Release Notes SRN050

PSoC Designer Version 5.0
Release Date: June 30, 2008

Thank you for your interest in PSoC Designer™ version 5.0. This release note lists installation requirements and describes software updates and changes.

System Requirements and Recommendations

System Requirements	Minimum	Recommended
▪ Processor Speed	1 GHz	2 GHz Dual Core
▪ MB of RAM	256 MB	1 GB
▪ MB of Free Hard Drive Space	300 MB	500 MB
▪ Screen Resolution	1024x768	1280x1024
▪ CD-ROM Drive	✓	✓
▪ USB Port, preferably Open Host Controller or Universal	✓	✓
▪ Windows® 2000, XP (SP1 or 2), or Vista	✓	✓
▪ Microsoft Internet Explorer 6.0 (SP1)	✓	✓
▪ .NET Framework	2.0	3.5
▪ Adobe Reader (For Viewing of .PDF Documentation)	6	8
▪ PSoC Programmer	3.00.0.91	3.00.0.91

Updates

Check http://www.cypress.com/psocdesigner for the latest downloads of software and documentation.

New for Version 5.0

PSoC Designer 5.0 incorporates both PSoC Designer 4.4 and PSoC Express 3.0 into one tool. PSoC Designer 5.0 allows you to create chip-level (PSoC Designer) projects, or system-level (Express) projects that can also be used as chip-level projects.

New features and enhancements in PSoC Designer 5.0

1. Flexible Windows Environment
    - Patterned after Visual Studio 2005 (VS8)
    - Movable windows that dock, tab, and float
    - Automatically hide all windows or individual windows
    - Vertical and Horizontal tab grouping allows more views to be visible at the same time (such as pin out and user module layout)
    - Enable or disable default windows and panes layout based upon file type
2. New Start Page
    - Browse recent projects
    - Catalog of example/template Express designs
    - Access to help articles

3. Customizable Toolbars
    - Modify the contents of existing toolbars
    - Add a new toolbar with custom operations
4. Persistent User Module Catalog
    - Only displays what is available for each device
    - Displays **all** user modules across **all** devices before you select a target device
5. New Application Explorer
    - Instantly launch or open any part of the design
    - Collects all project files and documents in one place
        - System level design (drivers, valuators and transfer functions)
        - Chip level design (user modules and placement)
        - Pin out
        - User modules selected for project
        - Source files – both user added and auto-generated
6. Upgraded Debugger
    - Dockable, floatable windows to make your work easier to manage
    - Memory window enables the lookup value of a variable or location
    - Add watch variables with a mouse click
    - Events window is now persistent and dockable
    - New “run-to-cursor” temporary breakpoint feature
7. Integration of PSoC Express v3.0 Design Capabilities with PSoC Designer v4.4
    - Start in system level mode (looks like PSoC Express v3.0)
        - Choose drivers and create transfer functions
        - Select your appropriate target device
    - Switch instantly to chip-level mode (the capabilities of PSoC Designer v4.4)
        - View chip-level placement and routing

            Note: Do not change auto-routing-and-placement at this time

            Note: System level auto-routing-and-placement takes priority and can:

            - Add more user modules to the chip level design
            - Add a loadable configuration for unused blocks
            - Add and edit “custom.c” code functions
8. Dynamic configurations are easier to manage

PSoC Device Support

PSoC Designer 5.0 contains the equivalent device support of PSoC Designer 4.4 with SP3 and PSoC Express 3.0 with the EZ-Color Express Pack installed.

New Terminology

This table shows the nomenclature used in PSoC Designer before PSoC Designer 4.4 and PSoC Express 3.0 were integrated into a common IDE:

Old	New
Express Editor	System Level Editor
Interconnect Editor	Chip Level Editor
Express Project	System Level Project
Designer-Only Project	Chip Level Project
Application	Workspace

In general, System-Level now refers to the high-level system view of a design that was first available in PSoC Express and replaces anything formerly associated with the term “PSoC Express”. Chip-Level applies to more complex device level designs possible in PSoC Designer and replaces the general use of the term “PSoC Designer”.

