**Altium.**

Altium's 3000-series Nano Board

Product Overview:

Each of Altium's 3000-series NanoBoards is a 242 x 176mm (9.5" x 6.9") six layer printed circuit board (4 x signal, 2 x plane), powered by an external 5 Volt regulated supply. One of the plane layers is used predominantly as a grounding plane (GND, AGND, AUGND, SHIELD), but incorporates split regions to accommodate 1.2V, 1.8V and 2.5V supplies. The other plane is used primarily for 5V and 3.3V supplies. Both top and bottom of the board are used for component placement.
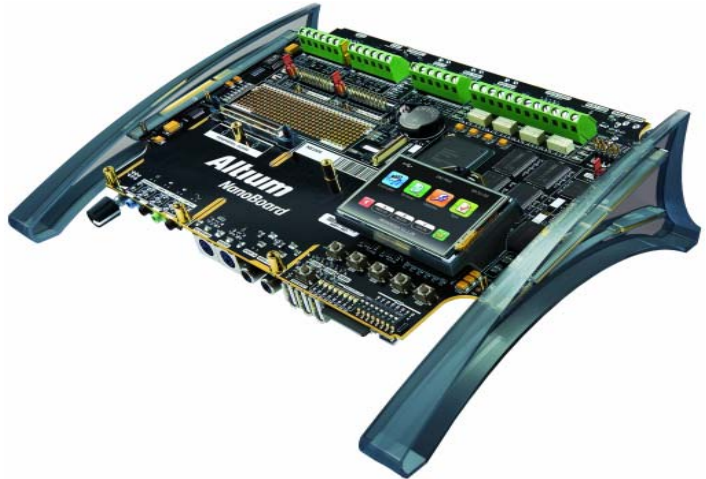
For each variant in the NanoBoard 3000 series, the layout of the motherboard and available resources are the same – all that differs are the physical devices used for the Host (NanoTalk) Controller and the target User FPGA.

Kit Contents:

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

Key Features:

- NanoBoard 3000XN – with fixed Xilinx® Spartan™-3AN device (XC3S1400AN-4FGG676C)
- 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, analogue 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 i-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 theuser 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

Ordering Information

Products:

Part Number	Manufacturer	Farnell P/N	Newark P/N
12-400-NB3000XN-01	Altium	1714411	10R0248

Associated Products:

Part Number	Manufacturer	Description	Farnell P/N	Newark P/N
ADAPTER	Altium	JTAG USB	1714426	10R0257
Flash Memory	ST Microelectronics	Serial SPI Flash Memory	1099669	26M1754
Transceiver	Maxim	RS-232	1379769	68K4632
CAN Bus	Maxim	Transceiver	NA	24R9638
ADC	Maxim	ADC-IC	NA	68K9410
DAC	Maxim	DAC IC	NA	78C3271
Amplifier	Maxim	Current Sense	NA	67K5237
FPGA	Xilinx	Spartan 3	1762476	22M4732
Flash Memory	Spansion	Flash	NA	42K8611
Switch	Maxim	Switch Addressable	96B0597	1379761
Power Supply	Maxim	Power Supply IC	NA	67K4263
SDRAM	Micron	Memory	1216280	97K6120
SDRAM	Micron	Memory	1216280	97K6120

Similar Products:

Part Number	Manufacturer	Description	Support Device	Farnell P/N	Newark P/N
12-401-DB42	Altium	XILINX SPARTAN-3A DSP DB42 DAUGHTER BOARD	Spartan 3A	1714421	10R0255
12-401-DB46	Altium	BOARD, DAUGHTER, DB46, VIRTEX-4 SX	Virtex-4	1714422	10R0256
12-400-NB2DSK01 (ALTERA)	Altium	DESKTOP NANOBOARD WITH ALTERA CYCLONE II	Cyclone II	1337908	10R0245
12-400-NB2DSK01 (LATTICE)	Altium	DESKTOP NANOBOARD WITH LATTICE ECP	Lattice ECP	NA	10R0246
12-400-NB2DSK01 (XILINX)	Altium	DESKTOP NANOBOARD WITH XILINX SPARTAN-3	Spartan 3	NA	10R0247
12-400-NB2DSK01-DB30	Altium	NANOBOARD KIT NB2 SPARTAN-3	Spartan 3	1714409	25R5626
12-400-NB2DSK01-DB31	Altium	NANOBOARD KIT NB2, CYCLONE II	Cyclone II	1714407	25R5627
12-400-NB2DSK01-DB32	Altium	NANOBOARD KIT NB2, LATTICE ECP	Lattice ECP	1714410	25R5628
12-401-DB40	Altium	ALTERA CYCLONE III DB40 DAUGHTER BOARD	Cyclone III	1714419	10R0253
12-401-DB41	Altium	XILINX SPARTAN-3AN DB41 DAUGHTER BOARD	Spartan 3AN	1714420	10R0254

Document List:

Datasheets:

Part Number	Description	Size
Xilinx's Spartan Series	Spartan 3 User guide	8.94MB
	Spartan 3 Datasheet	5.1MB
DS2406	Dual Addressable Switch Plus 1Kb Memory	240KB
MT48LC16M16A2TG	Common-Bus SDRAM	2.9MB

S29GL256N11FFIV10	Common-Bus Flash memory	4.8MB
MAX8860	Linear Regulator	168KB
MAX1831	Voltage Regulator	106KB

Application Notes:

File Name	Size
XAPP058 - Xilinx In-System Programming Using an Embedded Microcontroller	641KB
XAPP195 - Implementing Barrel Shifters Using Multipliers	52KB
XAPP452 - Spartan-3 FPGA Family Advanced Configuration Architecture	574KB
XAPP453 - The 3.3V Configuration of Spartan-3 FPGAs	215KB
XAPP454 - DDR2 SDRAM Interface for Spartan-3 Generation FPGAs	328KB