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Arduino Due

100Y: 98442



## Overview

The Arduino Due is a microcontroller board based on the Atmel SAM3X8E ARM Cortex-M3 CPU ([datasheet](#)). It is the first Arduino board based on a 32-bit ARM core microcontroller. It has 54 digital input/output pins (of which 12 can be used as PWM outputs), 12 analog inputs, 4 UARTs(hardware serial ports), a 84MHz clock, an USB OTG capable connection, 2 DAC (digital to analog), 2 TWI, a power jack, an SPI header, a JTAG header, a reset button and an erase button.

Warning: Unlike other Arduino boards, the Arduino Due board runs at 3.3V. The maximum voltage that the I/O pins can tolerate is 3.3V. Providing higher voltages, like 5V to an I/O pin could damage the board.

The board contains everything needed to support the microcontroller; simply connect it to a computer with a micro-USB cable or power it with a AC-to-DC adapter or battery to get started. The Due is compatible with all Arduino shields that work at 3.3V and are compliant with the 1.0 Arduino pinout.

The Due follows the 1.0 pinout:

- TWI: SDA and SCL pins that are near to the AREF pin.
- The IOREF pin which allows an attached shield with the proper configuration to adapt to the voltage provided by the board. This enables shield compatibility with a 3.3V board like the Due and AVR-based boards which operate at 5V.
- An unconnected pin, reserved for future use.

The Due has a [dedicated forum](#) for discussing the board.

### ARM Core benefits

The Due has a 32-bit ARM core that can outperform typical 8-bit microcontroller boards. The most significant differences are:

- A 32-bit core, that allows operations on 4 bytes wide data within a single CPU clock. (for more information look [int type](#) page).
- CPU Clock at 84Mhz.
- 96Kbytes of SRAM.
- 512Kbytes of Flash memory for code.
- a DMA controller, that can relieve the CPU from doing memory intensive tasks.

### Schematic, Reference Design & Pin Mapping

EAGLE files: [arduino-Due-reference-design.zip](#)

Schematic: [arduino-Due-schematic.pdf](#)

Pin Mapping: [SAM3X Pin Mapping page](#)

### Summary

Microcontroller	AT91SAM3X8E
Operating Voltage	3.3V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-16V
Digital I/O Pins	54 (of which 12 provide PWM output)
Analog Input Pins	12
Analog Outputs Pins	2 (DAC)
Total DC Output Current on all I/O lines	130 mA
DC Current for 3.3V Pin	800 mA
DC Current for 5V Pin	800 mA
Flash Memory	512 KB all available for the user applications
SRAM	96 KB (two banks: 64KB and 32KB)
Clock Speed	84 MHz

### Power

The Arduino Due can be powered via the USB connector or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the



voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

The power pins are as follows:

- VIN. The input voltage to the Arduino board when it's using an external power source (as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or if supplying voltage via the power jack, access it through this pin.
- 5V. This pin outputs a regulated 5V from the regulator on the board. The board can be supplied with power either from the DC power jack (7 - 12V), the USB connector (5V), or the VIN pin of the board (7-12V). Supplying voltage via the 5V or 3.3V pins bypasses the regulator, and can damage your board. We don't advise it.
- 3.3V. A 3.3 volt supply generated by the on-board regulator. Maximum current draw is 800 mA. This regulator also provides the power supply to the SAM3X microcontroller.
- GND. Ground pins.
- IOREF. This pin on the Arduino board provides the voltage reference with which the microcontroller operates. A properly configured shield can read the IOREF pin voltage and select the appropriate power source or enable voltage translators on the outputs for working with the 5V or 3.3V.

### Memory

The SAM3X has 512 KB (2 blocks of 256 KB) of flash memory for storing code. The bootloader is preburned in factory from Atmel and is stored in a dedicated ROM memory. The available SRAM is 96 KB in two contiguous bank of 64 KB and 32 KB. All the available memory (Flash, RAM and ROM) can be accessed directly as a flat addressing space.

