



190p-1b-nano-rtc-battery-hl-2023-8-27.odp

IO-NANO-W100

This document is created by:

Harry Li, Ph.D.

Yusuke Yakuwa

Nicole Wang, Youran Zheng,

Keyang Qin

First Created: July 9, 2023

Jetson Nano J41 Header Pinout for GPIO/PWM

<https://www.jetsonhacks.com/nvidia-jetson-nano-j41-header-pinout/>

Note: I2C and UART pins are connected to hardware and should not be reassigned. By default, all other pins (except power) are assigned as GPIO. Pins labeled with other functions are recommended functions if using a different device tree.

nnn-n—2023-3-15-#2022S-107c-pwm-v4-hl-2022-3-3, pp. 2

| | | | | | |
|---------|------------------------|----|----|------------------------|---------|
| | GND | 25 | 26 | SPI_1_CS1 | gpio20 |
| | I2C_1_SDA I2C Bus 0 | 27 | 28 | I2C_1_SCL I2C Bus 0 | |
| gpio149 | CAM_AF_EN | 29 | 30 | GND | |
| gpio200 | GPIO_PZ0 | 31 | 32 | LCD_BL_PWM | gpio168 |
| gpio38 | GPIO_PE6 | 33 | 34 | GND | |
| gpio76 | I2S_4_LRCK | 35 | 36 | UART_2_CTS | gpio51 |
| gpio12 | SPI_2_MOSI | 37 | 38 | I2S_4_SDIN | gpio77 |
| | GND | 39 | 40 | I2S_4_SDOUT | gpio78 |

Use pin 32 for PWM

pin 12 for gpio78

| Sysfs GPIO | Name | Pin | Pin | Name | Sysfs GPIO |
|------------|------------------------|-----|-----|--|------------|
| | 3.3 VDC Power | 1 | 2 | 5.0 VDC Power | |
| | I2C_2_SDA I2C Bus 1 | 3 | 4 | 5.0 VDC Power | |
| | I2C_2_SCL I2C Bus 1 | 5 | 6 | GND | |
| gpio216 | AUDIO_MCLK | 7 | 8 | UART_2_TX <code>/dev/ttyTHS1</code> | |
| | GND | 9 | 10 | UART_2_RX <code>/dev/ttyTHS1</code> | |
| gpio50 | UART_2_RTS | 11 | 12 | I2S_4_SCLK | gpio79 |
| gpio14 | SPI_2_SCK | 13 | 14 | GND | |
| gpio194 | LCD_TE | 15 | 16 | SPI_2_CS1 | gpio232 |
| | 3.3 VDC Power | 17 | 18 | SPI_2_CS0 | gpio15 |
| gpio16 | SPI_1_MOSI | 19 | 20 | GND | |
| gpio17 | SPI_1_MISO | 21 | 22 | SPI_2_MISO | gpio13 |
| gpio18 | SPI_1_SCK | 23 | 24 | SPI_1_CS0 | gpio19 |
| | GND | 25 | 26 | SPI_1_CS1 | gpio20 |

pin 12 for gpio79

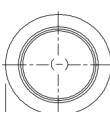
Design Update with CR2032 RTC Battery 7/27/23

ENGINEERING DATASHEET

ENERGIZER NO. CR1225



Industry Standard Dimensions



mm (inches)

Energizer

EVEREADY BATTERY COMPANY, INC. 1-800-383-7323 / CANADA - USA
www.energizer.com + 44 (0) 208 920 2306 / EUROPE

Specifications

| | |
|--------------------------|---|
| Classification: | "Lithium Coin" |
| Chemical System: | Lithium / Manganese Dioxide (Li/MnO ₂) |
| Designation: | ANSI-5020LC, IEC-CR1225 |
| Nominal Voltage: | 3.0 Volts |
| Typical Capacity: | 50 mAh (to 2.0 volts) (Rated at 45K ohms at 21°C) |
| Typical Weight: | 0.9 grams (0.02 oz.) |
| Typical Volume: | 0.3 cubic centimeters (0.02 cubic inch) |
| Max Rev Charge: | 1 microampere |
| Energy Density: | 161 milliwatt hr/g, 518 milliwatt hr/cc |
| Shipping: | Global (except US): Special Provision A45 of the International Air Transport Association Dangerous Goods Regulations United States: 49 CFR 173.185 |



WITH YELLOW GLOVE
CORRECT HANDLING
ENSURE LONG LIFE

4.6 ★★★★★ 69 ratings | 3 answered questions

\$7.99 (\$4.00 / Count)

prime Two-Day

FREE Returns

Unlock a \$10 Amazon Gift Card upon approval for the Prime Store Card. No annual fee. Get info

Size: 2PACK

1PACK

\$5.99

prime

2PACK

\$7.99

(\$4.00 / Count)

prime

2 CR2 batteries required. (included)

Brand

LeFix

Battery Cell

Lithium Manganese Dioxide

Composition

Compatible

For Computer RTC

Phone Models

Recommended

Computer Laptop

Uses For Product

About this item

- Battery Size Code: CR2032
- Please refer to the image 2 and image 3 to correctly handle the coin battery while you replace it. Please don't touch negative and positive side with your naked fingers
- Battery Key Data: Capacity: 235mAh; Voltage: 3V**
- Battery Terminals: Pressure Contact
- Compatible with Dell Optiplex 740,745,755,760,780,790 Computer HP Pro 6000 8000
- Package Content: 2 CR2032 Batteries; 1 Pair of anti-static gloves

[Report incorrect product information.](#)

The previous CR1225 only has **50mAh** capacity, which is inadequate to last for the entire life span of the W100.

The CR2032 has **235mAh** capacity, which is compatible with desktop/laptops requirements (Dell, HP etc). It is considered as a new option to provide longer life span of the W100.

