



ISEL

DEETC

Departamento de
Engenharia Electrónica e
de Telecomunicações e
de Computadores

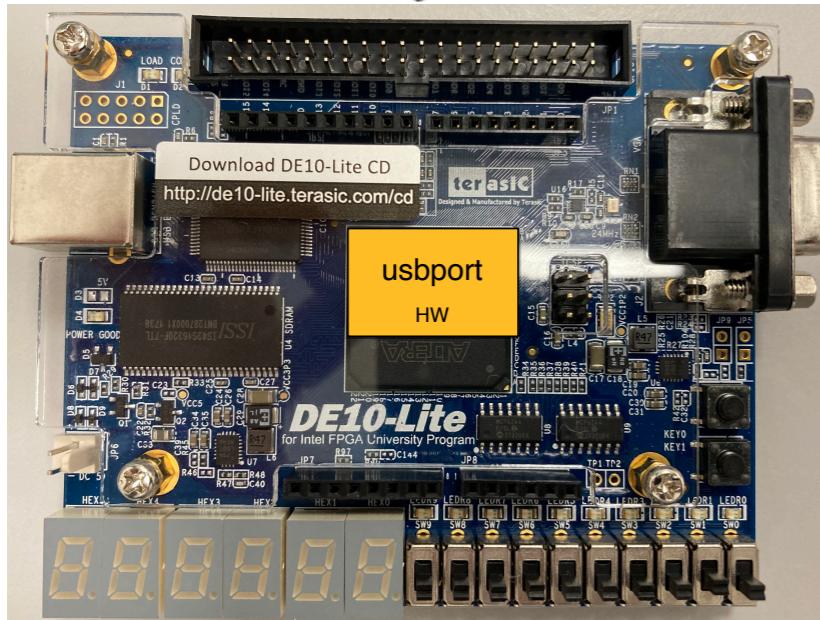
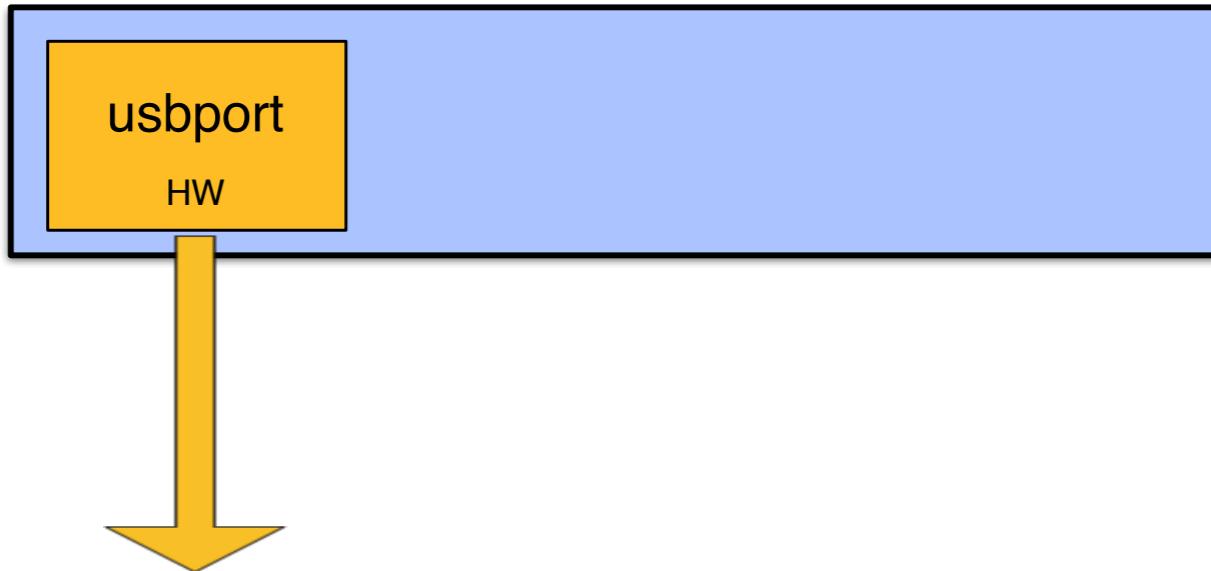
Laboratório de Informática e de Computadores

2021 / 2022 verão

LEIC

Biblioteca UsbPort

UsbPort.jar

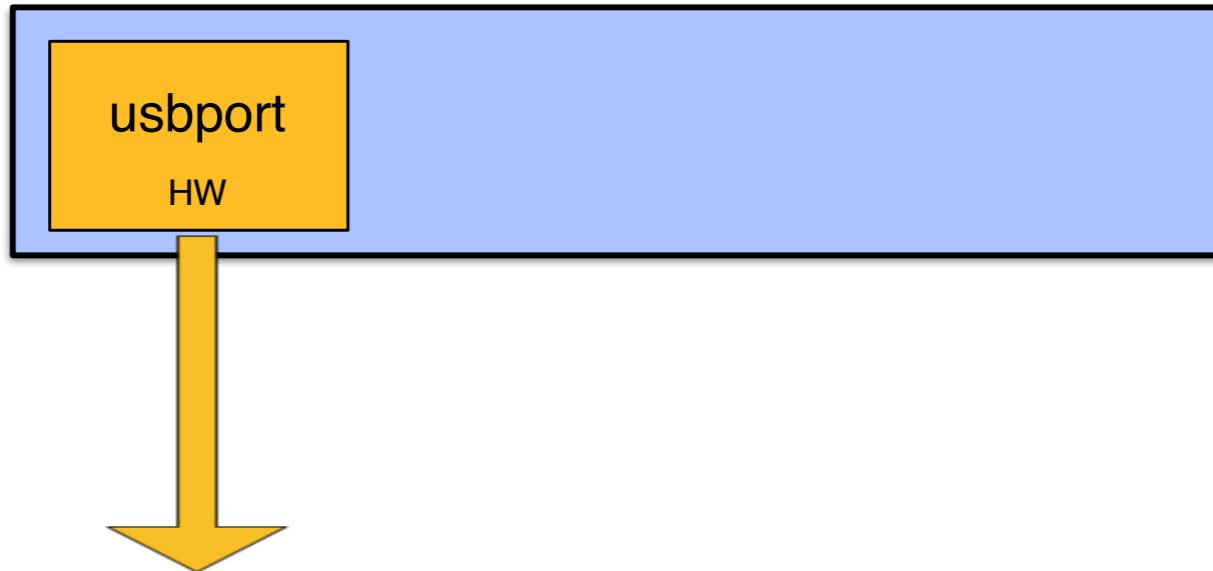


UsbPort.vhd

```
ENTITY UsbPort IS
  PORT
  (
    inputPort: IN STD_LOGIC_VECTOR(7 DOWNTO 0);
    outputPort : OUT STD_LOGIC_VECTOR(7 DOWNTO 0)
  );
END UsbPort;
```

