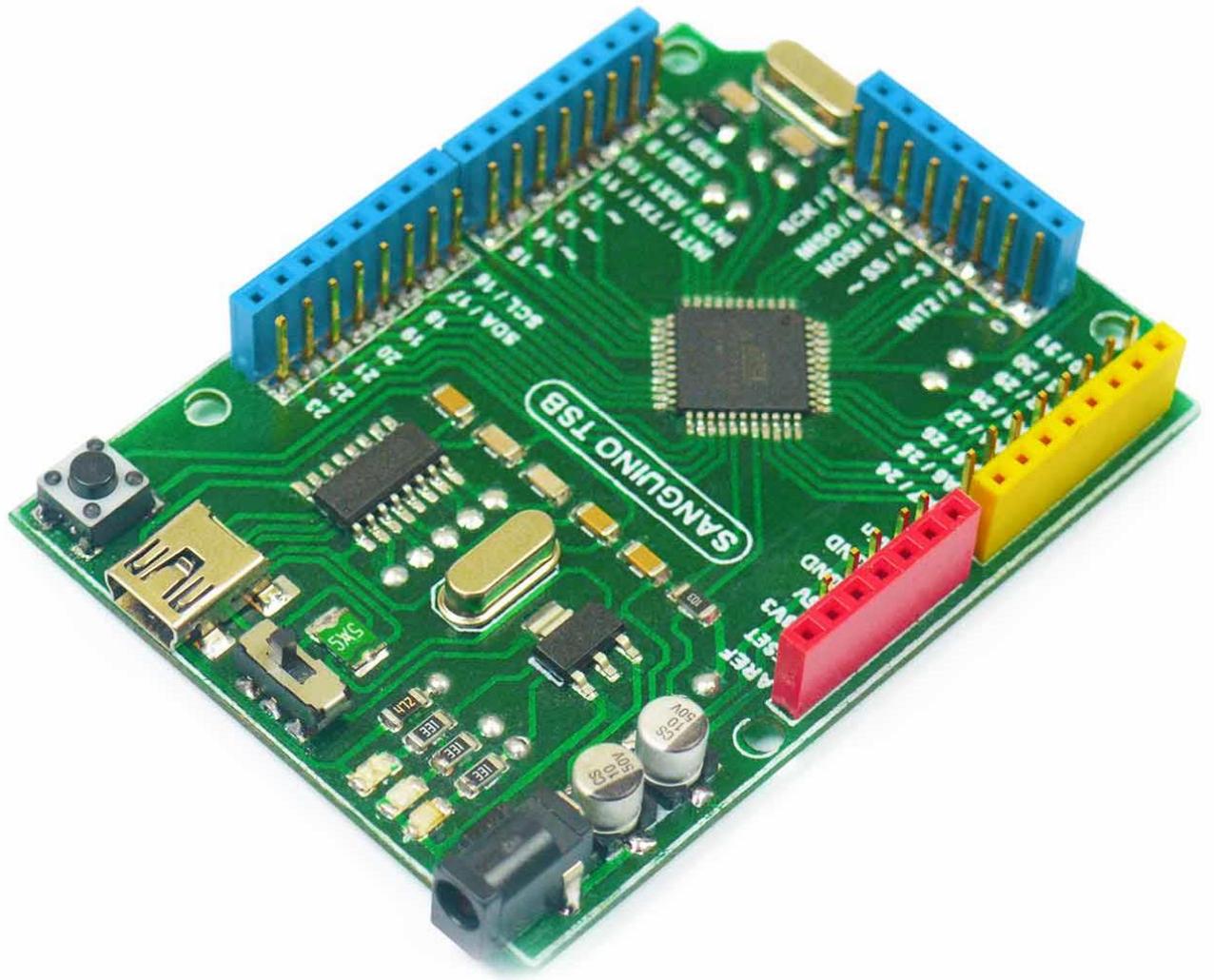


Sanguino TSB



Introduction:

Atmega644 is being used as CNC machine driver for a while. In 2012, Kristian Sloth Lauszus from Denmark developed a hardware add-on of Atmega644 for the popular Arduino IDE and named the bootloader as “Sanguino”. But it’s been designed only for driving CNC machines and no one really tried to make a general purpose Arduino hardware like the Uno or Mega.

