

# NanoBoard 3000 Series

## Additional Resources

[NanoBoard 3000 series datasheet](#)

[NanoBoard 3000XN Schematics](#)

[NanoBoard 3000AL Schematics](#)

[NanoBoard 3000XN Reference Design](#)

## NanoBoard 3000 Mini-Site

Further information on the NanoBoard 3000 can be found at the dedicated [NanoBoard 3000 mini website](#).

The site includes:

- A high-level introduction to the board
- An in-depth guided tour of board resources
- Detailed photos of the board, including a 360 degree view
- Access to data sheets containing overviews of technical specifications
- A dedicated "Training Room", taking you on a voyage of discovery with your NanoBoard 3000 in a very hands-on, fun way. Instruction is through videos and also a number of associated "Discovery Session" PDF documents – all aimed at getting you quickly up to speed with your board.

Remember back to the time when you first became impassioned by electronics. The time when perhaps you opened your first electronics kit, marveling at the in-numerous circuits that could be built. Fast forward to the present, a time when that passion to create and innovate can be rejuvenated in an exciting way. Enter the NanoBoard 3000 series.

Part of Altium's growing family of [NanoBoards](#), the 3000-series NanoBoards provide the perfect entry-point to discover and explore the world of [soft design](#) in a low-cost, fun way. In true NanoBoard style, each board in the series offers a reprogrammable hardware platform that harnesses the power of a high-capacity, low-cost programmable device to allow rapid and interactive implementation and debugging of your digital designs.

The NanoBoard 3000 provides a fixed User FPGA that is located on the motherboard itself and provision for the attachment of a single [peripheral board](#). Much of the peripheral resource functionality found on the [NanoBoard NB2](#) is also found on the NanoBoard 3000, along with additional resources of its own – including Relays, Power PWM Drivers and a MIDI interface.

There are three variants available in the series:

- NanoBoard 3000XN – Xilinx variant, incorporating a Xilinx Spartan-3AN device (XC3S1400AN-4FGG676C) as the User FPGA.
- NanoBoard 3000AL – Altera variant: incorporating an Altera Cyclone III device (EP3C40F780C8N) as the User FPGA.
- NanoBoard 3000LC – Lattice variant: incorporating a LatticeECP2 device (LFE2-35SE-5FN672C) as the User FPGA.

The NanoBoard 3000 is designed to be a perfect complement to [Altium Designer](#), Altium's unified electronic product design environment. Together, they transform your desktop into a complete, interactive electronics design laboratory using Altium's LiveDesign environment.

LiveDesign is a unified electronics system design methodology that is based on 'live' engineering inside a programmable physical hardware design space. Altium Designer, the NanoBoard 3000 and LiveDesign, provide real-time communication and 'hands-on' interaction between you and your design during the development process. Unlike conventional electronics design flows, a unified design flow and LiveDesign eliminate the need to work in simulated environments, allowing you to run software on hardware in real time, right from the start of the design cycle through to final production!

By implementing your system on the NanoBoard 3000, your circuit can be probed, analyzed and debugged interactively using an array of [virtual instruments](#) and [JTAG-based monitoring features](#). The implementation is performed within a programmable hardware realm, so you can update the design quickly and as often as you need to, without incurring cost or time penalties, all the while rapidly building your knowledge and equipping yourself with the skills to embrace the soft design paradigm.