It is possible to erase the Flash memory of the SAM3X with the onboard erase button. This will remove the currently loaded sketch from the MCU. To erase, press and hold the Erase button for a few seconds while the board is powered.

## Input and Output

- Digital I/O: pins from 0 to 53

Each of the 54 digital pins on the Due can be used as an input or output, using [pinMode\(\)](#), [digitalWrite\(\)](#), and [digitalRead\(\)](#) functions. They operate at 3.3 volts. Each pin can provide (source) a current of 3 mA or 15 mA, depending on the pin, or receive (sink) a current of 6 mA or 9 mA, depending on the pin. They also have an internal pull-up resistor (disconnected by default) of 100 KOhm. In addition, some pins have specialized functions:

- Serial: 0 (RX) and 1 (TX)
- Serial 1: 19 (RX) and 18 (TX)
- Serial 2: 17 (RX) and 16 (TX)
- Serial 3: 15 (RX) and 14 (TX)

Used to receive (RX) and transmit (TX) TTL serial data (with 3.3 V level). Pins 0 and 1 are connected to the corresponding pins of the ATmega16U2 USB-to-TTL Serial chip.

- PWM: Pins 2 to 13

Provide 8-bit PWM output with the [analogWrite\(\)](#) function. the resolution of the PWM can be changed with the [analogWriteResolution\(\)](#) function.

- SPI: SPI header (ICSP header on other Arduino boards)

These pins support SPI communication using the [SPI library](#). The SPI pins are broken out on the central 6-pin header, which is physically compatible with the Uno, Leonardo and Mega2560. The SPI header can be used only to communicate with other SPI devices, not for programming the SAM3X with the In-Circuit-Serial-Programming technique. The SPI of the Due has also advanced features that can be used with the [Extended SPI methods for Due](#).

- CAN: CANRX and CANTX

These pins support the CAN communication protocol but are not yet supported by Arduino APIs.

- "L" LED: 13

There is a built-in LED connected to digital pin 13. When the pin is HIGH, the LED is on, when the pin is LOW, it's off. It is also possible to dim the LED because the digital pin 13 is also a PWM output.

- TWI 1: 20 (SDA) and 21 (SCL)

- TWI 2: SDA1 and SCL1.

Support TWI communication using the [Wire library](#).

- Analog Inputs: pins from A0 to A11

The Due has 12 analog inputs, each of which can provide 12 bits of resolution (i.e. 4096 different values). By default, the resolution of the readings is set at 10 bits, for compatibility with other Arduino boards. It is possible to change the resolution of the ADC with

[analogReadResolution\(\)](#). The Due's analog inputs pins measure from ground to a maximum value of 3.3V. Applying more than 3.3V on the Due's pins will damage the SAM3X chip. The [analogReference\(\)](#) function is ignored on the Due.

The AREF pin is connected to the SAM3X analog reference pin through a resistor bridge. To use the AREF pin, resistor BR1 must be desoldered from the PCB.

- DAC1 and DAC2 These pins provides true analog outputs with 12-bits resolution (4096 levels) with the [analogWrite\(\)](#) function. These pins can be used to create an audio output using the [Audio library](#).

Other pins on the board:

- AREF  
Reference voltage for the analog inputs. Used with [analogReference\(\)](#).
- Reset  
Bring this line LOW to reset the microcontroller. Typically used to add a reset button to shields which block the one on the board.

## Communication

The Arduino Due has a number of facilities for communicating with a computer, another Arduino or other microcontrollers, and different devices like phones, tablets, cameras and so on. The SAM3X provides one hardware UART and three hardware USARTs for TTL (3.3V) serial communication.

The Programming port is connected to an ATmega16U2, which provides a virtual COM port to software on a connected computer (To recognize the device, Windows machines will need a .inf file, but OSX and Linux machines will recognize the board as a COM port automatically.). The 16U2 is also connected to the SAM3X hardware UART. Serial on pins RX0 and TX0 provides Serial-to-USB communication for programming the board through the ATmega16U2



microcontroller. The Arduino software includes a serial monitor which allows simple textual data to be sent to and from the board. The RX and TX LEDs on the board will flash when data is being transmitted via the ATmega16U2 chip and USB connection to the computer (but not for serial communication on pins 0 and 1).

