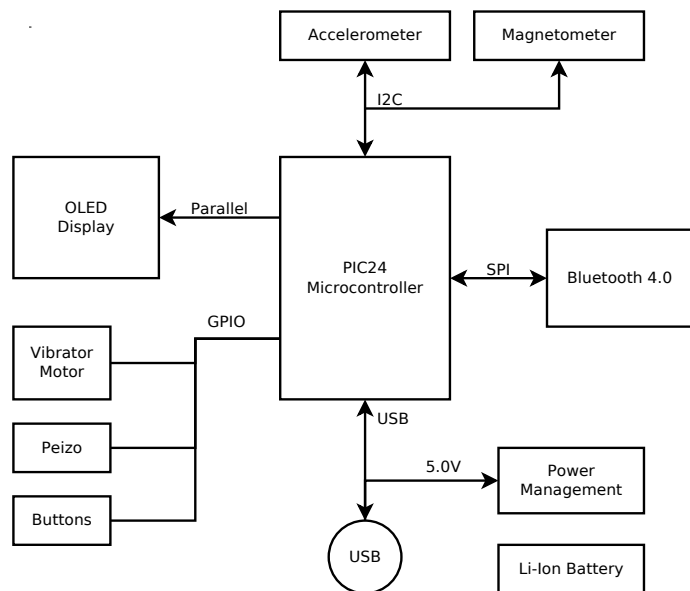# OSHWatch System Design

Overview

The OSHWatch is a custom-built smartwatch platform, built as a learning exercise, and intended to be able to be built with modest tool and part requirements. The current revision has a few issues which will be fixed in the next revision.

Requirements:

- Can tell the time!
- Alarm clock
- Easily programmable
- Fast graphics drawing
- Low power use/Long battery life
- USB communications
- Bluetooth LE communications
- Built-in battery charger

Features:

- 128x128 colour OLED display
- Bluetooth 4.0 LE
- PIC24 DA 16-bit Microcontroller
- 3 Axis Accelerometer
- 3 Axis Magnetometer
- Peizo buzzer
- Vibrator motor

Firmware

The firmware is written using the XC16 compiler, and is available here:
https://github.com/jorticus/zeitgeber-firmware

Features:

- Custom Real-Time Operating System (RTOS)
- USB-HID bootloader and communications
- Abstraction of application layer and peripheral/driver layer

Tasks	Applications	API	Low-Level
USB Communications	Clock & Calendar	Graphics Drawing	SSD1351 Driver
Display Draw	Accelerometer Logging	Accelerometer Interface	Accel Driver
Button Polling & Power Monitoring		Magnetometer Interface	Magnetometer Driver
Application Background Processing		RealTime Clock	Internal RTC Peripheral
		Calendar & Events	
	Kernel & Power Debug	Kernel & OS Info	RTOS Kernel
		Power Management	ADC Peripheral
		Peizo/Vibration Control	PWM & GPIO
			USB Comms