

# ***SmartDesign MSS***

*I2C Configuration*

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# Configuration Options

The SmartFusion Microcontroller Subsystem (MSS) provides two I2C hard peripherals (APB\_0 and APB\_1 sub busses) with optional FPGA fabric Baud Clock and SMBus extensions.

The actual behavior of each I2C instance must be defined at the application level using the SmartFusion MSS I2C Driver provided by Actel.

In this document, we describe how you can enable the MSS I2C instances and access the optional fabric Baud Clock and SMBus ports. For more details about the MSS I2C hard peripherals, please refer to the [Actel SmartFusion Microcontroller Subsystem User's Guide](#).

## Configuration Options

**Enabling/Disabling I2C Instances** - On the MSS canvas, you need to enable (default) or disable each I2C instance based on whether it is being used into your current application ([Figure 1](#)). Disabled I2C instances are held in reset (lowest power state) after the Actel system boot code is executed.

Enabled I2C instances external ports - MSS I/Os - are also automatically configured by the Actel system boot code.

MSS I/Os allocated to an I2C instance are available to connect to MSS GPIOs if that I2C instance is disabled. Refer to the [MSS GPIO configurator handbook](#) for more details.

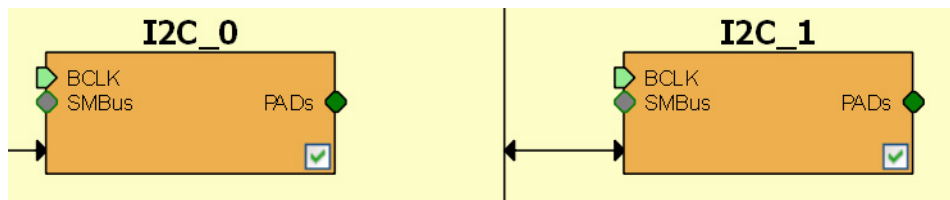


Figure 1 · MSS I2C

**Fabric Baud Clock Extension** - You can use an FPGA fabric generated Baud Clock signal (BCLK) to generate the internal I2C baud rate clock; to do so, check the **Use Fabric Baud Clock (BCLK)** option in the MSS I2C Configurator ([Figure 2](#)) to expose the BCLK port on the MSS I2C instance(s) used in your application. This port is automatically promoted to the top level of the MSS Configurator Canvas so that it is available at the next level of hierarchy. You must ensure that the I2C driver configuration used in your software application is compatible with using the MSS I2C BCLK port.

**Fabric SMBus Extension** - To use the fabric SMBus extension, check the **Use Fabric SMBus** option in the MSS I2C Configurator to expose the SMBus group port on the MSS I2C instance(s) used in your application. This port is automatically promoted to the top level of the MSS Configurator Canvas so that it is available at the next level of hierarchy.

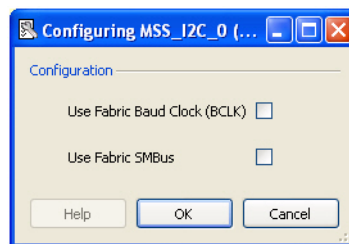


Figure 2 · Configure MSS I2c Dialog Box

## Port Description

Table 1 · I2C Port Description

Port Name	Port Group	Direction	PAD?	Description
SCL	PADs	INOUT	Yes	External dedicated serial Interface. Wired-AND serial clock input/output.
SDA	PADs	INOUT	Yes	External dedicated serial Interface. Wired-AND serial data input/output.
BCLK		IN	No	Pulse for SCL speed control. Overrides PCLK when used.
SMBSUS_NO	SMBus	OUT	No	Suspend Mode signal; used if Core is the master/host. NOTE: Not a Wired-AND signal.
SMBALERT_NO	SMBus	OUT	No	Wired-AND interrupt signal; used in slave/device mode if the Core wants to force communication with a host.
SMBSUS_NI	SMBus	IN	No	Input Suspend Mode signal; used if Core is slave/device. NOTE: Not a Wired-AND signal.
SMBALERT_NI	SMBus	IN	No	Wired-AND interrupt signal; used in master/host mode to monitor if slave/devices want to force communication with the host.

Note: PAD ports are automatically promoted to top throughout the design hierarchy.

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Visit the [Actel Customer Support website \(www.actel.com/support/search/default.aspx\)](http://www.actel.com/support/search/default.aspx) for more information and support. Many answers available on the searchable web resource include diagrams, illustrations, and links to other resources on the Actel web site.

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You can communicate your technical questions to our email address and receive answers back by email, fax, or phone. Also, if you have design problems, you can email your design files to receive assistance. We constantly monitor the email account throughout the day. When sending your request to us, please be sure to include your full name, company name, and your contact information for efficient processing of your request.

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