The Pico HID - PS/2 Bridge

The Pico HID Bridge is a special version of the generic Pico HID. It is a PS/2 keyboard and mouse emulator that connects to PiKVM via USB-A. Unlike generic Pico HID and legacy Arduino HID, it doesn't require SPI wiring with GPIO.

It is suitable for all devices except V4 Mini and DIY based on Zero 2 W board.

At one end it connects to USB-A on PiKVM, on the other side it has two PS/2 connectors for keyboard and mouse:
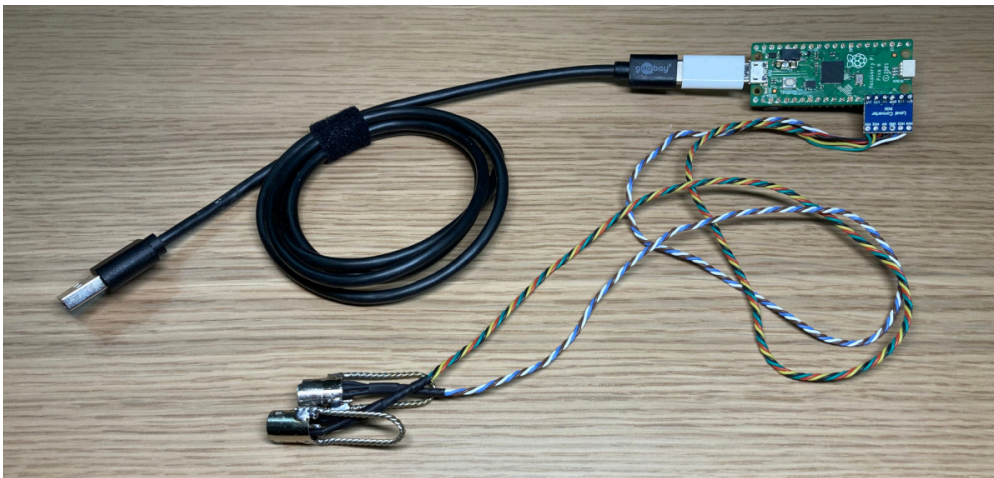
In addition, on PiKVM V2+, the use of Pico the HID Bridge does not exclude the use of a regular USB OTG port with Mass Storage emulation. Thus, on V2+ you will be able to use PS/2 and USB Mass Storage at the same time, and even switch between OTG HID and Pico HID.


Making the Bridge

- *x1* Raspberry Pi Pico board with soldered pins.
- *x1* USB-A to Micro-USB cable.
- *x1* 3.3V/5V bi-directional logic level shifter like this.
- *x2* PS/2 cable with male connector.
- *x2* Small dip jumpers.

Make sure that the level shifter pinout matches the scheme, and connect everything according to the Pico pinout.

```
                  _____
                 |                   |
   Pico GP11 _____| LV1        HV1 |_____  PS/2 keyboard data
   Pico GP12 _____| LV2        HV2 |_____  PS/2 keyboard clock
   Pico GP13 _____| LV         HV  |_____  PS/2 5V
   Pico  GND _____| GND        GND |_____  PS/2 GND
   Pico GP14 _____| LV3        HV3 |_____  PS/2 mouse data
   Pico GP15 _____| LV4        HV4 |_____  PS/2 mouse clock
                 |_____|
```

You can take the 5V power line from one of the PS/2, for example from the keyboard, or from both at once, but use a multimeter to make sure that both PS/2 female connectors have the same line.

PS/2 mini-DIN 6 pin

Male   Female
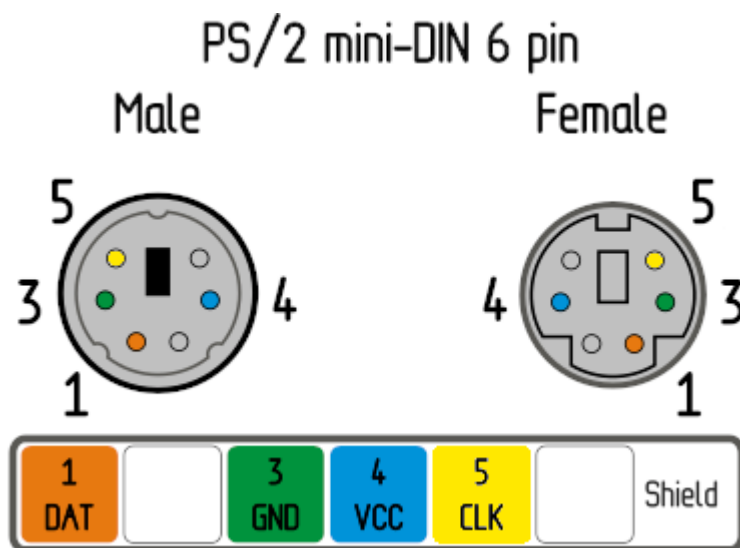
PS/2 female socket pinout on the motherboard is the same for the keyboard and the mouse. A purple socket usually corresponds to the keyboard, and a green one to the mouse. If your motherboard only has one port, it's probably universal and can be used for both the keyboard and the mouse. Most likely, it will be painted both colors.

