analog columns 0 and/or 1. Previously, only the 3-bit resolution was available for the Reference setting.

*If You Have an Existing Project with the CSD2X v1.x User Module That You Do Not Want to Change*

The new version (v2.1) of this user module is *not* backwards compatible with previous versions of this user module. However, you can continue to use the previous version if you desire. Also, you can continue with PSoC Designer 5.0 as this will co-exist with PSoC Designer 5.1.

*New Projects with the CSD2X User Module*

The best strategy to take advantage of the improvements in the CSD2x User Module on CY8C21x45 and CY8C22x45 devices is to start a new project with PSoC Designer 5.1. Any CSD2x User Module that you add to your project will be the new 2.1 version. You will be able to take full advantage of the new and improved features of the 2.1 version of the user module.

*Upgrading an Existing Design to the CSD2X User Module Version 2.1*

If you are willing to do the rework necessary in an existing design to take advantage of the improvements in the user module, open your existing design in PSoC Designer 5.1.

- The old user module wizard had the ability to define unique scan settings for each sensor. The new user module does not have this ability. Instead, it sets all scan settings the same and allows you to change them at run time. All sensors will be scanned with these same scan settings unless the scan settings are changed at run-time in user application code. All scan settings that were previously defined for each sensor in the user module wizard will be lost and any scan settings that were previously defined in the user module properties will be reset to their default values.
- All Reference values for the user module now range from 0 to 31. The previous range was from 0 to 7. The old values are retained rather than converted. You will have to adjust the settings. For example, in the original user module, a Reference setting of 2 provided a reference that was 3/8 of full-scale. In CSD2x 2.1 the same reference value of 2 gives a reference that is 3/32 of the full-scale. You must reset the reference to 11 to get a reference that is 3/8 full scale.

If your project no longer works as desired after upgrading a CSD2X UM to version 2.1, this is what you should do to restore the proper functionality of your project.

1. Go through each setting for the UM and ensure that it is proper. You may need to modify user module settings to restore desired settings. Pay particular attention to the reference value settings, since these values are now on a different scale.
2. If you need any sensors to have unique scan settings, then you must modify your application code to change the scan settings before you scan the affected sensors. Unique scan settings for each sensor can now only be implemented by modifying the scan settings at run-time. New API functions have been provided to implement this.
3. It may be necessary to retune the sensors.

## Design Impact

The following section contains important notes from this release that could affect your designs:

Several updates have been made in PSoC Designer 5.1 Beta 2 to improve the updateability of projects both in the field and with subsequent releases of PSoC Designer. These include:

- The ability to optionally stay with older versions of User Modules or upgrade based on the improvements made to the UM and the phase of your design cycle.
- A new Project Update interface, featuring extensive help on moving the boot.tpl file.
- A new user module, BootLdrUSBFSe, mentioned earlier, which addresses previous difficulties customers may have encountered when changing compilers or deploying a bootloader update.

Some PSoC 1 customers have observed that with certain firmware running, some parts may reset and become unresponsive. This happens when a watchdog timer reset is followed by failure to clear the watchdog timer before another reset is asserted.

This problem is heavily influenced by the trimmed and untrimmed IMO and ILO frequencies. It is also influenced by the firmware used by the customer; specifically by how quickly the watchdog timer is cleared in boot.asm.

Resolving the problem involves changing firmware and screening parts for low IMO frequencies and high ILO frequencies. An instruction has been added in the boot.tpl/boot.asm files to clear the Watch Dog Timer (WDT) immediately before enabling the WDT. This occurs near the beginning of the boot files. This is to prevent a subsequent Watch Dog Reset (WDR) from occurring within this boot firmware if a Watch Dog Reset has occurred.

## Open Source

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## Supported Tool Chains

### ImageCraft Compiler (Standard and Pro versions)

ICCV7 for M8C STD version 7.04.

ICCV8 for M8C PRO

## Installation

### Minimum and Recommended Requirements

| Hardware/Operation System Requirements | Minimum | Recommended |
|---|---|---|
| • Processor Speed | 2 GHz | 2 GHz Dual Core |
| • MB of RAM | 2 GB | 3 GB |
| • MB of Free Hard Drive Space | 1 GB | 1 GB |
| • Screen Resolution | 1024x768 | 1280x1024 |
| • CD/DVD Drive | Not Req. | ✓ * |
| • USB | Full Speed | 2.0 Hi-Speed |
| • Windows® XP (SP2 or higher), Vista, or Windows 7 | ✓ | ✓ |

| Software Prerequisites ** | Minimum/Recommended Version | |
|---|---|---|
| • Microsoft Internet Explorer (not IE8 beta) | 7 | |
| • .NET Framework | 2.0 SP1 | |
| • Adobe Reader (for viewing PDF Documentation) | 6 | 9+ |
| • Windows Installer | 3.1 | |
| • PSoC Programmer | 3.12 beta | |

* CD/DVD drive is only required for installation with no web access.

** Software Prerequisites – In order to install and run the PSoC Designer, 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.

### 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 programs you have installed when updates for them become available.

