Ensigma Whisper

IEEE 802.15.4 Baseband IP

IEEE 802.15.4-2006

Ensigma™ Whisper is a family of lower power wireless connectivity IPs for standards such as Bluetooth Low Energy (BLE), Bluetooth Dual-Mode, IEEE 802.15.4 and Wi-Fi. Specifically designed to meet the communications requirements for emerging low-power consumption markets such as the Internet of Things (IoT) and wearables, Ensigma Whisper implements all of the connectivity requirements of tomorrow's complex low-power System-on-Chips (SoCs).

The IEEE 802.15.4 IP includes the MAC Stack (Firmware), Baseband accelerators (Soft Macro) and Multi-standard Modem (Soft Macro). The IEEE 802.15.4 Baseband IP can be controlled through either the Host Processor (on the same SoC) or External Control (via USB/UART or other).

The IEEE 802.15.4 Baseband IP enables compact ultra-small form factor solutions designs which can be easily integrated in a SoC. The baseband and MAC uses several algorithmic optimizations to deliver the lowest active and idle power. This extends the system battery life while maintaining consistent connectivity and still provides a rich set of features.

IEEE 802.15.4 PHY Support

2.4 GHz	DSSS PHY employing O-QPSK modulation

Features

- Support for 802.15.4 PHY and MAC
- Flexible Baseband and RF interfaces
- Industry-leading performance
- Low power
- Small die area

Benefits

- Complete Baseband IP solution
- End to End Solution when paired with Imagination's BT/BLE RF IP
- Silicon proven solution that minimises risk and reduces time-to-market
- Easy integration into an SoC

Applications

- Connected consumer products
- Internet of Things

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General Features

- ***Extreme low power:*** the system enters low power mode at every opportunity, thus maximising battery life
- ***Seamless dual-mode operation:*** through optimised baseband resource management
- ***Robust WLAN co-existence*** with maximal throughput using
  - Imagination Technologies WLAN IP
  - External WLAN IP via the Packet Traffic Arbitration interface
- ***Customisable*****:** both HW and Firmware can be tailored to exactly suit a range of use-cases, thus requiring a minimum of resources whilst maximising performance
- ***Choice of suppliers:*** the Baseband hardware presents a firmware-configurable interface to the modem and RF/AFE, allowing these items to be sourced separately.
- ***Range of SoC layout options:*** the Baseband, Modem and RF/AFE components can be integrated into one SoC, or distributed across chip boundaries.
- ***Choice of Host interface transport layers:*** Shared memory, USB or UART
- ***Small Area*** overhead when combined with Imagination's Bluetooth Low Energy IP

IEEE 802.15.4 PHY & MAC

- 2.4GHz band O-QPSK
- Coherent demodulation
- Shared HW with BTLE
- Sensitivity : -102 dBm
- Carrier sense multiple access with collision avoidance (CSMA-CA) including automatic clear channel assessment (CCA) and retry
- All 3 CCA modes supported
- Automatic frame check sequence (FCS) and start-of-frame delimiter (SFD) generation (transmit)
- Automatic FCS verification (receive)
- Fully Compliant MAC to support both FFD and RFD devices

Software

- The Host-MAC Interface (HMI), which provides transport for the MCPS and MLME Service Access Points.
- Works with ZigBee, Thread and Open Thread protocols

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