So, we made one that takes all the advantageous features of Atmega644 and still maintains a form factor of the Arduino Uno. The Sanguino TSB has got double the flash memory, SRAM & EEPROM and 60% more I/O pins than those of typical Arduino Uno while maintaining the same size. It’s also shield compatible to some extent and follows similar pin configuration of typical Arduino boards.

Features:

I/O pins: There are a total of **32 I/O pins** arranged in 4 groups of 8 pins each. The connectors consist of both male and female rails so that you can take multiple outputs from a pin.

8 ADC: pin 24 – pin 31. They can be used both as ADC pins or Digital pins.

6 PWM: pins 3,4,12,13,14,15

2 sets of Serial (Serial0 & Serial1): 8 (RX0), 9 (TX0), 10 (RX1), 11 (TX1).

3 hardware interrupt: 10 (INT0), 11 (INT1), 2 (INT2).

2 I2C: 16 (SCL), 17 (SDA).

4 SPI: 4 (SS), 5 (MOSI), 6 (MISO), 7 (SCK).

Memory: There's a huge 64 KB flash memory to store your code. The RAM is 4KB and EEPROM is 2KB. All of these are double than that of Arduino Uno.

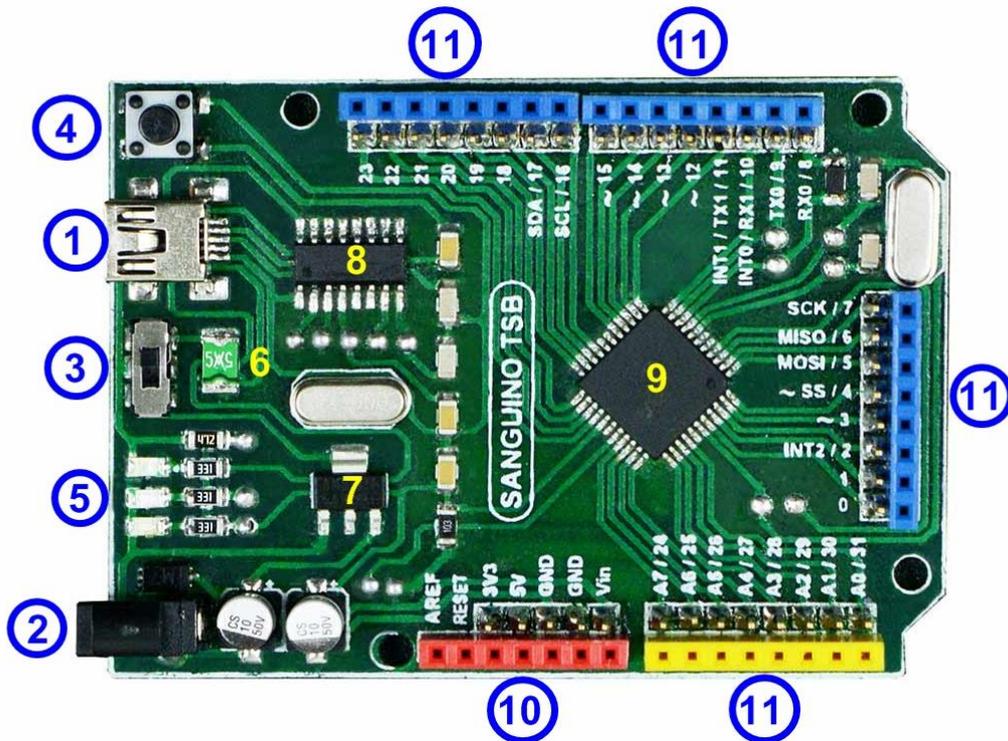
More Usable Pin Names: The pin name printed on the board not only shows the pin numbers but also their secondary functions (like serial or I2C) so that users don't have to memorize them.

Power Switch: There's a slide switch that act as a power selector / on-off switch. You can use it as the power switch of your robot/ project. Slide towards the USB port while programming or to select USB power. Slide towards the DC power socket if you want to run the board using external power. Sliding towards the opposite directions will turn the board off.