Further discussion is needed.

In Stock Chrome d

Qty: 1 Add to Cart Buy Now

Payment Secure transaction Ships from Amazon Sold by LeFix-Official Returns Eligible for Return, Refund or Replacement within 30 days of receipt

Add a gift receipt for easy returns

Add to List

Harry Li HYSTOU Fanle 11 Pro i7 8550 \$669.00 prime Save 5% with coupon

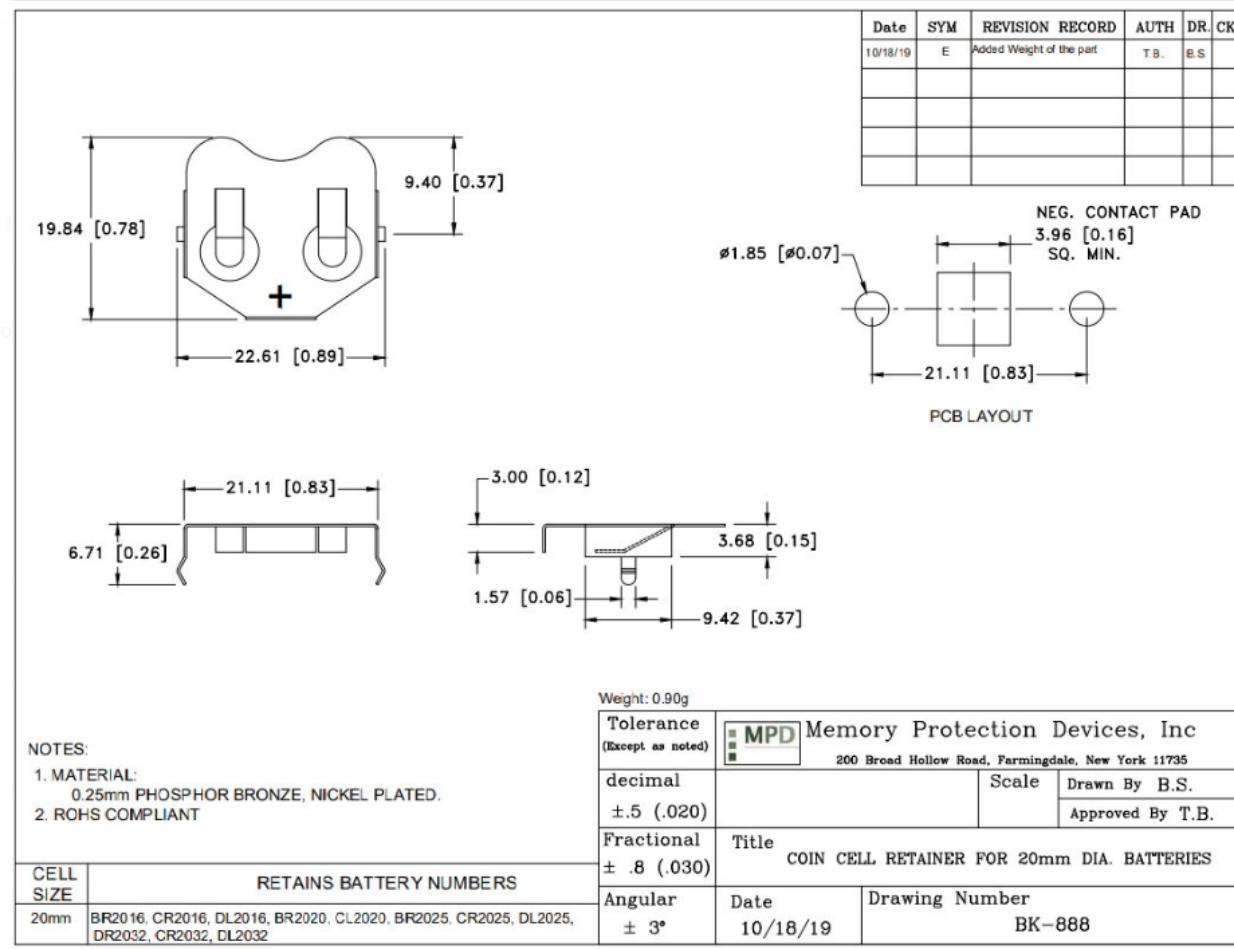
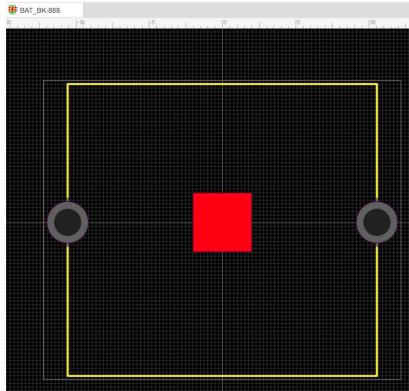
Sponsor

