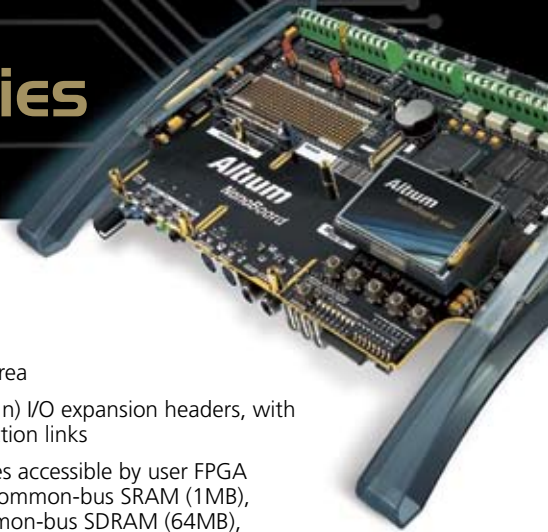


# Altium NanoBoard 3000 Series



## 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 FPGA-based 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 next-generation 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® Spartan™-3AN device (XC3S1400AN-4FGG676C)
  - NanoBoard 3000AL – with fixed Altera® Cyclone™ 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 non-latching 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](http://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](http://www.altium.com/gettingstarted)
- Full technical information on the NanoBoard 3000 – [www.altium.com/wiki/nanoboard3000](http://www.altium.com/wiki/nanoboard3000)