Serial Communication: There are 2 sets of hardware serial ports (Serial0 & Serial1). Moreover, RX0 pin is diode isolated. That means, unlike the Uno or Nano or Mega, you can upload program to this board without any issue while a Serial communication based device such as a bluetooth module (like HC-05) is connected to Serial0 pins.

1 year service warranty: We'll provide 1 year free service warranty for this board. That means if any component of this board gets damaged due to misuse or anything else, we'll repair it only at the cost of the damaged component; no service charge required. You have to buy this board only once and every time you damage it, bring it to us and we'll repair it.

A Closer Look:



1. USB Mini B port: Needed to upload program and/ or supply 5V from USB. Same port as Arduino Nano. USB cable is included in product package.

2. DC Power Socket: Small sized barrel socket to power the board from a 7V-12V dc power supply. Small size of this socket ensures better clearance while a shield is attached.

3. Power Switch: Toggle between Input power sources. Also acts as a power on-off switch. Below is a table of the ON/OFF state of the board depending on the position of the switch and the power source. To summarize, Slide the switch towards the power source (USB port or DC socket) to power up the board. Slide towards the opposite direction to power off.

	Powered by USB port	Powered by DC socket
Slide power switch towards USB port	ON	OFF
Slide power switch towards DC socket	OFF	ON

4. Reset Button: Resets Atmega644P.

5. LEDs: There are 3 LEDs namely power LED, Pin 0 LED (bootloader LED) and Serial data transfer indication LED.

6. Resettable Fuse: 500mA fuse saves your PC's USB port in case of short circuit while USB power from PC is being used. Automatically resets when power cycled.

7. Voltage regulator: An AMS1117 5V IC to provide 5V to the microcontroller when powered from DC 7V-12V using the DC socket.

8. USB to Serial Converter: CH340 as USB to Serial data converter.

9. Atmega644P: Microcontroller flashed with Sanguino bootloader.

10. Power Rail: Contains Vin, 5V, GND, 3.3V and Reset pins.

12. I/O rails: 4 rails contain the 32 I/O pins of the board.

Windows USB Driver Installation:

This board uses the same **CH340 IC** used in our **Arduino Nano** as the USB to Serial converter.

If you already have used your PC to program our Arduino Nano, then the driver is already installed and your PC will detect the Sanguino board automatically. If not, then download and install the driver from [here](#). Unzip it and then run the installer file inside the unzipped folder.

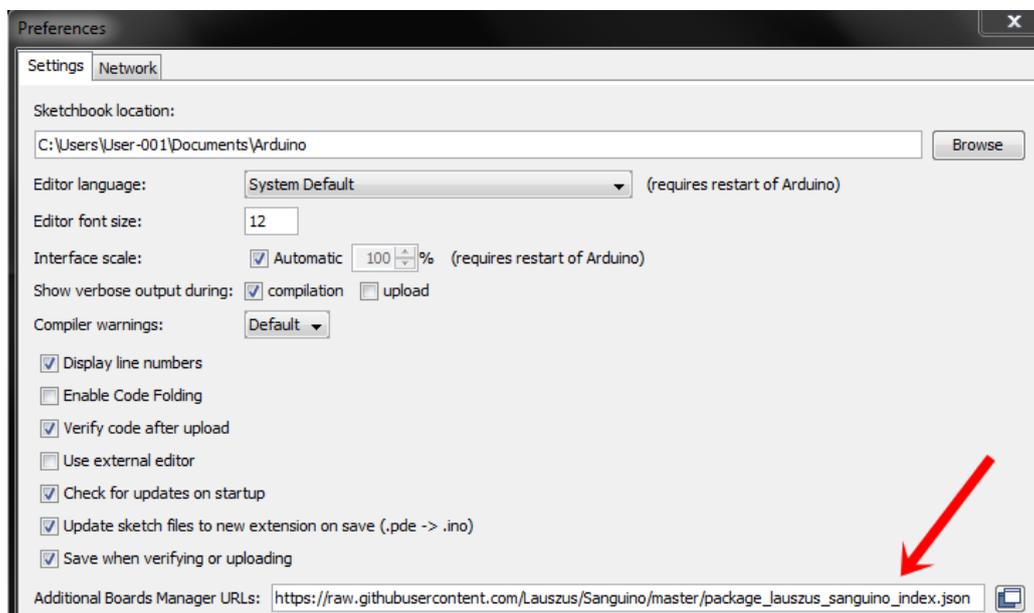
Adding Sanguino to Arduino IDE:

By default, you won't find Sanguino on your Arduino IDE boards list. You have to add it manually.

