

Kiosk NFC

Use cases

- Kiosk
 - Scan NFC tag, display QR; user scans QR with mobile to see account balance, top up, etc.
 - Physical event enables function, scanning NFC tag delivers tokens to wallet (no phone required)
 - Bicycle generator demo
- Fablab access point
 - Authorize user - no phone needed = [-ph]
 - Record time on machine/in booth [-ph]
 - Pay for use using CW tokens [-ph]
 - Top up token balance using phone
 - Tokens transferable among affiliated makerspaces/fablabs/...
 - User tiers
 - Different rates?
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 - Ref commercial product <https://fabman.io/>
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- Merchant reader
 - Mini POS system:
 1. Salesclerk side: use HDMI touch screen to select item being sold (could be flutter app <https://github.com/ardera/flutter-pi>)
 2. Mini display and NFC reader at customer side: “scan tag to pay 4.25 SFLUV”
 3. Customer scans tag, which creates sales transaction on chain
 4. Salesclerk sees confirmation on screen
 5. System sends transaction data to accounting history endpoint
 - Or use QR instead of NFC
 - Same
 - Mini display: QR code
 - Customer scans QR with phone, signs transaction
 - Same
 - Same
- API proxy (ref Square discussion)
 - Filter API requests from CW indexer for security reasons
- Transient interactors
 - NFC-only (no phone), typically low or no financial value, low security
 - Attendance monitor (get token for being at event)
 - Activity credit (get token for dropping something in recycling receptacle)
 - Vending machine
 - Some cases could operate with intermittent network connection (storage of pending transactions)
 - Consider cost issues for event venues with large number of interactors
- Remote location

- No wifi; need alternate communications
 - Rely on user's mobile phone?
 - LoRa net to access point?

Hardware/Software

<https://github.com/chuck-h/rpi-kiosk>

Prototyping:

Raspberry Pi Arm Debian Linux

Wifi

NFC reader

Bluetooth (use case?)

Micro usb power, could use USB power bank for standalone (1 day?)

Hardware gpio (buttons, LEDs)

Display sufficient for QR code display

Audio output (for RPi zero, HDMI or

<https://learn.adafruit.com/introducing-the-raspberry-pi-zero/audio-outputs>)

Hardware security modules <https://store.zymbit.com/products/zymkey4i> ,

<https://www.sparkfun.com/products/15573>

Low cost:

ESP32 based e.g. <https://www.seeedstudio.com/Seeed-XIAO-ESP32C3-p-5431.html>

With display

<https://www.aliexpress.us/item/3256805784238887.html?gatewayAdapt=glo2usa4itemAdapt>

Remote:

LoRaWAN <https://en.wikipedia.org/wiki/LoRa>

Possible merchant setup: 1 tiny screen for customer interface, second ~5" hdmi touchscreen for sales clerk. Could have some POS features. Write to dedicated screen on RPi without using graphical OS:

<https://stackoverflow.com/questions/58772943/how-to-show-an-image-direct-from-memory-on-rpi>

Flutter on RPi! <https://github.com/ardera/flutter-pi> Upgrade to at least RPi Zero 2 W (Arm V7 or v8 is needed).

Qi wireless open charging receiver <https://www.adafruit.com/product/1901> . Packaged versions like

<https://www.amazon.com/Nillkin-Wireless-Charger-Receiver-Charging/dp/B01DLYF0Q0?th=1>

connect to usb power pack.

Based on power measurements

here: <https://www.cnx-software.com/2021/12/09/raspberry-pi-zero-2-w-power-consumption/> it's plausible we can keep well under 200ma (1 watt) at idle which would mean a 10,000 ma-hr power pack is good for a day or two per charge.

Some parts I bought for prototyping Qi charging for RPi POS:



YUMGOOD 2-Pack Power Bank 10000mAhx2 with 5V Dual USB&USB-C, Portable Charger Double Battery Pack for iPhone, Samsung, and Outdoor (Black & White)



Buy it again



313 Anker Wireless Charger (Pad), Qi-Certified 10W Max for iPhone 14/14 Pro/14 Pro Max/13/13 Pro Max, AirPods (No AC Adapter, Not Compatible with MagSafe Magnetic Charging)



Buy it again



Wireless Charger Receiver, 2pcs Type C QI Wireless Charger Charging Receiver Module Self Adhesive Sticker Charging Receiver for Mobile Phone