The Native USB port is connected to the SAM3X. It allows for serial (CDC) communication over USB. This provides a serial connection to the Serial Monitor or other applications on your computer. It also enables the Due to emulate a USB mouse or keyboard to an attached computer. To use these features, see the [Mouse and Keyboard library reference pages](#).

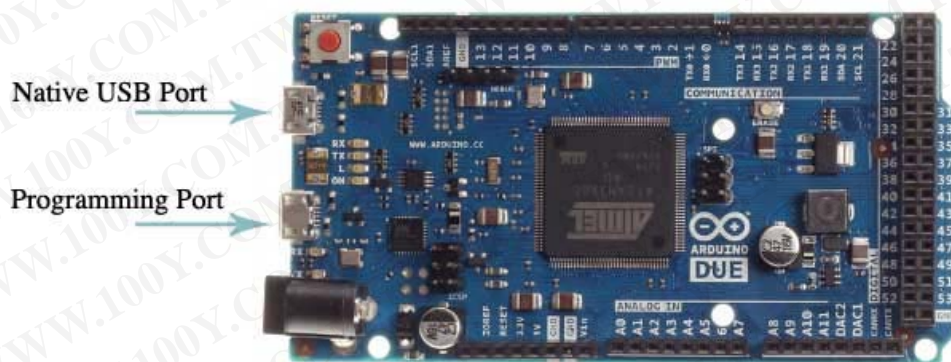
The Native USB port can also act as a USB host for connected peripherals such as mice, keyboards, and smartphones. To use these features, see the [USBHost reference pages](#).

The SAM3X also supports TWI and SPI communication. The Arduino software includes a Wire library to simplify use of the TWI bus; see the [documentation](#) for details. For SPI communication, use the [SPI library](#).

### Programming

The Arduino Due can be programmed with the Arduino software ([download](#)). For details, see the [reference](#) and [tutorials](#).

Uploading sketches to the SAM3X is different than the AVR microcontrollers found in other Arduino boards because the flash memory needs to be erased before being re-programmed. Upload to the chip is managed by ROM on the SAM3X, which is run only when the chip's flash memory is empty.



Either of the USB ports can be used for programming the board, though it is recommended to use the Programming port due to the way the erasing of the chip is handled :

- Programming port: To use this port, select "Arduino Due (Programming Port)" as your board in the Arduino IDE. Connect the Due's programming port (the one closest to the DC power jack) to your computer. The programming port uses the 16U2 as a USB-to-serial chip connected to the first UART of the SAM3X (RX0 and TX0). The 16U2 has two pins connected to the Reset and Erase pins of the SAM3X. Opening and closing the Programming port connected at 1200bps triggers a "hard erase" procedure of the SAM3X chip, activating the Erase and Reset pins on the SAM3X before communicating with the UART. This is the recommended port for programming the Due. It is more reliable than the "soft erase" that occurs on the Native port, and it should work even if the main MCU has crashed.
- Native port: To use this port, select "Arduino Due (Native USB Port)" as your board in the Arduino IDE. The Native USB port is connected directly to the SAM3X. Connect the Due's Native USB port (the one closest to the reset button) to your computer. Opening and closing the Native port at 1200bps triggers a 'soft erase' procedure: the flash memory is erased and the board is restarted with the bootloader. If the MCU crashed for some reason it is likely that the soft erase procedure won't work as this procedure happens entirely in software on the SAM3X. Opening and closing the native port at a different baudrate will not reset the SAM3X.

Unlike other Arduino boards which use avrdude for uploading, the Due relies on [bossac](#).



The ATmega16U2 firmware source code is available [in the Arduino repository](#). You can use the ISP header with an external programmer (overwriting the DFU bootloader). See [this user-contributed tutorial](#) for more information.

