# Altium NanoBoard 3000 Series

#### Architectural highlights

- Reprogrammable hardware development platform that harnesses the power of a dedicated high-capacity, low-cost programmable device to allow rapid and interactive implementation and debugging of your designs
- Perfect entry-point to discover and explore the world of FPGAbased embedded systems design. Programmable hardware realm allows you to update the design quickly and many times over without incurring cost or time penalties
- Works seamlessly and in full synchronization with Altium's nextgeneration electronic design solution, Altium Designer
- High-capacity FPGA located on the motherboard, and provision for a single plug-in peripheral board (Altium or user's own) for additional system flexibility
- Automatic peripheral board detection and configuration
- Dual boot system, allowing the board to update its firmware in the field by itself, over a standard USB connection – no parallel port or USB JTAG Adapter required

## Main board specifications

- Choice of high-capacity FPGAs
  - NanoBoard 3000XN with fixed Xilinx<sup>®</sup> Spartan<sup>™</sup>-3AN device (XC3S1400AN-4FGG676C)
  - NanoBoard 3000AL with fixed Altera<sup>®</sup> Cyclone<sup>™</sup> III device (EP3C40F780C8N)
  - NanoBoard 3000LC with fixed LatticeECP2™ device (LFE2-35SE-5FN672C)
- Integrated color TFT LCD panel (240x320) with touch screen that facilitates dynamic application interaction
- High-quality stereo audio capabilities including: Line in/out/ headphones, audio CODEC with I2S-compatible interface, analog mixer, audio power amplifier and high-quality speakers (located on a separate speaker board attachment)
- USB hub, providing connection of up to three USB 2.0 devices, with interfacing handled by an ISP1760 Hi-Speed USB Host Controller
- SVGA interface (24-bit, 80MHz)
- Variety of standard communications interfaces: RS-232, RS-485, PS/2, 10/100 Fast Ethernet, USB 2.0, S/PDIF, MIDI
- Dual SD card readers for use by user FPGA and Host Controller respectively
- IR receiver supports data transmitted using a 38kHz carrier frequency
- Programmable clock (6 to 200MHz) and fixed clock (20MHz) both available to user FPGA
- 4-channel 8-bit ADC, SPI-compatible providing maximum sample rate of 200ksps
- 4-channel 8-bit DAC, SPI-compatible operating at clock rates of up to 40MHz
- 4x isolated IM Relay channels each channel providing a 5V nonlatching DPDT relay with one coil
- 4x PWM power drivers
- 8-way general purpose DIP-Switch, 8 RGB LEDs, 5 PDA-style push button switches and a Test/Reset button – all wired directly to the user FPGA

- User prototyping area
- Dual 18-way (20 pin) I/O expansion headers, with power supply selection links
- On-board memories accessible by user FPGA

   256KB x 32-bit common-bus SRAM (1MB),
   16M x 32-bit common-bus SDRAM (64MB),
   8M x 16-bit common-bus 3.0V Page Mode Flash memory (16MB), dual 256KB x 16-bit independent SRAM (512KB each)
- Four 8Mbit SPI flash memory devices one containing Primary boot image for Host Controller, one containing golden boot image for Host Controller, two for use by user FPGA (for boot/embedded purposes)
- SPI Real-Time Clock with 3V battery backup
- Accommodates a single plug-in peripheral board for additional system flexibility
- Board ID memory 1-Wire® ID system uniquely identifies the motherboard and any attached Altium peripheral board
- Host (NanoTalk) Controller hosts the NanoBoard firmware. Responsibilities include managing JTAG communications (with Altium Designer/User FPGA/connected peripheral board), as well as access to common-bus SPI resources
- 5V DC power connector with power switch, plus testpoints for all major supplies on the board (and GND)
- High-speed PC interconnection through USB 2.0 allows for fast downloading and debugging

## Included in the box

#### Altium Designer

The NanoBoard 3000 includes a 12-month subscription to an Altium Designer Soft Design license which is linked to the NanoBoard in the box. This license option provides functionality to quickly start designing FPGA-based embedded systems, including:

- FPGA design entry in C, OpenBus, Schematic, VHDL and Verilog
- VHDL simulation engine, integrated debugger and waveform viewer
- Support for a range of 32-bit soft processors for use in FPGA design
- A rich set of royalty-free IP core libraries including peripherals and user-configurable custom logic
- Full software development tool chain with libraries and source code
- Programmable FPGA-based instruments for hardware debug and deployment
- Support for importing third-party FPGA IP cores, developing and reusing IP libraries

Additional Altium Designer license options are available for custom board design. For information on Altium Designer licensing options, visit www.altium.com/altiumdesigner

#### Training and resource materials

Altium provides extensive online resources designed to get you up and running as quickly as possible.

- Everything you need to know to get started and build your proficiency with Altium Designer – www.altium.com/gettingstarted
- Full technical information on the NanoBoard 3000 www.altium.com/wiki/nanoboard3000

