# Target Support Package™4Reference Guide

For Use with Analog Devices<sup>™</sup> Blackfin<sup>®</sup>

## MATLAB®



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Target Support Package<sup>™</sup> Reference Guide

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## Getting Started

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### **System Requirements**

For detailed information about the software and hardware required to use Target Support Package<sup>™</sup> software, refer to the Target Support Package system requirements areas on the MathWorks Web site:

- Requirements for Target Support Package: www.mathworks.com/products/target-package/requirements.html
- Requirements for use with Analog Devices<sup>™</sup>Blackfin<sup>®</sup>: www.mathworks.com/products/target-package/adi-adaptor/

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## **Block Reference**

ADSP-BF537 EZ-KIT Lite (bf537ezkitlite) (p. 2-2)

Blocks for ADSP-BF537 EZ-KIT Lite

## ADSP-BF537 EZ-KIT Lite (bf537ezkitlite)

Blackfin537 bf537_adc	Configure ADC to collect data from analog jacks and output digital data
Blackfin537 bf537_dac	Convert a stream of digital data to an analog signal and send it to the output jack
Blackfin537 bf537_uart_config	Configure UART transceiver to capture data from UART port
Blackfin537 bf537_uart_rx	Receive data stream from UART port
Blackfin537 bf537_uart_tx	Transmit data stream from UART port

## Blocks — Alphabetical List

### Blackfin537 bf537\_adc

#### **Purpose** Configure ADC to collect data from analog jacks and output digital data

Library ADSP-BF537 EZ-KIT Lite

#### **Description**



Configure AD1871 audio ADC on ADI BF537 EZ-KIT Lite board to capture audio stream from the Line In jack of BF537 board. This block uses a sampling rate of 48 kHz. It outputs the sampled signal as [Nx2], where N indicates number of samples per frame in an array of int32 values.

Dialog Box

Source Block Parameters: bf537_adc		
bf537_adc (mask) (link)		
ConfigureAD1871 audio ADC on ADI BF537 EZ-KIT Lite board to capture audio stream from the Line In jack of BF537 board. The samping rate is 48 kHz.Output is a [Nx2], N being the number of samples per frame, array of int32 values representing the sampled signal.		
Parameters Samples per frame:		
64		
[Inherit sample time]		
<u>O</u> K <u>C</u> ancel <u>H</u> elp		

#### Samples per frame

Set the number of samples the ADC buffers internally before it sends the digitized signals, as a frame vector, to the next block in the model. This value defaults to 64 samples per frame. The

	frame rate depends on the sample rate and frame size. The sample rate of the ADI BF537 EZ-KIT Lite board is 48 kHz. If you set <b>Samples per frame</b> to 64, the resulting frame rate is 750 frames per second (48000/64 = 750).
	Inherit sample time Select whether the block inherits the sample time from the model base rate or from the Simulink base rate. You can locate the Simulink base rate in the Solver options in Configuration Parameters. Selecting Inherit sample time directs the block to use the specified rate in model configuration. Entering -1 configures the block to accept the sample rate from the upstream Interrupt, Task, or Triggered Task blocks.
References	ADSP-BF537 EZ-KIT Lite® Evaluation System Manual, Part Number 82-000865-01, available from the Analog Devices Web site.
See Also	Blackfin537 bf537_dac

### Blackfin537 bf537\_dac

## **Purpose** Convert a stream of digital data to an analog signal and send it to the output jack

Library ADSP-BF537 EZ-KIT Lite

#### Description



Configure AD1854 audio DAC on ADI BF537 EZ-KIT Lite board to capture audio stream from the Line In jack of BF537 board. This block uses a sampling rate of 48 kHz. It outputs the sampled signal as [Nx2], where N indicates number of samples per frame in an array of int32 values.

#### Dialog Box

Configure AD 18 stream from the a [Nx2], N being representing the	54 audio DAC on AD Line In jack of BF5: the number of sam sampled signal.	DI BF537 EZ-KIT Li 37 board. The sar uples per frame, ar	te board to capture npling rate is 48 kHz rray of int32 values	audio .Output is
Parameters —				
Samples per fra	me:			
64				

#### Samples per frame

Set the number of samples per data input frame. Match this value with the value of the block creating the data frames. This value defaults to 64 samples per frame.

**References** ADSP-BF537 EZ-KIT Lite® Evaluation System Manual, Part Number 82-000865-01, available from the Analog Devices Web site.

See Also Blackfin537 bf537\_adc

### Blackfin537 bf537\_uart\_config

**Purpose** Configure UART transceiver to capture data from UART port

contain one configuration block per UART port.

Library ADSP-BF537 EZ-KIT Lite

**Description** 

Blackfin537 bf537\_uart\_config bf537\_uart\_config

Dialog Box

Block Parameters: bf537_uart_config
_bf537_uart_config (mask) (link)
Configure UART tranceiver on ADI BF537 based board to capture data stream from the UART port of BF537 board.
Parameters
UART port: UART0
Baud rate: 57600
Data bits: 8
Parity: None
Stop bits: 1
OK <u>C</u> ancel <u>H</u> elp <u>Apply</u>

Configure UART transceiver on ADI BF537 based board to capture data stream from the UART port of BF537 board. Your model can only

#### UART port

Select which UART port this block configures. UART0 uses processor pins PF0 (UART0 transmit) and PF1 (UART0 receive). UART1 uses processor pins PF2 (Push button SW13) and PF3 (Push button SW12). These pins have multiple GPIO functions that depend on the configuration of the processor. For more information, see the "Programmable Flags (PFs)" section of the *ADSP-BF537 EZ-KIT Lite*® *Evaluation System Manual*.

