0.1 ADC

When programming the ability to use a ADC (Analog to digital converter) to read a analog value on the microprocessor is of crucial impotents. In our project the ADC is use for reading values from our infrared and load sensors. On the ESP32 a total of 18 ADC channels are available with a config resolution options of 9,10,11 and 12-bits.

0.1.1 Configuring

It is impotent to ensure when using RTOS that functions are Thread safe. If not it can result in RTOS not being able to handle a task in the desired time frame. For this reason we have chosen to use libraries that are include in the ESP-IDF environment that are designed with thread safe in mind. The particular library used to facilitate ADC is called *esp_adc/adc_oneshot.h* that replaced the previous one in version 5.0.4 of ESP-IDF.

To configure a ADC unit:

```
        adc_oneshot_unit_handle_t adc1_handle;
        adc_oneshot_unit_init_cfg_t init_config1 = {
            .unit_id = ADC_UNIT_1,
            .ulp_mode = ADC_ULP_MODE_DISABLE,
        };
        ESP_ERROR_CHECK(adc_oneshot_new_unit(&init_config1, &adc1_handle));
        dc_oneshot.h" that replaced the previous one in version 5.0.4 of
        ESP-IDF.

```

Listing 1: Configuring ADC unit 1

0.1.2 Reading