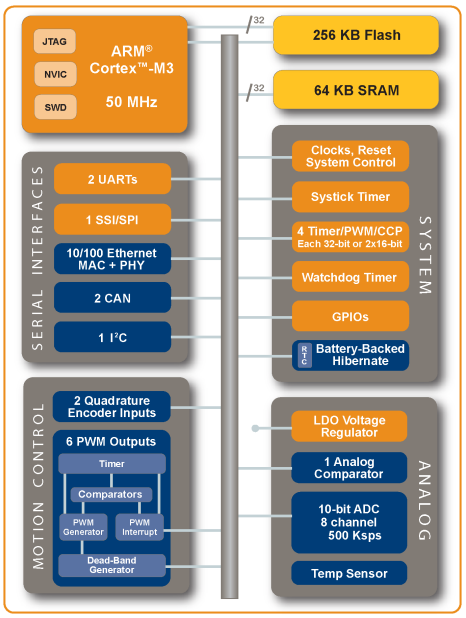
LM3S8962 Microcontroller

LUMINARY MICRO®



Product Features

32-Bit RISC Performance

- 50-MHz operation with 32-bit ARM® Cortex™-M3 architecture
- Thumb®-compatible Thumb-2-only instruction set, with hardware-division and single-cycle-multiplication
- Integrated Nested Vectored Interrupt Controller (NVIC) provides deterministic interrupt handling
- 36 interrupt channels with eight priority levels
- Memory protection unit (MPU)
- 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

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

Flexible Timer Capability

- Four general-purpose timers, each configurable as one 32-bit or two 16-bit timers
- Real-Time Clock (RTC) capability
- 24-bit system (SysTick) timer
- 32-bit watchdog timer

Controller Area Network (CAN)

- Supports CAN protocol version 2.0 A/B
- 32 message objects, each with its own identifier mask
- Bit rates up to 1Mb/s
- Disable automatic retransmission mode for TTCAN

10/100 Ethernet Controller

- Conforms to the IEEE 802.3-2002 Specification
- IEEE 1588-2002 Precision Time Protocol (PTP) compliant
- Full- and half-duplex for both 100 Mbps and 10 Mbps operation
- Integrated 10/100 Mbps Transceiver (PHY)
- Automatic MDI/MDI-X cross-over correction
- Programmable MAC address

Serial Interfaces

- Synchronous serial interface (SSI) with master and slave modes for SPI, MICROWIRE, or TI synchronous serial
- I^2C interface (master and slave)
- Two fully programmable 16C550-type UARTs with IrDA support

UART

- Two fully programmable 16C550-type UARTs with IrDA support
- Separate 16x8 transmit (TX) and 16x12 receive (RX) FIFOs to reduce CPU interrupt service loading
- Programmable baud-rate generator with fractional divider

Analog-to-Digital Converter (ADC)

- Single- and differential-input configurations
- Four 10-bit channels (inputs) when used as single-ended inputs
- Sample rate of 500 thousand samples/second
- On-chip temperature sensor

Analog Comparators

- One integrated analog comparator
- Configurable for output to: drive an output pin, generate an interrupt, or initiate an ADC sample sequence
- 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

Dedicated Motion-Control 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
- Can initiate an ADC sample sequence

Quadrature Encoder Inputs

- Two hardware position integrators track the encoder position
- Velocity capture using built-in timer
- Interrupt generation on index pulse, velocity-timer expiration, direction change, and quadrature error detection

GPIOs

- 5-42 GPIOs, depending on configuration
- 5-V-tolerant input/outputs
- Programmable interrupt generation

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- Fast toggle capable of a change every two clock cycles
- Can initiate an ADC sample sequence

Power

- On-chip Low Drop-Out (LDO) voltage regulator, with programmable output user-adjustable from 2.25 V to 2.75 V
- Battery-backed hibernation module with real-time clock and 256-bytes of non-volatile memory
- 3.3-V supply brown-out detection
- 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
- On-chip temperature sensor

Flexible Reset Sources

- Power-on reset (POR)
- Reset pin assertion
- Brown-out (BOR) detector alerts to system power drops
- Software reset
- Watchdog timer reset
- Internal low drop-out (LDO) regulator output goes unregulated

Additional Features

- Six reset sources
- Programmable clock source control
- Clock gating to individual peripherals for power savings
- IEEE 1149.1-1990 compliant Test Access Port (TAP) controller
- Debug access via JTAG and Serial Wire interfaces
- Full JTAG boundary scan

Package and Temperature

- 100-pin RoHS-compliant LQFP package
  - Industrial-range (-40°C to +85°C)
  - Extended-range (-40°C to +105°C)
- 108-ball RoHS-compliant BGA package
  - Industrial-range (-40°C to +85°C)

Target Applications

- Motion control
- Factory automation
- Fire and security
- HVAC and building control
- Power and energy
- Transportation
- Test and measurement equipment
- Medical instrumentation

Ordering Information

Orderable Part Number	Description
LM3S8962-IQC50	Stellaris® LM3S8962 Microcontroller Industrial Temperature
LM3S8962-IQC50 (T)[a]	
LM3S8962-EQC50	Stellaris® LM3S8962 Microcontroller Extended Temperature
LM3S8962-EQC50 (T)	
LM3S8962-IBZ50	Stellaris® LM3S8962 Microcontroller Industrial Temperature
LM3S8962-IBZ50 (T)	

a. T= Tape and Reel.

Evaluation Kit

The Luminary Micro Stellaris® LM3S8962 Ethernet and CAN Evaluation Kit provides the hardware and software tools to speed development using the LM3S8962 microcontroller's integrated CAN and 10/100 Ethernet controllers. Ask your Luminary Micro distributor for part number EKK-LM3S8962 (ARM RealView® MDK tools), EKI-LM3S8962 (IAR Embedded Workbench® tools), EKC-LM3S8962 (CodeSourcery Sourcery G++ tools), or EKT-LM3S8962 (Code Red Technologies Code Suite tools). See the Luminary Micro web site for the latest tools available.

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