#### **Baud** rate

Configure the rate at which the UART transfers bits per second. The bits include the start bit, the data bits, the parity bit (if enabled), and the stop bits. Configure both the sending and receiving devices to the same baud rate.

#### Data bits

Set the number of data bits per data frame to 5, 6, 7, or 8. The UART transmits the least significant bit sent first. Use the default value, 8 bits, unless your system requires a lower value. Configure both the sending and receiving devices to the same data bit value.

#### Parity

Set type of parity checking to be none, even, or odd. When you set **Parity** to none, the UART does not perform parity checking and does not transmit a parity bit. When you set **Parity** to even, the UART sets the parity bit to 1 to obtain an even number of ones in the data word. When you set **Parity** to odd, the UART sets the parity bit to 1 to obtain an odd number of ones in the data word. Parity checking can detect errors of 1 bit only. An error in 2 bits can cause the data to have a seemingly valid parity. Configure both the sending and receiving devices to the same parity value.

#### Stop bits

Set the number of bits used to indicate the end of a byte. When you set **Stop bits** to 1, the UART transmits 1 bit to signal the end of a transmission. When you set **Stop bits** to 1.5, the UART extends the length of time it transmits the 1-bit stop bit by half. Configure both the sending and receiving devices to the same stop bit value.

#### References

ADSP-BF537 EZ-KIT Lite® Evaluation System Manual, Part Number 82-000865-01, available from the Analog Devices Web site.

See Also Blackfin537 bf537\_uart\_rx, Blackfin537 bf537\_uart\_tx

#### Purpose Receive data stream from UART port

Library ADSP-BF537 EZ-KIT Lite

#### Description



Configure UART receiving on ADI BF537-based board to receive data stream from the UART port on the board. This block outputs [Nx1], where N indicates the data length in an array of uint8 values representing the ASCII characters. Your model can only contain one receive block per UART port.

Dialog Box

Source Block Parameters: bf537_uart_rx
bf537_uart_rx (mask) (link)
Configure UART receiving on ADI BF537-based board to receive data stream from the UART port on the board. Output is a [Nx1], N being the data length, array of uint8 values representing the ASII characters.
Parameters
UART port: UART0
Data length:
16
Enable blocking mode
Enable software buffer
Sample time:
1
OK <u>C</u> ancel <u>H</u> elp

#### **UART** port

Select which UART port from which this block receives data.

#### Data length

Set the data length, in bytes, of the **Out** port. This block always outputs the number of bytes the **Data length** parameter specifies.

#### Enable blocking mode

When you enable blocking mode, this block waits until it receives enough data before writing the data to the **Out** port.

When you disable blocking mode:

- If the receive buffer contains the number of bytes specified by **Data length**, the block writes the data to the **Out** port and also sends a positive number on the **Status** port. This positive number indicates valid data on the **Out** port.
- If the receive buffer does not contain the number of bytes specified by **Data length**, the block does not write the data to the **Out** port and instead sends a 0 to the **Status** port. This 0 indicates invalid data on the out port.

#### Enable software buffer

Use a software-managed buffer, in addition to hardware FIFO, to handle incoming data.

#### Software buffer size factor

If you enable the software buffer, set the size of **Software buffer** size factor to handle expected bursts in the incoming data.

#### Sample time

Specify the time interval between samples. To inherit sample time from the upstream block, set this parameter to -1.

**References** ADSP-BF537 EZ-KIT Lite® Evaluation System Manual, Part Number 82-000865-01, available from the Analog Devices Web site.

See Also Blackfin537 bf537\_uart\_config, Blackfin537 bf537\_uart\_tx

#### Purpose Transmit data stream from UART port

Library ADSP-BF537 EZ-KIT Lite

#### Description



Configure UART transmission on ADI BF537 based board to send data stream through the UART port of the board. The block requires an input of [Nx1], where N indicates the data length, in an array of uint8 values representing the ASCII characters. Your model can only contain one transmit block per UART port.

Dialog Box

🙀 Sink Block Parameters: bf537_uart_tx	×
_bf537_uart_tx (mask) (link)	
Configure UART transmission on ADI BF537 based board to send data stream through the UART port of the board. Input is a [Nx1], N being the data length, array of uint8 values representing the ASII characters.	
Parameters	
UART port: UART0	-
Data length:	
16	
OK <u>C</u> ancel <u>H</u> elp <u>Apply</u>	

#### UART port

Select the UART port the transmit block uses to send data.

	<b>Data length</b> Set the data length, in data words, of each transmission. Mate this value to the data size on the <b>In</b> port.		
References	ADSP-BF537 EZ-KIT Lite® Evaluation System Manual, Part Number 82-000865-01, available from the Analog Devices Web site.		
See Also	Blackfin537 bf537_uart_config, Blackfin537 bf537_uart_rx		



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