NXP LPC54102-based Application-in-a-box Sensor Processing/Motion Solution

Complete solution for motion-based, always-on sensor-processing applications

This all-in-one solution, based on the ultra low power LPC54102 microcontroller, provides everything needed to bring sensor-based motion and other sensor-processing applications to market quickly.

KEY FEATURES

▸ Complete hardware and software design, ready to customize
▸ 32-bit LPC54102 Cortex-M4F/M0+ microcontroller
▸ LPCXpresso54102 development board
▸ Sensor Shield Board
▸ LPCOpen software drivers
▸ LPC Sensor Fusion Framework
▸ Bosch BSX Lite Sensor Fusion Library
▸ Software demo
▸ Documentation

KEY BENEFITS

▸ Add 6- or 9-axis motion sensors to your application
▸ Integrated sensor fusion middleware and portable sensor fusion framework
▸ Sensor Fusion APIs allow users to easily create applications that use motion sensors
▸ Additional digital sensors (pressure/temperature, ambient light, proximity)
▸ Software development tools for a quick start to writing, compiling, and running sensor-based applications
▸ Gives end-product designers access to a rich set of reference design materials, including documentation, porting guide, and schematics

▸ Stackable hardware to support more sensors or add plug-in modules
▸ Large set of pinouts for measurement and prototyping
▸ On-board debugger included
▸ Low power

APPLICATIONS

▸ Tablets, smartphones
▸ Portable fitness, health monitoring
▸ IoT nodes
▸ Asset tracking
▸ Robotics and Unmanned Vehicles
▸ Gaming, entertainment
▸ Pointing Devices

The NXP LPC54102-based Application-in-a-box Sensor Processing/Motion Solution enables a new generation of always-on, context-aware products. The system listens to, monitors, and aggregates data from several sensors and processes this data using complex sensor-fusion software, included in the solution.

NXP has partnered with Bosch Sensortec to offer an integrated solution that makes it easy to incorporate motion/inertia and other sensor data into a variety of end applications.

The solution includes commercial and development licenses for Bosch Sensor Fusion (BSX Lite). The software combines motion-sensor data to get accurate, sensor signals or derived sensory information with minimal memory requirements.

It supports 6- and 9-axis motion vectors, and the use of quaternions, heading, and pitch and roll.

HOW TO GET STARTED

The solution comes with a demo already flashed in memory. Follow the Quick Start Guide to bring up the demo into your PC. Follow the instructions in the User Guide to install the development environment and create your own application utilizing the sensors available in the sensor shield.

What's in the box

32-bit LPC54102 Cortex-M4F/M0+ microcontroller	
LPCXpresso 54102 development board ▸ Built-in Link2 high-speed USB based debug probe ▸ Support for external debug probes ▸ Tri-color user-programmable LED ▸ Target Reset, ISP and WAKE buttons ▸ On-board 1.8/3.3 V or external power-supply options ▸ Built-in MCU power consumption and supply voltage measurement for LPC54102 device and sensor board ▸ UART, I²C, and SPI port bridging from LPC54102 target to USB via Link2 device ▸ FTDI UART connector	**Software** ▸ LPCOpen software drivers ▸ LPC Sensor Fusion Framework ▸ Bosch BSX Lite Sensor Fusion (includes development and commercial license) ▸ Demo
Sensor Shield Board ▸ Bosch Sensortec sensors: BMI055 inertial measurement unit, BMC150 digital compass, BMM150 magnetometer, BMP280 pressure/temperature sensor, MAX44000 ambient light and proximity sensor ▸ ACKme AMS0002 Bluetooth LE module ▸ IR remote-control driver ▸ Headers for easy prototyping of additional sensors	**Documentation** ▸ Quick Start Guide ▸ User Guide ▸ Schematics
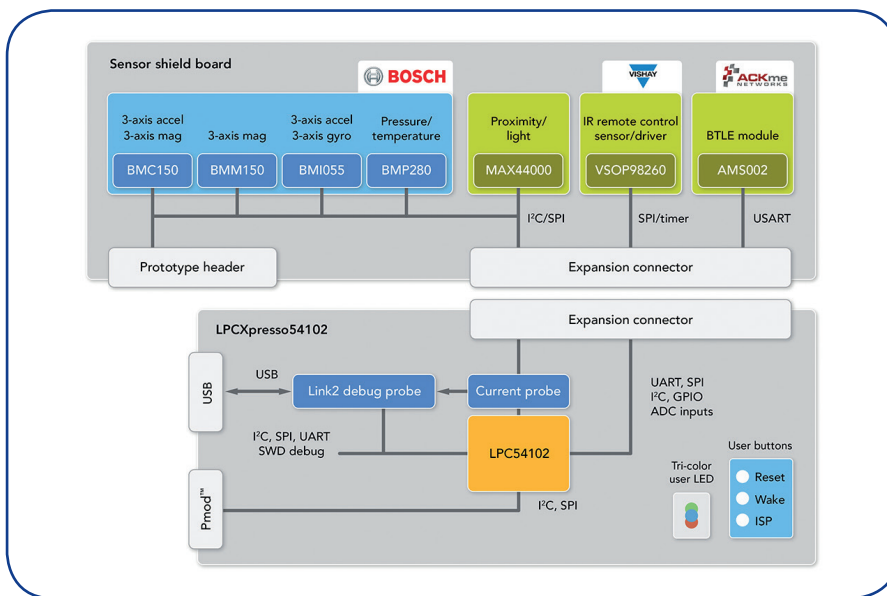
LPC54102 solution diagram
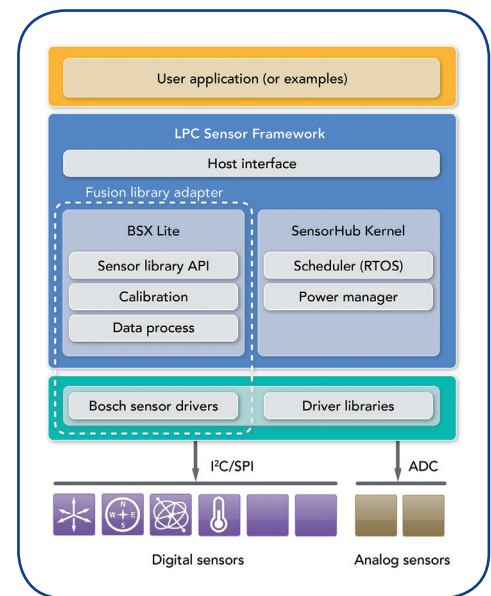
LPC54102 application software

Solution web page: www.nxp.com/spm-solution
Ordering information: www.nxp.com/demoboard/OM13078.html