General Purpose I/O

General Purpose I/O (8 bits)

- Named P1 to P10
  - Number of ports and available bits depends on model
  - P1 and P2 have interrupt capability
- Bit independently programmable
- Edge selectable interrupt capability
- Family 2XX has individually programmable pulldown/pull-up resistors
- Depending on model, pins can be configured for special I/O

I/O Registers (1/4)

- **Direction Register** (PxDIR): Selects in or out direction function for pin
  - 1: Output direction
  - 0: Input direction
  - Example: mov.b #0xF0, &P1DIR
- **Input Register** (PxIN): Read only register
  - Example: mov.b &P1IN, r6
  - Avoid writing to this register (power consumption and does nothing)

I/O Registers (2/4)

- **Output Register** (PxOUT): to write signal to output
  - Do not use in models 2xx when pull-down/pull-up resistors are enabled
  - Example: mov.b @(R5),&P1OUT
- **PullUP/PullUp R Enable** (PxREN) -2xx family only-
  - 1: Pin is pulled up
  - 0: Pin is pulled down

I/O Registers (3/4)

- **Function Select Registers** (PxSEL y PxSEL2 for 2xx family): To select between I/O port or peripheral
  - PxSEL: 0- pin for I/O, 1 – pin for peripheral
  - PxSEL -- PxSEL2:
    - 00: I/O pin
    - 01: Primary peripheral module
    - 10: Reserved (device specific)
    - 11: Secondary peripheral module
- Interrupt capability is disabled when peripheral is selected

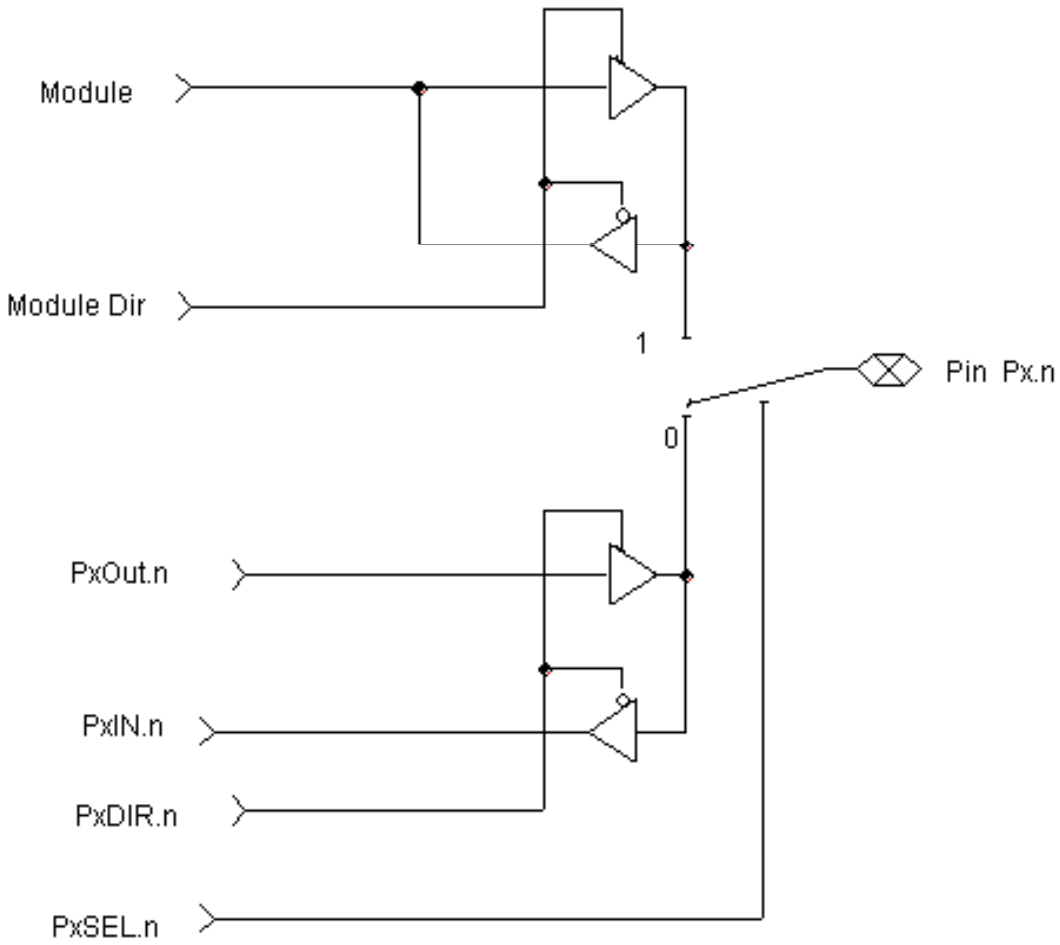
Interruptible I/O ports (1 and 2)

- Each pin has individual interrupt capability which can be enabled or disabled independently of other pins.
- Has the same registers as non interruptible I/O ports, plus three additional registers (all read and write registers)
- Interrupt capability is lost when pin is selected for peripheral

Interruptible Port Registers

- **Interrupt Enable Register** (PxIE): enables interrupt capability
  - 1 enabled, 0 disabled
- **Interupt Edge Select Register** (PxIES):
  - 1: high to low, 0 low to high
- **Interrupt Flags** (PxIFG)
  - Automatically set when interrupt is generated
  - Writable, so interrupt may be generated by software
  - ATTENTION: Reset only by software
  - 0: no interrupt pending, 1: interrupt pending

Hardware configuration: Non interruptible port



Hardware Configuration: Interruptible port