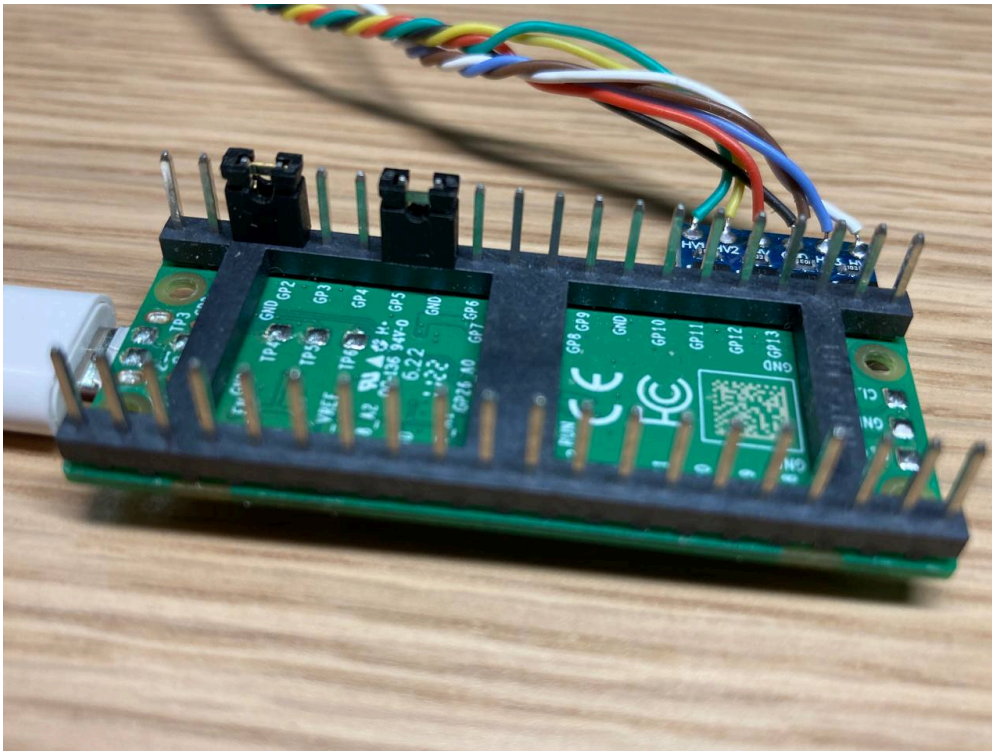Use a multimeter to determine the purpose of the wires in your PS/2 cables.

A good idea is to mount the level shifter on top of the Pico, as in this photo:
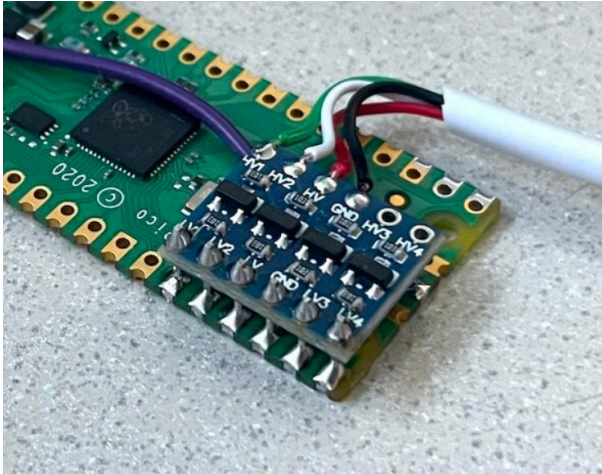
Finally, install DIP jumpers to soldered pins of the Pico to enable PS/2 and Bridge modes:

- `GP2 <-> GND`

- `GP5 <-> GND`

Like this:

Flashing the firmware

To upload the firmware to Pico HID, you can use any computer with a USB port.

1. [Download](#) the latest release of the firmware. The file is called `pico-hid.uf2`.

2. Press and hold the white button on the Pico board.

3. While still holding the button, plug it in the computer using a USB cable.

4. Release the button.

5. The Pico board appears as a flash drive on your computer.

6. Copy the `pico-hid.uf2` file to this flash drive.

7. Safely eject the USB device.

The final steps

Connect the Pico HID to the target host using PS/2 cable and USB to USB-A port on PiKVM.

Add following lines to the PiKVM configuration and reboot it:

- `/etc/kvmd/override.yaml`:

```yaml
kvmd:
    hid:
        type: serial
        device: /dev/kvmd-hid-bridge
        reset_pin: -1
```