

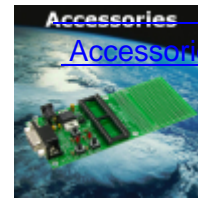
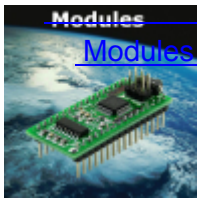


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# Technological Arts Inc.

*Technological Arts*

## NanoCore12



### Overview

NanoCore12™ is an ideal low-cost platform that brings the advanced features of the 9S12C microcontroller family within easy reach of engineers, students, and hobbyists. The flexible design makes it suitable for education, development, and prototyping. And, as a family of standardized modules in production since 2004, it is also perfect for OEM applications. While there are several DIP-format MCU modules on the market, none of them comes close to the power and value of NanoCore12! Others are based on RISC processors-- some relying on serial program memory, and have limited or no hardware subsystems on-chip. NanoCore12 is the only complete family of DIP modules based on a high-speed CISC device. Since RISC processors only possess primitive instructions, their high speed is necessary, in order to produce acceptable computing power. With a CISC processor running at the same speed, the overall performance is vastly improved-- and performance improvement is in orders of magnitude for certain types of operations. The S12 instruction set includes powerful DSP-like instructions, 16-bit arithmetic, and the architecture implements memory-to-memory moves, and many powerful addressing modes.

NanoCore12 Overview:

- based on the 9S12C MCU (48-pin LQFP version)
- includes 8 Mhz crystal
- 24 MHz bus speed (via PLL)
- local 5 Volt low-dropout 100 mA regulator
- includes RS232 transceiver circuit
- has on-chip Serial Monitor
- supports standalone operation
- DIP form-factor

## Details

- supports programming in C, BASIC, nqBASIC, Forth, assembler, etc.
  - fast in-circuit programming
  - small footprint on-chip bootloader/monitor and free uBug12 GUI for quick loading/debugging of user programs on Windows, Mac, and Linux platforms
  - directly supported by CodeWarrior Classic suite
  - Run/Load switch for choice of Standalone or Monitor operation following reset
  - compatible with virtually all 9S12 development tools on the market
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- capable of 3-Volt operation (Note: CAN transceiver on 40-pin module will not work at 3V)
  - standard 6-pin BDM connector for full debugging capabilities (with an optional BDM pod)
  - up to 31 digital I/O lines, including Port M, Port T, and Port E (depending on module)
  - access to eight 10-bit analog input or digital I/O port lines (Port AD)
  - access to eight digital I/O port lines (Port T)
  - up to six PWM timer channels (PT0 - PT4, PP5)
  - up to eight Input Capture/Output Compare pins (Port T)
  - key wake-up interrupt pin (PP5)
  - serial peripheral interface (SPI) (not on 24-pin version)
  - serial communications interface (SCI)
  - controller area network (CAN 2.0) (on-board transceiver circuit included on 40-pin module)
  - internal programmable pullup and pulldown resistors on most pins
  - user access to MCU reset signal

## Resources

- [NanoCore12 \(24-pin module\) Data Sheet](#)
- [NanoCore12DX \(32-pin module\) Data Sheet](#)
- [NanoCore12MAX \(40-pin module\) Data Sheet](#)
- [NanoCore12 Family User Manual](#)
- [MC9S12C Family Product Brief](#)
- [9S12C Data Sheet](#)
- [Freescale MC9S12C Webpage](#)

- [uBug12 GUI for working with the on-chip Serial Monitor](#)
  - [Linux command line tool \*\*hcs12mem\*\* for working with the Serial Monitor](#)
  - [SynCode: Free Integrated Editor and GNU C Compiler package for Windows](#)
  - [CodeWarrior Special Edition](#) from Freescale, has a 32K code limit for C, so it's essentially free for NanoCore12C32 users !
  - [45-day Demo C compiler](#) from ImageCraft
  - [Windows IDE for AS12 Assembler](#)
  - [Using the GNU Development Tools for 68HC11 and 68HC12](#)
  - [FreeRTOS for 9S12C32](#)
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- [University of Texas Course Notes & Examples](#)
  - [Montana State University Robot Course based on NC12DXC32 \(a.k.a. M68MOD912C32\)](#)



**NanoCore12C32S Module, RS232 Interface, 24-pin**  
**USD \$49.00**

9S12C32 MCU module in 24-pin DIP form-factor, RS232 interface [\[Product Details...\]](#)



**NanoCore12C32ST Module, TTL Interface, 24-pin**  
**USD \$49.00**

9S12C32 MCU module in 24-pin DIP form-factor, TTL serial interface [\[Product Details...\]](#)



**NanoCore12DXC32S Module, RS232 Interface, 32-pin**  
**USD \$49.00**

9S12C32 MCU module in 32-pin DIP form-factor, RS232 interface [\[Product Details...\]](#)



**NC12DXC32S Module, RS232 Interface, 32-pin, 25-pack**  
**USD \$913.75**

25-pack of NanoCore12DXC32 modules (15% savings) [\[Product Details...\]](#)



**NC12DXC32S Module, RS232 Interface, 32-pin, 50-pack**  
**USD \$1,720.00**

50-pack of NanoCore12DXC32 modules (20% savings) [\[Product Details...\]](#)



**NanoCore12DXC32ST Module, TTL Interface, 32-pin**  
**USD \$49.00**

9S12C32 MCU module in 32-pin DIP form-factor, TTL serial interface [\[Product Details...\]](#)



**NanoCore12MAXC128S Module, RS232 Interface, 40-pin**  
**USD \$74.00**

9S12C128 MCU module in 40-pin DIP form-factor, RS232 and CAN interfaces [\[Product Details...\]](#)



**NanoCore12MAXC128ST Module, TTL Interface, 40-pin**  
**USD \$74.00**

9S12C128 MCU module in 40-pin DIP form-factor, CAN and TTL serial interfaces [\[Product Details...\]](#)



**NanoCore12MAXC32S Module, RS232 Interface, 40-pin**  
**USD \$59.00**

9S12C32 MCU module in 40-pin DIP form-factor, RS232 and CAN interfaces [\[Product Details...\]](#)



**NanoCore12MAXC32ST Module, TTL Interface, 40-pin**  
**USD \$59.00**

9S12C32 MCU module in 40-pin DIP form-factor, CAN and TTL serial interfaces [\[Product Details...\]](#)

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