

# VciBlockDevice

## 1) Functional Description

This VCI component is both a target and an initiator.

- It is addressed as a target to be configured for a transfer.
- It is acting as an initiator to do the transfer

There is only one block device handled by this component, limited to  $2^{41}$  bytes. An IRQ is optionally asserted when transfer is finished.

This hardware component checks for segmentation violation, and can be used as a default target.

It contains the following memory-mapped registers:

- `BLOCK_DEVICE_BUFFER` Physical address of the buffer in SoC memory
- `BLOCK_DEVICE_COUNT` Count of blocks to transfer
- `BLOCK_DEVICE_LBA` Base sector for transfer
- `BLOCK_DEVICE_OP` Type of operation, writing here initiates the operation.  
This register goes back to `BLOCK_DEVICE_NOOP` when operation is finished. (write only)
- `BLOCK_DEVICE_STATUS` State of the transfer. Reading this register while not busy resets its value to IDLE. Value may be one of
  - ◆ `BLOCK_DEVICE_IDLE`
  - ◆ `BLOCK_DEVICE_BUSY`
  - ◆ `BLOCK_DEVICE_READ_SUCCESS`
  - ◆ `BLOCK_DEVICE_WRITE_SUCCESS`
  - ◆ `BLOCK_DEVICE_READ_ERROR`
  - ◆ `BLOCK_DEVICE_WRITE_ERROR`
  - ◆ `BLOCK_DEVICE_ERROR`
- `BLOCK_DEVICE_IRQ_ENABLE` Boolean enabling the IRQ line
- `BLOCK_DEVICE_SIZE` Number of blocks addressable in the controller (read-only)
- `BLOCK_DEVICE_BLOCK_SIZE` Block size (in bytes) (read-only)

The following operations codes are defined:

- `BLOCK_DEVICE_NOOP` Nothing
- `BLOCK_DEVICE_READ` `read()`
- `BLOCK_DEVICE_WRITE` `write()`

For extensibility issues, you should access this component using globally-defined offsets. You should include file

soclib/block\_device.h from your software, it defines BLOCK\_DEVICE\_COUNT, BLOCK\_DEVICE\_READ, ...

Sample code: Please see reference implementation in [source:trunk/soclib/soclib/platform/topcells/caba-vgmn-block\\_device-mips32el](source:trunk/soclib/soclib/platform/topcells/caba-vgmn-block_device-mips32el)

(add -I/path/to/soclib/include to your compilation command-line)

## 2) Component definition & usage

[source:trunk/soclib/soclib/module/connectivity\\_component/vci\\_block\\_device/caba/metadata/vci\\_block\\_device.sd?](source:trunk/soclib/soclib/module/connectivity_component/vci_block_device/caba/metadata/vci_block_device.sd?)

See [SoclibCc/VciParameters](#)

```
Uses( 'vci_block_device', **vci_parameters )
```

## 3) CABA Implementation

### CABA sources

- interface :  
[source:trunk/soclib/soclib/module/connectivity\\_component/vci\\_block\\_device/caba/source/include/vci\\_block\\_device.h](source:trunk/soclib/soclib/module/connectivity_component/vci_block_device/caba/source/include/vci_block_device.h)
- implementation :  
[source:trunk/soclib/soclib/module/connectivity\\_component/vci\\_block\\_device/caba/source/src/vci\\_block\\_device.cpp?](source:trunk/soclib/soclib/module/connectivity_component/vci_block_device/caba/source/src/vci_block_device.cpp?)

### CABA Constructor parameters

```
VciBlockDevice(  
    sc_module_name name,    // Component Name  
    const soclib::common::IntTab & index, // Target index  
    const soclib::common::MappingTable &mt, // MappingTable  
    const std::string &filename, // mapped file, may be a host block device  
    const uint32_t block_size = 512 ); // one-block size
```

### CABA Ports

- sc\_in<bool> **p\_resetn** : Global system reset
- sc\_in<bool> **p\_clk** : Global system clock
- soclib::caba::VciTarget<vci\_param> **p\_vci\_target** : The VCI target port
- soclib::caba::VciInitiator<vci\_param> **p\_vci\_initiator** : The VCI initiator port
- sc\_out<bool> **p\_irq** : Interrupt port

## 4) TLM-T Implementation

The TLM-T implementation is not yet available.