### USB Overcurrent Protection

The Arduino Due has a resettable polyfuse that protects your computer's USB ports from shorts and overcurrent. Although most computers provide their own internal protection, the fuse provides an extra layer of protection. If more than 500 mA is applied to the USB port, the fuse will automatically break the connection until the short or overload is removed.

### Physical Characteristics and Shield Compatibility

The maximum length and width of the Arduino Due PCB are 4 and 2.1 inches respectively, with the USB connectors and power jack extending beyond the former dimension. Three screw holes allow the board to be attached to a surface or case. Note that the distance between digital pins 7 and 8 is 160 mil (0.16"), not an even multiple of the 100 mil spacing of the other pins.

The Arduino Due is designed to be compatible with most shields designed for the Uno, Diecimila or Duemilanove. Digital pins 0 to 13 (and the adjacent AREF and GND pins), analog inputs 0 to 5, the power header, and "ICSP" (SPI) header are all in equivalent locations. Further the main UART (serial port) is located on the same pins (0 and 1). *Please note that I<sup>2</sup>C is not located on the same pins on the Due (20 and 21) as the Duemilanove / Diecimila (analog inputs 4 and 5).*

注意事項：

Arduino Due 是一款特殊的 Arduino 產品，目前已知的 Due 相容 Shield 並不多，主要是因為類庫有所差異，Due 與 Arduino MEGA 2560 的引腳定義完全一致，但 I/O 口的供電參數有所不同，Arduino Due 官方網站有警告提示：

<http://arduino.cc/en/Main/ArduinoBoardDue>

本店發貨前已對每一個 Due 進行嚴格的測試，請在使用前仔細閱讀 Arduino Due 官方網站相關說明及文檔，凡因操作不當導致 Due 損毀，本店概不負責

欲瞭解更多 Due 相關問題的解決，可搜索 Arduino 官方論

壇：<http://arduino.cc/forum/index.php/board,87.0.html>

選擇了錯誤的 USB 下載埠，注意檢查 Arduino 1.5.x 軟體中，功能表欄 Board 中選擇與 USB 線實際與 Due 連接相符的下載埠

Arduino 開源硬體平臺簡介：

Arduino 是一款便捷靈活、方便上手的開源電子原型平臺，包含硬體和軟體，它適用於藝術家、設計師、愛好者和對於“互動”有興趣的朋友們。

Arduino 能通過各種各樣的感測器來感知環境，通過控制燈光、馬達和其他的裝置來回饋、影響環境。板子上的微控制器可以通過 Arduino 的編程語言來編寫程式，編譯成二進位檔，燒錄進微控制器。對 Arduino 的編程是利用 Arduino 編程語言和

Arduino 開發環境來實現的。

新特性：

- Arduino 首款 ARM 32 位主控
- 雙路 USB 下載，Native USB 埠可將 Due 類比為 USB 設備

技術參數：

- 處理器 AT91SAM3X8EA
- 工作電壓 3.3V
- 輸入電壓 7-12V
- 輸入電壓 (極限)6-20V
- 數位 I/O 口 54 個 ( 12 個 PWM 輸出)
- 模擬輸入引腳 12 個
- 類比輸出引腳 2 (數模轉換)
- 排母 I/O 口直流輸出總電流 130mA
- 3.3V 電源引腳可提供 800 mA 電流
- 5V 電源引腳可一同 800 mA 電流
- 內部快閃記憶體容量 512KB
- SRAM96 KB (two banks: 64KB and 32KB)
- 時鐘頻率 84 MHz



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Due 常式：

- DUE 驅動 VGA 顯示

器：<http://www.thetonywang.com/2012/11/08/arduino-due-vga/>

概述

Arduino Due 是一塊基於 Atmel SAM3X8E CPU 的微控制器板。它是第一塊基於 32 位 ARM 核心的 arduino。它有 54 個數位 IO 口（其中 12 個可用於 PWM 輸出），12 個模擬輸入口，4 路 UART 硬體串口，84 MHz 的時鐘頻率，一個 USB OTG 介面，

