Analog Resource Constraint

1.50

Features



- Limits analog routing of a signal to a specific routing resource
- All terminals on the signal must connect directly to the routing resource

  Note Routing is strict. All of the devices connected to the net with the resource constraint must have a direct hardware connection to the resource. Refer to the Analog Routing Diagram in the applicable Technical Reference Manual (TRM), which is available from the Cypress website, www.cypress.com. If the resources do not have a hardware connection to the specified constraint, an error will occur.

General Description

The Analog Resource Constraint component allows you to define the route of the analog signal to which it is connected. This is an advanced feature that is not needed for most designs, and should be used with caution.

When to Use an Analog Resource Constraint

The Analog Resource Constraint should be used to manually control analog routing when strict control over the signal routing is required.

Input/Output Connections

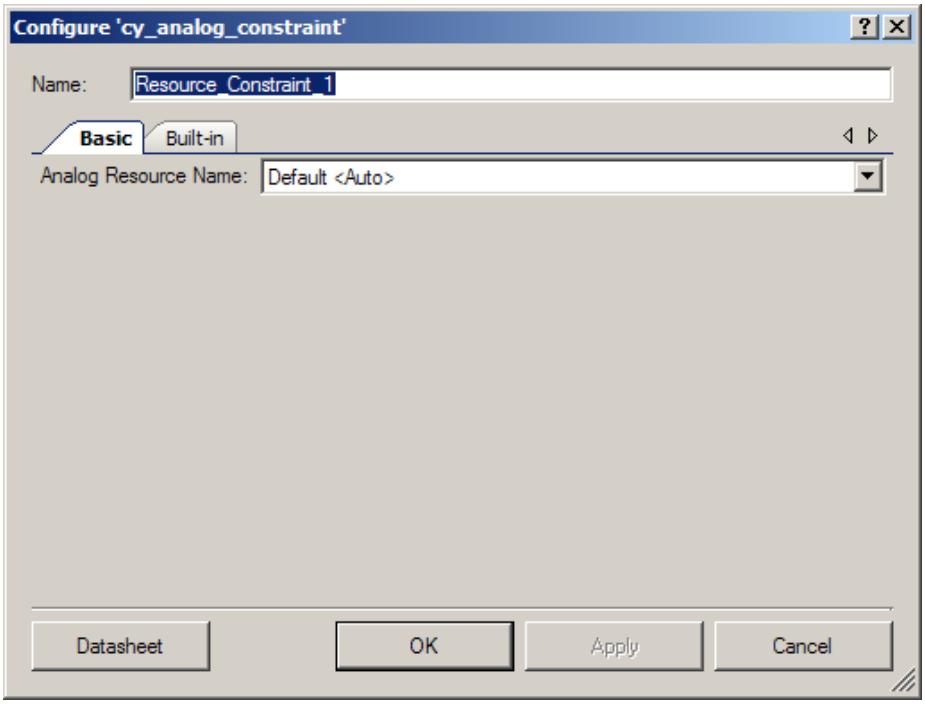
This section describes the various input and output connections for the Analog Resource Constraint.

connect – Input /Output

Provides the connection to the analog signal to which the Analog Resource Constraint applies.

Component Parameters

Drag an Analog Resource Constraint onto your design and double-click it to open the **Configure** dialog.



The Analog Resource Constraint provides the following parameters.

Analog Resource Name

The analog resource to assign to the connected signal. The default value, **Auto**, has no effect. The routing resource list depends on the selected family.

Placement

The Analog Resource Constraint consumes hardware resources, because it specifies which hardware resource must be used by the router. It has no other placement specification.

Resources

The Analog Resource Constraint component causes the connected analog signal to consume the selected analog routing resource.

Functional Description

The following analog routing resource names are available for PSoC 3 and PSoC 5. Not every analog routing resource connects to every component terminal. For detailed information about analog connectivity, refer to the applicable device datasheet and TRM. These documents are available on the Cypress website, www.cypress.com.