Design Update with CR2032 RTC Battery 7/27/23

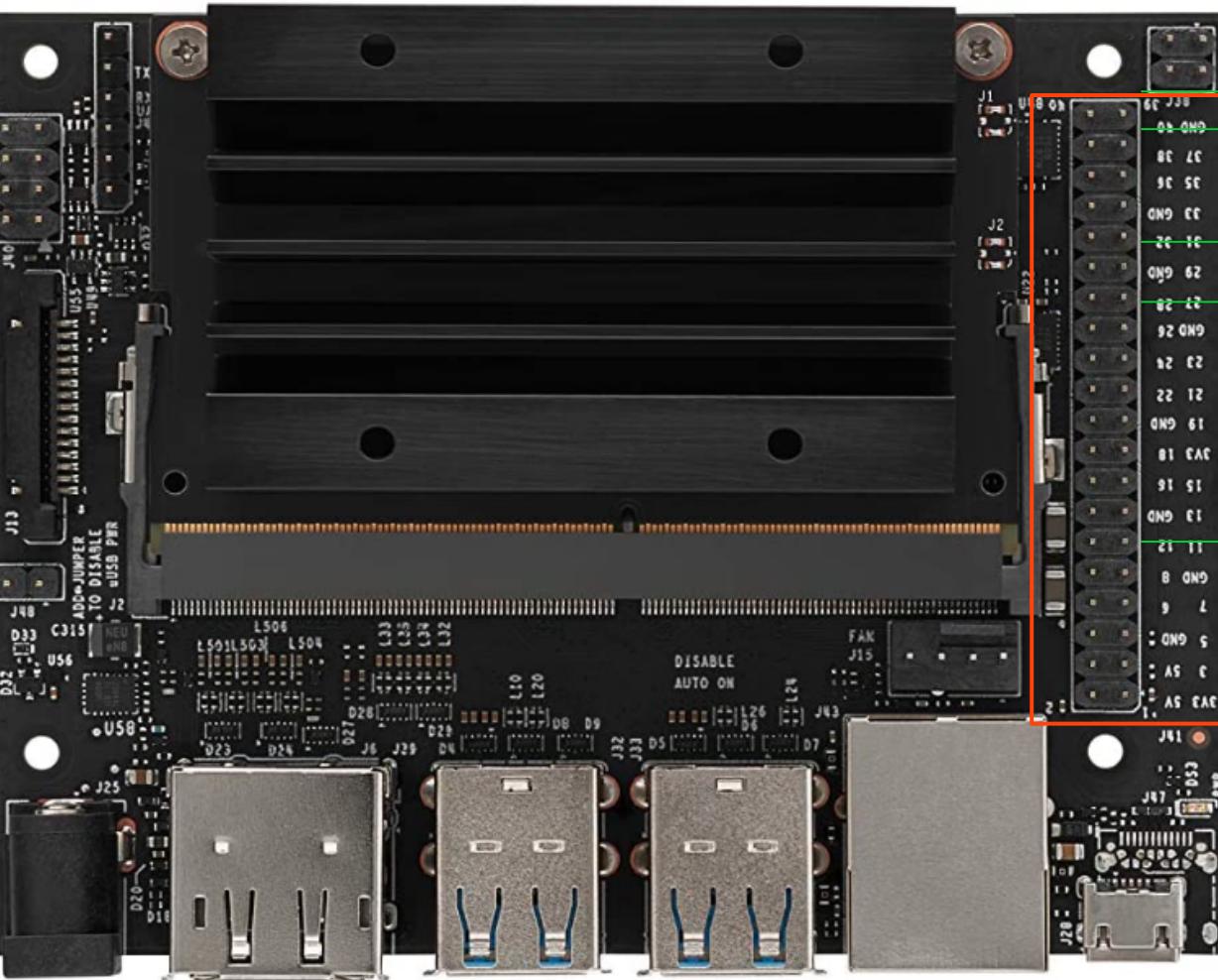
Update (1) parts number and manufacturer,
\$0.87/PCS (2) Datasheet

<https://www.memoryprotectiondevices.com/datasheets/BK-888-datasheet.pdf>

(3) footprint from EasyEDA <https://easyeda.com/component/31f4dac21ee844b8852fe736cfbbfd95>



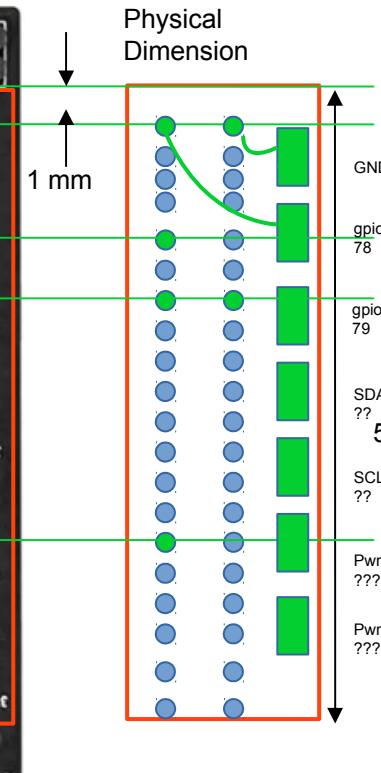
70 x 45 mm



IO Board Design 6/22/23

<https://jetsonhacks.com/2019/06/07/jetson-nano-gpio/>

NVIDIA Jetson Nano
Developer Kit (945-13450-
0000-100)



0.1" pitch, 0.025" square pins

<https://electronics.stackexchange.com/questions/77910/standard-length-of-male-header-pins>

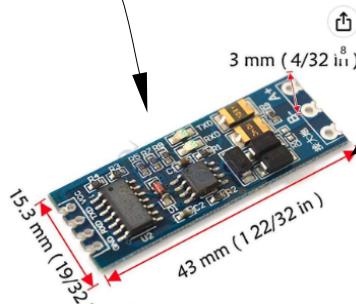
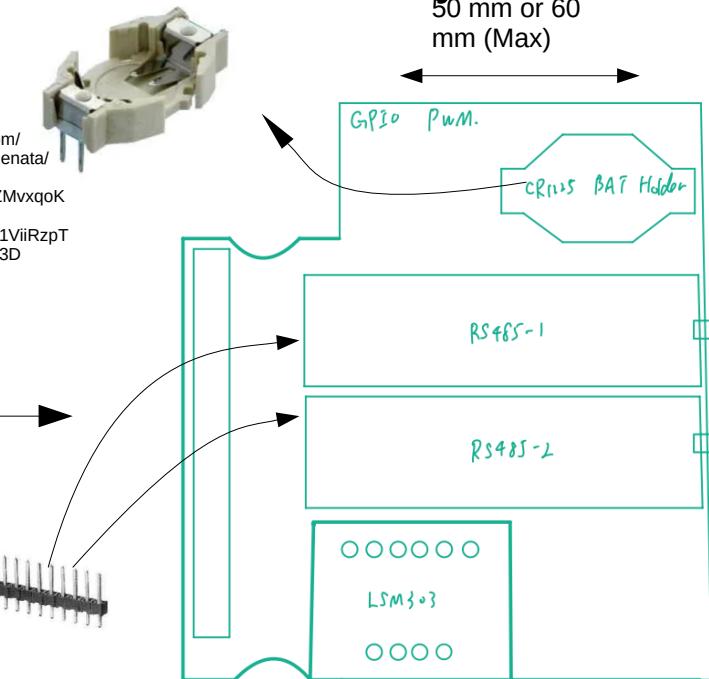
| GPIO | |
|------|---------|
| 12 | gpio 79 |
| 40 | gpio 78 |
| | |
| PWM | |
| 32 | pwm0 |
| 33 | pwm2 |
| | |
| I2C | |
| 27 | SDA |
| 28 | SCL |

