

The macOS/win32 SLIP-39 App

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Creating personal Ethereum, Bitcoin and other cryptocurrency accounts is *urgently* needed, but is complex and fraught with potential for loss of funds.

All Crypto wallets start with a large, random number "Seed" used to derive all of your actual Bitcoin, Ethereum, etc. wallets. You do not want to try to generate such a Seed by yourself, or trust any hardware/software solution for this – even us! So, we architected the SLIP-39 App so you *don't need to trust it*.

Download the macOS (.pkg) or win32 (.msi) SLIP-39 App to generate Mnemonic cards to create (or back up an existing BIP-39) Seed securely and reliably, by distributing Mnemonic cards for recovering the Seed to partners, family and friends. Also, encrypted "Paper Wallets" can be output, to support software cryptocurrency wallets such as Metamask, Brave or various mobile-phone and computer-based wallets.

The best practice for *using* these Seed-generated wallets is to load this Seed into a secure hardware device, like a Trezor Safe 3 hardware wallet which supports both SLIP-39 and BIP-39 Seeds. SLIP-39 Mnemonic cards contain the recovery words, which can be typed directly into the Trezor device to recover the Seed, and all of its cryptocurrency accounts.

For the Ledger Nano and all other hardware wallets supporting *only* BIP-39 Mnemonics, **you can now use the SLIP-39 App to securely and reliably *back up* these fragile BIP-39 Mnemonic phrases.**

Later, when you (or your heirs!) need to recover **all** of your cryptocurrency accounts, someone can collect a sufficient threshold of all of the SLIP-39 cards and regain access to all of the cryptocurrency accounts related to the Seed.

Contents

1	Security with Availability	2
1.1	Back Up Your BIP-39 Phrase!	2
1.2	SLIP-39 Mnemonic Recovery Cards	2
1.3	Paper Wallets	4
2	Recommended Vendors	6
2.1	Trezor	6
2.2	Ledger	6
2.3	Netcoins.app	6
2.4	Crypto.com	6
3	Privacy Policy	7

1 Security with Availability

For both BIP-39 and SLIP-39, a 128-bit or 256-bit random "Seed" is the source of an unlimited sequence of Ethereum, Bitcoin, etc. HD (Hierarchical Deterministic) Wallet accounts.

Anyone who can obtain this Seed gains control of all Ethereum, Bitcoin (and other) accounts derived from it, so it must be securely stored.

Losing this Seed means that **all** of the HD Wallet accounts derived from it are permanently lost. Therefore, it must be backed up reliably, and be readily accessible.

Therefore, we must *both*:

- Ensure that nobody untrustworthy can recover the Seed, but
- Store the Seed in many places with several (some perhaps untrustworthy) people.

How can we address these conflicting requirements?

1.1 Back Up Your BIP-39 Phrase!

The SLIP-39 App helps you to break your BIP-39 recovery phrase into multiple "Groups" and "Cards", and recover it any time you need it. Any individual cards are **not** usable to access or recover the BIP-39 recovery phrase.

Even if you don't want to distributed the cards to multiple people, but just wish to more securely and reliably store your BIP-39 recover phrase, SLIP-39's Shamir's Secret Sharing System allows you to "break up" your BIP-39 recovery phrase into several pieces which you can store in different locations. If you lose some of them, you can still recover the BIP-39 recovery phrase!

1.1.1 Alternative Installation (for techies, on macOS or Linux)

Open a terminal and run:

```
$ python3 -m pip install slip39[gui]
$ python3 -m slip39.gui
```

1.2 SLIP-39 Mnemonic Recovery Cards

We don't recommend writing down one BIP-39 12-word or 24-word Mnemonic phrase, and hoping that **you** can find it, but that nobody else **ever** finds it!

Instead, generate a number of SLIP-39 Mnemonic cards, which can be collected to recover the Seed:

1.2.1 Why Not a BIP-39 Mnemonic Phrase?

If **everyone** you talk to is recommending that you just write down your 12- or 24-word phrase and store it somewhere, why not do this?

