



Fact Sheet

Freescale Home Health Hub Reference Platform

Enabling remote health care device monitoring

Overview

Freescale's home health hub (HHH) reference platform provides seamless connectivity with commercially available wired and wireless health care devices, such as blood pressure monitors, pulse oximeters, weight scales and blood glucose monitors. The data obtained from these devices is then relayed to a remote device, such as a smartphone, tablet or PC, in order to track and monitor a patient's health status as well as provide alerts and medication reminders. The display interface also provides a real-time connection to caregivers, including family, friends and physicians, to bring peace of mind and offer comfort and safety to the person being monitored.

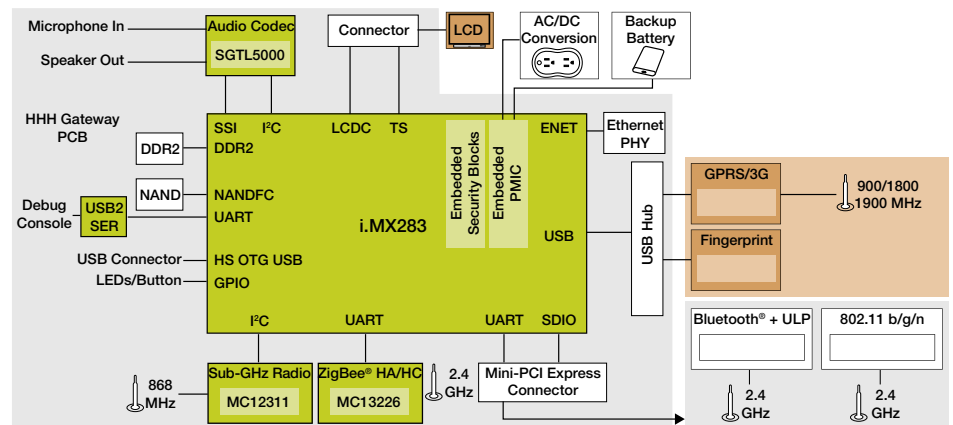
Kick-Start Telehealth Application Development

Freescale's HHH reference platform features multiple technologies from Freescale, including an i.MX28 ARM9™ based applications processor, a MC13226V ZigBee® transceiver and an MC12311 sub-1 GHz radio transceiver. The reference platform

Features

Features	Benefits
Development and demonstration platform includes gateway and a panic alarm sensor	Provides a rapid prototyping vehicle, reducing time to market and freeing resources to focus on differentiation
Pre-validated connectivity with USB, BT, BTLE, Wi-Fi®, and ZigBee® including medical class grades	Allows for connectivity to medical devices and sensors for automatic reporting and monitoring of vital sign measurements and implementation of daily activity alarms, and alarms for early detection of injury or security risks
Connectivity via Wi-Fi and Ethernet to external smart devices (tablet, smartphone, PC) along with a compelling user interface for remote display	Offers anytime access and consultation to trusted health resources, medical staff and family and friends through an intuitive and simple to use interface
Cost-efficient solution	Provides hardware schematics, Gerber files and software at no additional cost
Comprehensive ecosystem support for Linux® and Windows® Embedded Compact 7 operating systems, connectivity stacks, user interface, system integration and customization	Accelerates the time required to take a product from prototype state to production

Home Health Hub Block Diagram



■ Freescale Technology ■ Future Expansion Options ■ Included with HHH Kit

accelerates development design for medical telehealth applications such as health/wellness tracking, independent living for the elderly and in-home chronic disease management. The Freescale HHH reference platform collects data from health care end devices through a variety of wired and wireless connectivity options, including USB, Bluetooth®, Bluetooth Low Energy, sub-GHz, Wi-Fi®, ZigBee, Ethernet and medical class grades.

HHH Reference Platform Kit Contents

- HHH gateway printed circuit board (PCB)
- BT/Wi-Fi module (connects to the HHH Gateway PCB)
- Panic alarm sensor
- Quick start guide
- Windows-Embedded Compact 7/Linux BSP and example code
- ZigBee Healthcare and Home Automation stacks
- Bluetooth HDP and Low Energy stacks (subject to license from Stonestreet One)
- USB PHDC stack
- Wi-Fi stack
- Design files
- Cables
- Example user interface (UI) software for remote devices

The Reference Platform

The Freescale HHH reference platform consists of an aggregator/gateway board based on the low-power ARM-9 i.MX28 running various connectivity interfaces to health care end devices, remote user interfaces and a broadband IP network. A panic alarm sensor based on the MC12311 sub-1 GHz radio, providing personal emergency response system (PERS) functionality is also included.

Ecosystem of Partners

Freescale has an ecosystem of third-party partners supporting this reference platform, including Digi International, Microsoft, Stonestreet One, and UI Centric for software and hardware solutions.

Availability

The complete reference platform is available to designers at a cost of \$499 through Digi International at digi.com/hhh. A complete set of documentation, including a bill of materials, design files (schematics and layout) and a reference manual, is also included. Pre-validated OS (Linux® and Windows® Embedded Compact 7), connectivity stacks, and application example code software is also included (see the Software table for complete details). Digi International is the supplier for the HHH reference platform kit and also provides system on modules for various market segments, including medical design services.

Specifications

i.MX28 Applications Processor	Multiple connectivity options with the i.MX28 applications processor, including display, touch screen, 10/100 Ethernet, Dual USB with PHY, multiple UARTs and SDIO
	Optional display capabilities with integrated display controller and basic image processing capabilities for intuitive graphics and video playback
	Integrated power management reduces cost and complexity
	Part of a complete ARM® portfolio ranging from ARM9 to Cortex™-A9 provides performance and feature scalability
ZigBee® Radio Transceiver	Integrated 32-bit ARM7TDMI™ up to 26 MHz
	128 KB of flash, 96 KB of RAM, 80 KB of ROM
	Peripherals: UART, SPI, KBI, 8-ch., 12-bit ADC, 4x16-bit timer, I²C, SSI (I²S)
	MAC accelerator reduces MCU overhead
	ZigBee Health Care and ZigBee Home Automation supported
	AES 128-bit hardware encryption/decryption
Sub-1 GHz Radio Transceiver	Demonstrates exceptional RF performance with a budget link up to +137 dB
	Very low power consumption, suitable for battery-operated devices
	Supports multiple modulation schemes (GFSK, MSK, GMSK and OOK)
	Supports 290–340 MHz, 424–510 MHz, and 862–1020 MHz frequency bands
	High level of integration, including the proven HCS08QE 8-bit MCU core with up to 50 MHz bus clock, embedded 32 KB flash and 2 KB of RAM supporting wireless communication protocol and application software in a single chip
	Full set of peripherals

Software

Windows Embedded Compact 7/Linux BSP and example code	Object and source code provided at no added cost
ZigBee® Healthcare and Home Automation stacks	Object and source code provided at no added cost
Bluetooth® HDP and Low Energy stacks	Object code provided at no cost. Source code subject to third-party license (Stonestreet One)
USB PHDC stack	Object and source code provided at no added cost
Wi-Fi® stack	Object and source code provided at no added cost
Example user interface software	Object code provided at no added cost. Source code subject to third-party license (UI Centric for Android™, QNX for Neutrino)

For more information, visit freescale.com/homehealthhub

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