Installation

PSoC Designer 5.0 is safely installed without the need to uninstall either PSoC Designer 4.4 or PSoC Express 3.0. This means, however, that you must use the “Open With” functionality to open an old project in PSoC Designer 4.4 or PSoC Express 3.0 if PSoC Designer 5.0 is the default program for PSoC project files. It is recommended you install all programs in their default installer locations to prevent any unintended interactions due to unintended file interactions, etc.

If an ICE-Cube is connected to the installation machine it must be disconnected and then reconnected after installing PSoC Designer 5.0.

If PSoC Designer 4.4 is already installed when PSoC Designer 5.0 installed and then the required PSoC Programmer 3.00 is installed, 4.4 will use Programmer 3.00 regardless of what programmer version was previously installed.

To Install:

1. Shut down any currently running instances of PSoC Express or PSoC Designer.
2. Download and install PSoC Designer 5.0 by running the provided installer.
3. Download and install the latest PSoC Programmer 3.00 by running the provided installer

Compatibility Running PSoC Designer v4.4 Designs and PSoC Designer v5.0

PSoC Designer 5.0 is designed to be installed on the same system as PSoC Designer 4.4. Using the default directories suggested by the installation program will assure this happens.

Only one version of PSoC Design tools can be open and running at any given time. In other words, you cannot have PSoC Designer 4.4 and PSoC Designer 5.0 running concurrently. But either will run on the same system, it just has to be one or the other at a time.

Because differences can be expected when old projects are run under the updated PSoC Designer 5.0, copy and save test projects in a new directory launching them in PSoC Designer 5.0, to protect the original files from any sort of corruption.

1. You may get an update message that boot.tpl needs updating or something similar when loading an older project. Upon updating, the file will load, but may then give similar update errors if reopened later by PSoC Designer 4.4. After updating, files from PSoC Designer 5.0 may not work right when going backwards to PSoC Designer 4.4. It is better not to attempt this, as correct operation is not guaranteed.
2. Certain UM's in PSoC Designer 5.0 may have newer versions than those in PSoC Designer 4.4 and require update changes when first loaded or the old versions may be used with unpredictable results. The boot.tpl might need changing, too. Follow message prompts and allow updating to occur for correct operation.
3. In PSoC Designer 5.0, the data directory structure of PSoC Designer 4.4 will always be modified. The top level data directory in PSoC Designer 4.4 (containing the x.soc design file) and all the subdirectories under it will be pushed down one level and a new top directory with the same name as before will be created. Contained in that new top directory will be the project start file (x.cmx). To restore to a PSoC Designer 4.4 configuration, it is possible to reattach to directory containing the x.soc file back to the top level. A better practice is to copy a complete project to a new directory location. Then there the new structure will only be used by PSoC Designer 5.0 and no alteration is required.

Compatibility Running PSoC Express v3.0 Designs with PSoC Designer v5.0

PSoC Express 3.0 already uses the same directory structure as PSoC Designer 5.0. So, there is no need to change the directories created by PSoC Designer 5.0 for use with PSoC Express 3.0. The same advice, however, is given as before. The project directories and files contained within should be copied to new locations for use exclusively with PSoC Designer 5.0. This avoids the potential of any possible problems.

User Module Modifications

A number of user modules are upgraded or have bug fixes in PSoC Designer 5.0. The following is a list of those user modules:

1. Sleep Timer
2. SSDM(8-32)
3. TX8
4. ADC10
5. USBUART
6. BootLdrI2C
7. USB (HID and Non-HID)
8. CSD (Clock Prescalar, without Clock Prescalar)
9. USB Bootloader (HID and Non-HID)

The user modules were tested using PSoC Designer 4.4 (SP3) and PSoC Designer 5.0 across both ImageCraft and Hi-Tech compilers. The user modules were tested against the following devices families:

User Module	Device Family
Sleep Timer	CY8C29x66
SSDM (8-32)	CY8CLED02
ADC10	CY8C21x43
TX8	CY8C27x43
BootLdrI2C	CY8C27x43
USBUART	CY8C24x94
USB	CY8C24x94
CSD	CY8C21x43
BootLdrUSBFS	CY8C24x94

Nine of the user modules had negligible changes in code size. This is consistent with the minor modifications that were made.

