



ATmega328P Button and Bluetooth Control Project

This project provides a simple firmware for the ATmega328P microcontroller that:

- Toggles an output pin using a button with software debouncing
- Allows remote control of the output pin via Bluetooth using the HC-05 module



Features

- Debounced button toggles digital output
- HC-05 Bluetooth module control via serial commands:
 - '1': Set output pin HIGH
 - '0': Set output pin LOW



Pin Configuration

Function	Pin # (ATmega328P)	Arduino Pin
Button Input	PD2	2
Output	PD7	7



Upload Instructions (Using Arduino IDE)

1. Connect USB-to-TTL to Your PCB

USB-TTL Pin	Connect to ATmega328P
TX	RX (Pin 2)
RX	TX (Pin 3)
GND	GND
VCC	VCC (3.3V or 5V, match your PCB design)**

⚠️ Ensure voltage compatibility! HC-05 uses 3.3V logic but often tolerates 5V on RX.

2. Upload Code

- Open Arduino IDE
- Select **Board**: Arduino Uno
- Select the **Port** of your USB-to-TTL adapter
- Click **Upload**
- As soon as "**Uploading...**" appears, **press and release the RESET button** on your PCB
- Wait for "Done uploading"



Post-Upload Testing

- **Button Press** toggles the OUTPUT pin (e.g., drives an LED or relay)
- **Bluetooth Commands**:

- '1' → Output HIGH
- '0' → Output LOW

You can use a serial terminal (like a phone app or the Arduino Serial Monitor via HC-05) to test Bluetooth communication.