SBI - Sandbox input from FPGA

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The Sandbox Input from FPGA (SBI) block reads the value of the SBI registers in the FPGA. It is used to transfer data from user-made code within the FPGA to the CPU. To transfer data from the CPU to the user-made code within the FPGA, the SBO block should be used.

Information on FPGA edition is available on:

- Editing the FPGA firmware (sandbox) (PN116)

Usage examples of the SBI block are available on:

- FPGA-based hysteresis current control (TN120)
- FPGA-based SPI communication IP for A/D converter (TN130)

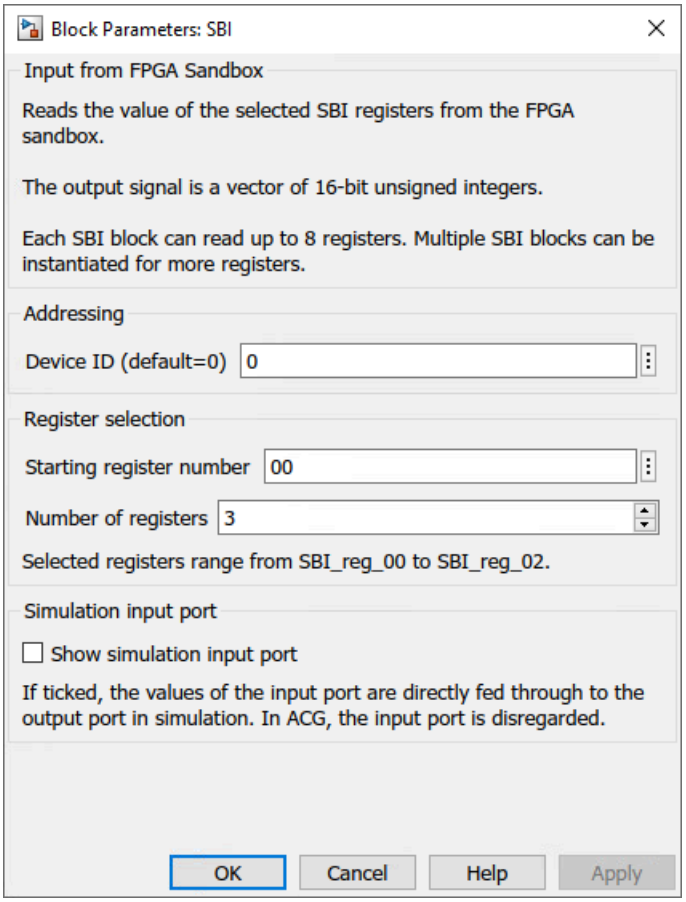
Simulink block

Signal specification

The output returns a vector of the 16-bit unsigned integers representing the SBI register values. Up to 8 registers can be read from a single SBI block. Multiple SBI blocks can be used to read more registers.

Parameters

- `Device ID` selects which B-Box/B-Board to address when used in a multi-device configuration.
- `Starting register number` and `Number of registers` defines the range of registers to read.



PLECS block

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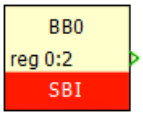

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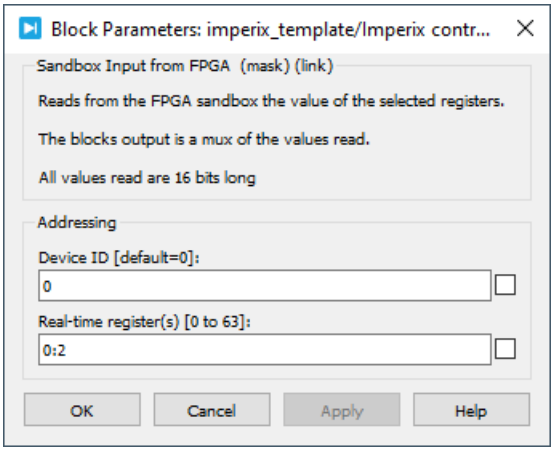

C++ functions

`Sbi_ReadDirectly` **— Read during init phase**

```
uint16_t Sbi_ReadDirectly(unsigned int address, unsigned int device=0);Code language: C++ (cpp)
```

Returns the SBI register value.

It can only be called in `UserInit()`.

Parameters

- `address` : address of the targeted register (0 to 63)
- `device` : the id of the addressed device (optional, used in multi-device configuration only)

`Sbi_Read` **— Read during run-time**

```
uint16_t Sbi_Read(unsigned int address, unsigned int device=0);Code language: C++ (cpp)
```

Returns the SBI register value, has to be called in the interrupt.

For this function to work the addressed register must be set as *real-time* using `Sbi_ConfigureAsRealTime()`, otherwise it returns 0.

Parameters

- `address` : address of the targeted register (0 to 63)
- `device` : the id of the addressed device (optional, used in multi-device configuration only)

`Sbi_ConfigureAsRealTime` **— Configure as readable during run-time**

```
void Sbi_ConfigureAsRealTime(unsigned int address, unsigned int device=0);Code language: C++ (cpp)
```

Tags an SBI register as *real-time*, meaning that its value is transferred before each interrupts and can then be retrieved using `Sbi_Read()`.

It has to be called in `UserInit()`.

Parameters

- `address` : address of the targeted register (0 to 63)
- `device` : the id of the addressed device (optional, used in multi-device configuration only)