Trabajo Practico Final

Reproductor MP3

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Veámoslo en funcionamiento!!

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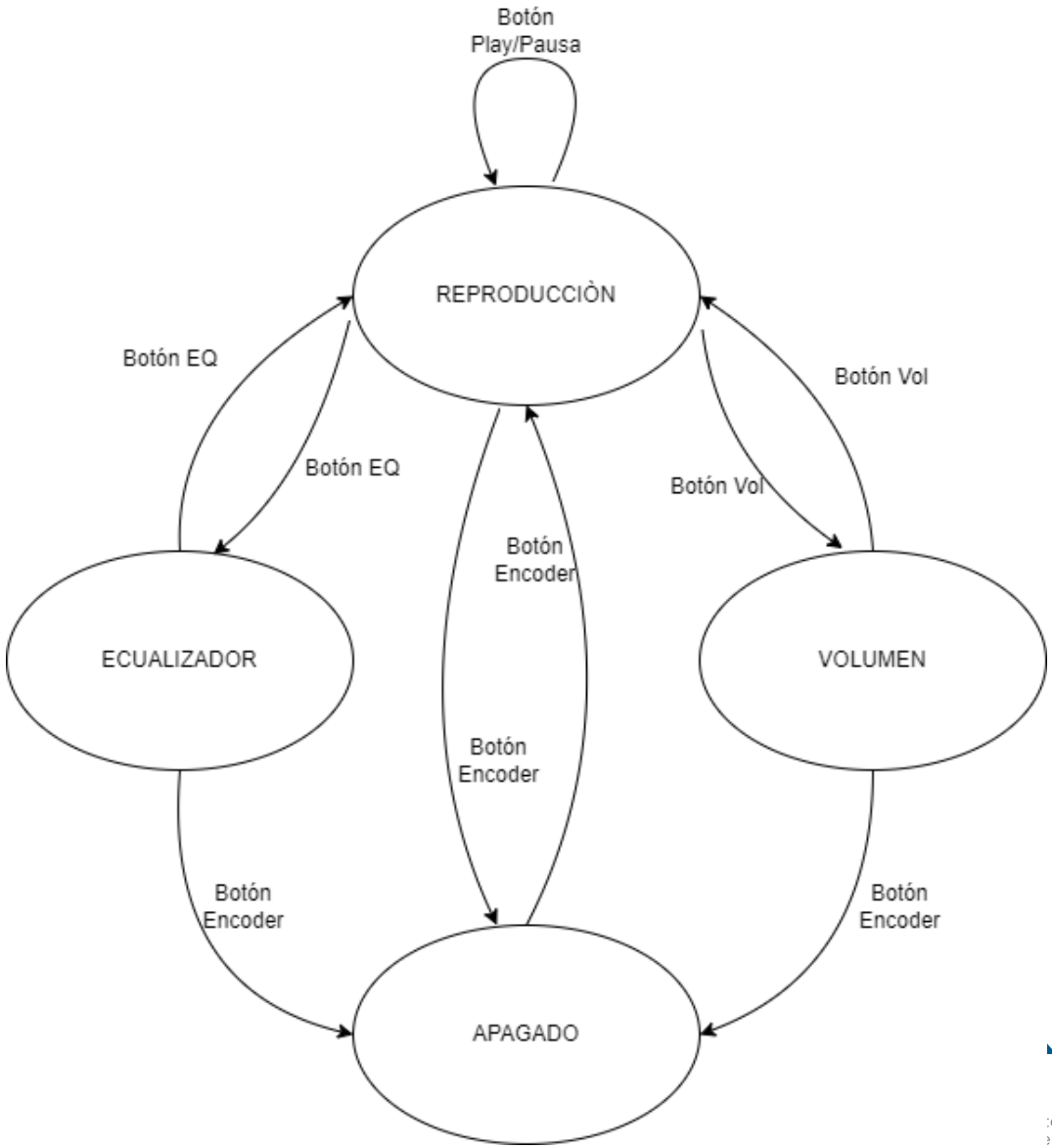
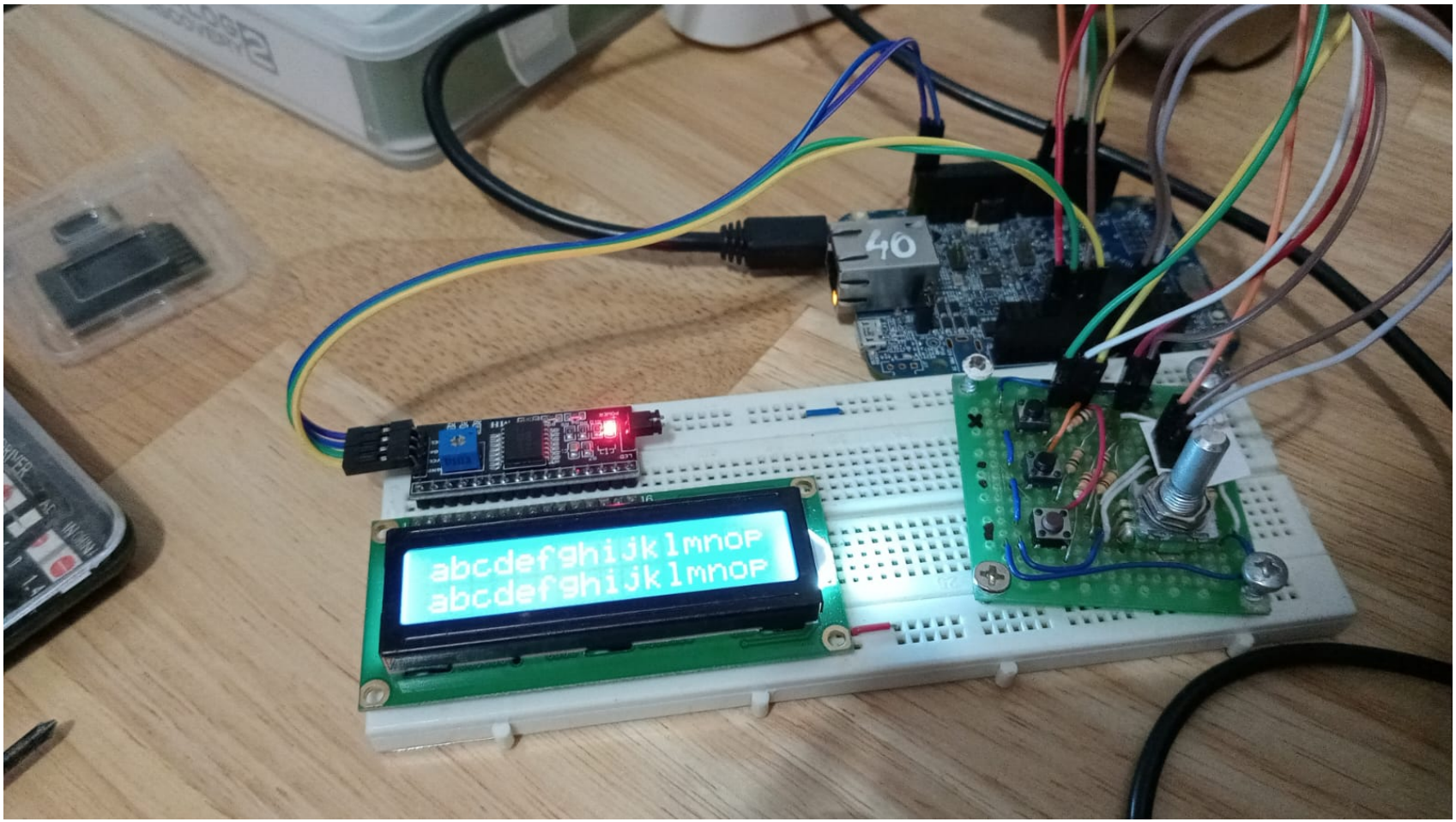
Máquina de estados



