

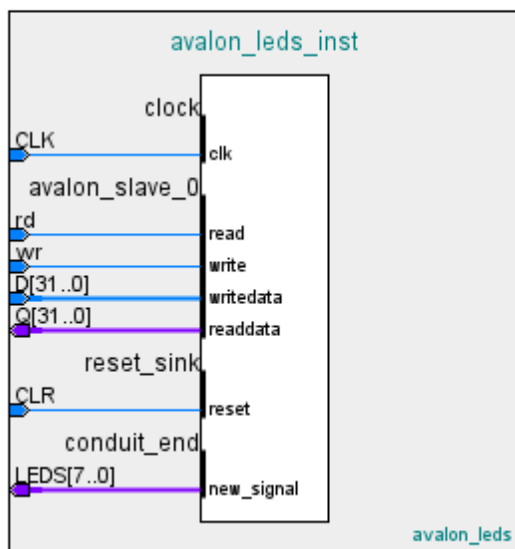
Avalon-väyläkomponentin VHDL-kuvaus:

```
library ieee;
use ieee.std_logic_1164.all;

entity avalon_leds is
  port( CLK, CLR, rd, wr: in std_logic; D: in std_logic_vector (31 downto 0);
        Q: out std_logic_vector (31 downto 0); LEDS: out std_logic_vector(7 downto 0));
end avalon_leds;

architecture toiminta of avalon_leds is
begin
  process(wr)
    variable apu: std_logic_vector(7 downto 0);
  begin
    if wr='0' then apu:=D(7 downto 0);
    end if;
    LEDS<=apu;
  end process;
end toiminta;
```

Kuvauksesta tehdyn IP:n kuva (sis. signaalit ja liitynnät):



Name
▶ avalon_slave_0 <i>Avalon Memory Mapped Slave</i>
▶ D [32] <i>writedata</i>
▶ Q [32] <i>readdata</i>
▶ rd [1] <i>read</i>
▶ wr [1] <i>write</i>
<<add signal>>
▶ clock <i>Clock Input</i>
▶ CLK [1] <i>clk</i>
▶ conduit_end <i>Conduit</i>
▶ LEDS [8] <i>new_signal</i>
<<add signal>>
▶ reset_sink <i>Reset Input</i>
▶ CLR [1] <i>reset</i>
<<add signal>>
<<add interface>>

Näkymä QSYSistä:

Use	Connections	Name	Description	Export	Clock	Base
<input checked="" type="checkbox"/>		clk_0	Clock Source			
		clk_in	Clock Input	clk	exported	
		clk_in_reset	Reset Input	<i>Double-click to export</i>		
		clk	Clock Output	<i>Double-click to export</i>	clk_0	
		clk_reset	Reset Output	<i>Double-click to export</i>		
<input checked="" type="checkbox"/>		niossi	Nios II Processor			
		clk	Clock Input	<i>Double-click to export</i>	clk_0	
		reset	Reset Input	<i>Double-click to export</i>	[clk]	
		data_master	Avalon Memory Mapped Master	<i>Double-click to export</i>	[clk]	
		instruction_master	Avalon Memory Mapped Master	<i>Double-click to export</i>	[clk]	
		irq	Interrupt Receiver	<i>Double-click to export</i>	[clk]	
		debug_reset_request	Reset Output	<i>Double-click to export</i>	[clk]	
		debug_mem_slave	Avalon Memory Mapped Slave	<i>Double-click to export</i>	[clk]	0x0002_0800
		custom_instruction_m...	Custom Instruction Master	<i>Double-click to export</i>		
<input checked="" type="checkbox"/>		onchip_memory2_0	On-Chip Memory (RAM or ROM)			
		clk1	Clock Input	<i>Double-click to export</i>	clk_0	
		s1	Avalon Memory Mapped Slave	<i>Double-click to export</i>	[clk1]	0x0001_0000
		reset1	Reset Input	<i>Double-click to export</i>	[clk1]	
<input checked="" type="checkbox"/>		jtag_uart_0	JTAG UART			
		clk	Clock Input	<i>Double-click to export</i>	clk_0	
		reset	Reset Input	<i>Double-click to export</i>	[clk]	
		avalon_jtag_slave	Avalon Memory Mapped Slave	<i>Double-click to export</i>	[clk]	0x0002_1008
		irq	Interrupt Sender	<i>Double-click to export</i>	[clk]	
<input checked="" type="checkbox"/>		avalon_leds_0	avalon_leds			
		clock	Clock Input	<i>Double-click to export</i>	clk_0	
		avalon_slave_0	Avalon Memory Mapped Slave	avalon_leds_0	[clk]	0x0000_0000
		reset_sink	Reset Input	<i>Double-click to export</i>	avalon_leds [avalon_leds 1,0]	
		conduit_end	Conduit	avalon_leds_0_conduit_...	[clock]	

Koodiksi käy materiaalin NIOSII LED-esimerkki (PIO-rekisteriin liittyvän headerin voi joutua lisäämään Eclipsen projektiin).