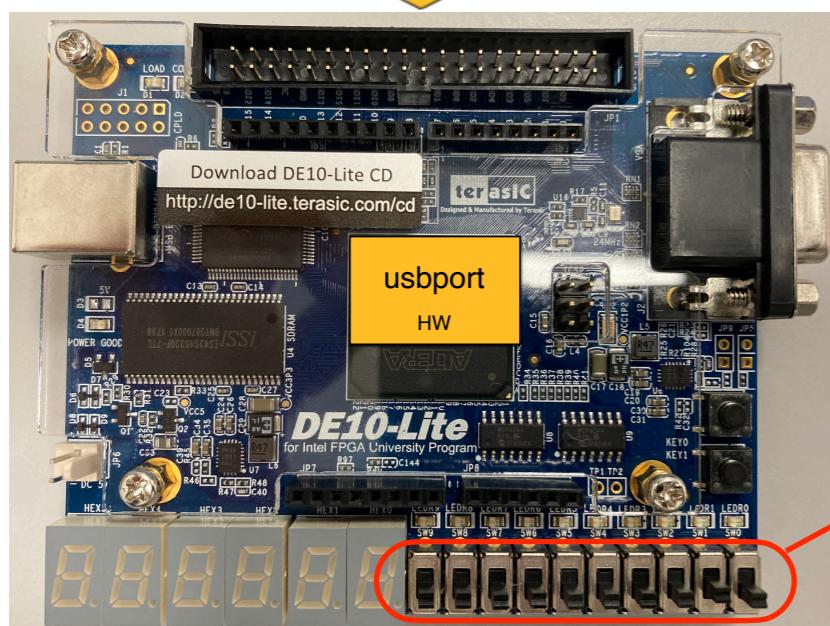
Biblioteca UsbPort

UsbPort.jar



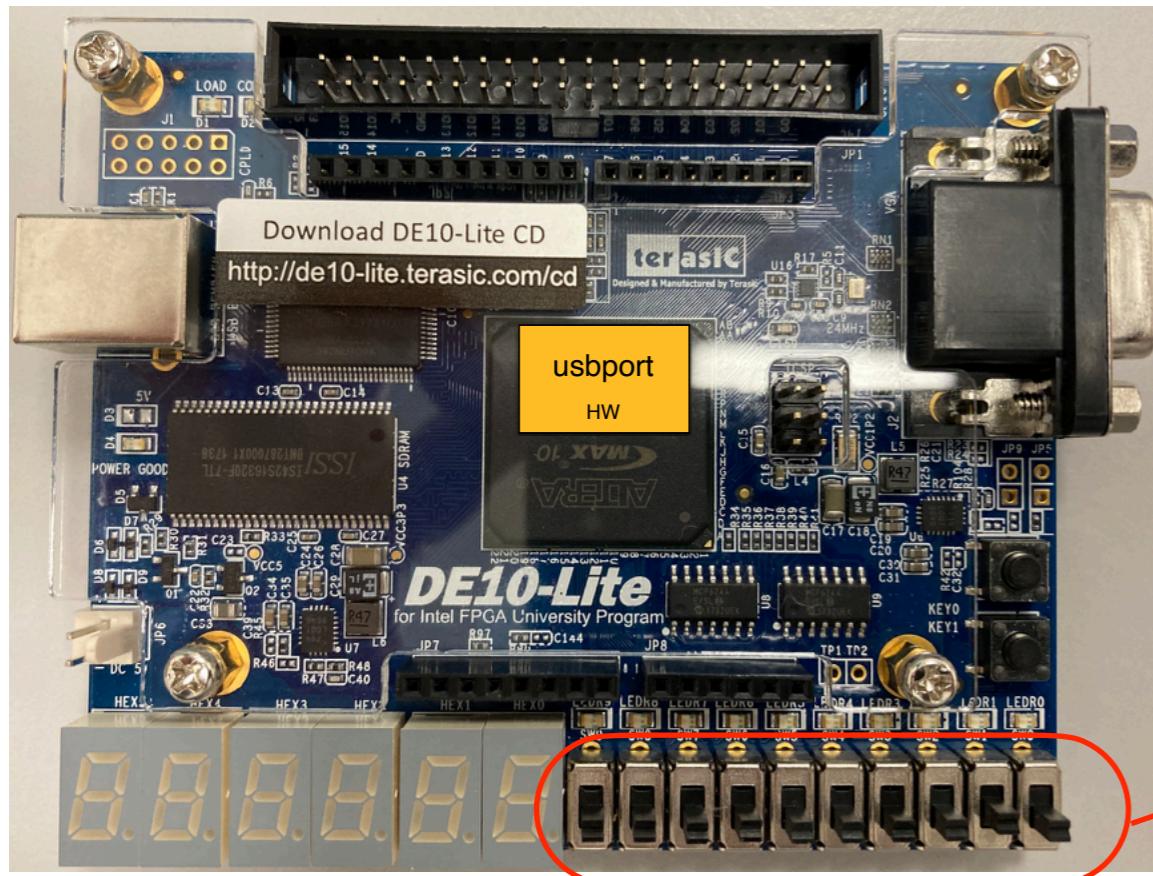
UsbPort.vhd

```
ENTITY UsbPort IS
  PORT
  (
    inputPort: IN STD_LOGIC_VECTOR(7 DOWNTO 0);
    outputPort : OUT STD_LOGIC_VECTOR(7 DOWNTO 0)
  );
END UsbPort;
```



```
set_location_assignment PIN_C10 -to inputPort[0]
set_location_assignment PIN_C11 -to inputPort[1]
set_location_assignment PIN_D12 -to inputPort[2]
set_location_assignment PIN_C12 -to inputPort[3]
set_location_assignment PIN_A12 -to inputPort[4]
set_location_assignment PIN_B12 -to inputPort[5]
set_location_assignment PIN_A13 -to inputPort[6]
set_location_assignment PIN_A14 -to inputPort[7]
```