Interfaz física



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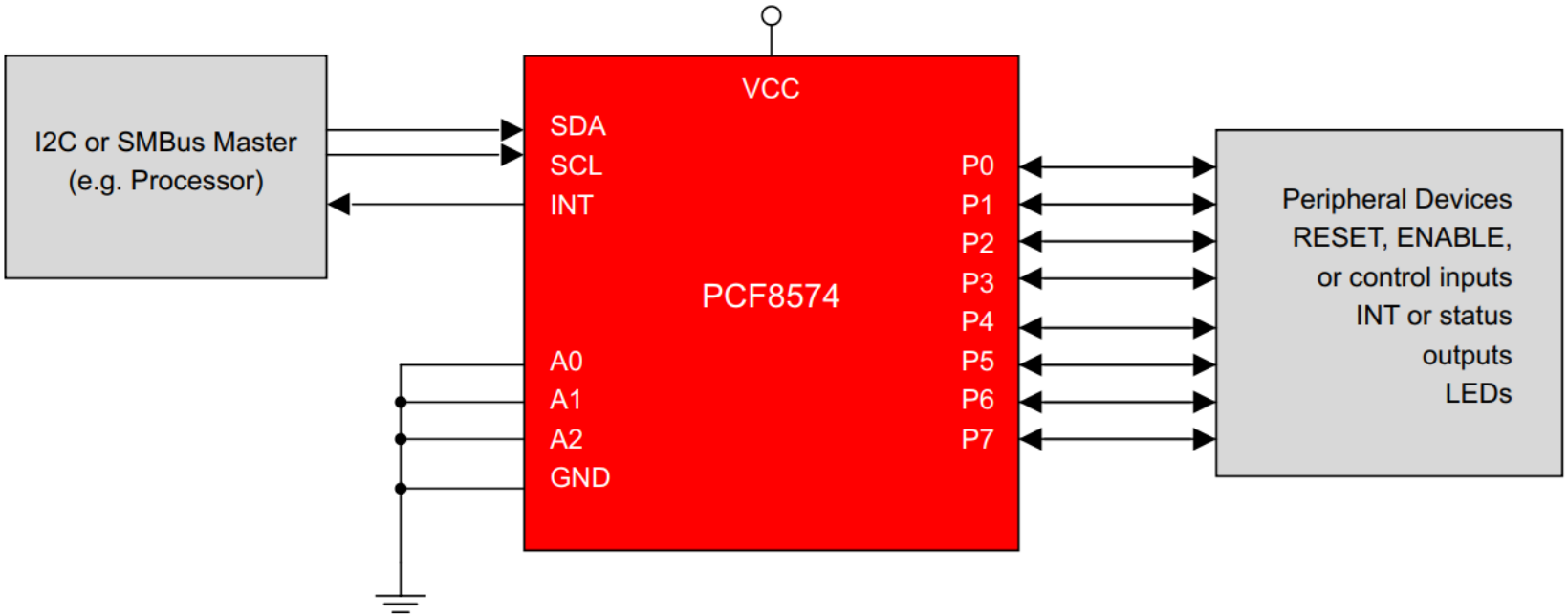
Display 16x2

TEXAS INSTRUMENTS

PCF8574

SCPS068J – JULY 2001 – REVISED MARCH 2015

PCF8574 Remote 8-Bit I/O Expander for I^2C Bus



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Display 16x2

```
void displaySendPeriodicISR(){

  static int sendingState = 0;
  static uint8_t wordSend;

  switch(sendingState){
  case 0:
    if (getFillLevel(&displayDataBuffer) != 0){
      wordSend = getNext(&displayDataBuffer);
      WriteDriverByteIIC(&wordSend);
      sendingState=1;
    }
  break;
  case 1:
    wordSend |= En;
    WriteDriverByteIIC(&wordSend);
    sendingState=2;
  break;
  case 2:
    wordSend &= ~En;
    WriteDriverByteIIC(&wordSend);
    sendingState = 0;
  break;
  default:

  break;
  }
}
```

