

Project 1

By: Santiago Palomares and Ben Boben

In this project we used an embedded system using the ATmega32 microcontroller to control an LED blink pattern. A push button that initiates the LED blinking, which persists as long as the button is pressed. The blinking is set at a 500 ms on-off rate, which we initially use the internal 1 MHz clock. We later used an external 8 MHz crystal

The core of the system is the ATmega32 microcontroller. The circuit includes a simple push button for input and an LED for output, with a 10k Ω resistor to limit the current to the LED. An 8 MHz crystal oscillator provides an accurate timing reference for the microcontroller's clock. Power stability is ensured by decoupling capacitors near the power pins of the microcontroller.

We used C to code with PlatformIO in Visual Studio to the ATATMEL-ICE programmer. For the program we developed both the `avr.c`, `avr.h` and `main.c` files to upload to the programmer. This code contained information on how the microcontroller should react when the button is pressed and when it's not pressed. The code also contains information on how the crystal 8 MHz clock should react to the saved state of the led light aka 1 or 0, after the button is pressed. When the crystal is removed, we wrote code that would prevent the light from blinking thus being in a constant state when the crystal is not in the circuit.