Cross reference:
/media/harry/easystore1/bacup-2020-2-15/SJSU/CMPE242/242-2-homework-projects/242-4-SubmissionProjects/2023S-adc-i2c-motor-python-7Justin_Stokes_PWM-GPIO-Motor-LSM303-ADC_CMPE242-1/Justin_Stokes_PWM-GPIO-Motor-LSM303-ADC_CMPE242

Design Update with Dual 485 Modules and CR1225 battery holder 7/9/23

Previous version, 6/22
in this document

[https://www.mouser.com/
ProductDetail/Renata/
HU1225-LF?
qs=sGAEpiMZZMvxqoKe%252BDjhrivg1ViRzpTmO5jZl56OM%3D](https://www.mouser.com/ProductDetail/Renata/HU1225-LF?qs=sGAEpiMZZMvxqoKe%252BDjhrivg1ViRzpTmO5jZl56OM%3D)



Note: HL 2023-6-30, (1) design through holes for the male header to connect IO board and 485 boards;
(2) need the physical dimension of the hole spacing to make the through hole on the IO board.

Physical dimension (measurement) of the 485 board

The right connector Spacing given: 3 mm

The left connector Spacing
(1) from the top edge of board: ??? mm
(2) spacing of the through hole: ??? mm

https://www.amazon.com/HiLetgo-Reciprocal-Hardware-Automatic-Converter/dp/B082Y19KV9/ref=sr_1_4?crid=3ND4JA7TYWJEG&keywords=uart+to+485&qid=1688190894&sprefix=uart+to+485%2Caps%2C136&sr=8-4

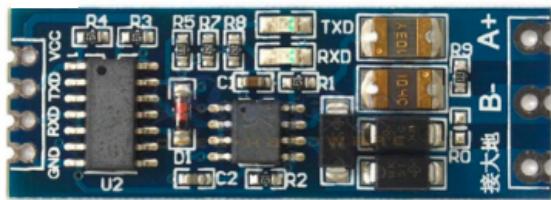


Fig. 1a

Jetson Nano has 3 physical UART ports: UART0 at the M2 Slot for WiFi/BT card. UART1 at the J41 Header (40-pin connector) for System Console after boot up (run by a service), Pin 8 - TX, Pin 10 - RX. UART2 at the J50 header for debug (early access during boot from bootloader), Pin 4 - RX, Pin 5 - TX

The 2nd UART Connector (6/30,23)

Table 1. J50

- 1 - LED-
- 2 - LED+
- 3 - UART RXD
- 4 - UART TXD
- 5 - DISABLE
- 6 - AUTO ON
- 7 - GND
- 8 - SYS RST
- 9 - GND
- 10 - FC REC
- 11 - GND
- 12 - PWR BTN

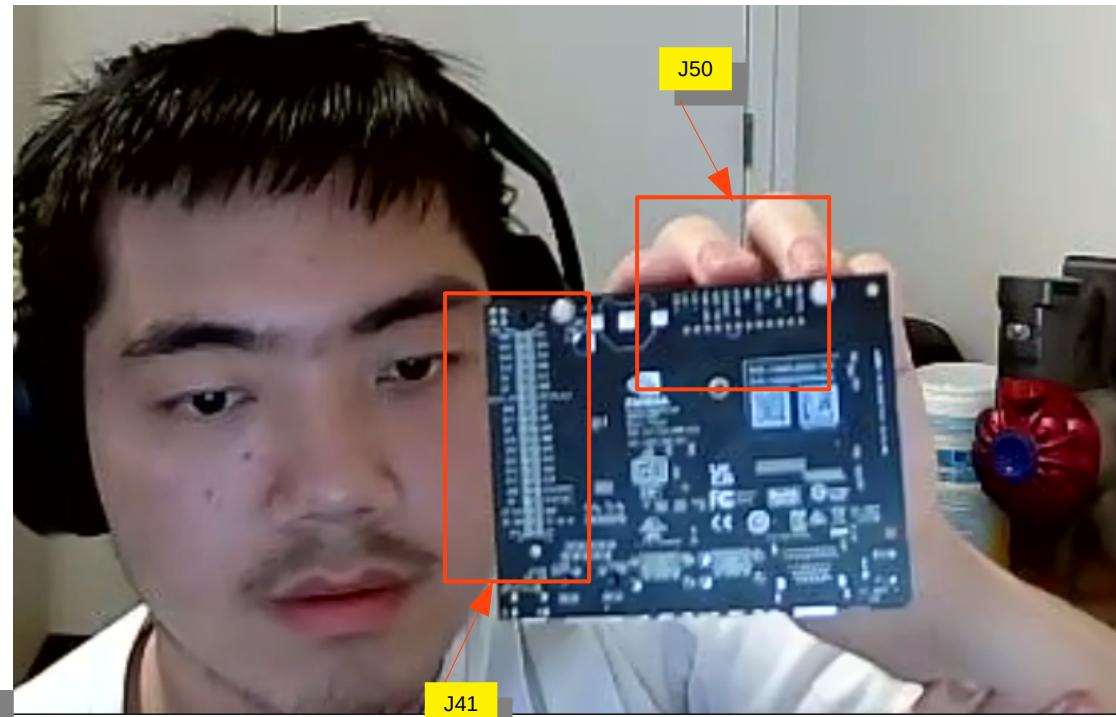
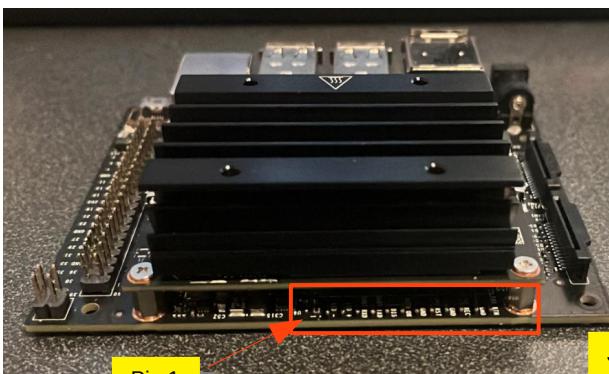