Follow the instructions provided with the tool, as needed.

### Installation Notes

The Installation process has changed from PSoC Designer 5.0. This was done to accommodate a Live Update capability and decrease download size. The installation process is a set of wizards that walk you through the installation. You can install PSoC Designer and various prerequisites from the web. For those that have issues with installing behind a firewall or on a machine with no internet connection, an ISO file is provided on the web for creation of your own CD. There are slight differences in the process, based on the medium used to install the software.

In order to install PSoC Designer, you need to first install PSoC Programmer. The CDs provide the necessary prerequisites and the wizards to guide you through installing the appropriate software. The Web installation requires you to download and install the executables separately. The following sections contain more specific installation details.

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

*How to Install PD5.1 from the Web:*

1. Download PSoCDesignerSetup.exe from the Cypress website.
2. PSoCDesignerSetup.exe will install CyInstaller for PSoC Designer.
3. CyInstaller will do a pre-requisite test, leading the user through the install process for missing prerequisites such as PSoC Programmer.
4. When the pre-requisite tests are passed, CyInstaller will provide the user with the option to do a "Typical", "Complete" or "Custom" install.
    a. Typical or Complete Install: Will install the latest available PSoC Designer 5.1 release.
    b. Custom Install: Will show the user all releases of PSoC Designer 5.1 and install the selected release (for now there is just one).
5. Once the PD5.1 release is downloaded, CyInstaller will display the EULA & other applicable licenses.
6. Once the install is complete, CyInstaller will display the finish screen with options to view the "Release Notes" and "Add Desktop Shortcut".

*How to Install Using an ISO Image (2 methods):*

1. Create a CDROM using the ISO image:
    a. Drag the ISO image onto the CD/DVD drive containing the CD/DVD. Right click on the CD/DVD drive and select "Burn" to create a CD/DVD for PD5.1 installation.
    b. Download MagicISO (http://www.magiciso.com/download.htm) and follow the tutorial to create a CD/DVD from ISO http://www.magiciso.com/tutorials/miso-burnwin.htm .
        ***Note*** – To burn a CD with MagicISO, you will need to pay $30 for the full version. There are also Freeware versions and tools that allow you to mount the ISO file without burning a CD. This is described in step 2.
    c. The installer, cyautorun.exe, will be launched once the CD/DVD is inserted in the CD/DVD drive, if not double click on cyautorun.
2. Install directly from an ISO image:
    a. Download MagicISO (http://www.magiciso.com/download.htm) or other Virtual Drive creators (these are typically freeware) and create a virtual drive. Mount the ISO image on the drive from the "Mount" option in MagicISO.
    - For help on mounting and un-mounting ISO images see http://www.magiciso.com/tutorials/tutorials.htm .
    b. When you have mounted the ISO file, the installer should start.
        - if it does not start, double click on cyautorun.
    c. An alternative to using Virtual Drive creators is to download winrar (http://www.rarlab.com/download.htm) and open the ISO file in it. Then, extract and run "cyautorun.exe".
3. cyautorun.exe will prompt you to install PSoC Designer 5.1. You can then follow the steps 3-6 from the Web Installation instructions above.

**Note to HI-TECH Compiler Users**

You must manually update the *psoc.ini* file to add device support before you can compile projects that use the new devices. The HI-TECH *psoc.ini* file is found in the HI-Tech installation folder. The default location of the *psoc.ini* is here:

*C:\Program Files\HI-TECH Software\HCPSOC\PRO\9.61\dat\psoc.ini*

The default location of the replacement *psoc.ini* file that adds support for the new devices is here:

*C:\Program Files\Cypress\PSoC Designer\5.1\Common\CypressSemiBuildMgr\tools\psoc.ini*

## Known Problems and Limitations for PSoC Designer 5.1 Beta 2

In PSoC Designer 5.1 Beta 2, the Known Problems and Solutions (KPS) are included in a separate file. Please download it from the appropriate PSoC Designer directory, http://www.cypress.com/?rID=41083..

## Further Reading

Documentation for PSoC Designer is provided with on-line Help, which you can open from the **Help** menu or by pressing [**F1**]. There are numerous other documents under the Help->Documentation menu, including:

- IDE User Guide
- PSoC Designer Release Notes
- PSoC Device Selector
- Updating the boot.tpl file (*update of BOOT.pdf*)
- Project Update help (*Version Update.pdf*)
- ICE User Guide
- C Language Compiler User Guide
- Math Libraries User Guide
- ImageCraft Release Notes
- Assembly Language Users Guide
- Hi-Tech to ImageCraft Migration guide
- User Module and device datasheets

and many more

## Defects Fixed

The following defects were fixed in this release:

