SAO DEMO CONTROLLER V2

FROM BADGE

https://www.digikey.com/en/products/

detail/adam-tech/BHR-06-VUA/10414837

MICROCONTROLLER

TO SAO SAO BADGE/HOST SOCKET

sullins-connector-solutions/

Sullins SFH11-NBPC-D03-ST-BK female header

SFH11-NBPC-D03-ST-BK/S9717-ND/4558818

https://www.digikey.com/product-detail/en/

QWIIC PORTS

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

RP2040-Zero https://www.waveshare.com/wiki/RP2040-Zero Omboard buttons not user accessible GPI016 is NeoPixel onboard

GPIO1 is also data from the badge to the SAO (Badge TX, SAO RX). GPIO2 is also data from the SAO to the badge (Badge RX, SAO TX). 3٧3 **POWER SELECT** SDA_IN SDA_IN BTX_SAORX SAO_POWER JP4: SAO Voltage Select SJ_GPI01_PASSTHRU Default 1-2 is 3.3V 5VUSB Alternate 2-3 is 5V USB GP1 RP2040-Zero U1 D Schottky D1 **GPI01 SELECT** GP0 SDA_OUT SDA_OUT 5V/VUSB SDAO/GPO 0 34 GND SAO_GPI01 SCL0/GP1 R1 33 _{3V3} 3٧3 SDA_IN JP5: SAO GPIO1 Select SDA1/GP2 3K3 29 GP29/ADC3 SCL_IN 1-2 is RP2040 GP1 GP3 3 MP MP 2-3 is RP2040 GP26 28 GP28/ADC2 27 GP27/ADC1 SDA_OUT SCL_OUT GP4 SJ_VIN_VUSB_PASSTHRU CN3V3 CN3V3 SSC SDA SSC SDA SSC SON SAO_GPIO2_GP27 SCL_OUT SDA_OUT SDA_OUT GP5 5 X5 Х6 SAO_GPI01_GP26 26 GP26/ADC0 D1 prevents USB-C SAO_POWER 2 SAO_POWER 2 QWIIC QWIIC GP6 6× 5V from going to 15 GP15 GP14 GND GND MP the Badge SAO Port. GP7 MP VIN GP8 8X **GPIO2 SELECT** GP13 GP12 GP11 GP10 GP9 MONITOR S1 JP6 SCL_0U1 SCL_OUT JP6: SAO GPIO2 Select 1-2 is RP2040 GP0 **USER** 2-3 is RP2040 GP27 SJ_GPI02_PASSTHRU BUTTON BRX_SAOTX GP0 SCL_IN SCL_IN SAO_GPIO1_GP26 SAO_GPIO2_GP27 \rightarrow GND GND GND GND GND GND GND

SDA IN from Badge

SCL IN from Badge

DEMO CONTROLLER FUNCTIONS INPUT 3-5V from Badge or USB-C GROUND 3V3 regulated output to SAO VIN/2 input voltage measurement SAO GPIO2 I2C1 SCL ADC1 GP27 SAO GPI01 I2C1 SDA ADC0

I2C1 SCL SPI1 TX GP15 User Button 12C1 SDA SPI1 SCK GP14

GND

GP26

ADC3 GP29

ADC2 GP28

used pin

GPO SPIO RX 12CO SDA UARTO TX GP1 SPI0 CSn 12C0 SCL UARTO RX GP3 SPI0 TX I2C1 SCL GP4 SPIORX 12CO SDA UARTI TX SDA OUT to SAO GP5 SPIO CSN 12CO SCL UARTI RX SCL OUT to SAO GP6 SPI0 SCK 12C1 SDA GP7 SPI0 TX I2C1 SCL GP8 SPI1 RX I2C0 SDA UART1 TX GP9 SPI1 CSn 12C0 SCL UART1 RX GP10 SPI1 SCK 12C1 SDA GP11 SPI1 TX I2C1 SCL GP12 SPI1 RX I2C0 SDA UARTO TX

GP13 SPI1 CSn 12C0 SCI LIARTO BX

GND GP25 GP23 GP22 GP21 WS2812 RGB LED GP20 I2CO SDA GP19 SPI0 TX I2C1 SCL GP18 SPI0 SCK 12C1 SDA GP16 DIN

> 11 Machine Ideas Logo

DEMO CONTROLLER FUNCTIONS SAO GPIO2 pass-through or Badge RX / SAO TX SAO GPIO1 pass-through or Badge TX / SAO RX

COMMON 12C ADDRESSES

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

SAO STANDARDS

PRIMARY: https://docs.google.com/document/d/1EJqvkkLMAPsQ9VWF5A4elWoi0gMlKyr5Giw5rqRmtnM/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.

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Title: SAO Demo Controller

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