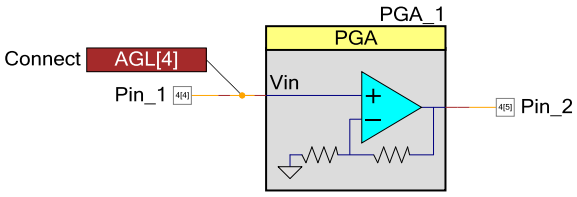
- Analog globals: AGL[0] – AGL[7], AGR[0] – AGR[7]
- Analog local bus: abusl0 – abusl3, abusr0 – abusr3
- Analog mux bus: AMUXBUSL, AMUXBUSR
- Combined left/right resources: AG[0] – AG[7], abus0 – abus3, AMUXBUS

When an Analog Resource Constraint is present on a signal, the signal will be routed using **only** the specified resource. All of the component terminals connected to the signal must have a direct connection to the routing resource. The analog placer might not be able to automatically ensure that components are placed in way that satisfies Analog Resource Constraints. Components connected to constrained signals should be placed manually.

Analog Resource Constraint Example

In this example, the Analog Resource Constraint is used to force a signal (Pin_1) on P4[4] to be routed on Analog Global Left 4.

Figure 1. Analog Resource Constraint Example



Design-Wide Resources Settings

The following figures show settings in the Design-Wide Resources editors.

Figure 2. Directives Editor

Component (Signal) Name	Directive Type	Directive Value
\PGA_1:SC\	ForceComponentFixed	F(SC,0)

Figure 3. Pin Editor

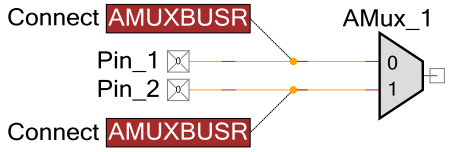
Alias	Name	Pin	Lock
	Pin_1	P4[4]	☑
	Pin_2	P4[5]	☑

Analog Resource Constraint Example with AMux

When the Analog Resource Constraint is connected to an input of an analog mux, it controls the routing of the mux rather than the routing of the input signal.

Figure 4 shows that the constraint applies to the routing of the AMux. Pin_1 is connected to Pin_2 when the firmware connects both inputs of the AMux.

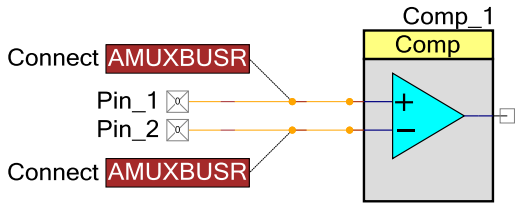
Figure 4. Analog Resource Constrained with AMux



Short Circuit Example

If the same analog routing resource is specified for multiple signals that are not connected to an AMux, the signals will be connected to each other, which is not always the intended behavior.

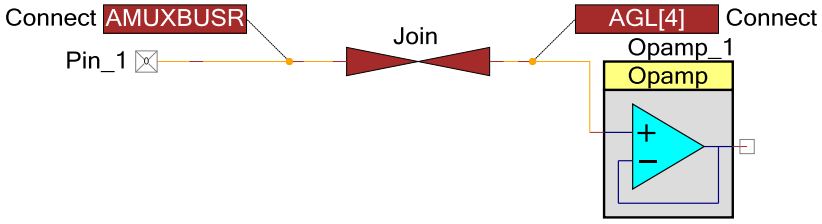
Figure 5. Short Circuit Example



Analog Net Join Example

To apply multiple constraints to a signal or constrain a subset of the connections in a signal, use a Net Join component. Refer to the Net Join component datasheet for details (available from the PSoC Creator Component Catalog).

Figure 6. Net Join Example



Component Changes

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

Version	Description of Changes
1.50.g	Minor datasheet edit.
1.50.f	The component was made visible for PSoC 6.
1.50.e	Minor datasheet edit.
1.50.d	Minor datasheet edit.
1.50.c	Released to internet.
1.50.b	Cosmetic change removing wire guide from terminal
1.50.a	Minor datasheet edits and updates

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