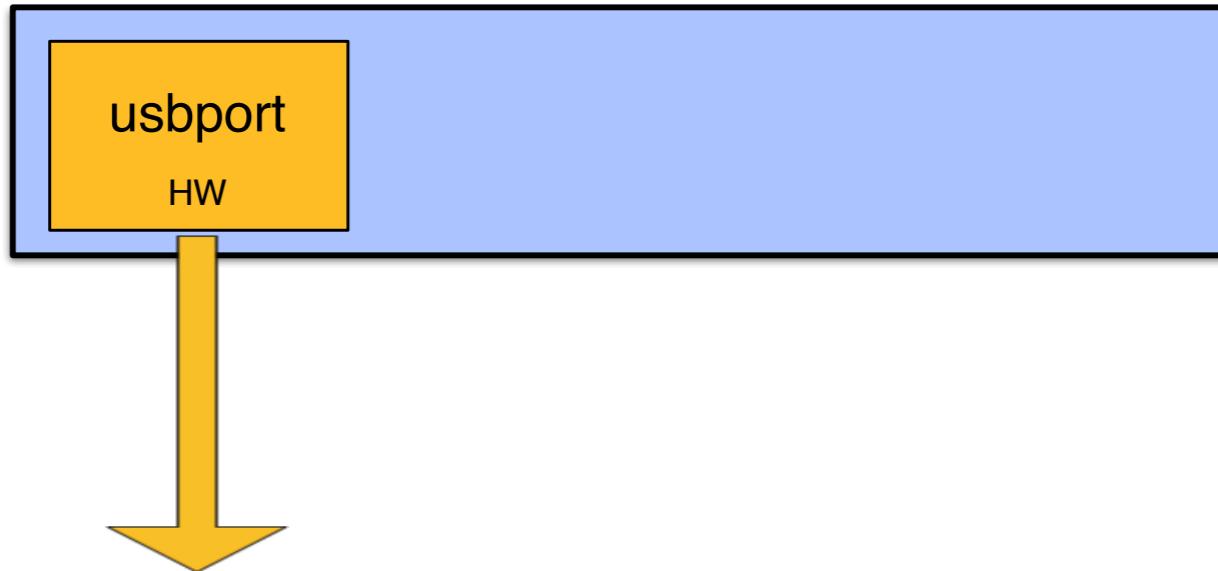
UsbPort :: Input Port



`UsbPort.read(): Int`

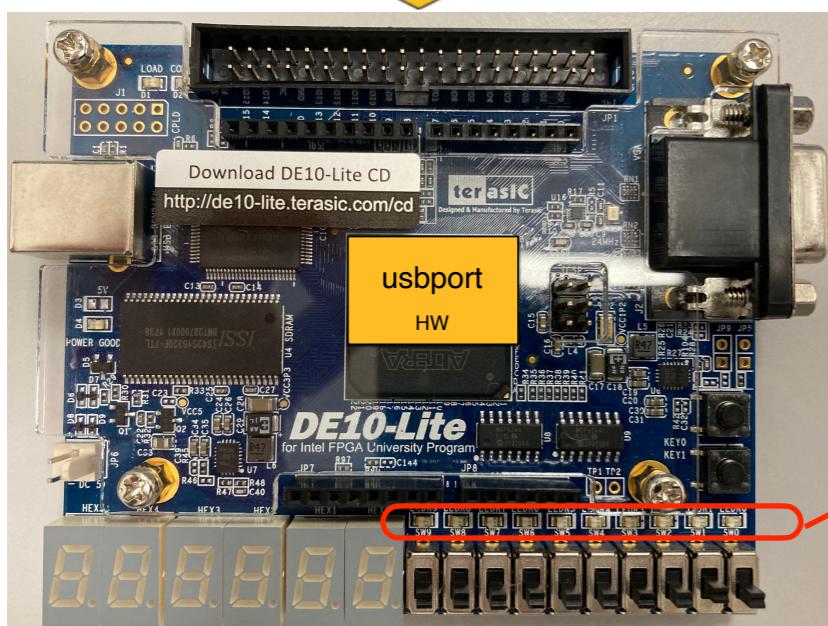
Biblioteca UsbPort

UsbPort.jar



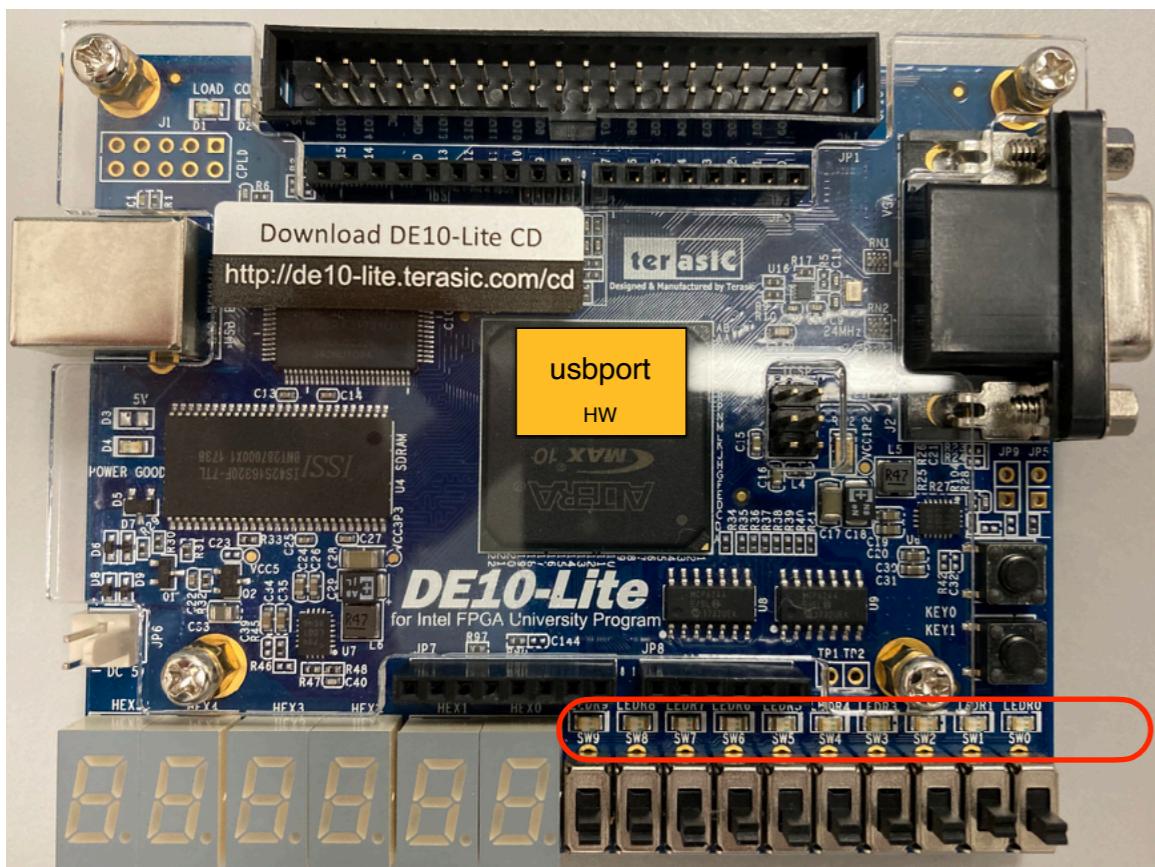
UsbPort.vhd

```
ENTITY UsbPort IS
  PORT
  (
    inputPort: IN STD_LOGIC_VECTOR(7 DOWNTO 0);
    outputPort : OUT STD_LOGIC_VECTOR(7 DOWNTO 0)
  );
END UsbPort;
```



```
set_location_assignment PIN_A8 -to outputPort[0]
set_location_assignment PIN_A9 -to outputPort[1]
set_location_assignment PIN_A10 -to outputPort[2]
set_location_assignment PIN_B10 -to outputPort[3]
set_location_assignment PIN_D13 -to outputPort[4]
set_location_assignment PIN_C13 -to outputPort[5]
set_location_assignment PIN_E14 -to outputPort[6]
set_location_assignment PIN_D14 -to outputPort[7]
```

UsbPort :: Output Port



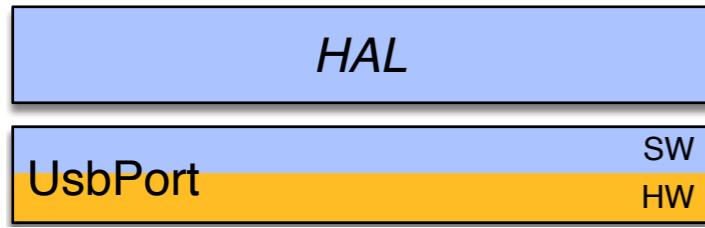
UsbPort.write(Int)

Hardware Abstraction Layer (HAL)

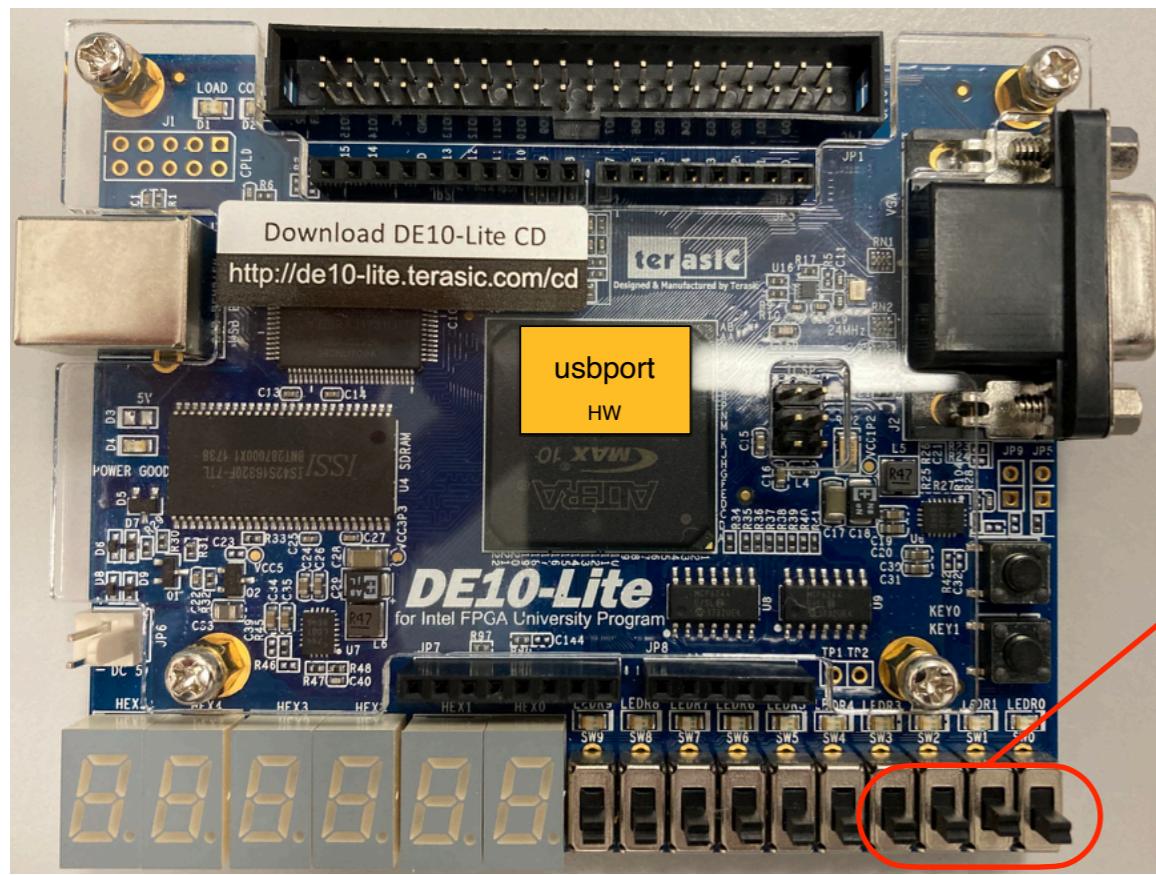


readBits(mask: Int) : Int
isBit(mask: Int) : boolean
setBits(mask: Int)
clrBits(mask: Int)
writeBits(mask: Int, value: Int)