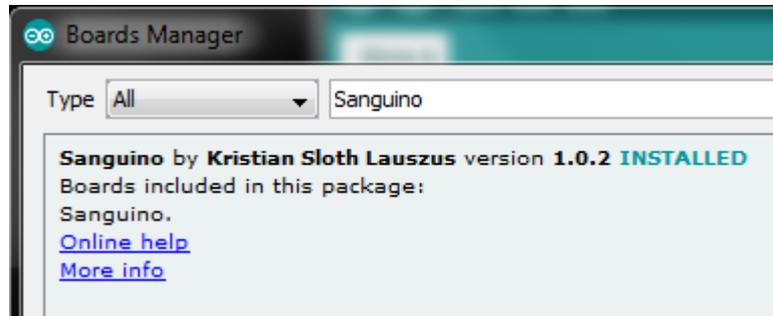
Adding Sanguino to the Arduino IDE is fairly simple and takes only **4 simple steps**:

STEP 1: Open Arduino IDE. **Go to File> Preferences.** Now put the following text to the “**Additional Boards Manager URLs field**”

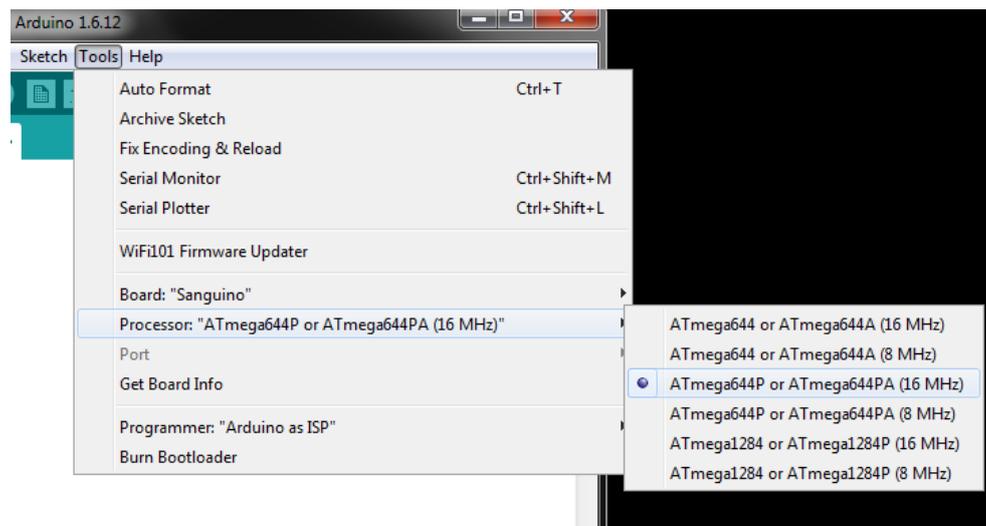
https://raw.githubusercontent.com/Lauszus/Sanguino/master/package_lauszus_sanguino_index.json



STEP 2: Make sure your PC's got internet access. Then go to **Tools> Board> Boards Manager**. Type **Sanguino** in the search box. Necessary information of the Sanguino board will appear. Click **More Info**. Then click **Install**.



STEP 3: Go to **Tools> Board** and you'll be able to find "Sanguino" on the list. Select it. Then go **Tools>Processor** and select Atmega644P or Armega644PA (16MHZ), the 3rd option on the list.



STEP 4: Select the correct COM port from **Tools>Port** and the board is ready to use.

Shield Compatibility:

As the SPI and I2C pins location in this board is different than Arduino Uno, Shields that use SPI or I2C aren't compatible with it. Shields that use Serial0 is compatible (like wireless programming shield). Moreover, any shield that needs only basic digital / analog I/O and no special function like SPI, I2C or hardware interrupt is compatible (like motor driver shield or 16x2 LCD shield).