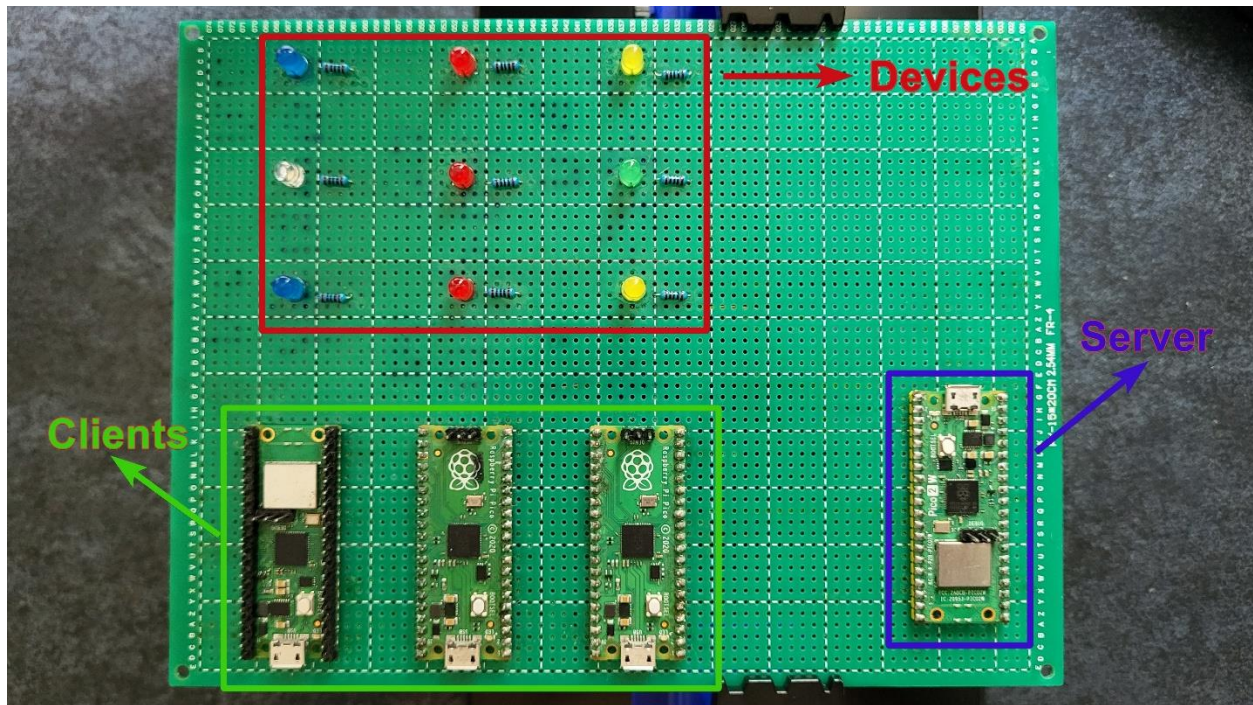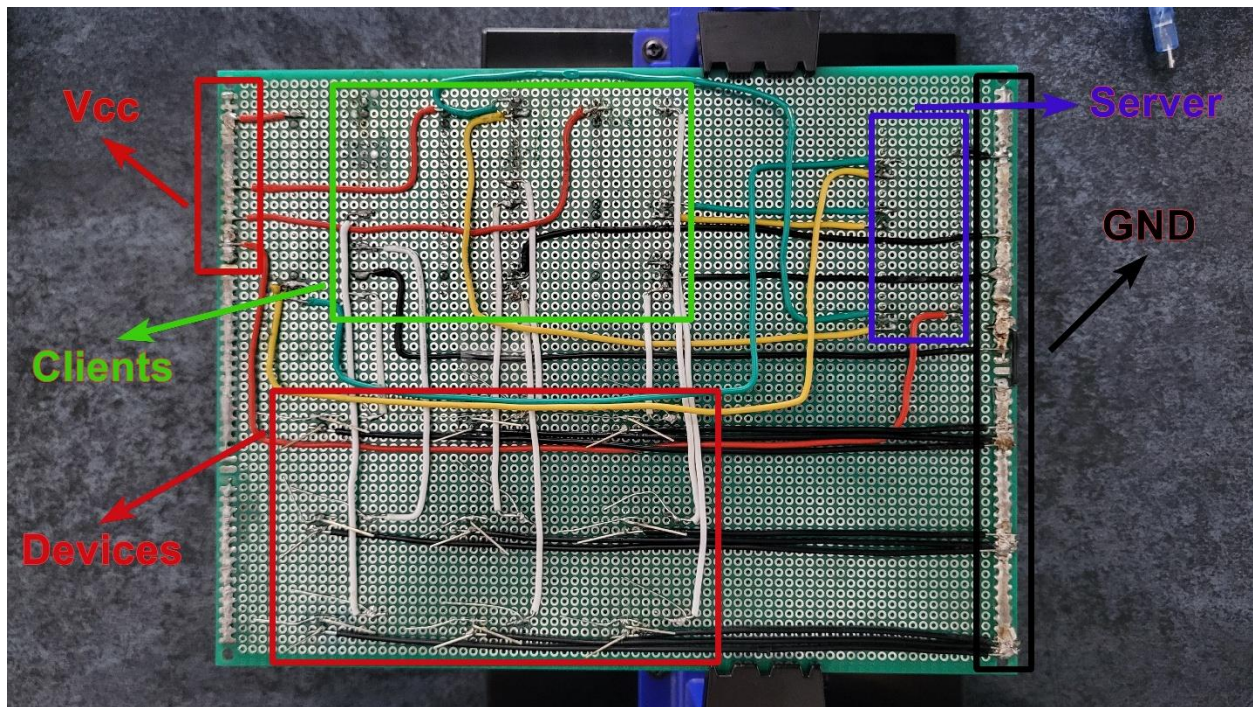# Pico UART GPIO Hub
Quick DEMO

