1. PWM – Motor Speed Control

* Generates digital pulses with variable duty cycle (speed)
* Motor Voltage = Duty \* Power Supply Voltage

Motor Voltage = Duty (Vxx) \* Vp (H-bridge)

Configuration

* 1. configPWM();
  2. Set frequency
  3. Set duty cycle according to the command (Vxx)

1. GPIO – Motor Direction and Encoders

* Output GPIOs
  + Control H-bridge
* Input GPIOs
  + Read encoder signals to notice forward/backwards movements (A/B quadrature signals phase diference)
  + Detect rising/falling edges

1. Timer – Encoder Pulse Counting and Timing

* Encoder (CAP) – Velocity/Distance
  + Counter mode
  + IRQ – pulse – distance travelled
* Generation of beep (MAT)
  + Timer mode
  + IRQ – toggle – beep

1. UART – Communication Vxx…[0x0D]

* UART0 : PC communication
* UART3 : Bluetooth communication

1. ADC – Power Monitoring

* Reads potentiometer battery voltage supply
* Converts analog voltage to digital value

1. DAC – Audio Output

* Generate sine wave from digital signal (MAT) – Controlled by velocity

1. I2C/SPI – Ambient Sensor
2. LCD display

* Displays
  + Distance (cm)
  + Direction
  + Battery level

Block diagram