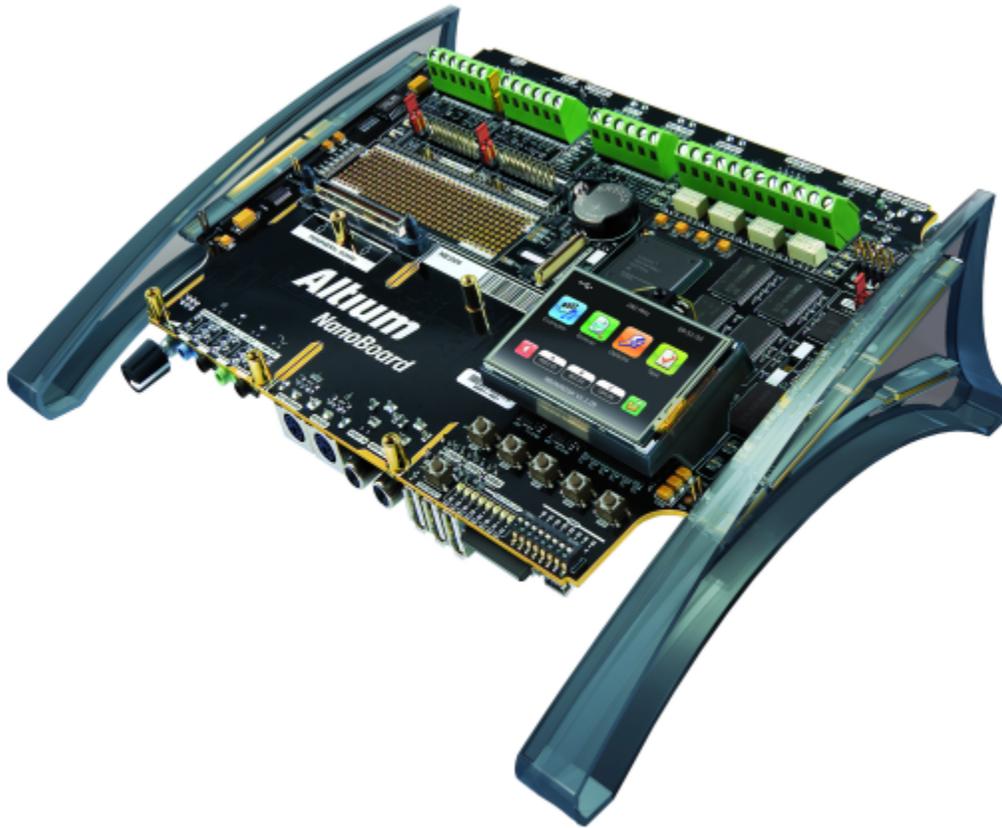
Some architectural highlights of the NanoBoard 3000 include:

- 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
- Accommodation of a single application-specific plug-in peripheral board for additional system flexibility
- High-quality stereo audio capabilities, including audio CODEC, high-quality speakers and both MIDI and S/PDIF interfaces
- 4x Relay and Power PWM drivers
- USB Hub, providing for the connection of up to three USB devices to be attached for use by an FPGA design programmed within the User FPGA
- Integrated color TFT touch screen that facilitates dynamic application interaction.

Additionally, a wide variety of FPGA-ready schematic components (ranging from processors to peripheral components and generic logic), and a complete set of tools for development and debugging, are included with Altium Designer.

Each 3000-series NanoBoard comes with a 12-month subscription to the Soft Design licensing option of Altium Designer. The license is unique and linked to the board – initial access to the license is only possible provided that particular NanoBoard 3000 is connected and powered up. Thereafter, the license can be used with or without connection to the NanoBoard. For more information, see [Licensing and the NanoBoard](#).

So as you can see, when combined with Altium Designer, a LiveDesign-enabled 3000-series NanoBoard transforms your PC desktop into an interactive reprogrammable hardware development system – truly an electronics 'kit' for the 21st century! Explore, Discover, Deploy – with a 3000-series NanoBoard, you are limited only by your imagination.



One of Altium's 3000-series NanoBoards.

## NanoBoard 3000 Overview

[Functional Overview](#)

[Key Features](#)

[Board Communications](#)

[ESD and the NanoBoard 3000](#)

[Handling Caution](#)

## Working with the NanoBoard 3000

[Understanding the NanoBoard 3000 Constraint System](#)

[SPI Communications on the NanoBoard 3000](#)

[NanoBoard 3000 - Firmware Updates](#)

[Programming In-System Flash Memory for a Xilinx Spartan-3AN Device](#)

## Setting up the NanoBoard 3000

[What's in the Box](#)

[Assembling the NanoBoard 3000](#)

[Connecting the NanoBoard 3000](#)

[Installing Altium Designer](#)

[Vendor Tool Installation](#)

[Testing the PC to NanoBoard Connection](#)

[Downloading a Test Project to the NanoBoard 3000](#)

[Troubleshooting NanoBoard 3000 Connection Problems](#)

## Altium Designer Introductory Topics

[Getting Started with Altium Designer](#)

[Soft Design](#)

[Tutorial - Getting Started with FPGA Design](#)

[Tutorial - Getting Started with Embedded Software](#)

[Tutorial - Implementing a 32-bit Processor-based Design in an FPGA](#)

## Resources

[Motherboard Resources](#)

[Peripheral Boards](#)

## Deployment

[NanoBoard 3000 Modular Enclosure](#)

- ❌ ISE 11.1i does not support the Spartan 3AN 1400 device that ships on the NanoBoard 3000XN. Xilinx have an update available that patches 11.1i WebPACK to 11.3i WebPACK to resolve the problem. 10.1 SP2 WebPACK is the last known working version with the NanoBoard 3000XN.