The BootLdrI2C User Module increased in code size approximately 12%. The BootLdrI2C User Module was upgraded to meet new compiler requirements and bug fixes.

The user modules are continuously upgraded between releases to provide improved functionality.

ColorLock Limitations

1. There is no resource tracking for High Brightness LED drivers. You must be aware of the quantity of HBLED drivers and PSoC pin limitations. Currently there are no warnings issued when too many HBLED drivers are added to your project.
2. When using the 3 HBLED 700mA Rebel driver, naming the Trigger Valuator “ColorLockTrigger” creates Transfer Function errors.
3. When assigning pins to the 700 mA Luxeon Rebel ColorLock driver, the pins must be unassigned and applied in reverse order. The driver has the pin name pse_TCS230SHARED_# S#. You must apply pin S3 first followed by S2, S1, and ending with S0.
4. For any 3-LED color mixing drivers in simulation mode, the Current Value display box displays CIEx and CIEy irrespective of any color space parameters.
5. If you calibrate the color sensor inside the tuner, you must restart the EZ-Color device.

Considerations Using HI-TECH as the Default C Compiler with System-Level Designs (formerly referred to as Express Designs in PSoC Express v3.0)

This section refers to a project that was either done originally in PSoC Express 3.0 or using PSoC Designer 5.0 in the system-level mode (formerly called Express) to generate the design.

- When recompiling an old project with the new HI-TECH Lite C compiler, it is unlikely that you will get an error due to any change in compilers. This is because of the standardized and modular programming model of PSoC Express. However, if the base device runs out of available ROM space, a compile error does occur. To remedy this condition:
    - Choose a device with more resources

- Upgrade to the Pro version of the HI-TECH C compiler
- Revert to the ImageCraft C compiler

- Compiler settings are saved in individual PSoC projects. When you open an existing project that you built with the ImageCraft C compiler, the project is built with ImageCraft. To change this behavior, you must switch the compiler vendor to HI-TECH (**Build → Select Compiler Vendor** for *project*) for all previously built projects. There is a default compiler selection as well (**Build → Select Default Compiler Vendor**). The default compiler applies to all new projects, not previously built projects.
- The default compiler selection is applied to a project when it is created. After creating a new project, the compiler vendor cannot be changed until the project is built once. Changing the default compiler vendor with a project open does not alter the compiler setting for the open project.
- Because of the amount of code and floating point math required, ColorLock and ColorMix driver operations may exceed the timing of the 64Hz system loop timer, resulting in "Free Run" operation. When compiled with the HI-TECH Lite C Compiler, the behavior of the system may appear to be sluggish when compared to the same code compiled using the HI-TECH Pro C Compiler. The Lite compiler produces less optimized code than Pro, resulting in longer execution time.
- Under “Project Settings, Build, Compiler, Options” with HI-TECH C compiler selected as the default, there is a push-button switch below the “Options” box where the user can toggle between HI-TECH Pro mode and HI-TECH Lite mode. The correct control code will be entered into the “Options” box by PSoC Designer 5.0 automatically when the button is pressed.

Considerations Using HI-TECH as the Default C Compiler with Chip Level Designs (formerly referred to as Designer Only Designs in PSoC Designer v4.4)

This section refers to a project that was either created originally in PSoC Designer 4.x or using PSoC Designer 5.0 exclusively in the chip level mode to generate the design. The issues relate to PSoC Designer 5.0 with version 9.61 of the HI-TECH C compiler. For additional help with the HI-TECH compiler, see the docs folder in the HI-TECH installation directory.