Hardware Abstraction Layer (HAL)



`readBits(mask: Int) : Int`



`mask`

`0b0000_1111`

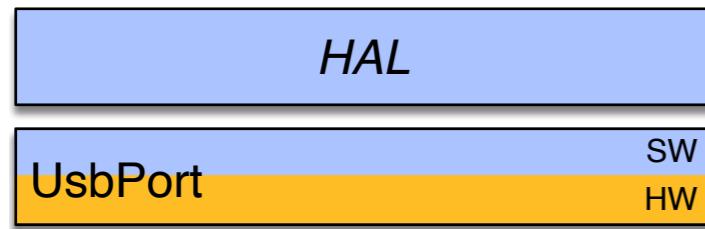
`0x0F`

Representado
em

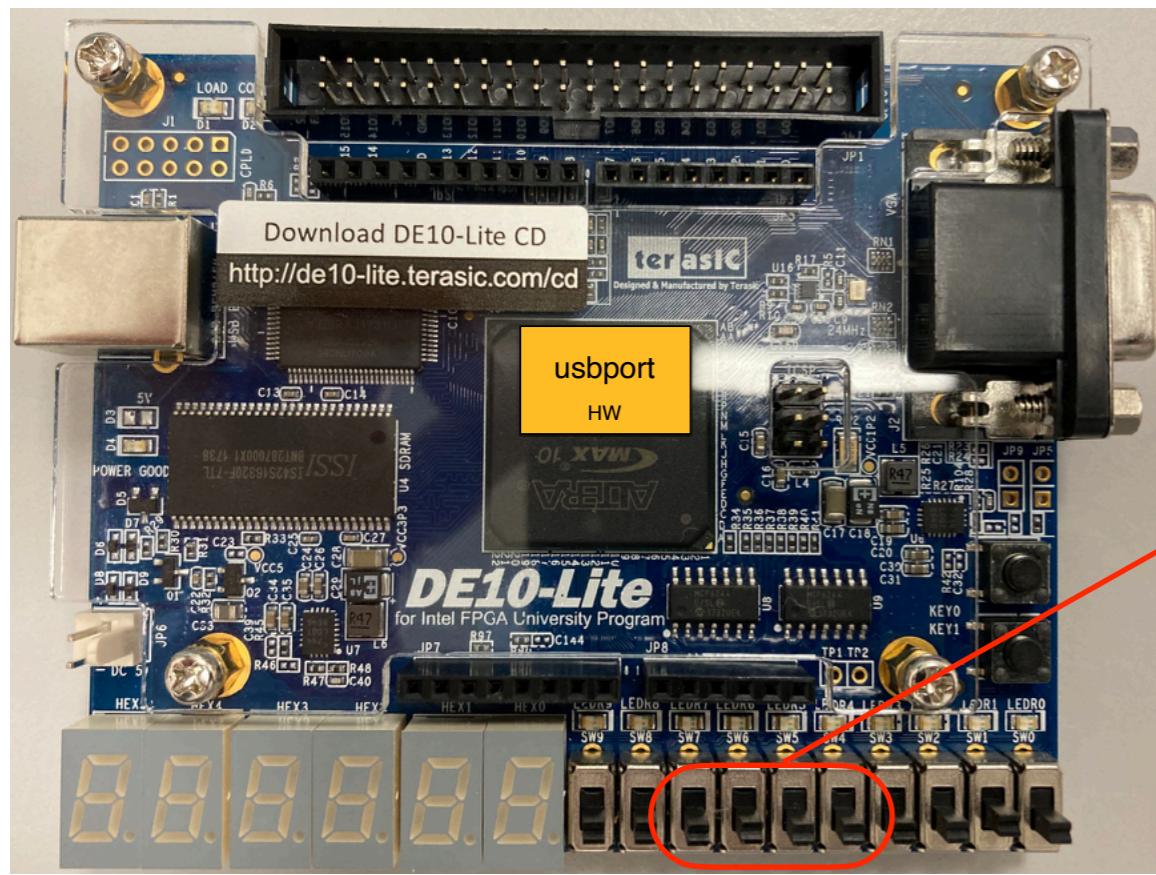
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`readBits(mask: Int) : Int`



`mask`

`0b1111_0000`

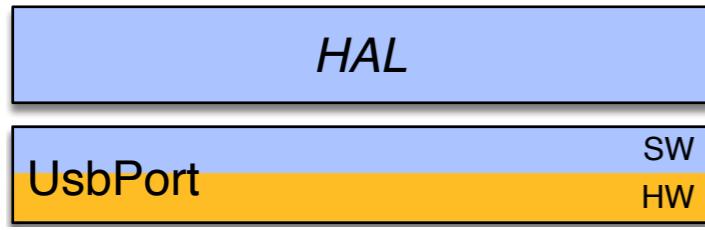
`0xF0`

Representado
em

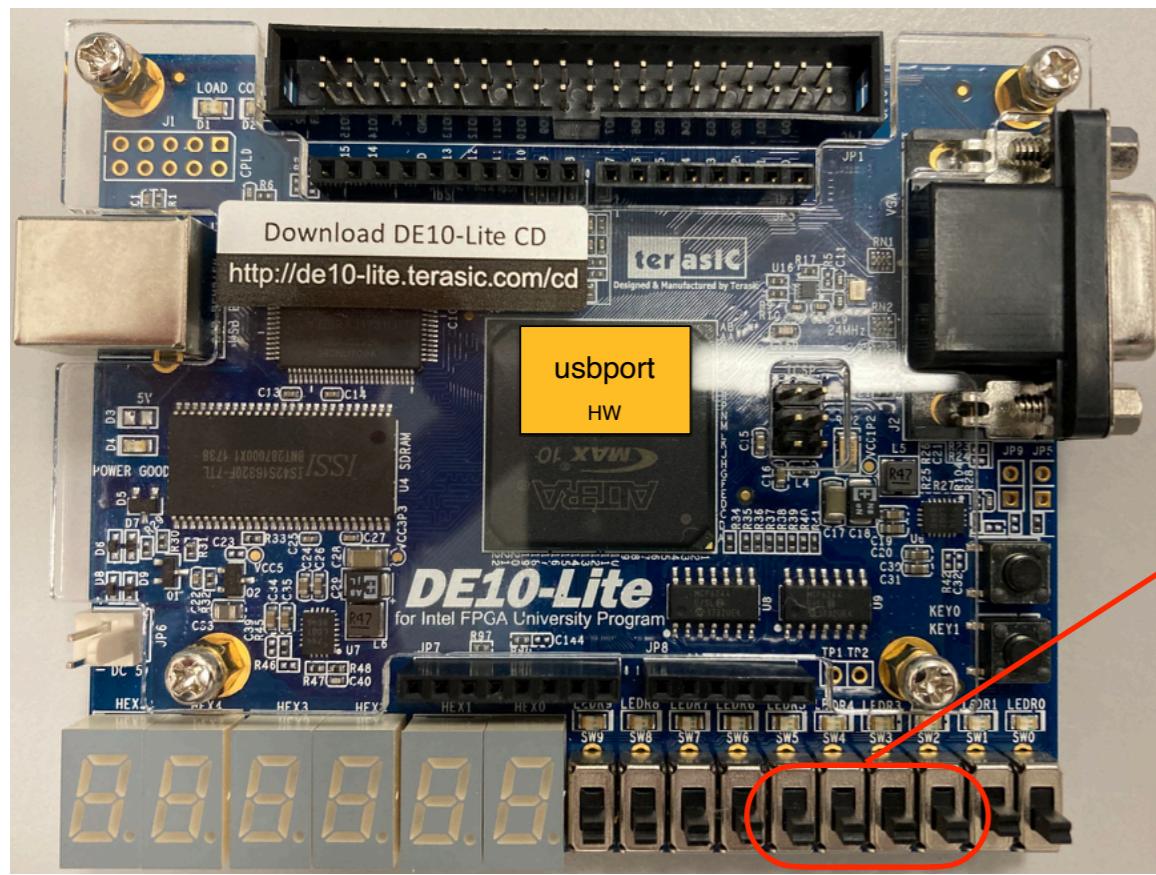
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`readBits(mask: Int) : Int`



