# Altium NanoBoard NB2

## Architectural highlights

- Innovative and reconfigurable hardware platform harnesses the power of today's high-capacity, low-cost programmable devices – allowing rapid system development and implementation
- Works seamlessly and in full synchronization with Altium's next-generation electronic design solution, Altium Designer
- Real-time on-board power monitoring and analysis for the entire system
- Supports range of swappable target-FPGA and processor daughter boards from all major chip vendors
- Automatic peripheral and daughter board detection and configuration for plug-and-play platform creation
- Powerful instrumentation reduces or eliminates the need to simulate
- Reprogrammability eliminates the need to build multiple prototypes during development

## Main board specifications

- Integrated color TFT LCD panel (320x240) with touch screen that facilitates dynamic application interaction
- Stereo analog audio system with high-quality on-board amplifiers, mixer, line in/out and stereo speakers
- Variety of standard communication interfaces – RS-232 serial, CAN, PS/2 mini-DIN
- SD card reader – for additional I/O flexibility including the ability to download a variety of files
- Four channel, 8-bit ADC and 10-bit DAC, I2C-compatible
- User definable PDA-style push button switches that function as generic design inputs
- Variety of general purpose switches and LEDs
- Programmable clock, 6 to 200 MHz, available to target FPGA
- Power sensing system allows real-time monitoring of system and device power consumption
- SPI Real-Time Clock with 3V battery back-up
- Onboard memory accessible by NanoTalk Controller – 256K x 32-bit common-bus SRAM (1MB), 16M x 32-bit common-bus SDRAM (64MB), 16M x 16-bit common-bus 3.0V Page Mode Flash memory (32MB), 256K x 32-bit independent SRAM (1MB)
- Dual User Board JTAG headers for direct interaction and development on production board
- Home/Reset button – Home button enables firmware to take control of TFT panel; Reset provides NanoBoard reset functionality
- NanoTalk Controller – manages real time proprietary communication with Altium Designer, the board, and the NanoBoard firmware using a Xilinx® Spartan™-3 (XC3S1500-4FG676C) controller with JTAG-accessible Flash configuration PROM
- Master-Slave connectors for chaining multiple development boards – allowing multiple-FPGA system development
- Board ID memory – 1-Wire® ID system uniquely identifies each daughter board and peripheral board
- Power – Dual 5V DC power daisy-chain connectors with power switch, 5V DC power output connector, power supply test points for all supply levels available on the board, four GND points
- High-speed PC interconnection through USB 2.0 allows faster downloading and debugging

## Included in the box

### Altium Designer

The NanoBoard NB2 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**

### Peripheral boards

The NanoBoard NB2 caters for the use of up to three peripheral boards, and is delivered with the following standard peripheral boards:

**Audio/Video Peripheral Board (PB01)**
- Composite and S-Video output and capture, 24-bit VGA output, high-performance I2S stereo audio codec

**Mass Storage Peripheral Board (PB02)**
- Compact Flash, SD card slot, ATA hard-drive interfaces

**USB-IrDA-Ethernet Peripheral Board (PB03)**
- 10/100 Ethernet interface, USB 2.0 interface, 4Mbits/sec IrDA

Additional peripheral boards continue to be developed by Altium, and users can also develop their own, making it easy to evaluate new and alternate technology options.

### Choice of daughter board

Each NanoBoard NB2 comes with one daughter board, which can be selected from the following:

**Xilinx® Spartan™-3 Daughter Board (DB30)**
- With Xilinx Spartan-3 FPGA (XC3S1500-4FG676C)

**Altera® Cyclone™ II Daughter Board (DB31)**
- With Altera Cyclone II FPGA (EP2C35F672C8)

**LatticeECP™ Daughter Board (DB32)**
- With LatticeECP FPGA (LFECP33E-3FN672C)

Daughter boards are swappable and an extended range can be purchased separately from Altium.

### 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 NB2 – **www.altium.com/wiki/nanoboardnb2**

For information on all available NanoBoard configurations, visit the Altium website at **www.altium.com/nanoboard**

**Altium**