- Opening projects created with PSoC Designer version 4.1 or earlier and building them with the HI-TECH compiler may result in the loss of any ImageCraft custom compiler/linker settings.
- The UART_szGetParam() function for the UART User Module currently does not function as expected using the HI-TECH C Compiler. The function is supposed to return a null pointer if there are no more parameters left. Under certain circumstances, when returning a null pointer through a fastcall16 function such as szGetParam(), the pointer is returned to C as a 16-bit pointer with the most significant bit set to 1. See HI-TECH Manual Section 3.3.11.2 Data Pointers. This causes a test against 0 to return as FALSE. The workaround is to include a terminator token in the command string sent to the UART and check for the existence of the token rather than using szGetParam() to terminate the processing loop.
- The HI-TECH C Compiler operates on 7-bit ASCII source code. Extended ASCII characters in source code cause errors. If you need to use extended characters, enter them as \x*FF* where *FF* is the hex value of the extended ASCII character.

- When passing a structure pointer to a fastcall16 function, you may receive a warning if any of the members of the structure are uninitialized, (350) unused member. This is true even if the target function writes values to those members.
- Reusable Local Labels using the HI-TECH C compiler may only contain 1 period. Extraneous periods result in a compile error. See HI-TECH Manual section 4.3.5.5 Symbolic Labels.

Known Problems and Solutions in PSoC Designer 5.0

These items are a listing of all known issues and limitations at the time of initial product release. The number in brackets is a unique Cypress control number used to track each documented item listed here.

Installation Issues

	Problem	Solution
1.	If you install PSoC Designer 4.4 after you install PSoC Designer 5.0, PSoC Designer 4.4 will be associated with.SOC files and will open when you double click a .SOC file in Windows Explorer. [25132]	Right-click a .SOC file and select "Open With, Choose Program" to invoke "Open With" dialog. In the list, the PSoC Designer 4.4 is called “PSoC Designer Application” and Designer 5.0 is “PSoC Designer”. Select "PSoC Designer". Mark the check box labeled “Always use the selected program to open this kind of file” to make the change permanent.
2.	If PSoC Designer 4.4 is already installed when PSoC Designer 5.0 installed and then the required PSoC Programmer 3.00 is installed, 4.4 will use Programmer 3.00 regardless of what programmer version was previously installed. [27165]	PSoC Programmer 3.00 is required for use with PSoC Designer 5.0. A previous version of Programmer can still be run, but must be invoked outside of 4.4 as a separate application.

	Problem	Solution
3.	The Tools → Options dialog does not open due to conflicting choices during HI-TECH installation. If you answer **No** to the question "There is a previous installation in that location. Do you want to remove it (recommended)?" and answer **Yes** to "Then it is OK to overwrite the previous installation?" on the following page, it will break the Tools → Options dialog (it will not display). [27706]	During the HI-TECH installation either allow the installer to remove the previous version of the HI-TECH compiler **or** disallow the removal of the previous version and choose NOT to overwrite the previous installation. **To fix the problem after it occurs:** 1. Open regedt32 2. Browse to HKLM\Software\HI-TECH Software\HCPSOC\pro 3. Check the 9.61 (and 9.60 if it exists) for multiple PL keys. Check any subkeys with a value named "InstDir" for duplication. 4. For example, if 9.61\PL0 and 9.61\PL1 both have InstDir values that point to the same location on the disk, delete the one that isn't installed anymore.

General Problems

	Problem	Solution
4.	Slow behavior in monitor mode for High Brightness LED drivers. Performance of the communication interface with the target hardware and updates of the driver GUI widgets can be slow when in monitor mode for a project that includes a High Brightness LED driver. It can take from 1 to 2 seconds for keystrokes entered in a text box to be reflected in the GUI. Values entered in the text entry box to be sent to the target hardware can take from 3 to 5 seconds to be transmitted to the target hardware and be read back and displayed in the High Brightness LED driver monitor widget. [26693]	No solution at this time.