兩路 DAC（模數轉換），兩路 TWI，一個電源插座，一個 SPI 介面，一個 JTAG 介面，一個重定按鍵和一個擦寫按鍵。

警告：不同於其他 arduino，arduino due 的工作電壓為 3.3V。IO 口可承載電壓也為 3.3V。如果你使用更大的電壓，比如 5V 到一個 IO 口，可能會燒了晶片。

電路板上已經包含控制運行所需的各種部件，你僅需要通過 USB 連接到電腦 或者通過 AC-DC 適配器、電池連接到電源插座就可以讓控制器開始運行。arduino due 相容工作在 3.3V 且引腳排列符合 1.0 arduino 標準的 arduino 擴展板。

## ARM 核心的優勢

使用 32 位 ARM 核心的 Due 相較於以往的使用 8 位 AVR 核心的其他 arduino 更強大。明顯的差別有：

32 位元核心在一個時鐘能處理 32 位元的資料；

84Mhz 的 CPU 時鐘頻率；

96 KBytes 的 SRAM；

512 KBytes 的 Flash；

一個 DMA 控制器，他能減輕 CPU 做大量運算時的壓力。

## 原理圖及參考設計

[arduino-Due-reference-design.zip](#)

[Schematic: arduino-Due-schematic.pdf](#)

## 電源

Arduino Due 可以通過 Micro USB 介面或外接電源供電，電源可以自動被選擇。

外部（非 USB）電源可以用 AC-DC 適配器（wall-wart）或電池。T 適配器可以插在一個 2.1 毫米規格中心是正極的電源插座上，以此連接到控制器電源。Leads from a battery can be inserted in the Gnd and Vin pin headers of the POWER connector.

The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts. The power pins are as follows:

**VIN.** Arduino 使用外部電源時的輸入電壓引腳(as opposed to 5 volts from the USB connection or other regulated power source). You can supply voltage through this pin, or if supplying voltage via the power jack, access it through this pin.

**5V.** 通過板載穩壓晶片輸出的 5V 的電壓引腳。你可以從 DC 電源口、USB、VIN 三處給控制器供電。也可以繞過穩壓 IC，直接從 5V、3V3 引腳供電，但不建議這樣使用。

**3.3V.** 通過板載穩壓晶片輸出的 3.3V 的電壓引腳。最大電流 800 mA。該電壓也是 SAM3X 的工作電壓。

**GND.** 接地引腳。



**IOREF.** 該引腳提供 **arduino** 微控制器的工作參考電壓。一個適合的 **arduino** 擴展板能夠讀取 **IOREF** 引腳電壓選擇合適的電源，或者提供 **3.3V** 或 **5V** 的電平轉換。

## 存儲空間

**SAM3X** 有 **512 KB** (兩塊 **256 KB**)用於存儲用戶程式的 **Flash** 空間。**ATMEL** 已經在生產晶片時，將 **bootloader** 預燒寫進了 **ROM** 裏。**SRAM** 有 **96 KB**，由兩個連續空間 **64 KB** 和 **32 KB** 組成。所有可用存儲空間 (**Flash**, **RAM** 和 **ROM**) 都可以直接定址。你可以通過板子上的擦寫按鈕，擦除 **SAM3X** 的 **Flash** 中的資料。這個操作將刪除當前載入的項目。在通電狀態下，按住擦寫按鈕幾秒鐘，即可讀寫。

## 輸入和輸出

### Digital I/O: pins from 0 to 53

使用 **pinMode()**, **digitalWrite()**, **anddigitalRead()** 函數，每一個 **IO** 都可以作為輸入輸出埠。他們工作在 **3.3V**。每一個 **IO** 都可以輸出 **3 mA** 或者 **15 mA** 電流，或者輸入 **6 mA** 或者 **9 mA** 電流。他們也都有 **100K 歐** 的內部上拉電阻 (默認狀態下不上拉)。另外,一些引腳有特殊功能：

