Input Capture

Features

Two capture/count channels

Shared 16-bit counter

Four outputs, with programmable set and reset count

Interrupt request on count roll-over or programmed condition

DMA request and dedicated DMA bus interface

Standard byte-wide interface

Description

The two-channel Input Capture/Count can be used to time or count input signals from various port pins. The two separate modes are called Input Capture and Input Count. Each Input Capture channel consists of a sixteen-bit counter that is clocked by an external prescaler, and can be connected to one or two out of twelve inputs. The Input Capture channel captures the state of its counter upon either of two programmed conditions and can then generate an interrupt. The programmed conditions can also be used to start and stop the counter.

Each Input Count channel uses the same sixteen-bit counter that is clocked by one out of the same twelve inputs. The counter increments by one with each Start condition, and generates the Stop condition when the count matches the programmed count. The Stop condition can generate an interrupt.

Each Input Capture channel has two inputs, called the Start condition and the Stop condition. The two inputs can come from the same or different pins, and are edge-sensitive. Each input can be disabled, rising-edge-sensitive, falling-edge-sensitive or responsive to either edge polarity. Either or both inputs can generate an Input Capture interrupt, and either or both inputs can cause the current count to be latched.

Interface

```
module cpt_top (cpt_int, cpt_rbus, clkp, cpt_clk, cpt_rd, cpt_test, cpt_wr, pc_data_cpt,
                pd_data_cpt, pe_data_cpt, peri_addr, pwrite_bus, resetb);

  input         clkp;          /* main peripheral clock                                  */
  input         cpt_clk;       /* input capture clock                                    */
  input         cpt_rd;        /* input capture peripheral read strobe                   */
  input         cpt_test;      /* input capture test mode                                */
  input         cpt_wr;        /* input capture peripheral write strobe                  */
  input         resetb;        /* internal reset                                         */
  input   [3:0] pc_data_cpt;   /* portc capture inputs                                   */
  input   [3:0] pd_data_cpt;   /* portd capture inputs                                   */
  input   [3:0] pe_data_cpt;   /* porte capture inputs                                   */
  input   [3:0] peri_addr;     /* internal peripheral address bus                        */
  input   [7:0] pwrite_bus;    /* internal peripheral write bus                          */
  output  [3:1] cpt_int;       /* input capture interrupt request                        */
  output  [7:0] cpt_rbus;      /* input capture peripheral read bus                      */
```