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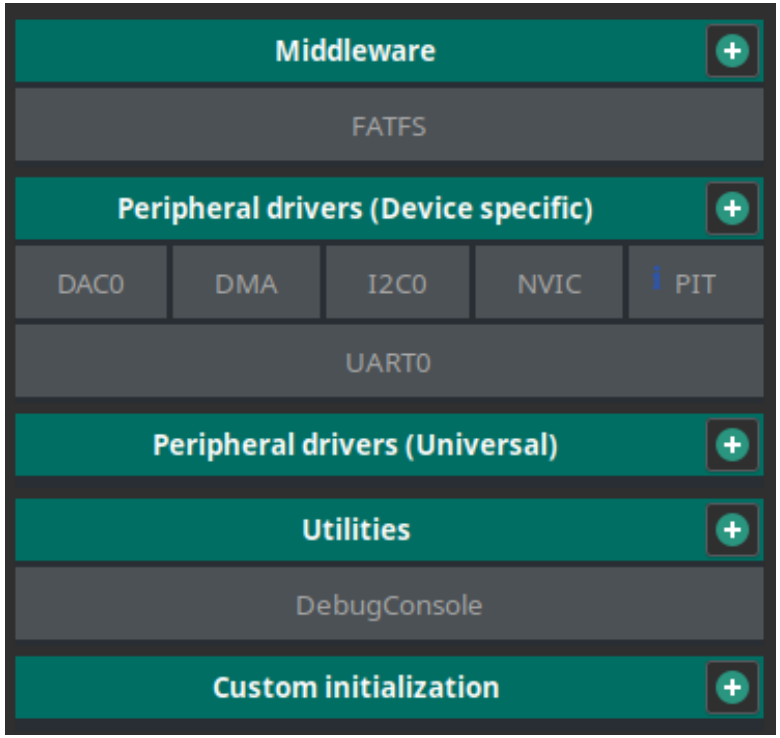
Uso de SDK



