MCP2221 USB Raw HID I/O Expander Library Alire Crate for GNAT Ada

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MCP2221 USB Raw HID I/O Expander

The **MCP2221A** is a **PIC16F1455** microcontroller that has been preprogrammed with firmware to implement *two* USB devices: a USB serial port and a raw HID device that acts as an I/O expander providing one **I²C** bus controller (master only) and four **GPIO** pins (**GP0**, **GP1**, **GP2**, and **GP3**).

The GPIO pins **GP1**, **GP2**, and **GP3** can be configured for some alternate functions, including 10-bit A/D inputs or 5-bit D/A outputs:

```
GP1:  GPIO ADC1
GP2:  GPIO ADC2 DAC1
GP3:  GPIO ADC3 DAC2
```

The MCP2221A replaces an earlier part, the MCP2221. The only difference between the older MCP2221 and the newer MCP2221A is that the latter supports some higher baud rates on the USB serial port device. Since this crate only deals with the raw HID I/O expander functions, it will work fine with either the older MCP2221 or the newer MCP2221A.

About this Crate

This crate contains a subset of the ***Linux Simple I/O Library*** Ada packages that are relevant for building programs for the MCP2221 I/O expander.

This crate can be built for Linux, MacOS, or Windows targets.

Web Links

Linux Simple I/O Library:
https://github.com/pmunts/libsimpleio

MCP2221A datasheet:
https://www.microchip.com/content/dam/mchp/documents/APID/ProductDocuments/DataSheets/MCP2221A-Data-Sheet-DS20005565D.pdf

MCP2221 Ada example programs:
http://git.munts.com/libsimpleio/ada/programs/mcp2221

Buy an MCP2221A breakout board:
https://www.adafruit.com/product/4471
https://www.tindie.com/products/pmunts/usb-grove-adapter

HIDAPI library for HID (Human Interface Device) device access:
https://github.com/libusb/hidapi

libusb library for USB device access:
https://github.com/libusb/libusb