	Problem	Solution
5.	The Variables Chart may continue sampling and therefore consume CPU resources after you issue the command to stop sampling. [27598]	1. Use the View → Variables Chart menu option to activate the Variables Chart. 2. Make sure that the window is not sampling data. The button in the lower right corner should say "Sample". Click on the button if it does not. 3. If the Variables Chart window will be left in "Open" or "Auto-hide" state the button in the lower right corner should say "Sample." This indicates the inactive state. 4. If the Variables Chart window will be closed the button in the lower right corner must say "Stop" (active state) to avoid sampling when the window is closed. Closing the window will automatically toggle its state.

Problems with Chip-Level Projects

	Problem	Solution
6.	When cloning a project the user must be aware that some devices do not share user module capabilities. If you clone a project for one device to another device certain user modules may not appear. [27409]	Check what user modules are available for the cloned device.
7.	The Chip Level view GUI does not indicate the connection between a placed REFMUX user module and its input multiplexer and the connection between the REFMUX user module and its corresponding analog output bus.[25387]	The generated firmware will function properly regardless of the GUI defect. No work-around is known for the GUI defect.
8.	The USB Bootloader datasheet is ImageCraft centric and contains some items that do not apply to the HI-TECH compiler. [27324]	For a HI-TECH compiler based USB Bootloader project you are not required to set the relocatable code address. Disregard the ImageCraft setting shown in the datasheet.

	Problem	Solution
9.	The I2CHW and EZI2Cs user modules are unable to detect whether I2C bus pins are consumed by the CSD user module. Therefore, it is possible to configure the I2CHW or EZI2Cs user module to use pins already consumed by the CSD user module. [22470]	Place and configure the applicable I2CHW, or EZI2Cs user module prior to placing the CSD user module. The CSD user module wizard will detect that the I2C pins have been consumed.

Problems with System-Level Projects

	Problem	Solution
10.	When Monitor is running for System-level projects, some of the GUI elements (such as menu items or dialog buttons) may not update properly or may be disabled. [27057]	If this occurs, stop the Monitor before initiating other activities.

11.	The literal code transfer function does not support multiple variable declarations on a single line of code. [27225]
	Example:
	`int a, b;`
		Declare one variable per line of code.
		Example:
		`int a;`
		`int b;`

12.	The User Pin Assignment dialog may generate script errors or display extraneous text if you go back and forth between the User Pin Assignment and Device Configuration Selection dialogs without selecting a different Device Configuration. [27481]	Selecting a different Device in the Device Configuration Selection dialog, going to next, then going back and selecting the original device will restore normal operation of the User Pin Assignment dialog.
13.	PSoC Designer 5.0 allows you to add additional analog input drivers after adding a CSDR CapSense driver. [27385]	When using a CSDR driver you cannot add an additional analog driver even though this is allowed by the program.
14.	A Discrete interface valuator cannot be an input for a TableLookup transfer function if the Discrete interface valuator's state values are not defined in the state list as an unbroken numeric sequence of constants starting at 0. [27342]	When defining state values, define the first state value as 0, the second state value as 1, and so on until the last state is defined. Ensure that each successive value in the list is greater than the previous value by 1.

	Problem	Solution
15.	When a State Machine transfer function valuator's name contains an underscore character (_) and an input driver, output driver, or other valuator's name is identical to the portion of the State Machine valuator's name before the underscore (ex. State Machine valuator named abc_def and LED output driver named abc) , the System Level editor tool might show a transfer function relationship line between these two even though there is no relationship. The project will also fail to build. [27010]	Avoid using the underscore (_) character in driver and valuator names. Also avoid naming drivers or valuators with substrings of other driver and valuator names.
16.	When a System-level project created on a system with high display resolution is open on a system with lower display resolution some of the design elements (drivers, valuator) may appear outside of the viewport. [27356]	Use Zoom Out to bring all design elements into the viewport. Then relocate items as necessary. Or switch to higher display resolution.
17.	If the DriveMode property of the Generic Pin Output driver is set to OpenDrainDriveLow, the initial value is set to High, and the driver's assigned pin is connected to an external pull-up resistor, the driver will generate a low signal on the pin at the time of initialization. Upon execution of the first main loop iteration of the application, the pin output will correct itself to the state specified by the driver's transfer function. [27364]	There is no solution for the initial glitch.
18.	Half-Line LCD drivers allow up to 7 characters to be entered, while Full-Line LCD drivers allow up to 16 characters. PSoC Designer 5.0 does not limit you to the number characters that can be entered into a Half-Line and Full-Line LCD driver label edit box. The characters beyond the maximum number are disregarded by the PSoC Designer 5.0. [27343]	You can select the label in the Half-Line and Full-Line properties window and see the description detailing how many characters can be placed in the selected label.

