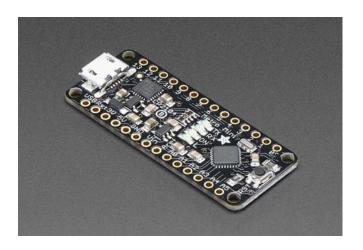


# Adafruit Metro Mini 328 - 5V 16MHz

PRODUCT ID: 2590



## Description

We sure love the ATmega328 here at Adafruit, and we use them *a lot* for our own projects. The processor has plenty of GPIO, Analog inputs, hardware UART SPI and I2C, timers and PWM galore – just enough for most simple projects. When we need to go small, we use a Pro Trinket 3V or 5V, but if you want to have USB-to-Serial built in, we reach for an **Adafruit METRO Mini**.

METRO Mini is the culmination of years of playing with AVRs: we wanted to make a tiny, breadboard-friendly development board that is easy to use and is hacker friendly. Metro Mini can be programmed with the Arduino IDE (select 'UNO' in the boards dropdown)

**ATmega328 brains** – This popular chip has 32KB of flash (1/2 K is reserved for the bootloader), <math>2KB of RAM, clocked at 16MHz

**Power the METRO Mini** with 6-16V polarity protected on the Vin pin, or plug the micro USB connector to any 5V USB source.

**METRO** has 20 GPIO pins, 6 of which are Analog in as well, and 2 of which are reserved for the USB-serial converter. There's also 6 PWMs available on 3 timers (1  $\times$  16-bit, 2  $\times$  8-bit). There's a hardware SPI port, hardware I2C port and hardware UART to USB.

**GPIO Logic level is 5V** but by cutting and soldering closed a jumper on the bottom, you can easily convert it to 3.3V logic

5V onboard regulator with 150mA out, 3.3V 50mA available via FTDI chip

**USB to Serial converter**, there's a genuine SiLabs CP2104 hardware USB to Serial converter that can be used by any computer to listen/send data to the METRO, and can also be used to launch and update code via the bootloader

Four indicator LEDs , on the top of the PCB, for easy debugging. One green power LED, two RX/TX LEDs for the UART, and a red LED connected to pin PB5 / digital #13

Easy reprogramming, comes pre-loaded with the Optiboot bootloader

Beautiful styling by PaintYourDragon and Bruce Yan, in Adafruit Black with gold plated pads.

The Metro Mini comes as a fully assembled and tested board, with bootloader burned in and also a stick of 0.1" header. Some light soldering is required if you'd like to plug it into a breadboard, or you can solder wires or header directly to the breakout pads. Once headers are installed they can be fitted into 0.6" wide sockets

Mac & Windows People! Don't forget to grab & install the FTDI VCP drivers from FTDI and the SiLabs CP210x drivers from SiLabs to make the COM/Serial port show up right! The default drivers may not support the interface chip!

## **Technical Details**

### **Revision History:**

As of Nov 8th 2016, we are now shipping with the SiLabs CP2104 - a high quality USB-to-Serial converter that performs as well or better than the FTDI series

#### Detailed specifications:

ATmega328 microcontroller with Optiboot (UNO) Bootloader

USB Programming and debugging via the well-supported genuine FTDI FT231X or the SiLabs CP2104

Input voltage (Vin): 6-16V (a 9VDC power supply is recommended)

5V logic with 3.3V compatible inputs, can be converted to 3.3V logic operation

20 Digital I/O Pins: 6 are also PWM outputs and 6 are also Analog Inputs

32KB Flash Memory - 0.5K for bootloader, 31.5KB available after bootloading

16MHz Clock Speed

Adafruit Black PCB with gold plate on pads

18mm x 44mm x 4mm / 0.7" x 1.7" x 0.2"

Weight: 3g



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