Front View:

Back View / Electrical Connections:

It is important that all system participants are powered on simultaneously, or that all clients are powered on before the server. In this setup, the Vsys and GND pins of every board are interconnected, so when a USB cable is connected to any device or a voltage source is applied, all microcontrollers receive power at the same time. This prevents missed handshakes, and a common ground is essential for proper UART communication.

The server scans all available UART TX/RX pin pairs, and if at least one client is detected, it proceeds with GPIO control. Therefore, if a client powers on too late, it will miss the handshake and be excluded from the session.

At power-up, clients begin cycling through all valid UART pin combinations, checking for a connection. The server performs a similar scan, but clients use a much shorter timeout per pin than the server. This ensures that no client is left behind during the handshake phase.

Once the handshake is complete, the server loads each client with its last known state before the previous shutdown. If this is the first boot after flashing, the server initializes the memory layout, and no devices are activated by default. After each new flash on the server, all previously saved device configurations are lost.

When a console connection is detected, the server displays the menu:

```
****************************************************
Welcome!
These are the active client connections:
1. GPIO Pin Pair=[0,1]. UART Instance=uart0.
2. GPIO Pin Pair=[12,13]. UART Instance=uart0.
3. GPIO Pin Pair=[8,9]. UART Instance=uart1.

Options:
1. Display Clients
2. Set Client's Device
3. Toggle Client's Device
4. Save Running State Into Preset Configuration
5. Build And Save Preset Configuration
6. Load Preset Configuration Into Running State
7. Reset Configuration
8. Clear Screen
9. Restart System

Pick an option
>
```

If the user disconnects and reconnects the USB cable while the system remains powered, or if the console is closed and reopened, the server will print the last `BUFFER_MAX_STRING_SIZE` lines from the previous session.

Video DEMO here: https://youtu.be/Ub3jZuVrXoA