Connect Serial to Ethernet in Seconds

MCF51CN128

Target Applications

- Industrial operator interfaces
- Consumer and industrial appliances
- Medical monitoring and instrumentation
- Point-of-sale and courier systems
- Security and building control systems

Overview

MCF51CN Ethernet MCUs are low-cost, low-power, high-performance 32-bit devices designed for developers who want to add Ethernet connectivity to their commercial and industrial applications. Backed by Freescale's extensive development ecosystem, the highly integrated MCF51CN devices combine a 10/100 Base-T/TX Fast Ethernet controller (FEC) and media independent interface (MII) to give developers an easy way to connect an external physical layer (PHY) transceiver. This device also includes a multi-function external bus and multiple communication interfaces for various Ethernet gateway applications.

Features	Benefits
CPU and System Configuration	
• 32-bit V1 ColdFire® CPU offering 46 MIPS at 50 MHz • 1.8V–3.6V single supply	• Offers high performance across the entire voltage range
On-chip Memory	
• Up to 128 KB flash	• Offers enough on-chip memory for serial to Ethernet bridge applications or Web server data storage
• Up to 24 KB SRAM	• Security circuitry helps to prevent unauthorized RAM access
• Mini-FlexBus (external bus interface)	• External bus interface available on 80-pin LQFP packages • Glueless connection to external memory devices
Power Management	
• Low-power operation modes	• Rapid response to interrupts from the low-power sleep mode
Peripherals	
• Fast Ethernet controller	• 10/100 Base-T/TX capability, half-duplex or full-duplex transmission
• Fast analog-to-digital converter (ADC)	• 12 analog input channels • 12-bit resolution • 2.5 µs conversion time
• Up to 70 general purpose input/output (GPIO)	• Provides a large number of flexible I/O pins
Software and Tools	
• Background debug mode (BDM) for in-circuit debugging	• Real-time trace and debug support
• Complimentary Freescale MQX™ software solutions: RTOS, Ethernet, File System	• Provides an Internet-enabled controller with serial capability that allows for real-time remote monitoring and configuration
• Strong Third-Party Alliance Network	• Value added tools and software, including GUI, stacks and RTOS

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Development Tools

TWR-MCF51CN ($39USD)

TWR-MCF51CN-KIT ($99USD)

The MCF51CN128 evaluation and demonstration board can be purchased individually or as part of a complete kit for quick and easy development.

- TWR-MCF51CN features the MCF51CN128 MCU in an 80-pin LQFP package with Ethernet connectivity
- TWR-MCF51CN-KIT, which includes:
  - TWR-MCF51CN standalone development board
  - TWR-SER serial board that supports Ethernet, USB, RS232, RS485 and CAN
  - TWR-ELEV elevator boards that connect the MCU and serial boards
  - USB and Ethernet cables
  - Interactive DVD complete with tools, software, lab supplements and other helpful resources
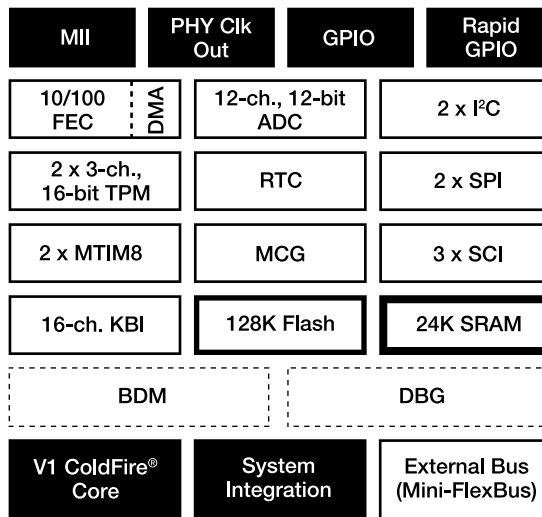
The MCF51CN is the first Freescale MCU to be included in the Tower System, a low-cost, reconfigurable evaluation and demonstration platform that speeds time to market and enables advanced development through rapid prototyping. The purchase of the complete development kit (TWR-MCF51CN-KIT) provides the basic building blocks for future designs using Freescale microcontrollers.

Freescale's MQX™ Software Solution (complimentary)

Integrating the MCF51CN MCU and Freescale MQX software provides an Internet-enabled controller with serial capability that allows for real-time remote monitoring and configuration. By providing both hardware and software, this small and cost-effective solution eliminates the need for customers to spend their resources designing network connectivity into a product.

- RTOS: full priority-based, pre-emptive scheduler
- Configurable real-time TCP/IP communication suite (RTCS): Telnet, FTP, HTTP and more

MCF51CN128 Block Diagram

MII	PHY Clk Out	GPIO	Rapid GPIO
10/100 FEC (DMA)		12-ch., 12-bit ADC	2 x I²C
2 x 3-ch., 16-bit TPM		RTC	2 x SPI
2 x MTIM8		MCG	3 x SCI
16-ch. KBI		128K Flash	24K SRAM
BDM			DBG
V1 ColdFire® Core		System Integration	External Bus (Mini-FlexBus)

Debugging/Interface   Peripherals   Flash/ROM   RAM   Core + System Features

Package Options

Part Number	Temp Ranges	Package
MCF51CN128CLK	-40°C to +85°C	80 LQFP
MCF51CN128CGT	-40°C to +85°C	48 QFN
MCF51CN128CLH	-40°C to +85°C	64 LQFP

- MS-DOS FAT32 file system (MFS): SD card and CompactFlash
- Time stamped status via e-mail
- Ultra-low-power modes
- Web server for device communication
- Serial-to-wireless application
- Board support package (BSP) I/O driver supporting RTC, A/D, UART, Ethernet, Mini-FlexBus and more

Leveraging 15 years in the market, Freescale MQX has been providing powerful real-time performance within a small, configurable footprint in over a million Freescale enabled products. Freescale MQX, a component-based architecture, provides scalability and reduces overhead by allowing developers to choose only those components required for their applications.

CodeWarrior™ Development Studio for Microcontrollers 6.2 (complimentary)

CodeWarrior Development Studio for Microcontrollers is a single tool suite that supports software development for applications targeting either Freescale's 8-bit or 32-bit microcontrollers. Designers can further accelerate application development with the help of Processor Expert™, an award-winning rapid application development tool integrated into the CodeWarrior tool suite.

Learn More: For current information about Freescale ColdFire products, Tower System and MQX, please visit **www.freescale.com/coldfire**, **www.freescale.com/tower** and **www.freescale.com/mqx**.

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