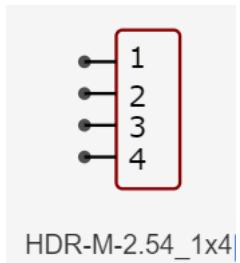
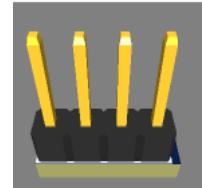
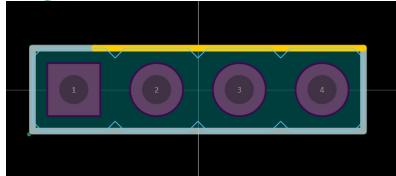
Table 2. J50
UART

J50 header (total 12 pins, one row) for UART Connection
Pin 4 - RX
Pin 5 - TX

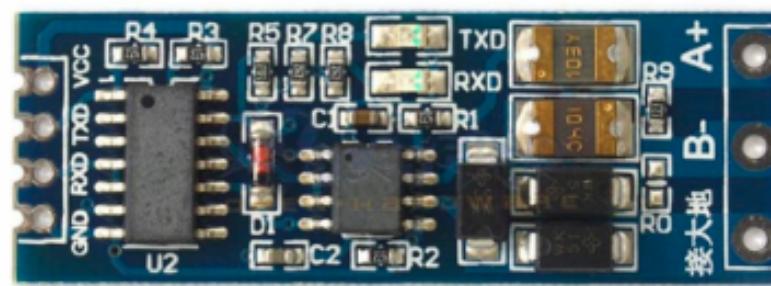


Connector/cable
information

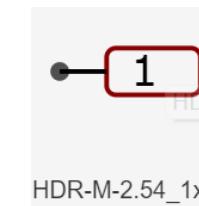
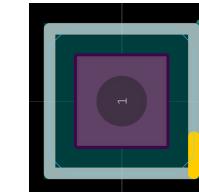
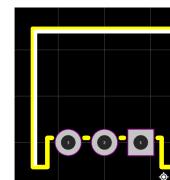
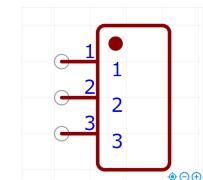
Components Selection of the UART part 7/5/23



We use the HDR-M-2.54_1X4 to connect the left through holes on the uart board. And here are its schematic model, footprint and 3D view.

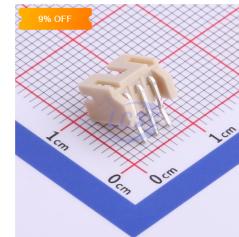
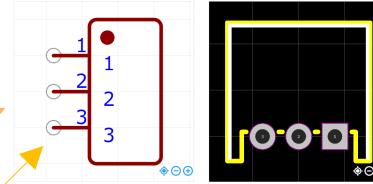
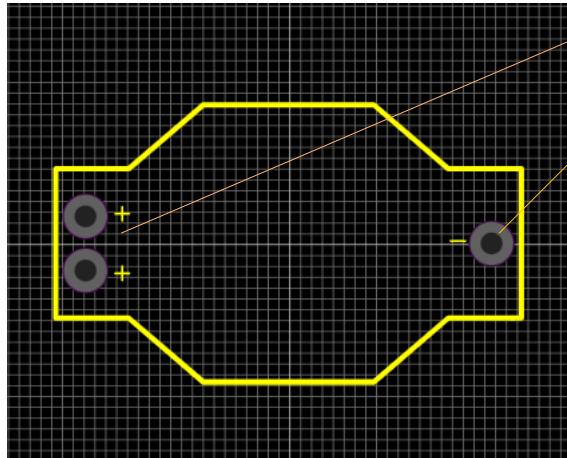


JST Sales America S3B-PH-K(LF)(SN) Component in real life. Match the JST connectors.



We use the three HDR-M-2.54_1X1 to connect the 3 right through holes on the uart board. And here are its schematic model, footprint and 3D view. And this three head males should be connected to JST connectors.