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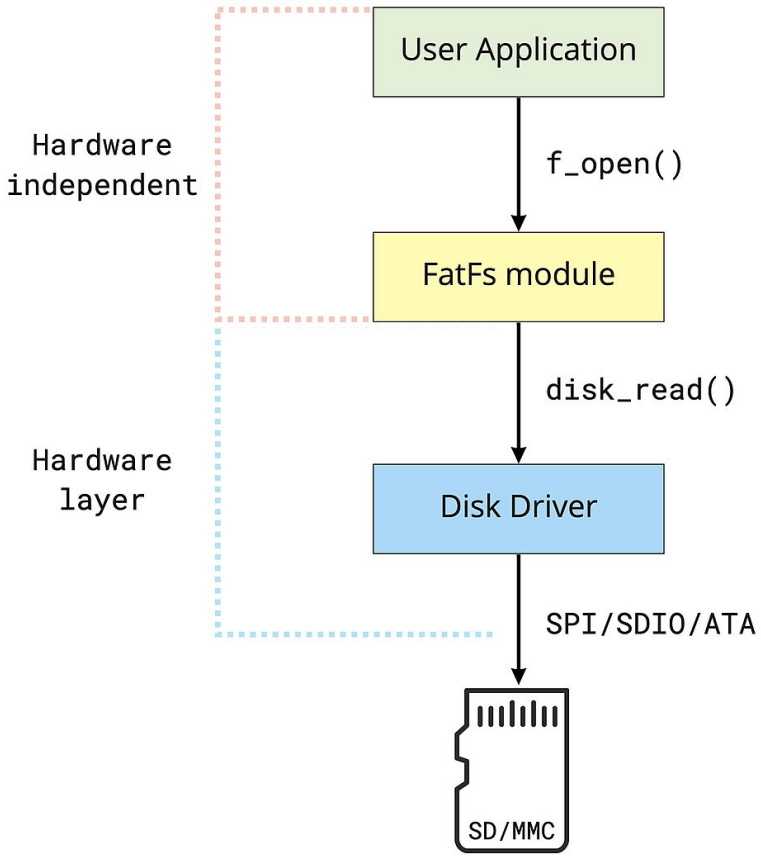
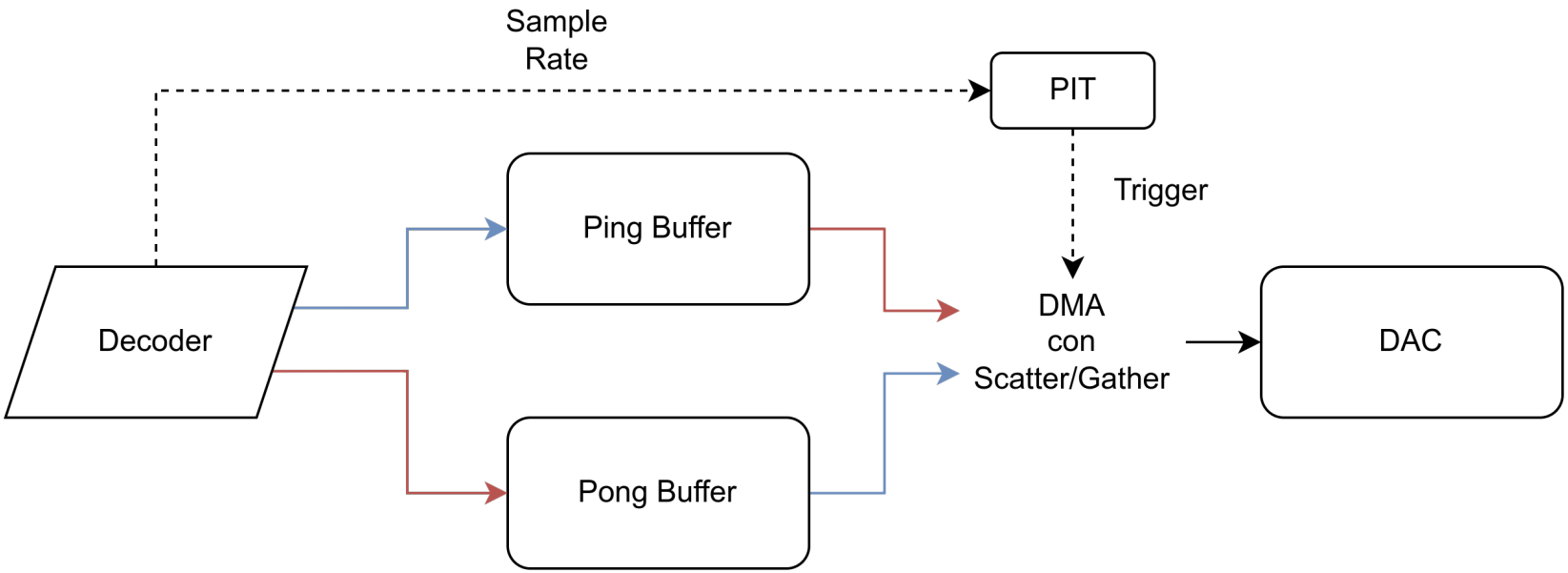
Uso de SDK: FATFS



