National Semiconductor

HPC16400/HPC36400/HPC46400 High-Performance Microcontrollers with HDLC Controller

General Description

The HPC16400 is a member of the HPC™ family of High Performance microControllers. Each member of the family has the same identical core CPU with a unique memory and I/O configuration to suit specific applications. Each part is fabricated in National's advanced microCMOS technology. This process combined with an advanced architecture provides fast, flexible I/O control, efficient data manipulation, and high speed computation.

The HPC16400 has 4 functional blocks to support a wide range of communication application-2 HDLC channels, 4 channel DMA controller to facilitate data flow for the HDLC channels, programmable serial interface and UART.

The serial interface decoder allows the 2 HDLC channels to be used with devices using interchip serial link for point-to-point & multipoint data exchanges. The decoder generates enable signals for the HDLC channels allowing multiplexed D and B channel data to be accessed.
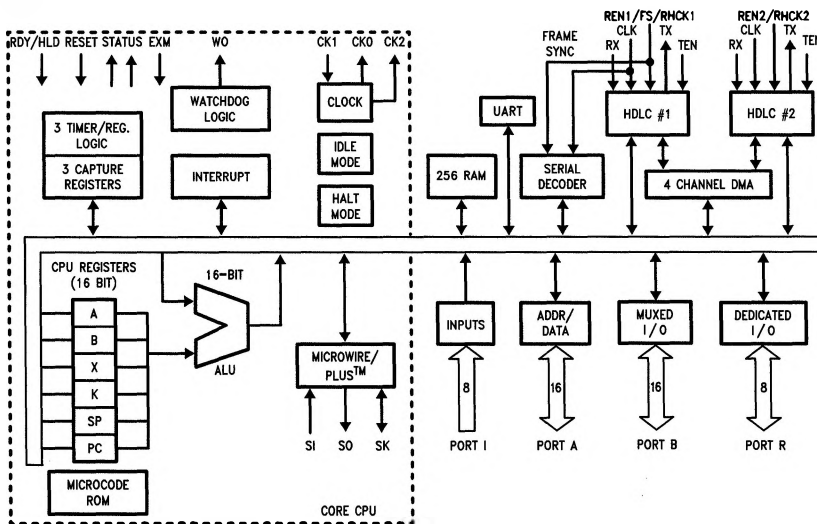
The HDLC channels manage the link by providing sequencing using the HDLC framing along with error control based upon a cyclic redundancy check (CRC). Multiple address recognition modes, and both bit and byte modes of operation are supported.

The HPC16400 is available in 68-pin PLCC, LCC, LDCC and PGA packages.

Features

- HPC family—core features:
  - 16-bit data bus, ALU, and registers
  - 64 kbytes of external memory addressing
  - FAST!—20.0 MHz system clock
  - High code efficiency
  - 16 x 16 multiply and 32 x 16 divide
  - Eight vectored interrupt sources
  - Four 16-bit timer/counters with WATCHDOG logic
  - MICROWIRE/PLUS serial I/O interface
  - CMOS—low power with two power save modes
- Two full duplex HDLC channels
  - Optimized for X.25 and LAPD applications
  - Programmable frame address recognition
  - Up to 4.65 Mbps serial data rate
  - Built in diagnostics
- Programmable interchip serial data decoder
- Four channel DMA controller
- UART—full duplex, programmable baud rate (up to 312.5 kBaud)
- 544 kbytes of extended addressing
- Easy interface to National's DASL, 'U' and 'S' transceivers—TP3400, TP3410 and TP3420
- Industrial (−40°C to +85°C) and military (−55°C to +125°C) temperature ranges

Block Diagram

TL/DD/8802-1