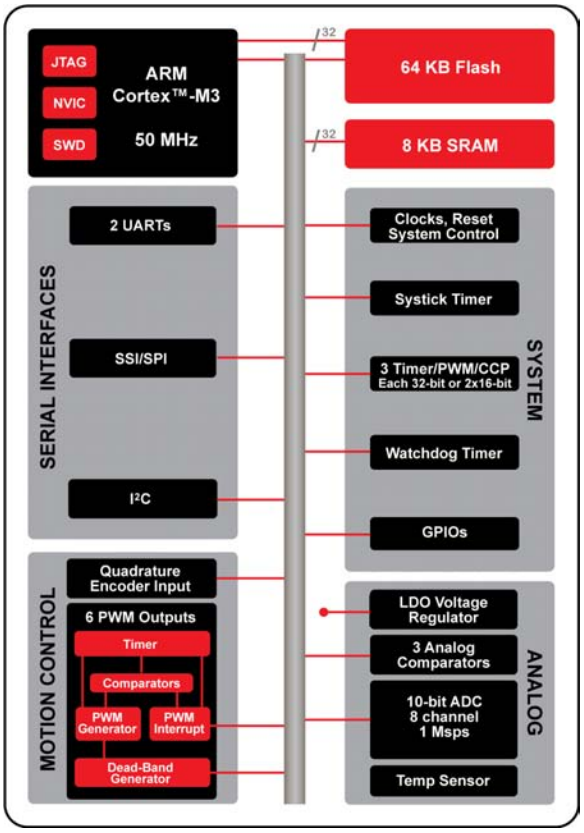
LM3S801 Microcontroller

STELLARIS® microcontrollers

TEXAS INSTRUMENTS



LM3S800 Series Block Diagram. This block diagram shows the superset of features for the LM3S800 series of microcontrollers.

Features

32-Bit RISC Performance

- 32-bit ARM® Cortex™-M3 v7M architecture optimized for small-footprint embedded applications
- 50-MHz operation
- System timer (SysTick) provides a simple, 24-bit clear-on-write, decrementing, wrap-on-zero counter with a flexible control mechanism
- Thumb®-compatible Thumb-2-only instruction set processor core for high code density
- Integrated Nested Vectored Interrupt Controller (NVIC) provides deterministic interrupt handling
- 25 interrupt channels with eight priority levels
- Memory protection unit (MPU) provides a privileged mode for protected operating system functionality
- Unaligned data access enables data to be efficiently packed into memory
- Atomic bit manipulation (bit-banding) delivers maximum memory utilization and streamlined peripheral control

On-Chip Memory

- 64 KB single-cycle flash with two forms of flash protection on a 2-KB block basis
- 8 KB single-cycle SRAM

General-Purpose Timers

- Three General-Purpose Timer Modules (GPTM), each configurable as one 32-bit or two 16-bit timers with capture and simple PWM modes
- Real-Time Clock (RTC) capability

Watchdog Timer

- 32-bit down counter with a programmable load register
- Separate watchdog clock with an enable
- Programmable interrupt generation logic with interrupt masking
- Lock register protection from runaway software
- Reset generation logic with an enable/disable

Synchronous Serial Interface (SSI)

- Programmable interface operation for Freescale SPI, MICROWIRE, or Texas Instruments synchronous serial interfaces
- Master or slave operation

UART

- Two fully programmable 16C550-type UARTs
- Separate 16x8 transmit (TX) and 16x12 receive (RX) FIFOs to reduce CPU interrupt service loading
- Programmable baud-rate generator allowing speeds up to up to 3.125 Mbps

Analog Comparators

- Three independent integrated analog comparators
- Configurable for output to: drive an output pin or generate an interrupt
- Compare external pin input to external pin input or to internal programmable voltage reference

Inter-Integrated Circuit (I^2C) Interface

- Master and slave receive and transmit operation with transmission speed up to 100 Kbps in Standard mode and 400 Kbps in Fast mode
- Interrupt generation
- Master with arbitration and clock synchronization, multimaster support, and 7-bit addressing mode

PWM

- Three PWM generator block, each with one 16-bit counter, two comparators, a PWM generator, and a dead-band generator
- Flexible output control block with PWM output enable of each PWM signal

Quadrature Encoder Inputs

- Hardware position integrator tracks the encoder position
- Velocity capture using built-in timer
- Interrupt generation on index pulse, velocity-timer expiration, direction change, and quadrature error detection

GPIOs

- 0-36 GPIOs, depending on configuration
- 5-V-tolerant input/outputs
- Programmable interrupt generation
- Programmable drive strength and slew-rate control

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Power

- On-chip Low Drop-Out (LDO) voltage regulator, with programmable output user-adjustable from 2.25 V to 2.75 V
- Low-power options on controller: Sleep and Deep-sleep modes
- Low-power options for peripherals: software controls shutdown of individual peripherals
- User-enabled LDO unregulated voltage detection and automatic reset
- 3.3-V supply brown-out detection and reporting via interrupt or reset

Package and Temperature

- 48-pin RoHS-compliant LQFP and QFN packages
  - Industrial temperature (-40°C to +85°C)
  - Extended temperature (-40°C to +105°C)

Target Applications

- Factory automation and control
- Industrial control power devices
- Building and home automation
- Stepper motors
- Brushless DC motors
- AC induction motors

High-performance ARM Cortex-M3 microcontroller for real-time embedded applications

Development Kit

The Stellaris® Family Development Kit provides the hardware and software tools that engineers need to begin development quickly. Ask your distributor for part number DK-LM3S801. See the website for the latest tools available.

Tools to begin development quickly

Ordering Information

Orderable Part Number	Description
LM3S801-IQN50-C2	Stellaris® LM3S801 Microcontroller Industrial Temperature 48-pin LQFP
LM3S801-IQN50-C2T	Stellaris® LM3S801 Microcontroller Industrial Temperature 48-pin LQFP Tape-and-reel
LM3S801-EQN50-C2	Stellaris® LM3S801 Microcontroller Extended Temperature 48-pin LQFP
LM3S801-EQN50-C2T	Stellaris® LM3S801 Microcontroller Extended Temperature 48-pin LQFP Tape-and-reel
LM3S801-IGZ50-C2	Stellaris® LM3S801 Microcontroller Industrial Temperature 48-pin QFN
LM3S801-IGZ50-C2T	Stellaris® LM3S801 Microcontroller Industrial Temperature 48-pin QFN Tape-and-reel
LM3S801-EGZ50-C2	Stellaris® LM3S801 Microcontroller Extended Temperature 48-pin QFN
LM3S801-EGZ50-C2T	Stellaris® LM3S801 Microcontroller Extended Temperature 48-pin QFN Tape-and-reel

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ARM POWERED

Cortex Intelligent Processors by ARM

PB-LM3S801-04

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