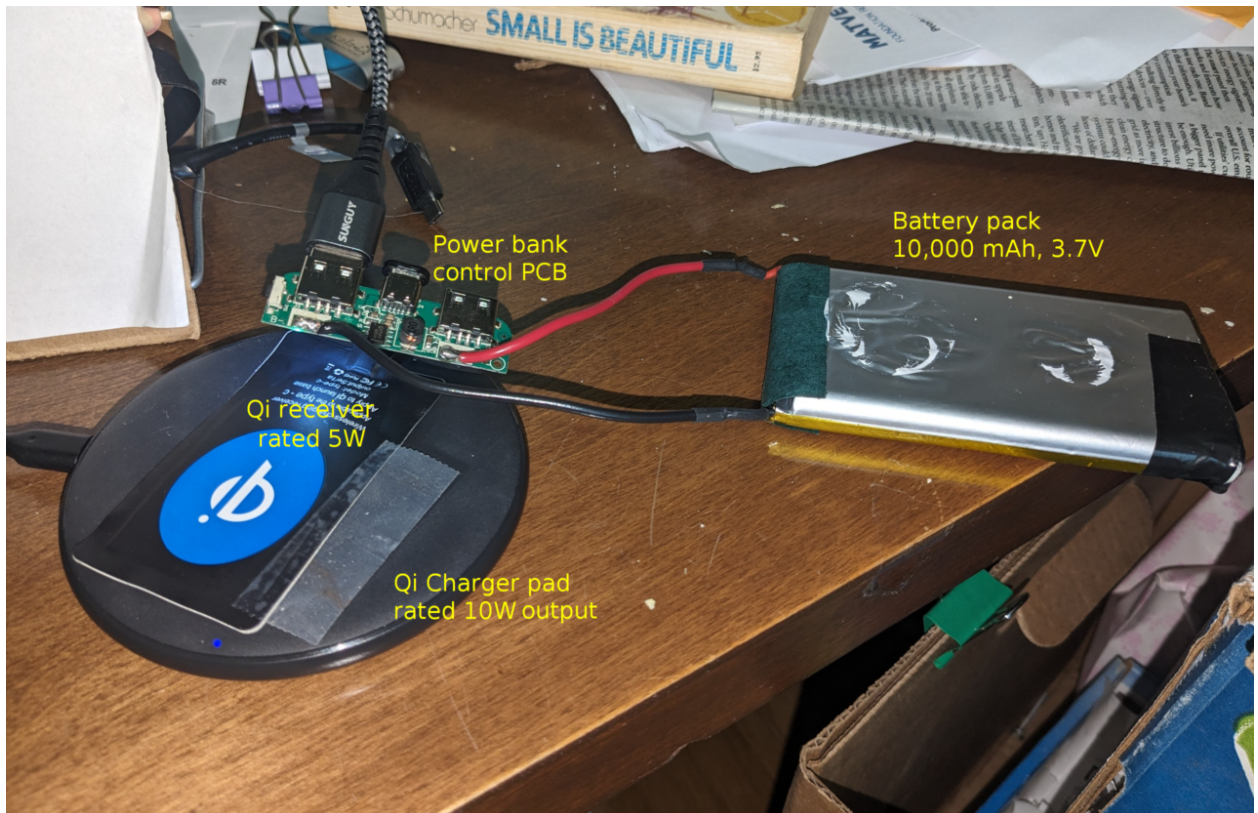
Buy it again



Buy it again

First charging test using parts above.

- Power bank 10,000 mAh is rating of internal 3.7V battery (not 5V output). Disassembled power bank.



- Connected to RPi Zero 2W with 1.3" display, NFC reader, 5" touch display containing LED backlight. Fully charged pack ran ~6 hrs before starting to blink warning light.
- Connected Qi receiver above (rated 1A 5V) to power bank, not quite enough to run kiosk (battery voltage still dropping very slowly).
- Disconnected 5" display, with RPi and other parts still running, battery is now charging slowly

Ordering 10W Qi receiver:

1 OTHER PERSON HAS THIS IN THEIR CART

Type C Wireless Charger Receiver
10W USB Type C Wireless Charging Receive BEA

beautylucky (863)
97.2% positive · Seller's other items · Contact seller

US \$12.41
or Best Offer
Was US \$13.20 (6% off)

US \$11.67 with coupon code [Price details](#)

Condition: **New**
Sale ends in: 1d 14h

More parts notes.

NFC reader Elechouse PN532

https://www.elechouse.com/elechouse/images/product/PN532_module_V3/PN532_%20Manual

V3.pdf <https://www.aliexpress.us/item/3256806046261874.html>
<https://www.amazon.com/HiLetgo-Communication-Arduino-Raspberry-Android/dp/B0111J17LC/>
Adafruit PN532 <https://www.adafruit.com/product/364>