`mask`

`0b0011_1100`

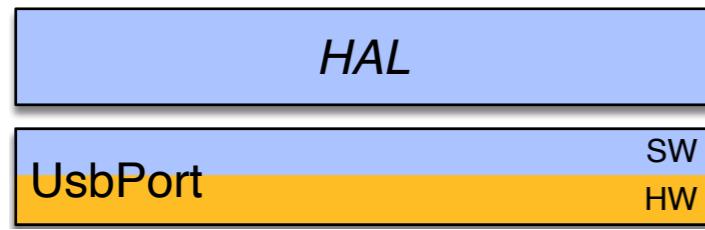
`0x3C`

Representado
em

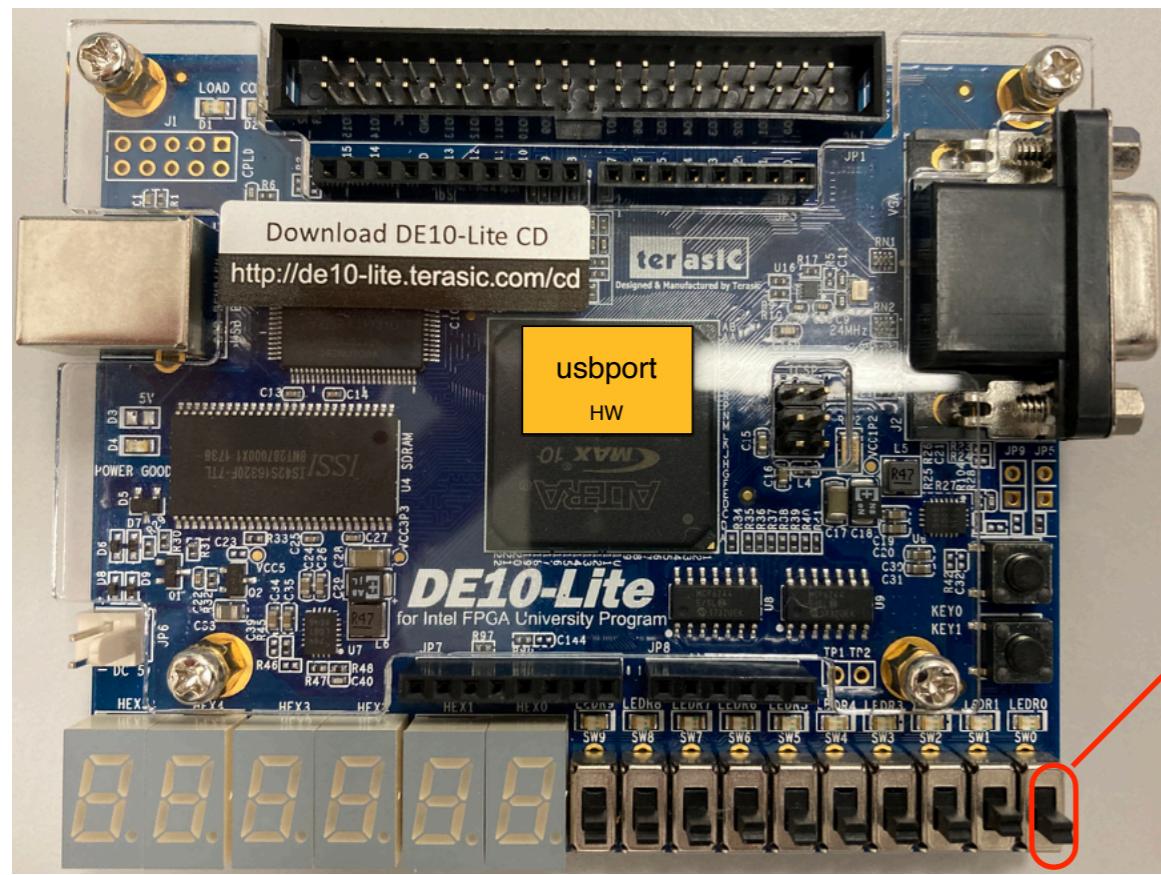
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`isBit(mask: Int) : boolean`



`mask`

`0b0000_0001`

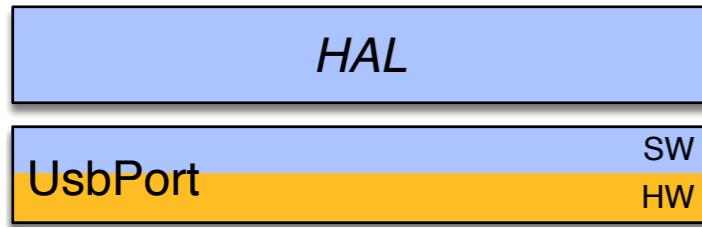
`0x01`

Representado
em

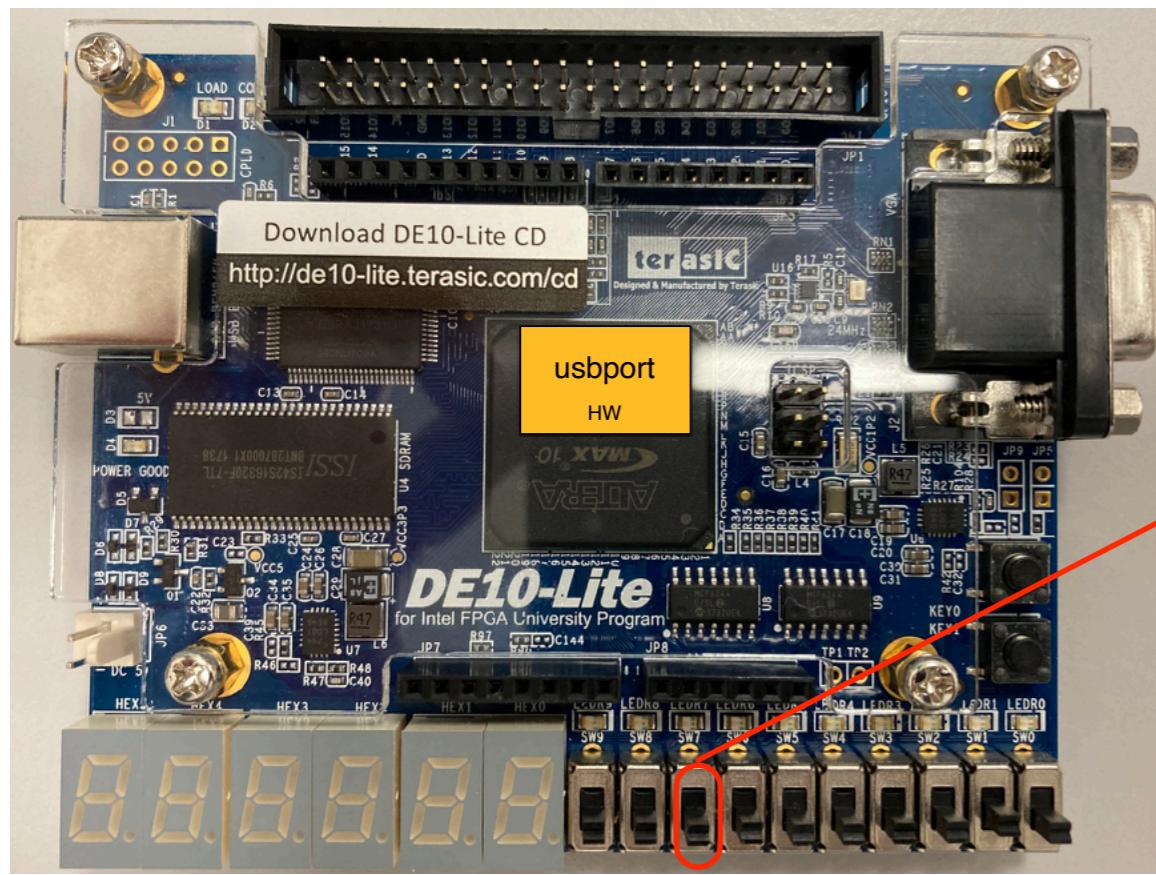
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`isBit(mask: Int) : boolean`