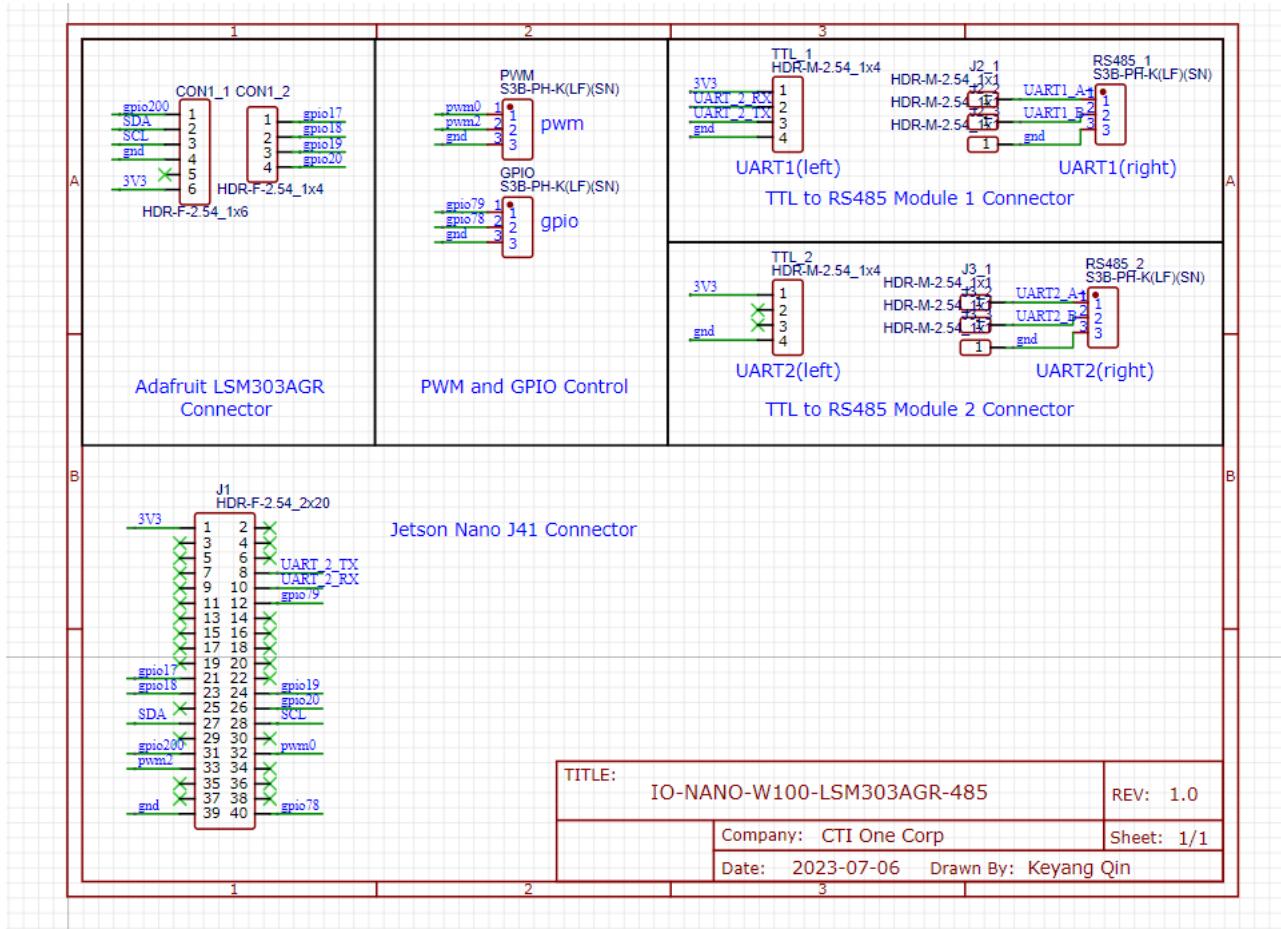
Components Selection of the Battery Holder 7/7/23



JST Sales America S3B-PH-K(LF)(SN) Component in real life. Match the JST connectors.

IO Board Design Schematic with UART (7/21-7/23)

HL, YZ, 2023-7-21: corrected
the typo by replacing the
previous label with “gnd”

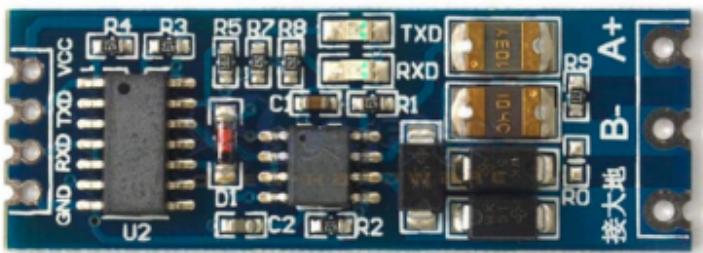
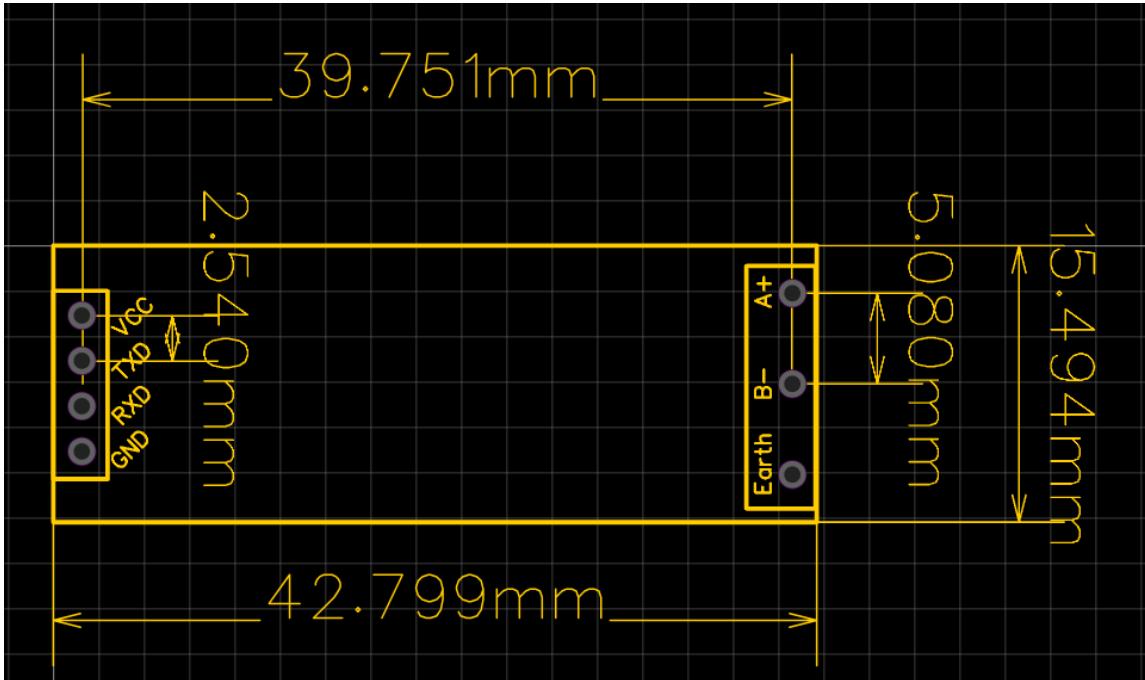