It is estimated that 20% of Bitcoin is already lost in the first 10 years of its existence, stored in wallet addresses that can never be accessed because the corresponding "Private Key" has been lost, or the passphrase forgotten.

The statistical chances of anyone successfully passing a cryptocurrency wallet Private Key + passphrase or Seed to their heirs over a 50-year period is therefore very low. Since memory fades



Figure 1: SLIP-39 App

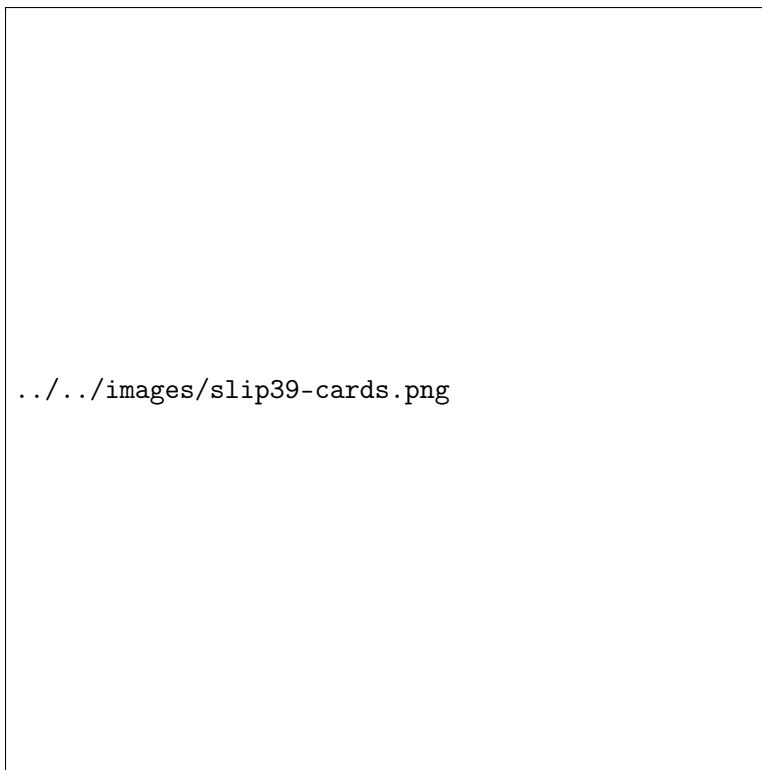


Figure 2: SLIP-39 Cards PDF

and "safe" storage places are lost, destroyed or forgotten, this risk actually increases exponentially over time.

I estimate the probability of successfully inheriting such a Paper Wallet + passphrase or BIP-39 Mnemonic protected Seed is probably less than 50%. Perhaps **much** less.

1.2.2 Why Not a BIP-38 Encrypted Wallet + Passphrase?

Have you ever forgotten a password to an online account?

Well, with a BIP-38 Encrypted Wallet + passphrase, there is *no password reset* option; there is no way to recover the passphrase.

If the Wallet is lost, there is of course no way to recover it, even if you have the passphrase.

This option is perhaps even less desirable than using a BIP-39 Mnemonic Seed phrase, because each and every Encrypted Wallet is exposed to this risk of loss.

1.2.3 Recovering your BIP-39 Seed Phrase

If you already have a BIP-39 Mnemonic, and would like back it up using SLIP-39 for more security and recovery reliability, you can use the SLIP-39 App's Backup Controls to do so. After you create your Seed Data (or enter an existing BIP-39 Seed Phrase), select "Using BIP-39". This will generate a set of SLIP-39 Mnemonic Cards that **backs up your existing BIP-39 Seed Phrase**.

Later, when you need to recover your BIP-39 Mnemonic (say, to initialize a fresh replacement Ledger hardware wallet), use the SLIP-39 App, select the Recover Controls, and enter sufficient SLIP-39 card Mnemonics – and click "Using BIP-39" to reveal your original BIP-39 Seed Phrase. Then, proceed with Ledger wallet recovery as normal, using the BIP-39 Mnemonic.