mask

0b0000_1000

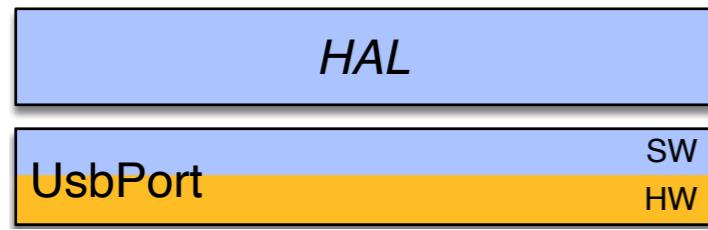
0x08

Representado
em

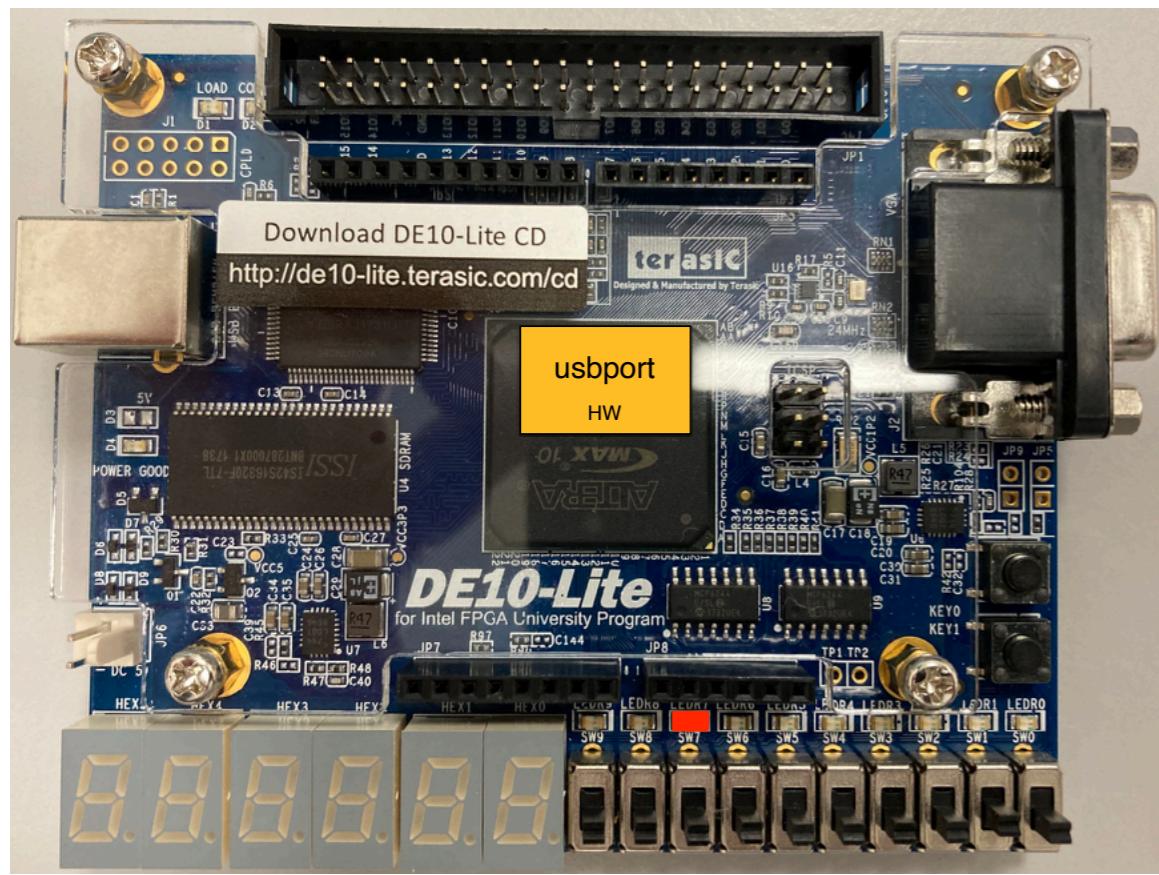
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`setBits(mask: Int)`



mask

0b0000_1111

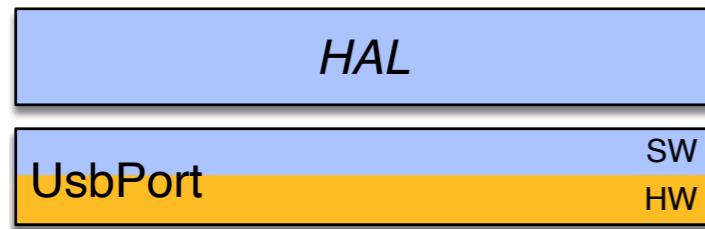
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Representado
em

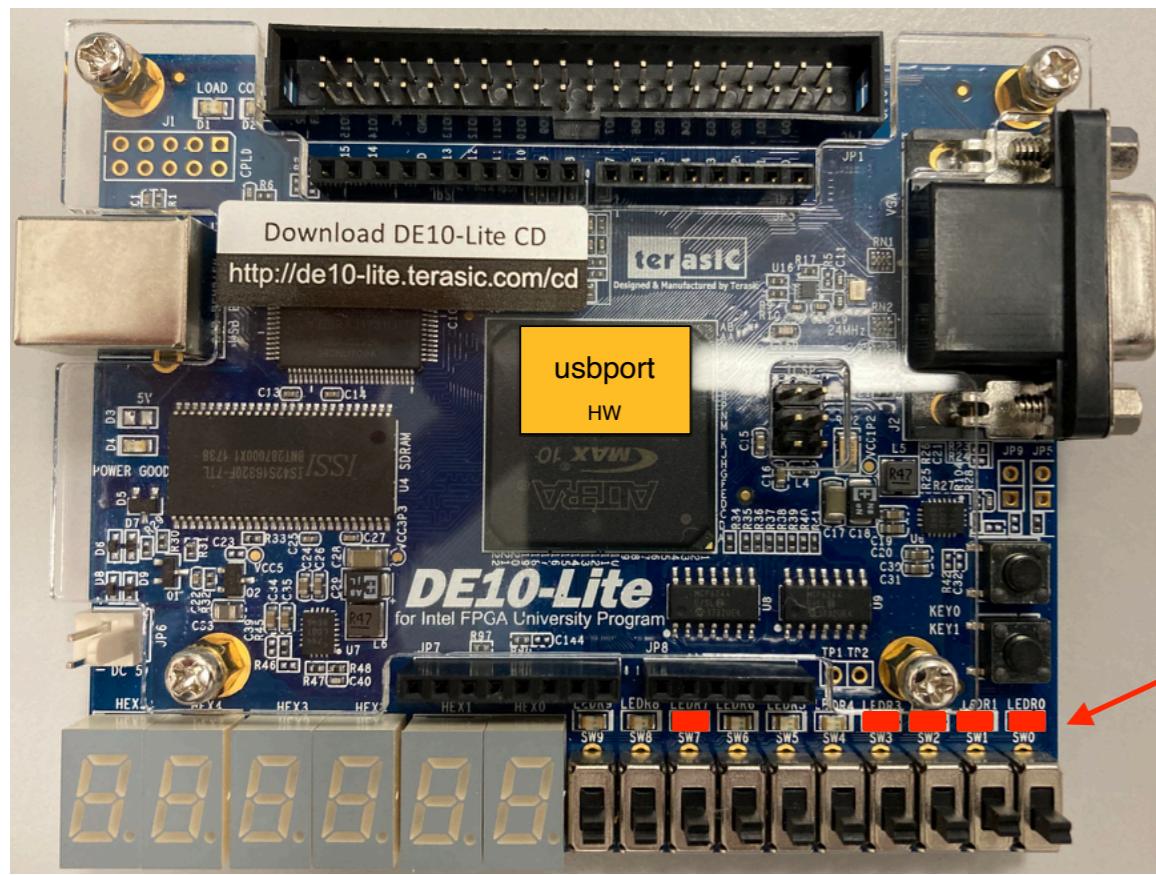
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`setBits(mask: Int)`