| | | | |
|---------------|-----|--------|-----------|
| UART1(left)_1 | VCC | J41-1 | 3V3 |
| UART1(left)_2 | TXD | J41-10 | UART_2_RX |
| UART1(left)_3 | RXD | J41-8 | UART_2_TX |
| UART1(left)_4 | GND | J41-39 | gnd |
| UART2(left)_1 | VCC | J41-1 | 3V3 |
| UART2(left)_2 | TXD | J50_RX | |
| UART2(left)_3 | RXD | J50_TX | |
| UART2(left)_4 | GND | J41-39 | gnd |

According the table above, connect each model with corresponding Pin.

J1-1 ----- > TTL_1-1
J1-10 ----- > TTL_1-2
J1-8 ----- > TTL_1-3
J1-39 ----- > TTL_1-4
J1-1 ----- > TTL_2-1
J1-39 ----- > TTL_2-4

Footprint of the 485 Module 7/1/23



Here are some important measurements:

Length: 42.799mm Width: 15.494mm

The distance between the left through hole and the right through hole:
39.751mm

Left:
From the top edge to the first through hole: 3.937mm

The spacing of the through hole:
2.540mm

The diameter of the through hole: 1mm

Right:

The spacing of the through hole:
5.080mm

The diameter of the through hole:
1.25mm

Footprint of the Battery Holder (HU1225-LF) 7/18-7/7/23



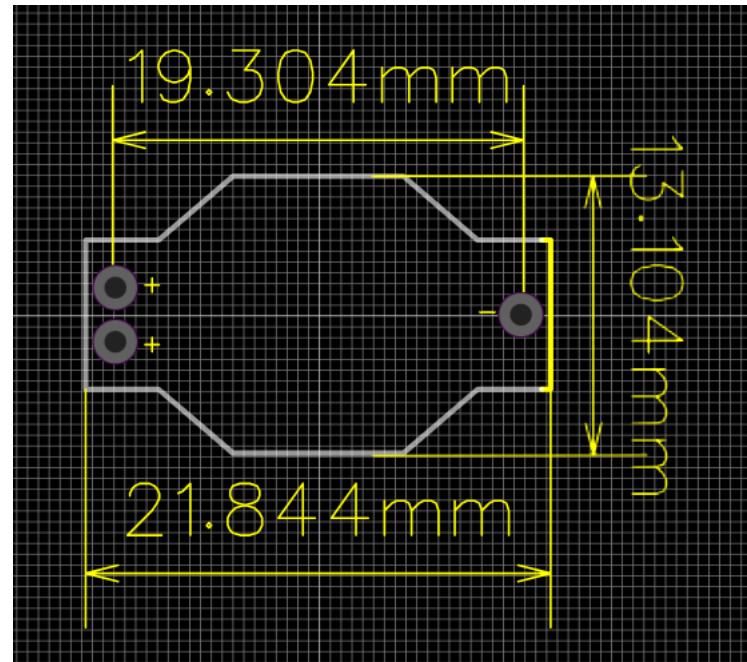
[https://www.mouser.com/
ProductDetail/Renata/HU1225-
LF?
qs=VBDla651eQFgeJRaxFmjFw
%3D%3D](https://www.mouser.com/ProductDetail/Renata/HU1225-LF?qs=VBDla651eQFgeJRaxFmjFw%3D%3D)