Problems with Compilation and Debug

	Problem	Solution
19.	When PD 4.2 or PD 4.3 project is converted into PD 5.0 format and built with Hi-Tech compiler, subsequent build with ImageCraft compiler will produce build errors if Relocatable Code Start Address is set to a value other than default. [21919]	Before building a project with the ImageCraft compiler, go to the Project → Settings → Linker dialog and restore the Relocatable Code Start Address.
20.	Although the Chip Level view indicates that the CY7C63803's CPU speed and sleep timer interval can be configured, PSoC Designer does not generate the applicable firmware initialization. [25756]	Manually add a line of code in the application program to initialize the value of OSC_CR0, the register that sets CPU speed and sleep timer interval.
21.	System-level projects do not allow compiler selection before the first "Generate/Build Project" invocation. [26969]	Set the desired compiler to be the default PSoC Designer 5.0 compiler using Tools → Options → Build → Compiler before creating a System-level project.
22.	Multiple instances of PSoC Designer and PSoC Programmer can be open at the same time, but only a single instance is allowed to access the ICE at a given time. An error message stating "ICE Unavailable" will result when instances of either application attempt to access the ICE if it is already connected. [23569]	Press the disconnect button in the application that is currently connected to the ICE or close it completely to free it for connection in one of the other open instances.
23.	There are known problems in the debugger when viewing function parameter variables with immediate values. [25847] For example foo(2,3)	The work-around is to assign values to variables instead and then pass the variables into the function. For example, foo(a,b)
24.	PSoC Designer 5.0 may not recognize a second ICE-Cube. [26513]	Go to Project → Setting → Debugger where the new ICE-Cube is listed and select it for use.
25.	Modifications to code or interconnect during debug mode are not loaded into device. [27053]	In either case, changes made during debug session are not effective until the project is built and downloaded again.

	Problem	Solution
26.	If you move a project from one location to another and you try to compile an individual file, the compile will fail because the compiler's path to the file is absolute. If you move the project from one location and then rebuild the entire project, the absolute file paths are regenerated and compilation will succeed. The bug only affects individual file compilation. [26059]	There are build files generated that include explicit paths. These files are rebuilt when the overall project is re-built. You should rebuild the entire project after copying the project before performing individual file compilation.

Documentation

User guides and key documents are located in the `\Documentation` subdirectory of the PSoC Designer installation directory. The default location is:

C:\Program Files\Cypress\PSoC Designer 5\Documentation

Also included in this documentation folder is a documentation guide which can assist you in understanding all the documentation that is included with PSoC Designer 5.0.

Supporting documents for PSoC Designer's public-domain functionality, using "Find in Files" text search (*grep.pdf*) and the build utility (*make.pdf* and *sed.pdf*), are located in:

…\Program Files\Cypress \PSoC Designer 5\Documentation\Supporting Documents

PSoC Training

We recommend that first time users download and take PSoC Designer *Module 1: Introduction to PSoC* for free by visiting www.cypress.com/psoctraining.

Silicon Errata

The most up-to-date versions of the silicon errata are available on the web site at http://www.cypress.com/psoc and navigating to **Errata Update → PSoC Mixed-Signal Array**.

For assistance go to http://www.cypress.com or contact our Applications Team at 425.787.4814.

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