`mask`

`0b0000_1111`

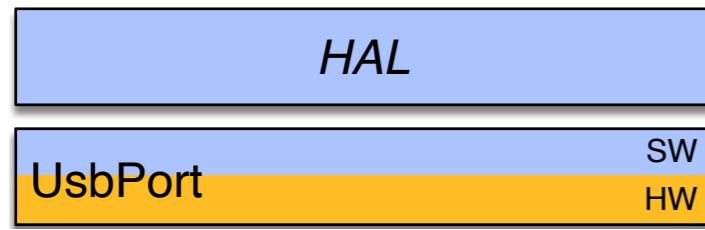
`0x0F`

Representado
em

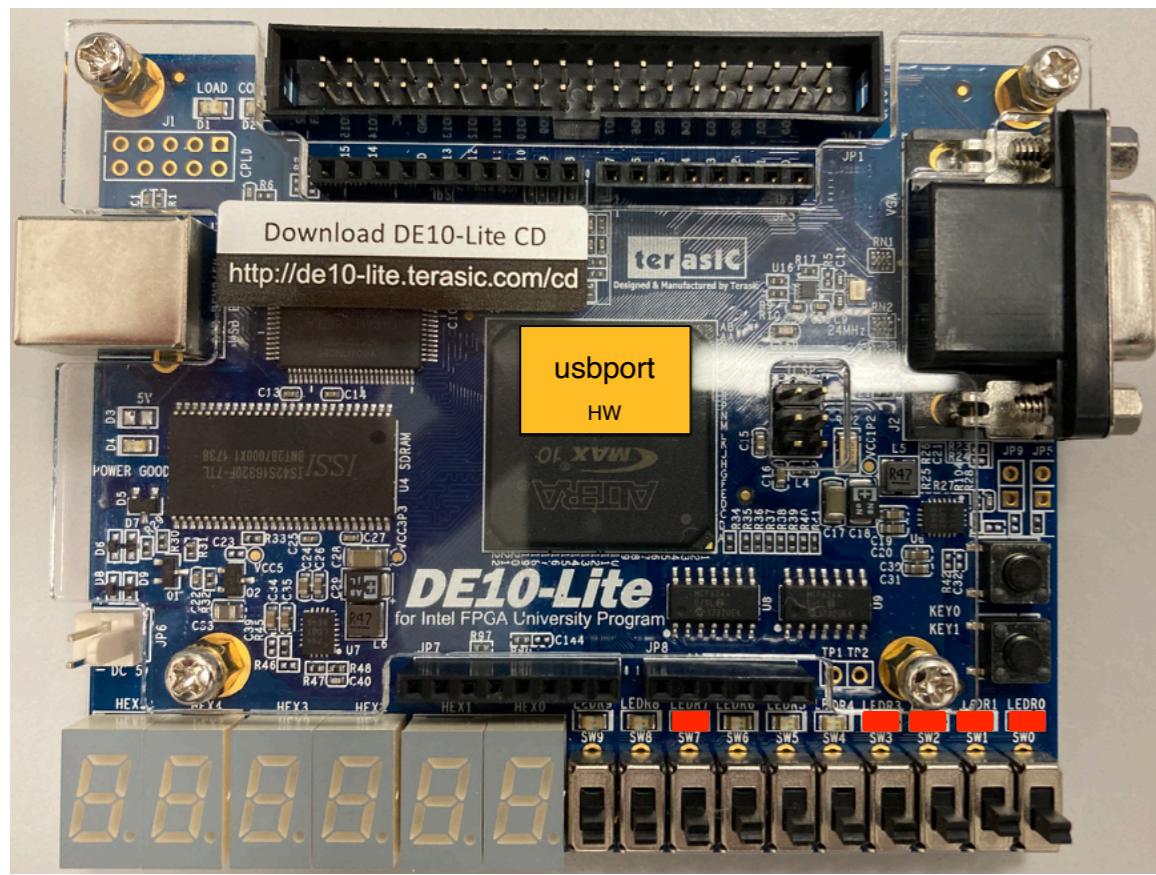
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



`clrBits(mask: Int)`



mask

0b0000_0011

0x03

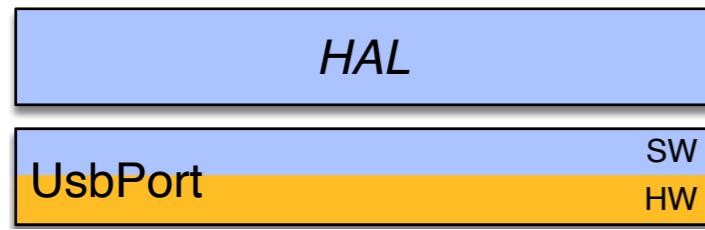
Representado
em

Binário

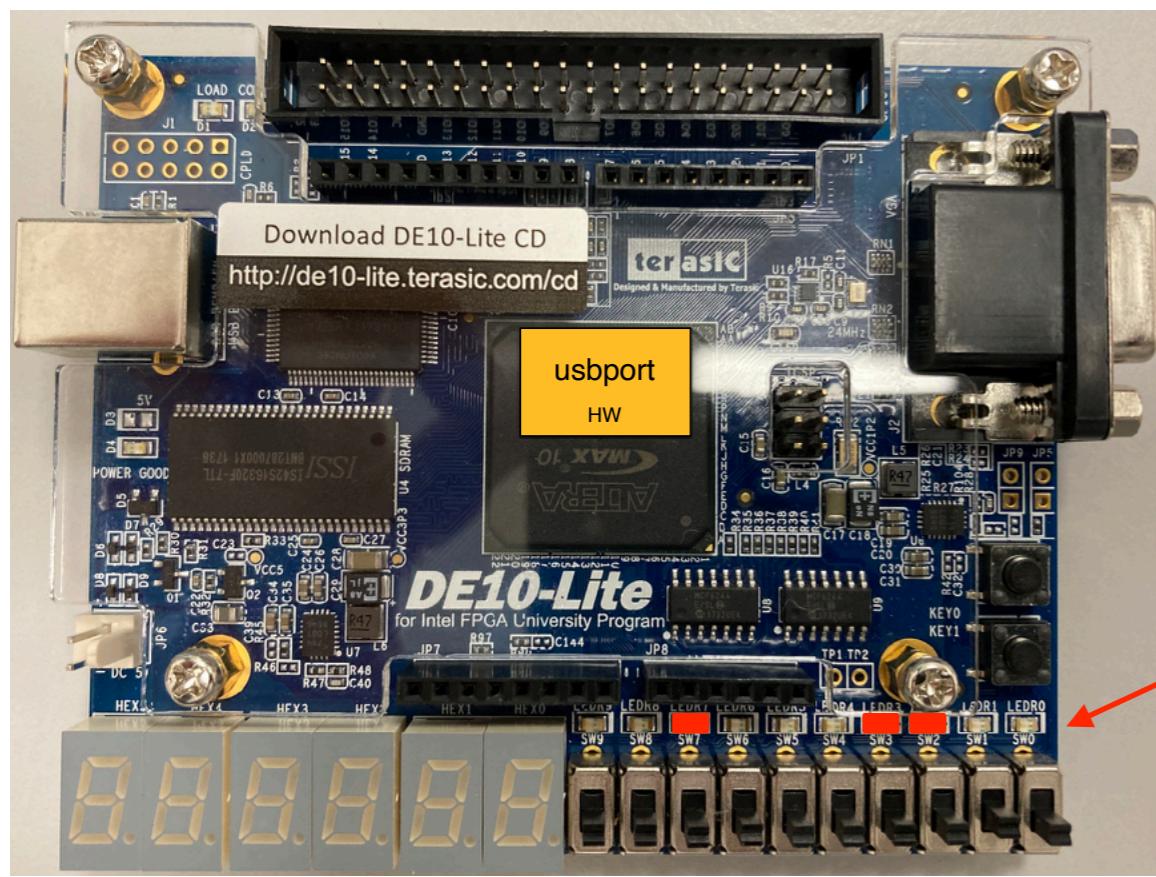
Hexadecimal



Hardware Abstraction Layer (HAL)



