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SmartDesign MSS

UART Configuration

Actel
POWER MATTERS

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Trademarks

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Configuration Options

The SmartFusion Microcontroller Subsystem (MSS) provides two UART hard peripherals (APB_0 and APB_1 sub busses) with optional FPGA fabric MODEM extension.

The actual behavior of each UART instance (baud rate, data width etc.) must be defined at the application level using the *SmartFusion MSS UART Driver* provided by Actel.

In this document, we describe how you can enable the MSS UART instances and access the MODEM fabric interface. For more details about the MSS UART hard peripherals, please refer to the Actel SmartFusion Microcontroller Subsystem User's Guide.

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

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

MSS I/Os allocated to a UART instance are available to connect to MSS GPIOs if that UART instance is disabled Refer to the MSS GPIO configurator handbook for more details.

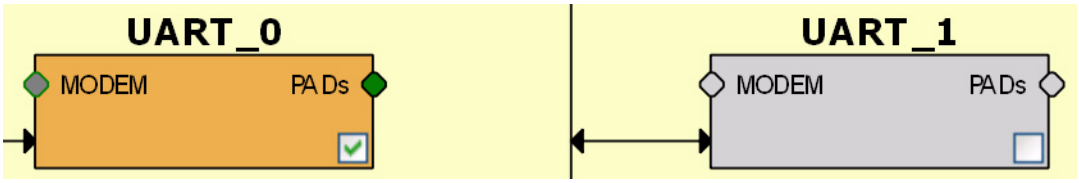

Figure 1 · MSS UART

Fabric MODEM Extension - To use the fabric MODEM extension, check the **Use Fabric Modem Interface** option in the MSS UART configurator to expose the MODEM group port (Figure 2). 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.

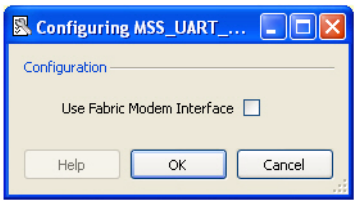

Figure 2 · MSS UART Configuration - Fabric Modem Interface

Port Description

Table 1 · MSS UART Port Description

Port Name	Port Group	Direction	PAD?	Description
TXD	PADs	OUT	Yes	Serial output data. This is the data that will be transmitted from Core16550. It is synchronized with the BAUDOUT output pin.
RXD	PADs	IN	Yes	Serial Input Data. This is the data that will be transmitted into Core16550. It is synchronized with the PCLK input pin.
RTS_N	MODEM	OUT	No	Request to Send. This active low output signal is used to inform the attached device (modem) that Core16550 is ready to send data. It is programmed by the CPU via the Modem Control Register.
DTR_N	MODEM	OUT	No	Data Terminal Ready. This active low output signal informs the attached device (modem) that Core16550 is ready to establish a communications link. It is programmed by the CPU via the Modem Control Register.
DSR_N	MODEM	IN	No	Data Set Ready. This active low signal is an input indicating when the attached device (modem) is ready to set up a link with Core16550. Core16550 passes this information to the CPU via the Modem Status Register. This register also indicates if the DSR_N signal has changed since the last time the register was read.
CTS_N	MODEM	IN	No	Clear to Send. This active low signal is an input showing when the attached device (modem) is ready to accept data. Core16550 passes this information to the CPU via the Modem Status register. This register also indicates if the CTS_N signal has changed since the last time the register was read.
RI_N	MODEM	IN	No	Ring Indicator. This active low signal is an input showing when the attached device (modem) has sensed a ring signal on the telephone line. Core16550 passes this information to the CPU via the Modem Status Register. This register also indicates when the RI_N trailing edge was sensed.
DCD_N	MODEM	IN	No	Data Carrier Detect. This active low signal is an input indicating when the attached device (modem) has detected a carrier. Core16550 passes this information to the CPU via the Modem Status Register. This register also indicates if the DCD_N signal has changed since the last time the register was read.

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

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