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percobaan 2 Kondisi 10

Link : https://wokwi.com/projects/463150266416583681

main.c

```
#include "main.h"

// HANDLE
ADC_HandleTypeDef hadc1;
TIM_HandleTypeDef htim3;

// VARIABLE
uint8_t manual_mode = 0;
uint8_t posisi_servo = 0;
uint8_t last_button = 1;

// THRESHOLD
#define LDR_THRESHOLD 2000

// ================= CLOCK =================
void SystemClock_Config(void) {
    RCC_OscInitTypeDef RCC_OscInitStruct = {0};
    RCC_ClkInitTypeDef RCC_ClkInitStruct = {0};
    RCC_OscInitStruct.OscillatorType = RCC_OSCILLATORTYPE_HSI;
    RCC_OscInitStruct.HSIState = RCC_HSI_ON;
    HAL_RCC_OscConfig(&RCC_OscInitStruct);
    RCC_ClkInitStruct.ClockType = RCC_CLOCKTYPE_HCLK |
RCC_CLOCKTYPE_SYSCLK;
    RCC_ClkInitStruct.SYSCLKSource = RCC_SYSCLKSOURCE_HSI;
    RCC_ClkInitStruct.AHBCLKDivider = RCC_SYSCLK_DIV1;
```

```
    HAL_RCC_ClockConfig(&RCC_ClkInitStruct, FLASH_LATENCY_0);
}

// ================= GPIO =================
void MX_GPIO_Init(void) {
    __HAL_RCC_GPIOA_CLK_ENABLE();
    __HAL_RCC_GPIOB_CLK_ENABLE();
    GPIO_InitTypeDef GPIO_InitStruct = {0};

    // LDR PA0
    GPIO_InitStruct.Pin = GPIO_PIN_0;
    GPIO_InitStruct.Mode = GPIO_MODE_ANALOG;
    HAL_GPIO_Init(GPIOA, &GPIO_InitStruct);

    // BUTTON PB1
    GPIO_InitStruct.Pin = GPIO_PIN_1;
    GPIO_InitStruct.Mode = GPIO_MODE_INPUT;
    GPIO_InitStruct.Pull = GPIO_PULLUP;
    HAL_GPIO_Init(GPIOB, &GPIO_InitStruct);

    // SERVO PA6
    GPIO_InitStruct.Pin = GPIO_PIN_6;
    GPIO_InitStruct.Mode = GPIO_MODE_AF_PP;
    GPIO_InitStruct.Pull = GPIO_NOPULL;
    GPIO_InitStruct.Alternate = GPIO_AF1_TIM3;
    HAL_GPIO_Init(GPIOA, &GPIO_InitStruct);
}

// ================= ADC =================
```

```
void MX_ADC1_Init(void) {
    __HAL_RCC_ADC_CLK_ENABLE();
    hadc1.Instance = ADC1;
    hadc1.Init.Resolution = ADC_RESOLUTION_12B;
    hadc1.Init.DataAlign = ADC_DATAALIGN_RIGHT;
    hadc1.Init.ScanConvMode = ADC_SCAN_DISABLE;
    HAL_ADC_Init(&hadc1);
}

// ================= PWM (FIX SERVO) =================
void MX_TIM3_Init(void) {
    __HAL_RCC_TIM3_CLK_ENABLE();
    htim3.Instance = TIM3;
    htim3.Init.Prescaler = 48 - 1;
    htim3.Init.CounterMode = TIM_COUNTERMODE_UP;
    htim3.Init.Period = 20000 - 1;
    HAL_TIM_PWM_Init(&htim3);
    TIM_OC_InitTypeDef sConfigOC = {0};
    sConfigOC.OCMode = TIM_OCMODE_PWM1;
    sConfigOC.Pulse = 1500;
    sConfigOC.OCPolarity = TIM_OCPOLARITY_HIGH;
    HAL_TIM_PWM_ConfigChannel(&htim3, &sConfigOC, TIM_CHANNEL_1);
}

// ================= SERVO CONTROL =================
void set_servo(uint8_t state) {
    if (state == 0) {
        __HAL_TIM_SET_COMPARE(&htim3, TIM_CHANNEL_1, 1000); // Posisi Masuk
    } else {
```

```
        __HAL_TIM_SET_COMPARE(&htim3, TIM_CHANNEL_1, 2000); // Posisi Keluar
    }
}

// ================= ADC READ =================
uint16_t read_LDR(void) {
    ADC_ChannelConfTypeDef sConfig = {0};
    sConfig.Channel = ADC_CHANNEL_0;
    sConfig.Rank = ADC_REGULAR_RANK_1;
    HAL_ADC_ConfigChannel(&hadc1, &sConfig);
    HAL_ADC_Start(&hadc1);
    HAL_ADC_PollForConversion(&hadc1, HAL_MAX_DELAY);
    return HAL_ADC_GetValue(&hadc1);
}

// ================= MAIN =================
int main(void) {
    HAL_Init();
    SystemClock_Config();
    MX_GPIO_Init();
    MX_ADC1_Init();
    MX_TIM3_Init();
    HAL_TIM_PWM_Start(&htim3, TIM_CHANNEL_1);

    while (1) {
        // ===== BUTTON TOGGLE (MANUAL) =====
        uint8_t button = HAL_GPIO_ReadPin(GPIOB, GPIO_PIN_1);
        if (last_button == 1 && button == 0) {
            manual_mode = !manual_mode;
```

```
            posisi_servo = !posisi_servo;
            set_servo(posisi_servo);
            HAL_Delay(50);
        }
        last_button = button;

        // ===== MODE OTOMATIS (LOGIKA TERBALIK) =====
        if (!manual_mode) {
            uint16_t ldr = read_LDR();

            // Perubahan di sini: Menggunakan '>' agar Terang = Masuk
            if (ldr > LDR_THRESHOLD) {
                posisi_servo = 0; // Terang -> Jemuran Masuk (Atap)
            } else {
                posisi_servo = 1; // Gelap -> Jemuran Keluar
            }
            set_servo(posisi_servo);
        }
        HAL_Delay(100);
    }
}
```

main.h

```
#ifndef __MAIN_H
#define __MAIN_H

#include "stm32c0xx_hal.h"
```

```
// PIN DEFINITIONS
#define LDR_PIN       GPIO_PIN_0
#define LDR_PORT      GPIOA
#define BUTTON_PIN    GPIO_PIN_1
#define BUTTON_PORT   GPIOB
#define SERVO_PIN     GPIO_PIN_6
#define SERVO_PORT    GPIOA

// FUNCTION PROTOTYPES
void SystemClock_Config(void);
void MX_GPIO_Init(void);
void MX_ADC1_Init(void);
void MX_TIM3_Init(void);

#endif
```