# element14 Your Electronic Engineering Resource

## Altium

# Altium - 12-400-NB3000AL-01 - 3000-Series Nanoboard

## Product Overview:

Altium's 3000-series NanoBoard 12-400-NB3000AL-01 is an Altera variant, incorporating an Altera Cyclone III device (EP3C40F780C8N) as the user FPGA. The NanoBoard 3000 boasts a huge array of features and connectivity options and can be used in a wide variety of development and deployment scenarios. 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.

## 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:

- NanoBoard 3000 with TFT LCD panel affixed
- Desktop stand – comprising two side panels and self-adhesive non slip feet
- Speaker board sub-assembly
- Power supply module
- Mains power cords X 4
- USB type A to Mini-USB type B cable
- IR remote control
- AAA batteries x 2 (for remote control)
- Volume knob

## Key Features:

- NanoBoard 3000AL – with fixed Altera® Cyclone III device (EP3C40F780C8N)
- 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
- SPI Real-Time Clock with 3V battery backup
- 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-NB3000AL-01 | Altium | NA | 08R0847 |

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## Associated Products:

| Part Number | Manufacturer | Description | Farnell P/N | Newark P/N |
|---|---|---|---|---|
| XC3S1400AN-4FGG 676C | Xilinx | Spartan-3 FPGA | 1671101 | 19P1177 |
| DS2406P | Maxim | Dual Address Switch | 1379761 | 32K5655 |
| MT48LC16M16A2 | Micron | SDRAM Memory | 1216280 | 97K6120 |
| MAX8860 | Maxim | Voltage Regulator | 1795460 | 67K6816 |
| 12-404-PB01 | Altium | A/V Peripheral Board | 1714423 | 10R0258 |

## Similar Products:

| Part Number | Manufacturer | Description | Support Device | Farnell P/N | Newark P/N |
|---|---|---|---|---|---|
| 12-400-NB300 0XN-01 | Altium | 3000 Series Nanoboard with Xilinx Spartan-3 | XC3S1400AN-4 FGG676 | 1714411 | 10R0248 |
| 12-400-NB2D SK01 (ALTERA) | Altium | DESKTOP NANOBOARD WITH ALTERA CYCLONE II | EP2C35F672C8 | 1714407 | 10R0245 |
| 12-400-NB2D SK01 (LATTICE) | Altium | DESKTOP NANOBOARD WITH LATTICE ECP | LFECP33E-3FN 672C | NA | 10R0246 |
| 12-400-NB2D SK01 (XILINX) | Altium | DESKTOP NANOBOARD WITH XILINX SPARTAN-3 | XC3S1500-4FG G676C | NA | 10R0247 |

# Document List:

## Datasheets:

| Part Number | Description | Size |
|---|---|---|
| EP3C40F780C8N | Cyclone III Datasheet | 7.1MB |
| 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 |
|---|---|
| Anti-Tamper Protection for Cyclone III LS Devices | 626KB |
| Using the Design Security Feature in Cyclone III LS Devices | 1MB |
| Cyclone III Active Parallel Remote System Upgrade Reference Design | 1MB |

## Hardware & Software:

| File Name | Size |
|---|---|
| Altium Designer | 1.5GB |
| Quartus II Web Edition Software v9.1 | 1.9GB |

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