

Servo Controller

Overview

A controller for the SG90 Servo Motor. The SG90 has 90 degrees of movement.

Memory Map & Register Usage

| Signal | Direction | Description |
|--------|-----------|------------------------|
| CLK | in | 50MHz clock |
| RST | in | Active high reset |
| DATA | in | 8-bit data bus |
| PWM | out | Wave that drives servo |

Theory

The **PWM** signal is generated based on **DATA**. A proper signal is generated when **DATA** is between 0 and 200. Where 0 is 0 degrees and 200 is 90 degrees. When **DATA** is larger than 200 there is no output. (**PWM** is '0')

Hardware Connections

CLK is mapped to the system clock.

RST is hard wired to '0'

DATA is memory mapped using a Avalon PIO

PWM is mapped to an arduino pin. That can be attached to the servo itself.

Usage

```
#include "servo.h"

// Continuously move the servo to a random position
char stored = -1;
while (1)
{
    char value = random_char();
    if (stored != value)
    {
        move_servo(SERVO_1, value);
        stored = value;
    }
}
```