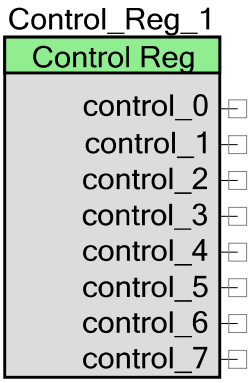
Control Register

1.60

Features

- Up to 8-bit Control Register



General Description

The Control Register allows the firmware to output digital signals.

When to Use a Control Register

Use a Control Register when the firmware needs to interact with a digital system. You can also use the Control Register as a configuration register, allowing the firmware to specify the desired behavior of the digital system.

Input/Output Connections

This section describes the input and output connections for the Control Register. An asterisk (*) indicates that the I/O may be hidden on the symbol under the conditions listed in the description of that I/O.

clock – Input *

This optional pin is present if the **Mode** parameter is set to **SyncMode** or **PulseMode**. Otherwise, the clock input does not show.

reset – Input *

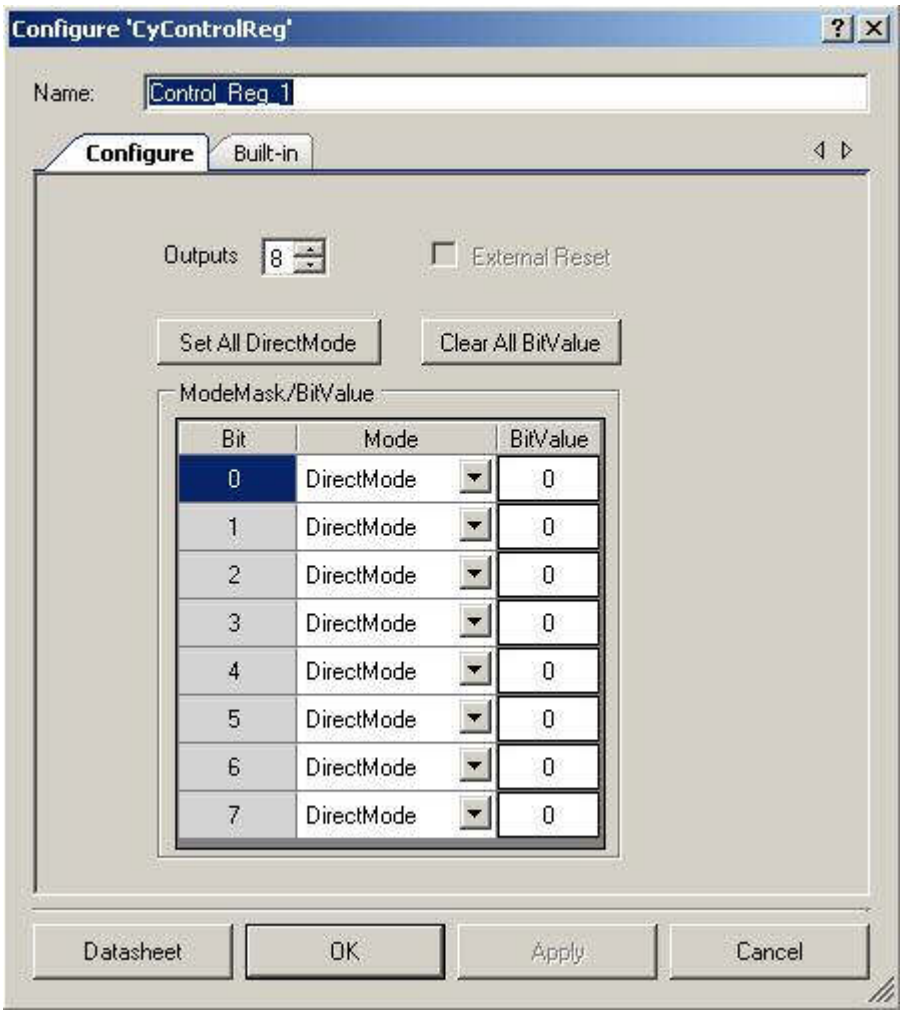
This optional input is used to reset Control Register bits. This input is shown on the symbol when you enable the **External Reset** parameter, and set the **BitMode** parameter to **SyncMode** or **PulseMode**. The reset input on the Control Register is optional if you use PSoC 3 Production silicon. The reset input may be left floating with no external connection. If nothing is connected to the reset line, the component will assign it a constant logic 0.

control_0 - control_7 – Output *

The Control Register contains up to eight outputs. The firmware sets the values of the output terminals by writing to the Control Register. The number of outputs depends on the setting for the **Outputs** parameter.

