Understanding GPIO Pins on Raspberry Pi Pico

General-Purpose Input/Output pins allow you to connect input and output devices to Raspberry Pi Pico and obtain or send signals between them.

The diagram below identifies the physical pin numbers and the GPO pin numbers of the Pins on the Pico. Note how the physical pin numbers differ from the GP numbers for example physical pin 1 is GP pin 0. Also note how some physical pins don’t have GP numbers for example pin’s 3, 8 & 12 are ground pins so can’t be used as GPIO pins.

A computer chip with many different colored labels

Description automatically generated

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In this second diagram you will see that some GPIO pins can be used for specific purposes such as pin 31 & 32 which are analogue to digital pins.

**Setting Up GPIO Pins**

Before you can use a GPIO pin, you need to set it up. Setting up a pin involves configuring it for a specific purpose, such as input or output. Here's a basic input and output sample.

**Input Mode**

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**Output Mode**

A screenshot of a computer program

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**Types of GPIO Pin Usage**

**Digital Input and Output**

Digital Input is used to read binary signals (0 or 1) from external devices like buttons or switches.

Digital Output Is used to send binary signals (0 or 1) to external devices like LEDs or relays.

**Analog Input**

Analog Input (ADC) Used to read continuous analog signals (range of values) from sensors like potentiometers or light sensors.

* PWM (Pulse Width Modulation)
* PWM Output Used to control the intensity of devices like LEDs or motors by varying the width of pulses.
* I2C, SPI, UART

**Communication Pins (I2C, SPI, UART)** Used for communication with other devices, enabling your Pico to talk to sensors, displays, or other microcontrollers.