This may not *seem* like an impressive feat. But, it is unexpectedly important and powerful! Your existing BIP-39 Seed Phrase is **extremely** risky; it can *easily* be lost or stolen. By using SLIP-39 to Backup your BIP-39 Seed Phrase, you can distribute the safe and reliable SLIP-39 Mnemonic cards to friends and family, and reduce the risks of theft or loss of your critical cryptocurrency accounts Seed data.

Learn how to use the SLIP-39 App to "back up" your BIP-39 Mnemonic Phrase:

1.3 Paper Wallets

If desired, you can produce encrypted Paper Wallets, to support software crypto wallets (eg. MetaMask, Brave or various mobile- and computer-based wallets):

1.3.1 Walking-Around Money

Money that doesn't *work* has low utility and hence low value. There are often situations where you want to transport money physically, perhaps to buy something somewhere where you have no access to a computer, or by mail. Paper Wallets allow this.

Losing this Paper Wallet usually results in the loss of the funds held in it. But, not if you generate it from your Seed!

Just pick a derivation path you aren't going to use for your own personal wallets (eg. ending in `...99'/0/0`), and generate some Paper Wallets (use each derivation path only once, of course). Fold them up so that the Private Key is not visible, laminate them and deposit funds into the wallet public address using the visible QR code.

The recipient can cut and unfold the Paper Wallet, exposing the private key and password hint, and can transfer the funds into their own wallet.



Figure 3: SLIP-39 Overview – BIP-39 Mnemonic Backup



Figure 4: Paper Wallets

If the Paper Wallet is ever lost, you can recover the Private Key (it was derived from your Seed!), and transfer the cryptocurrency back into one of your own wallets.

2 Recommended Vendors

To assist you in obtaining various SLIP-39 compatible components, we have established some relationships with reliable vendors. If you do nothing else – get a Hardware Wallet!

Regardless of whether or not you decide to use safer SLIP-39 Mnemonics, or just continue on with your BIP-39 Mnemonic phrase: using a Hardware Wallet or two to secure your Seed and all of its derived crypto wallets is the safest way to access your cryptocurrency!

2.1 Trezor

The inexpensive Trezor Safe 3 hardware wallet has built-in SLIP-39 generation and recovery capability. Enter the words on the SLIP-39 cards directly into the screen of the Trezor to recover your cryptocurrency accounts.

We recommend the Trezor Safe 3 for this reason. No other hardware wallet yet supports direct, on-screen SLIP-39 Seed recovery.

If you already have one of the less expensive Trezor wallets that only support BIP-39 backup, we also support those, using the same BIP-39 Seed Entropy backup via SLIP-39 as for the Ledger, and other traditional hardware wallets.

2.2 Ledger

The Ledger hardware wallets are also very popular – but they can be recovered only using BIP-39 Mnemonics. However, you can now use the SLIP-39 App to backup your BIP-39 Seed Entropy! Therefore, we now support the Ledger hardware wallets.

The Ledger Nano S Plus has a large screen, at a reasonable price point, and connects via USB-C.

The Ledger Nano X has a large screen and supports connectivity via Bluetooth, for much easier connectivity with mobile phone and laptop wallet software.

2.3 Netcoins.app

In Canada, one of the more highly regulatory-compliant cryptocurrency exchanges is Netcoins.app (referral code: 5YO1MZ); sign up with this referral link, and we both get some benefits.

They have higher than typical Interac e-transfer limits, which is very nice. However, they don't support a wide range of cryptocurrencies; presently, only BTC, ETH, XRP, LTC, BCH, USDC, and a few other lesser-known coins.

They also have a crypto-backed credit card which works well in Canada.

2.4 Crypto.com

Use my referral link for Crypto.com (referral code: 2x4hk92dnf) to sign up for Crypto.com and we both get \$25 USD :)

The Crypto.com exchange has many more coins available, as well as a crypto-funded credit card that works in Canada.

3 Privacy Policy

SLIP-39 does not save or store any data input to or output from the app. Any SLIP-39 Mnemonic card PDFs exported by the app are saved on your device in the location that you specify after clicking the 'Save' button.