**Serial: 0 (RX) and 1 (TX)**

**Serial 1: 19 (RX) and 18 (TX)**

**Serial 2: 17 (RX) and 16 (TX)**

**Serial 3: 15 (RX) and 14 (TX)**

串口發送接受埠 (工作在 **3.3V** 電平)。其中 **0**，**1** 連接到了 **ATmega16U2** 的對應串口上，用於 **USB** 轉 **UART** 通信。

**PWM: 引腳 2 to 13**

使用 `analogWrite()` 函數提供 8 位元的 PWM 輸出。可以通過

`analogWriteResolution()` 函數改變 PWM 輸出精度。

**SPI:** SPI 介面 (在其他 `arduino` 上稱作 ICSP 介面)

可以通過 SPI 庫是 SPI 介面用於通信。SPI 引腳已經引出到了 6 針介面位置，可以和 Uno、Leonardo、Mega2560 相容。這個 SPI 針僅用於和其他 SPI 設備通信，不能用於 SAM3X 的程式燒寫。Due 的 SPI 可以通過 Due 專用的擴展庫來使用其高級特性。

**CAN:** CANRX 和 CANTX

硬體支援 CAN，但 `arduino` 目前並不提供該 API

**"L" LED:** 13

有一個內置的 LED 在數字腳 13 上，當引腳是高電平時，LED 亮，引腳為低電平時，LED 不亮。因為 13 腳帶有 PWM 輸出功能，因此可以進行亮度調節。

**TWI 1:** 20 (SDA) 和 21 (SCL)

**TWI 2:** SDA1 和 SCL1.

支持使用 `Wire` 庫來進行 TWI 通信

**模擬輸入:** A0 到 A11

Arduino Due 有 12 路模擬輸入端，每一路都有 12 位精度 (0-4095)。默認情況下，類比輸入精度為 10 位，和其他型號的 `Arduino` 控制器一樣。通過

`analogReadResolution()` 你可以改變 ADC 的採樣精度。Due 的 `analog inputs` 引腳測量範圍為 0 至 3.3V。如果測量高於 3.3V 電壓，可能會燒壞 SAM3X。

`analogReference()` 函數在 Due 上是無效的。

AREF 引腳通過一個電阻橋接到 SAM3X 模擬參考腳。如果要使用 AREF 腳，你需

要先從 PCB 上拆下 BR1 這個電阻。

## DAC1 and DAC2

通過 `analogWrite()` 函數提供 12 位元精度的模擬輸出 (4096 個等級)。可以通過 `Audio` 庫創建音頻輸出。

其他引腳:

## AREF

類比輸入參考電壓。通過 `analogReference()` 使用。

## Reset

接低復位控制器。典型應用是通過該腳來連接擴展板上的重定按鍵。

## 通信

**Arduino Due** 可以通過多種方式與電腦、其他 **arduino** 或者其他控制器通信, 也可以和其他不同的設備通信, 像手機、平板、相機等等。**SAM3X** 提供一組硬體 **UART** 和 3 組 **TTL (3.3V)** 電平的 **UARTs** 來進行串列通信。

程式下載介面連接著 **ATmega16U2**, 他虛擬了一個 **COM** 口在(Windows 需要一個 `.inf` 檔來識別該設備, 而 **OSX** 和 **Linux** 可以自動識別)。 **SAM3X** 的硬體 **UART** 也連接著 **ATmega16U2**。 串口 **RX0** 和 **TX0** 通過 **ATmega16U2** 提供了用於下載程式的串口轉 **USB** 通信。**ArduinoIDE** 包含了一個串口監視器, 可以通過串口監視發送或接收簡單的資料。當資料通過 **16U2** 傳輸時 或者 **USB** 連接電腦時 (並不是 **0**, **1** 上的串口通信), 板子上的 **RX** 和 **TX** 兩個 **LED** 會閃爍。

