

MCF5275 Local Medical Monitoring Gateway

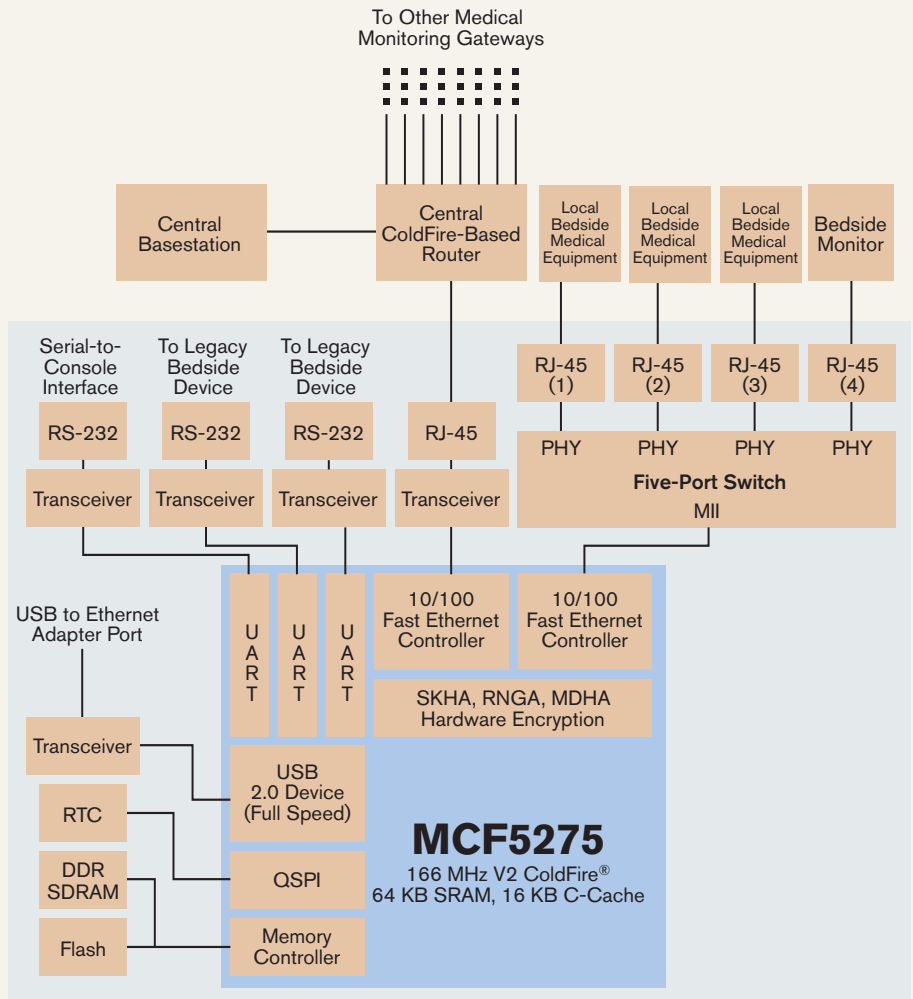
Overview

Medical personnel today have a wider variety of patient information sources than ever before, yet the volume of information can be an impediment if the data is not interconnected, analyzed, recorded and responded to—especially in the event of an emergency. Thus, a system becomes necessary to allow medical personnel to monitor and interface local frontier-connected equipment both locally and from a central basestation.

In this example, local bedside health care-related equipment, such as respirators, heart monitors and medicine dosage controllers, from several hospital rooms can be securely and remotely monitored by a central basestation. This is made possible by connecting the local bedside medical equipment to an MCF5275 ColdFire® microprocessor-based local medical monitoring gateway via Ethernet or, in the case of a legacy medical device that is not equipped with Ethernet, via a serial RS-232 port. The gateway in each room is wired to a central router, which is connected to the central basestation.



MCF5275 BLOCK DIAGRAM



Design Challenges

A microprocessor for a medical gateway application must offer connectivity, security and product lifetime longevity. The MCF5275 Family integrates dual Ethernet, USB, universal asynchronous receiver/transmitters (UARTs), DDR SDRAM memory control and hardware encryption into one cost-effective chip, thus streamlining design and reducing component count costs and space.

Due to the sensitive nature of the data in transit, this solution must help ensure that data cannot be accessed inappropriately. Hardware encryption onboard the MCF5275 device helps provide secure transmission of sensitive personal information over a potentially exposed network. The MCF5275 microprocessor in the gateway encrypts the data received from the bedside equipment before the data is transmitted by Ethernet to the central basestation, where the data is decrypted and interpreted.

In addition to the ability to monitor bedside medical equipment in a given room from the remote central basestation, medical personnel need access to the same data while in the patient's room. This has customarily been accomplished with a bedside monitor. Alternatively, a 12 Mbps USB device on the MCF5275 microprocessor allows the possibility of a doctor or attendant accessing the system through the gateway's USB-to-Ethernet adapter port. A doctor could use a PDA with a USB On-The-Go (OTG) port, keeping track of patients' conditions at every visit.

Furthermore, Freescale develops the ColdFire Family with commitment to long-term availability and continued innovation. The ColdFire Family's focus on the industrial market helps ensure your product will have the support it needs throughout its lifetime.

Freescale Solution

While the lower-end industrial connectivity and networking market space requires solutions with the system performance and integration benefits of a 32-bit microprocessor, it also brings more power and cost constraints. To meet these needs, Freescale expands the MCF527x family of microprocessors with an array of devices that combine high integration and cost-effective options.

This impressive combination of connection, protection and peripheral selection makes the MCF527x Family

ideal for power-conscious, cost-sensitive applications requiring significant control processing for file management, connectivity, data buffering, user interface and signal processing. MCF527x target applications include remote monitoring, data security, voice-over-Internet Protocol (VoIP) phones, health care-related instrumentation, gaming equipment, Ethernet switches, server appliances, point-of-sale printers and home routers.

Key Features

- > Version 2 ColdFire core
- > Up to 159 MIPS (Dhrystone 2.1) at 166 MHz
- > Low-power, high-performance 0.13µ technology
- > Connectivity options
 - Up to two 10/100 Fast Ethernet controllers
 - USB
 - Queued serial peripheral interface (QSPI)
 - I²C
 - Three UARTs
- > Hardware encryption capability
- > Enhanced Multiply-Accumulate (eMAC)
- > 64 KB SRAM
- > Up to 16 KB configurable cache
- > DDR SDRAM memory controller
- > MAPBGA and QFP packages
- > 10K suggested resale prices starting at US\$7.75

Support

With every MCF5274/75 microprocessor, users can benefit from extensive support by a world-class development tools suite from Metrowerks/ARC, Green Hills Software, Wind River and other leading tool developers.

Learn More: For more information about Freescale products, please visit www.freescale.com.