Cart

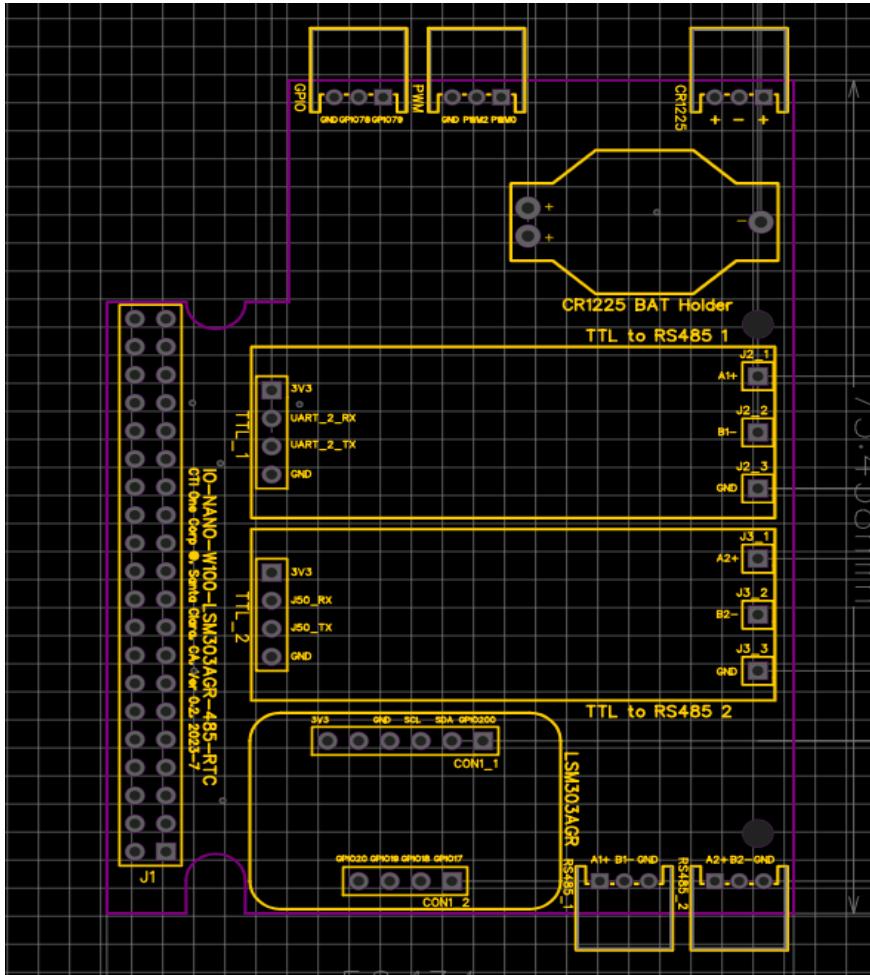
ADDED TO CART

Mfr. Part # HU1225-LF
Mfr.: Renata
Description:
Coin Cell Battery Holders THRU HOLE FOR CR1225
Qty: 10

Cart (2 items)
Cart Subtotal: \$10.26
[Continue Shopping](#)
[View Cart](#)



The basic layout 7/7/23

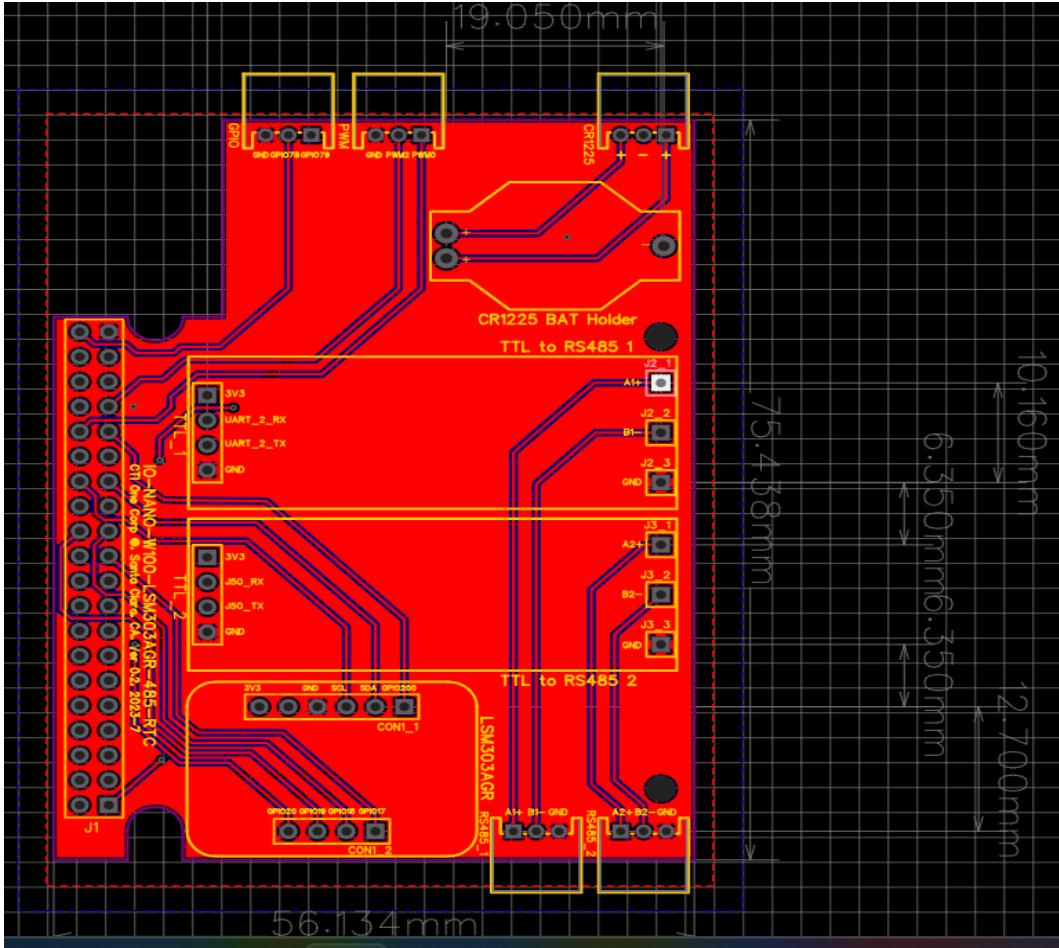


Requirements:

- (1) The length of the original board should not be extended so much.
- (2) The width of the board should be limited to 50-60mm.

IO Board Design PCB 7/7/23

Top layer with dimension



EasyEDA can help update the PCB board based on the modification of the schematic. After assigning the position of the elements. We can wire the components through the track. To avoid the intersection between wires, we can use the vias.

Finally, add a copper pour to the top layer and the bottom layer.

Bottom layer with dimension