| CY CDT # | Category | Title | Fix and Impact |
|---|---|---|---|
| 33355 | Dev-CY7C64xxx | AnalogMuxBus not shown in interconnect of CY7C64215 | Modified the JavaScript. AnalogMuxBus is correctly displayed for this part. |
| 35800 | User Module | SAR6 User Module datasheet - input impedance needs clarification | Datasheet updated. |
| 39080 | User Module | CY8C20xx6 Timer16 UM sample code needs to clarify ljmp for assembly ISR | Datasheet updated. |
| 41557 | User Module | Additional DRC warning needed for ADCINC14/VR User Module. | Designer rule warning added - ADCINC14 and ADcINCVR use bits of DEC_CR0 and DEC_CR1 registers for gating. There is only one set of these registers so users can select only one PWM source. |
| 53363 | Dev - CY8C24x94 | Updates to VC1 setting in CSDADC User Module datasheet of the CY8C24x94 | Datasheet updated. |

| CY CDT # | Category | Title | Fix and Impact |
|---|---|---|---|
| 55661 | CapSense | Register addresses in PSoCConfigTBL are wrong | When CapSense is added in loadable configuration, Code in PSoCConfigTBL file corresponding to Unload configuration of CapSense, contains statements like:<br><br>M8C_SetBank1<br>; Instance name CSD, User Module CSD<br>; Instance name CSD, Block Name CMP(ACE01)<br>mov reg[00h], 00h ;CSD_CR2 ()<br>; Instance name CSD, Block Name CMP0(ACE00)<br>mov reg[00h], 00h ;CSD_CR2 ()<br><br>Instead these register addresses should be 0x77 and 0x73 respectively.<br>This is fixed in PD5.1 Beta 2. |
| 60975 | General | Add warning if programming when project has been modified but not saved. | PSoC Programmer warns if the hex file is out of date (i.e. the project has changed and been saved since the hex file was created). However, prior to PD5.1 Beta 2, it does not warn the user if the project has been modified but not saved since the hex file was created. This is fixed in PD5.1 B2. |
| 62774 | Compiler | Document New Assembler Code Compresser Directives | Documentation added for two new asm directives to disable code compression.<br>.nocc_start<br>.nocc_end<br>C code can use<br>#define Suspend_CodeCompressor asm(".nocc_start")<br>#define Resume_CodeCompressor asm(".nocc_end") |

| CY CDT # | Category | Title | Fix and Impact |
|---|---|---|---|
| 64434 | Bootloader | BootLoader:Flash functions need to check for overflow in pulse width calculation | Any function that calculates the pulse width for Flash programming needs to check for overflow. Cypress recently discovered with certain parts and a temperature of -40C, the resulting calculated CLOCK_E and CLOCK_W pulse width parameters could exceed 255, which overflows the 8-bit data type used for the calculation. Then the actual PW parameter passed to SROM can be much too short (e.g. '2' instead of '258').<br><br>This only appears to occur on certain parts (with particular M, B & Mul parameters) and a low temp (also used in the PW calculation).<br><br>This problem can affect any UM that calculates the pulse widths to write to Flash. E.g.:<br>1. I2C Bootloader UM (this is confirmed)<br>2. USB Bootloader UM<br>3. FlashBlockWrite API<br>4. EEPROM UM<br><br>This is fixed in PD5.1 Beta 2 |
| 65800 | User Module | SARADC User Module transfer functions required in datasheet | The SARADC user module datasheet now provides a general form transfer function for signed and unsigned data. |
| 69357 | Dev - CY8C20xx6 | CY8C20xx6/A and enCoRe V (7C643x5/6) devices do not supporting USB pins as digital IO | Proper pins/pinout included in PD5.1 Beta 2 |
| 69983 | User Module | CY8C29x66 I2CHW Master UM does not include I2CHW_bReadBusStatus() | Prior to this release, the I2CHW Master UM does not include I2CHW_bReadBusStatus() function even though the function is described in the datasheet. This function is the only way to determine if the slave NAK'd. In PD5.1 Beta 2 the I2CHW_bReadBusStatus() function was added to the Single Master Operation of the I2CHW MUM. |
| 70453 | CapSense | Improvements to CY8C20xx6/A CSDAUTO UM | Several improvements made based on customer feedback. See the User Module datasheet for more information. |

| CY CDT # | Category | Title | Fix and Impact |
|---|---|---|---|
| 71658 | Dev - CY8CLEDxx | Unable to Add 2 UARTs to PPSoC devices (CY8CLEDxxDxx, CY8CLEDxxGxx) project. | Fixed in PD5.1 Beta 2. |
| 72047 | Dev - CY8C28xxx | Emulation difficulties with flash read/write libraries using CY8C28xxx | This was a silicon defect that was corrected in the production parts. |
| 73334 | User Module | Comparator0 output in CMP UM remains high even though input is < VREF | Some projects using CMP UM show comparator0 output staying HIGH after a board reset even after reducing the PMUX0 to less than NMUX0 (VREF, 1.3v). Comparator1 works fine. This was fixed by flipping the bit settings in the ComparatorPinMUX0 resource and changing the bitfield in the ComparatorPinMUX1 resource. |
| 74500 | User Module | CYFISNP UM fails to build with default parameters | In CY8C22x45 devices, the CYFISNP UM failed to build with default parameter settings. The error message was "cannot include source file 'CYFISNP_1.h'" The m8c.h/.inc code compression macros and inline asm code were modified to correct this problem. |

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