Component Parameters

Drag a Control Register onto your design and double-click it to open the **Configure** dialog.



Outputs

Number of output terminals (1 to 8). The default value is **8**. Bit 0 is the LSb and corresponds to the control_0 terminal.

External Reset

This check box is used to enable the reset input on the symbol. This option is not selected by default. **External Reset** is not valid when all the bits in the **Mode** parameter are configured as **DirectMode**. In that case this option is disabled.

Set All DirectMode

This button sets all bits to **DirectMode**.

Clear All BitValue

This button sets all **BitValue** fields to 0.

ModeMask/BitValue

Mode

These parameters are used to set specific bits of the Control Register to one of three settings:

- **DirectMode –** In this mode, when the control register is written with bus clock, the data is driven directly into the routing.
- **SyncMode –** Resamples (single-synched) the control bit input from the bus clock to the selected SC clock before it is driven into the routing. This mode is only supported for PSoC 3 Production silicon or later.
- **PulseMode –** This mode is similar to SyncMode, in that the Control bit input is resampled from the bus clock to the selected SC clock and a single SC clock period pulse is generated. The output of the control bit into the routing is asserted for one full SC clock period. At the end of the pulse, the control bit is automatically reset. This mode is supported for PSoC 3 Production silicon or later.

BitValue

These parameters allow you to set the default value of 0 or 1 for each bit in the Control Register. By default, the initial value is 0.

Resources

Analog Blocks	Digital Blocks					API Memory (Bytes)		Pins (per External I/O)
	Datapaths	Macro cells	Status Registers	Control Registers	Counter7	Flash	RAM	
N/A	N/A	N/A	N/A	1	N/A	22	0	N/A

The Control Register requires one UDB Control Register.

Application Programming Interface

Application Programming Interface (API) routines allow you to configure the component using software. The following table lists and describes the interface to each function. The subsequent sections cover each function in more detail.

By default, PSoC Creator assigns the instance name “Control_Reg_1” to the first instance of a control register in any given design. You can rename the component to any unique value that follows the syntactic rules for identifiers. The instance name becomes the prefix of every global function name, variable, and constant symbol. For readability, the instance names used in the following tables is “ControlReg.”

Function	Description
ControlReg_Write()	Writes a byte to a control register
ControlReg_Read()	Reads the current value assigned to a control register

void ControlReg_Write (uint8 control)

Description: Writes a byte to a control register

Parameters: control: The value to be assigned to the control register

Return Value: None

Side Effects: Sets the state of the control register’s outputs

uint8 ControlReg_Read (void)

Description: Reads the current value assigned to a control register

Parameters: None

Return Value: Returns the current value assigned to the control register

Side Effects: None

Sample Firmware Source Code

PSoC Creator provides many example projects that include schematics and example code in the Find Example Project dialog. For component-specific examples, open the dialog from the Component Catalog or an instance of the component in a schematic. For general examples, open the dialog from the Start Page or **File** menu. As needed, use the **Filter Options** in the dialog to narrow the list of projects available to select.

Refer to the “Find Example Project” topic in the PSoC Creator Help for more information.

Component Changes

This section lists the major changes in the component from the previous version.

Version	Description of Changes	Reason for Changes / Impact
1.60	Updated the Configure dialog	Changed the Bit display and addressed minor Configure dialog issues
1.50.b	Minor datasheet edits and updates	
1.50.a	Minor datasheet edits and updates	
1.50	Updated the Configure dialog.	Created a customized interface. Added "Set All" and “Clear All” buttons and changed Number of Inputs field to allow keyboard entry. Updated the dialog to comply with corporate standards.
	Added reset input and ExternalReset parameter to control visibility of reset input	This was added for PSoC 3 Production silicon to control the reset behavior of the control register
	Added BitValue parameter	To set control register Initial Value.
	Added Bit mode parameter to pick different control register modes (Direct, Sync and Pulse Mode).	New modes (Sync, Pulse Mode) were added to give the possibility to select a mode that resamples necessary Control Register bits to the UDB clock. This new mode can be used for PSoC 3 Production or later.
	Added Clock pin	Clock pin was added to support Sync and Pulse Mode which is exposed only when these modes are selected.

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