Reproducción



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Matriz LED

```c
typedef union
{
        uint32_t hex;
        struct
        {
                uint8_t b, g, r, bright;
        };
} color_t;
```

```c
typedef struct
{
        color_t color;
        uint8_t onoff : 1;
        uint8_t blink : 1;
} LED_t;

static LED_t LEDMatrix[NUMOFLEDS] = {0};
static uint16_t PWMLEDMatrix[NUMOFLEDS * RGBBITS + 2] = {0};
static uint8_t brightness = MAXBRIGHTNESS / 6;
static uint8_t refreshTimerID = 0;
static uint8_t blinkTimerID = 0;
```

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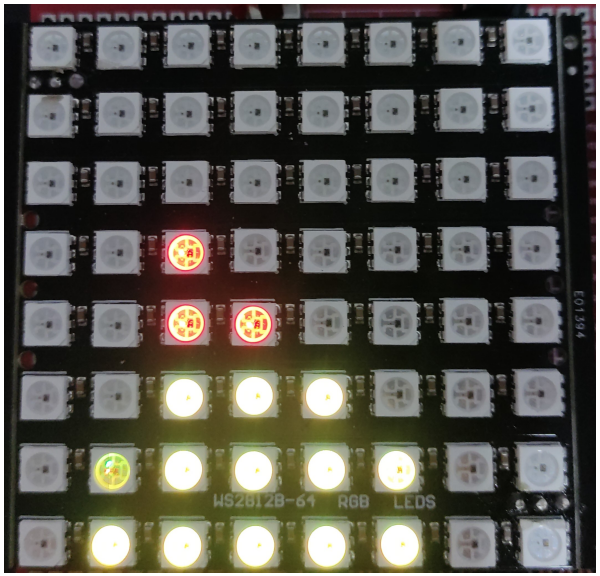
Vúmetro




```
1  void initVumeter()
2  {
3
4    color_t aux;
5
6    initLEDMatrix();
7
8    for (int i = 0; i < COLS; i++)
9    {
10     for (int j = 0; j < ROWS; j++)
11     {
12       switch (j)
13       {
14       case 0:
15       case 1:
16       case 2:
17         aux.hex = YELLOW;
18         changeColor(j, i, aux);
19         break;
20
21       case 3:
22       case 4:
23       case 5:
24         aux.hex = RED;
25         changeColor(j, i, aux);
26         break;
27
28       case 6:
29       case 7:
30         aux.hex = PURPLE;
31         changeColor(j, i, aux);
32         break;
33       }
34     }
35   }
36
37   adjustBrightness(2);
38   vumeterOn();
39 }
```

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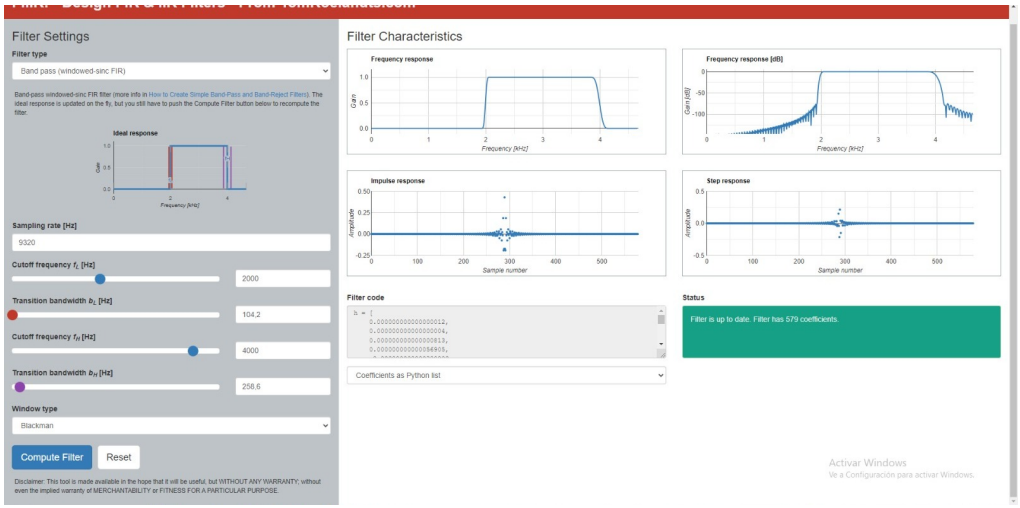
Ecualizador



$$y[n] = \sum_{k=-\infty}^{\infty} x[k]h[n-k]$$

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Ecualizador

Accurate Cascade Graphic Equalizer

Vesa Välimäki, *Fellow, IEEE*, and Juho Liski

***Abstract*—A graphic equalizer is a high-order filter controlling the gain of several frequency bands. For good accuracy, graphic**

independent of each other, but this makes the overall cascade graphic EQ a very large filter [12], [13]. Some researchers

$$H_C(e^{j\omega T_s}) = G_0 \prod_{m=1}^{M} H_m(e^{j\omega T_s})$$

$$\mathbf{g}_{\text{opt}} = \mathbf{A}^{-1}\mathbf{t}$$

$$H(z) = \frac{1 + G\beta - 2\cos(\omega_c)z^{-1} + (1 - G\beta)z^{-2}}{1 + \beta - 2\cos(\omega_c)z^{-1} + (1 - \beta)z^{-2}}$$

