

SAO DEMO CONTROLLER

**CAUTION: Do not connect USB C and a host Badge at the same time.
The SAO must be 5V tolerant to use with USB C.
USB C power is 5V and connected to SAO BADGE HEADER.**

FROM BADGE

SAO CLIENT PLUG
<https://www.digikey.com/en/products/detail/adam-tech/BHR-06-VUA/10414637>

GPIO1 will be data from the badge to the SAO (Badge TX, SAO RX).
 GPIO2 is data from the SAO to the badge (Badge RX, SAO TX).

MICROCONTROLLER

RP2040-Zero

GPIO16 is NeoPixel onboard
 3V3 current limit _____

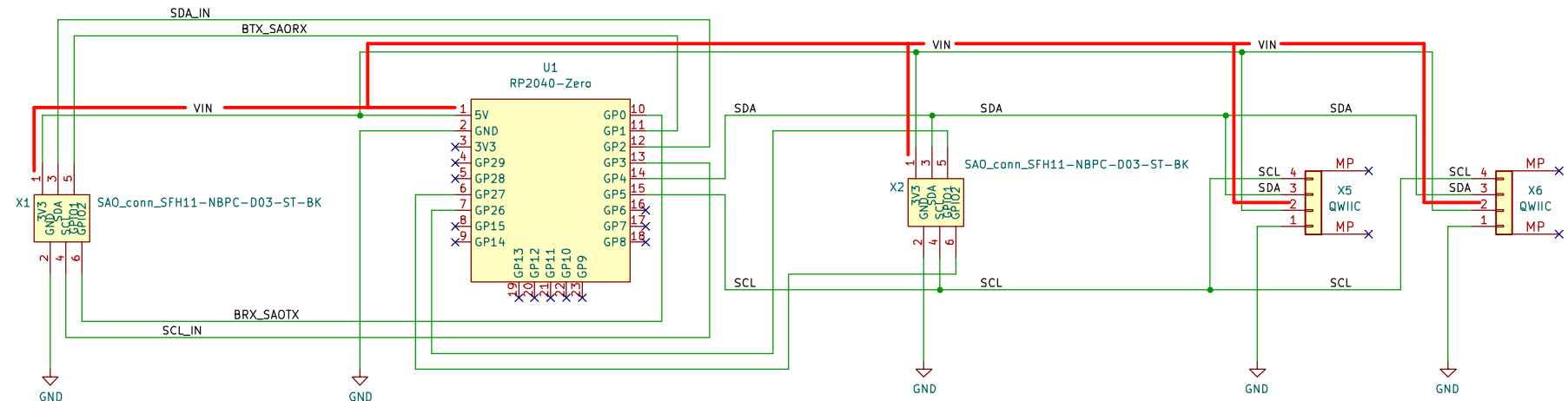
TO SAO

SAO BADGE/HOST SOCKET
 Sullins SFH11-NBPC-D03-ST-BK female header
<https://www.digikey.com/product-detail/en/sullins-connector-solutions/SFH11-NBPC-D03-ST-BK/59717-ND/4558818>

QWIIC PORTS

QWIIC SOCKET

Manufacturer: JST SM04B-SR55-TB
 Digikey: 455-SM04B-SR55-TBTR-ND
 LCSC: C160404



RP2040-ZERO PIN USAGE

Footprint Pin #: Pico Name

- 1 : 5V INPUT
- 2 : GROUND
- 3 : 3V3 regulated output
- 4
- 5
- 6 : GP27, GPIO27, ADC1, SCL1, PWM5B connected TO DOWNSTREAM SAO GPIO1
- 7 : GP26, GPIO26, ADC0, SDA1, PWM5A connected TO DOWNSTREAM SAO GPIO2
- 8
- 9
- 10 : GP0, GPIO0, SDA0, MIS00, TXD0, PWM0A connected to FROM BADGE GPIO2 (RX)
- 11 : GP1, GPIO1, SCL0, MCS0, RXD0, PWM0A connected to FROM BADGE GPIO1 (TX)
- 12 : GP2, GPIO2, SDA1 connected FROM BADGE SDA
- 13 : GP3, GPIO3, SCL1 connected FROM BADGE SCL
- 14 : GP4, GPIO4, SDA0 connected TO DOWNSTREAM SAO (Default Arduino I2C)
- 15 : GP5, GPIO5, SCL0 connected TO DOWNSTREAM SAO (Default Arduino I2C)
- 16
- 17
- 18
- 19
- 20
- 21
- 22
- 23

INTERNAL GPIO16 IS CONNECTED TO RGB WS2812B LED DIN
 More information: <https://www.waveshare.com/wiki/RP2040-Zero>

COMMON I2C ADDRESSES

OLED (SSD1306) 128x32 0x3C
 OLED (SSD1306) 128x64 0x3D
 OLED (SSD1327) 128x128 0x3C

SAO STANDARDS

PRIMARY: <https://docs.google.com/document/d/1EJqvkkLMAPsQ9VWF5A4eWoiQmKyr5Giw5rqRmtmN/edit?usp=sharing>
 SUPPLEMENT: <https://hackaday.io/project/175182-simple-add-ons-sao>

All non-polarized capacitors are X7R or X5R ceramic unless otherwise noted.

Design by Andy Geppert @ www.MachineIdeas.com

Sheet: /
 File: SAO_Demo_Controller.kicad_sch

Title: SAO Demo Controller

Size: A Date: 2024-09-24

KiCad E.D.A. 8.0.4

Rev: 1.0

Id: 1/1