ARDUINO NANO 3.0 328 CH340

The **Arduino Nano 3.0 with ATmega328P and CH340** is a popular microcontroller board based on the ATmega328P, but it uses a **CH340 USB-to-serial chip** instead of the traditional **FTDI** or **ATmega16U2** found in official Arduino boards.

Key Features:

- **Microcontroller:** ATmega328P (same as Arduino Uno)
- **Clock Speed:** 16 MHz
- **Operating Voltage:** 5V
- **Digital I/O Pins:** 14 (6 PWM-capable)
- **Analog Input Pins:** 8 (A0-A7)
- **Flash Memory:** 32 KB (0.5 KB used by bootloader)
- **SRAM:** 2 KB
- **EEPROM:** 1 KB
- **USB Interface: CH340G** (instead of FTDI)
- **Power Supply:** USB (5V) or 7-12V via VIN pin
- **Dimensions:** ~18mm × 45mm (compact breadboard-friendly design)

CH340 Driver Installation (Required for Windows & macOS)

Since the board uses a **CH340** instead of an FTDI chip, you may need to install drivers manually:

- **Windows:** Download & install the CH340 driver from WCH's official site.
- **macOS:** Use brew or download the driver from WCH's site.
- **Linux:** Usually works without drivers (kernel has built-in support).

Programming the Arduino Nano (CH340 Version)

1. **Select the correct board in Arduino IDE:**
    - **Board:** *"Arduino Nano"*

- **Processor:** *"ATmega328P"* (or *"ATmega328P (Old Bootloader)"* if upload fails)
- **Port:** Select the correct COM port (check Device Manager on Windows or ls /dev/tty* on Linux/macOS).

2. **Uploading a Sketch:**
   - If you get upload errors, try:
     - Pressing the reset button just before uploading.
     - Selecting *"Old Bootloader"* in the Arduino IDE.

Common Issues & Fixes

1. **CH340 Driver Not Recognized (Windows/macOS)**
   - Reinstall the driver and check Device Manager for unrecognized devices.
   - Try a different USB cable (some cables are power-only).
2. **Upload Fails (Error: "avrdude: stk500_recv(): programmer is not responding")**
   - Select *"ATmega328P (Old Bootloader)"* in Arduino IDE.
   - Check if the correct COM port is selected.
   - Ensure no other program is using the serial port.
3. **Board Not Detected**
   - Test on another USB port (preferably USB 2.0).
   - Some clones may have faulty CH340 chips—try another board.

Comparison with Official Arduino Nano

Feature	Official Nano	CH340 Nano Clone
USB Chip	FTDI or ATmega16U2	CH340

ARDUINO NANO 3.0 328 CH340

Feature	Official Nano	CH340 Nano Clone
Driver Needed?	Usually no (FTDI built-in)	Yes (CH340 driver)
Cost	Higher	Cheaper
Reliability	High	Varies (some clones may have issues)

```
/*
  كود أساسي لأردوينو نانو مع CH340
  هذا مثال بسيط لإضاءة LED مدمج مع تأخير
*/

// تعريف المنفذ الرقمي للLED المدمج (في نانو D13 عادة)
#define LED_BUILTIN 13

void setup() {
  // تهيئة منفذ الLED كخرج
  pinMode(LED_BUILTIN, OUTPUT);

  // بدء الاتصال التسلسلي (لأغراض التصحيح)
  Serial.begin(9600);
  Serial.println("تم بدء التشغيل!");
}

void loop() {
```

```
// تشغيل الLED
digitalWrite(LED_BUILTIN, HIGH);
Serial.println("LED ON");

// انتظر ثانية واحدة
delay(1000);

// إطفاء الLED
digitalWrite(LED_BUILTIN, LOW);
Serial.println("LED OFF");

// انتظر ثانية أخرى
delay(1000);
}
```

تعليمات إضافية:

1. **التوصيل**:
   - تأكد من توصيل الأردوينو نانو بشكل صحيح عبر كابل USB.
   - إذا كنت تستخدم نسخة CH340، قد تحتاج إلى تثبيت درايفر CH340G.
2. **إعدادات الأردوينو IDE**:
   - اختر لوحة: "Arduino Nano"
   - المعالج: "ATmega328P (Old Bootloader)"
   - المنفذ: اختر المنفذ الصحيح الذي يظهر عند توصيل الأردوينو
3.