原生的 **USB** 口虛擬串列 **CDC** 通信, 這樣可以提供一個串口, 與串口監視器 或者 你



電腦上其他應用相連。這個 **USB** 口也可以用來類比一個 **USB** 滑鼠或者鍵盤。要使用這個功能，請查看滑鼠鍵盤庫支援頁面。這個原生 **USB** 口也可以作為 **USB** 主機去連接其他外設，如滑鼠，鍵盤、智慧手機。要使用這個功能，請查看 **USBHost** 支援頁面。

**SAM3X** 也支援 **TWI** 和 **SPI** 通信。在 **ArduinoIDE** 中可以通過 **Wire** 庫輕而易舉的使用 **TWI** 匯流排；使用 **SPI** 庫可以進行 **SPI** 通信，細節方面請查看 **SPI** 支援頁面。

## 編程

**Arduino Due** 通過 **ArduinoIDE** 中的“download”下載程式。在 **SAM3X** 的 **arduino** 上上傳程式和 **AVR** 控制器有所不同，這是因為 **flash** 在上傳程式前，需要被擦寫。

**SAM3X** 的 **ROM** 中的程式會進行上傳任務，但運行該程式的前提是 **SAM3X** 的 **flash** 空間是空的。

兩個 **USB** 介面都可以給 **Due** 下載程式，由於晶片擦除方式的影響，更推薦使用編程埠：

編程埠：使用這個埠下載，你需要在 **arduinoIDE** 中選擇“**Arduino Due (Programming Port)**”作為你的板子。連接編程埠（靠近 **DC** 座的那一個）到你的電腦。編程埠使用 **16U2** 來作為 **USB** 轉 **serial** 連接到 **SAM3X** 的第一 **UART**(**RX0** and **TX0**)。 **16U2** 上有兩個針連接到連接到 **SAM3X** 的復位和擦除腳。在 **1200** 波特蘭下，打開和關閉串口會觸發 **SAM3X** 的硬擦寫程式，在通信之前通過串口觸發 **SAM3X** 的擦寫和復位引腳。推薦使用這個埠，上傳程式到 **arduino**。相對於使用原生 **USB** 埠軟擦寫晶片，使用編程埠硬擦寫更穩定可靠。即使主晶片壞了，該埠仍舊會工作。

原生埠：使用這個埠下載，你需要在 `arduinoIDE` 中選擇 "Arduino Due (Native USB Port)" 作為你的板子。連接原生 USB 埠（靠近重定按鍵的那一個）到你的電腦。在 1200 波特蘭下，打開和關閉串口會觸發 SAM3X 的軟擦寫程式：flash 空間被擦寫、程式倒轉到 bootloader 區。如果主晶片損壞，軟擦寫程式 會不工作，這是因為該程式完全在 SAM3X 上。開關原生 USB 埠 baudrate 不會復位 SAM3X。不同於其他的 Arduino 控制器使用 `avrdude` 上傳程式，Due 上傳程式依賴於 `bossac`。

ATmega16U2 固件源碼能在 `arduino` 庫中找到。你可以使用外部編程器，通過 ISP 介面燒寫固件（覆蓋 DFU bootloader）。更多資訊請參考相關文檔。

## USB 過流保護

Arduino Due 上有一個自恢復保險絲，短路或者過流時，可以自動斷開，從而保護你的電腦 USB。大部分電腦都帶有內部過流保護，這個保險絲可以提供一層額外保護。當電流大於 500MA 時，這個保險絲會自動斷開，直到沒有過載或者短路現象。

## 文档:

- 原理图 pdf <http://arduino.cc/en/uploads/Main/arduino-Due-schematic.pdf>
- 设计文档  
(sch+pcb) <http://arduino.cc/en/uploads/Main/arduino-Due-Reference-design.zip>
- Arduino 软件 <http://arduino.cc/en/Main/SoftwareDue>
- Arduino DUE 首页 <http://arduino.cc/en/Main/ArduinoBoardDue>