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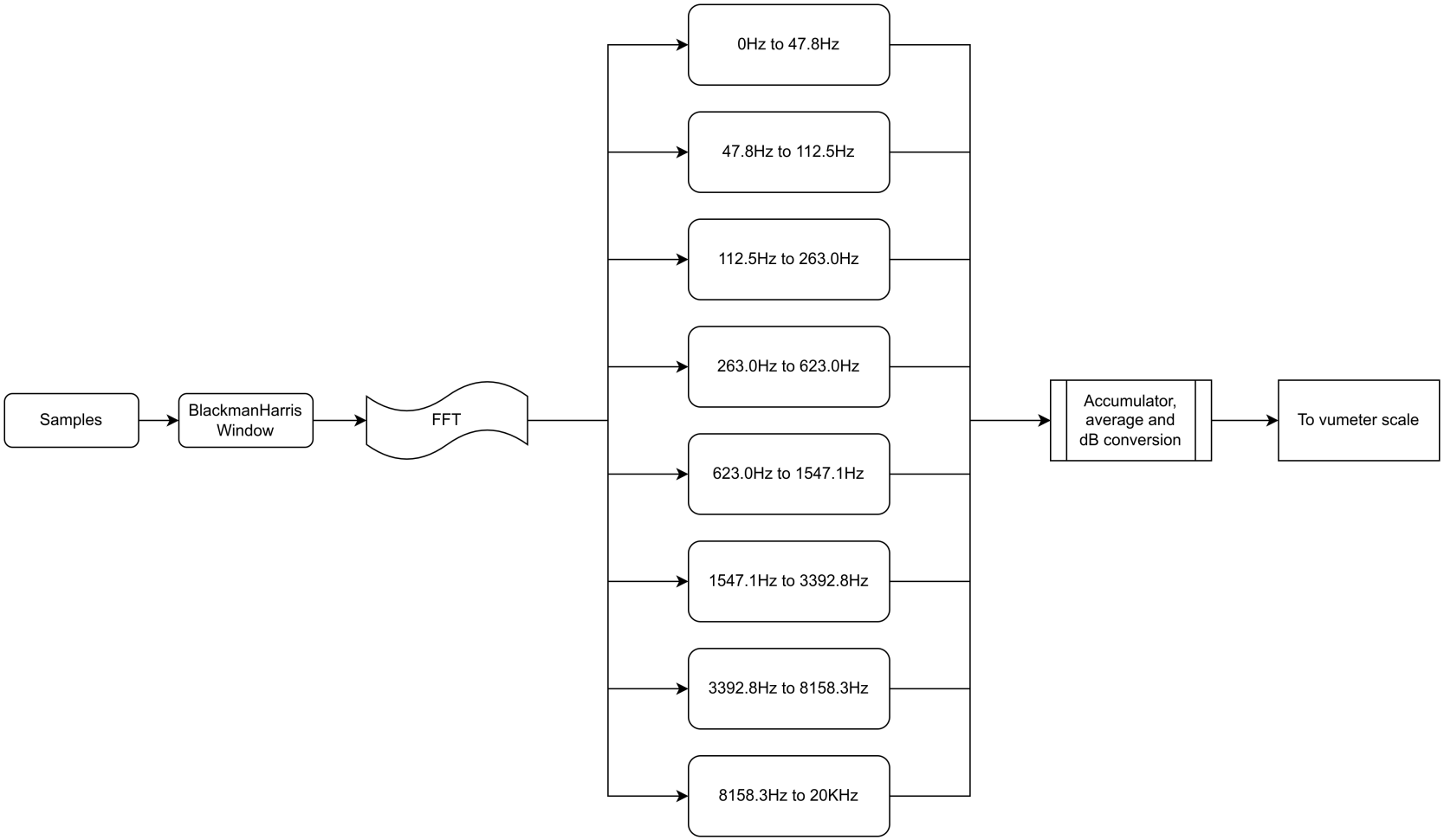
Calculo de potencia por bandas



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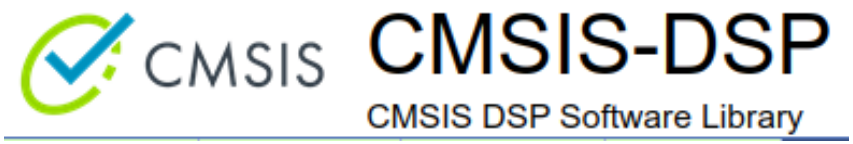
Libreria DSP



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Gracias

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