`clrBits(mask: Int)`



mask

0b0000_0011

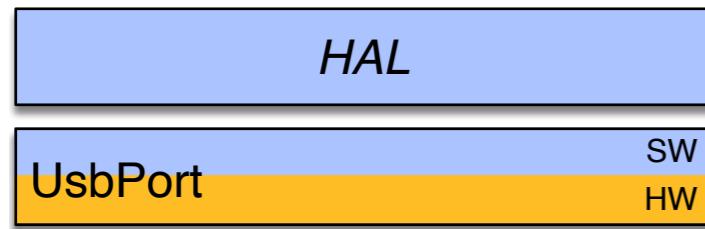
0x03

Representado
em

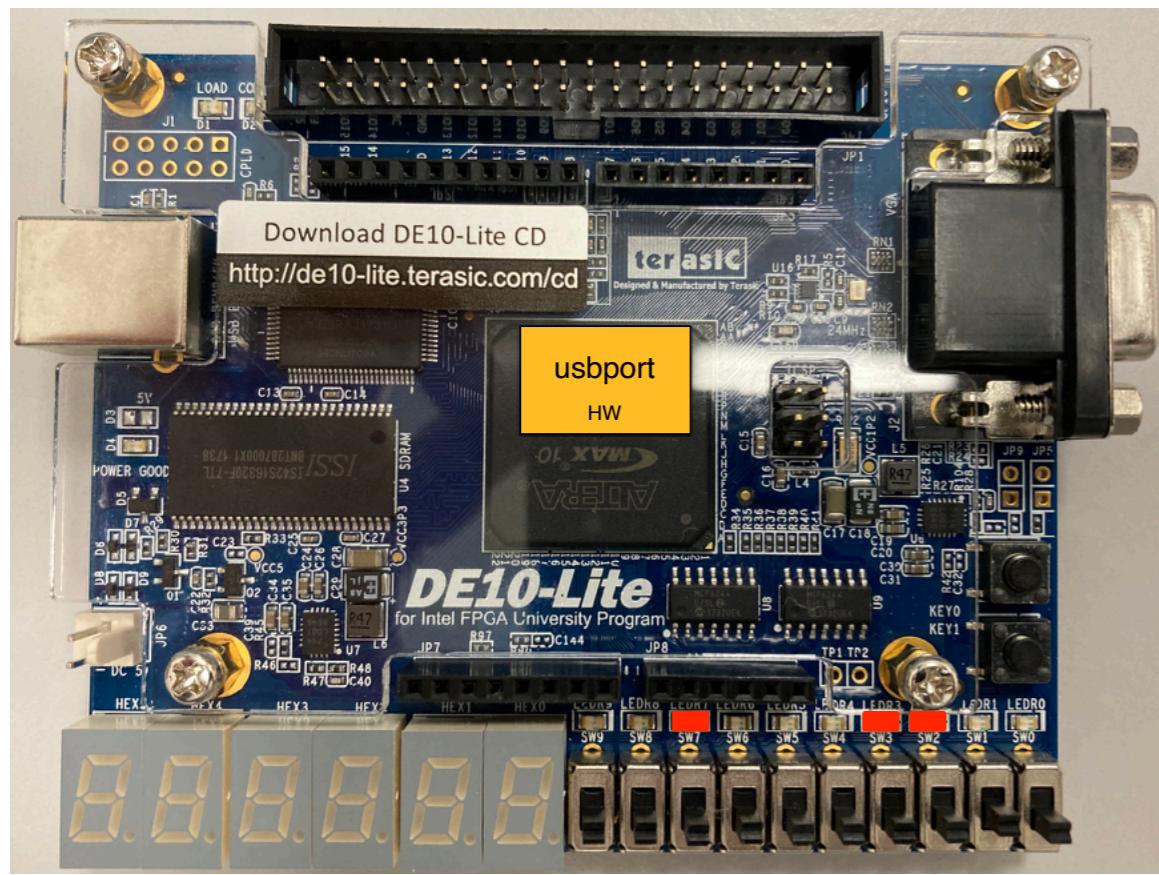
Binário

Hexadecimal

Hardware Abstraction Layer (HAL)



writeBits(mask: Int, value: Int)



mask

Representado
em
Binário

0b0000_1111

0x0F

Hexadecimal

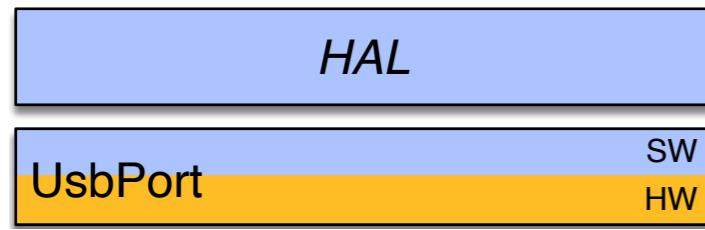
value

0b0000_1001

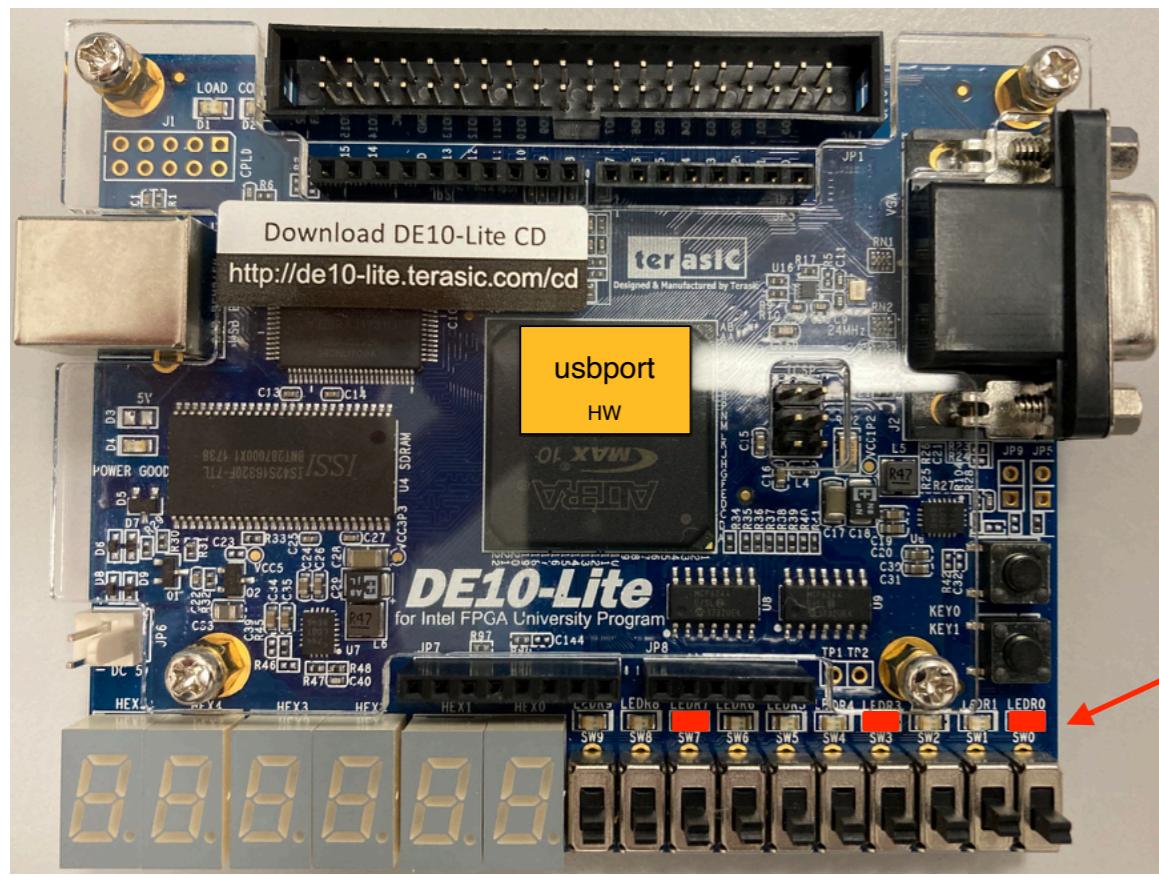
0x09



Hardware Abstraction Layer (HAL)



writeBits(mask: Int, value: Int)



mask

0b0000_1111

0x0F

value

0b0000_1001

0x09

Representado
em
Binário

Hexadecimal

Biblioteca UsbPort

