

Operational Description

The 1322x Sensor Node is an IEEE 802.15.4 compliant evaluation board based on the Freescale MC1322X device. The heart of the 1322x Sensor Node is Freescale's MC1322x 99-pin LGA Platform-in-Package (PiP) solution that can be used for wireless applications ranging from simple proprietary point-to-point connectivity to complete ZigBee mesh networking. The MC1322x is designed to provide a highly integrated, total solution, with premier processing capabilities and very low power consumption.

The 1322x Sensor Node provides a platform to evaluate the MC1322x device, develop software and applications, and demonstrate IEEE 802.15.4 and ZigBee networking capabilities. The Sensor Node surrounds the core device with capabilities that provide a complete 802.15.4 radio, user interface, debugging capabilities, connection to personal computers (PCs) and other devices, sensors, and portability.

Features

The 1322x Sensor Node provides the following features:

- Full IEEE 802.15.4 compliant wireless node; ZigBee capable with Freescale's BeeStack software stack
- Based on Freescale's third-generation MC1322x ZigBee platform which incorporates a complete, low power, 2.4 GHz radio frequency transceiver, 32-bit ARM7 core based MCU, hardware acceleration for both the IEEE 802.15.4 MAC and AES security, and a full set of MCU peripherals into a 99-pin LGA Platform-in-Package (PiP)
- MC1322x provides a highly integrated, low cost RF node
 - On-board balun and antenna switch in package
 - Typical -95 dBm sensitivity
 - Typical 0 dBm output power, with max approximately +3 dBm
 - Printed F-antenna
- USB interface is bus-powered and full-speed compatible to the USB 2.0 and 1.1 specifications
- Audio subsystem
 - 2.5mm audio jack for microphone and mono earpiece
 - Input amplifier and anti-aliasing filter for an electret microphone
 - Output path to second order analog filter from either 10-bit serial DAC or PWM as output signal sources
 - I2C controlled 32-position linear nonvolatile volume control for audio circuit
 - Audio output amplifier for both earpiece or on-board dynamic speaker (switched by headset jack)
- Freescale pressure sensor with 0-10 kPa range
- Temperature sensor with the full operating temperature range of the board with a $\pm 3^{\circ}\text{C}$ accuracy.
- Freescale XYZ tri-axis accelerometer for measuring changes in forces applied to the board (typical sensitivity of 800 mV/g @ 1.5g)
- 20-pin connector for standard JTAG debug/development interface
- Power management circuit with on-board regulation for multiple power sources
 - Can be powered from USB interface, DC power jack or two AA batteries
 - On/Off power switch
 - Power-on green LED
- User interface switches and LEDs
 - 4-directional TACT switch with center push for application purposes
 - 4 pushbuttons for application purposes
 - 4 processor controlled red LEDs for application purposes
 - Reset switch
- 26-pin user header for selected General Purpose Input Output signals and data interfaces
- System clock options