Aktionariat

Aktionariat AG, CHE-453.438.437, legal@aktionariat.com
Weinbergstrasse 18, CH-8703 Erlenbach, Switzerland

Brokerbot Architecture

Design and Interaction Overview

Overview

A Brokerbot has two sets of functions: the functions for the end users that want to buy or sell tokens, and the administrative functions for the issuers to configure and manage their copy of the Brokerbot. To access these functions, both the users and the administrators need an Ethereum wallet. Given the technical skills, it is possible to interact directly with the Brokerbot contract, bypassing the Brokerbot Widget or the Corporate Dashboard. In practice, however, access to the smart contract is usually done with the help of these supporting components that nicely display the relevant information and help to setup the cryptographic transactions to call the desired functions in the smart contract.

The document is structured into two sections: one describing the involved components and one describing the available functions.

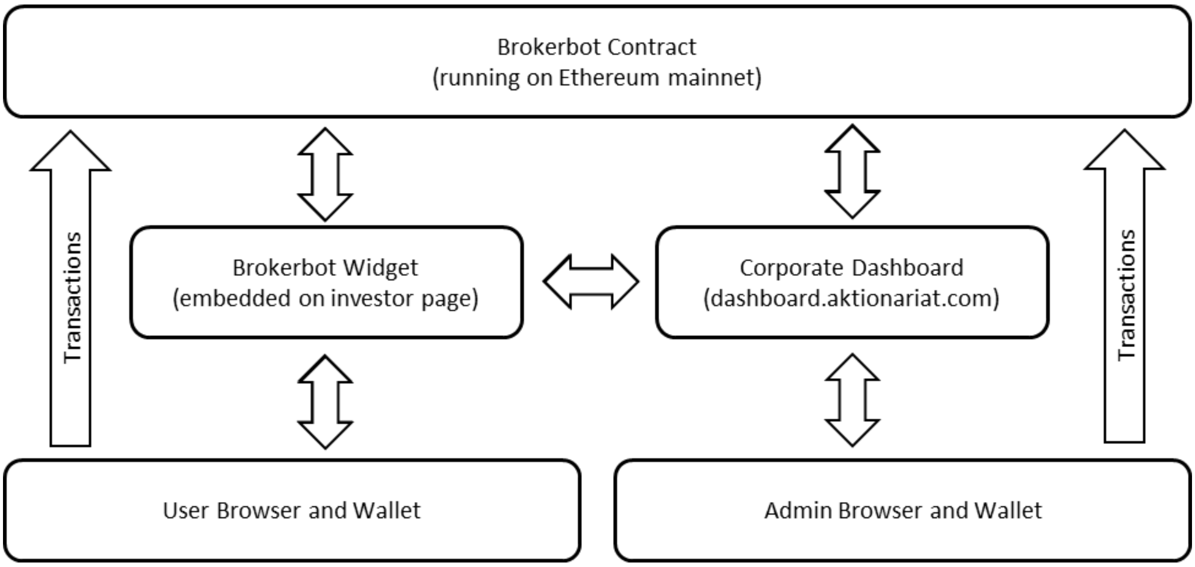


Figure 1 Component Overview

Components

Brokerbot Contract

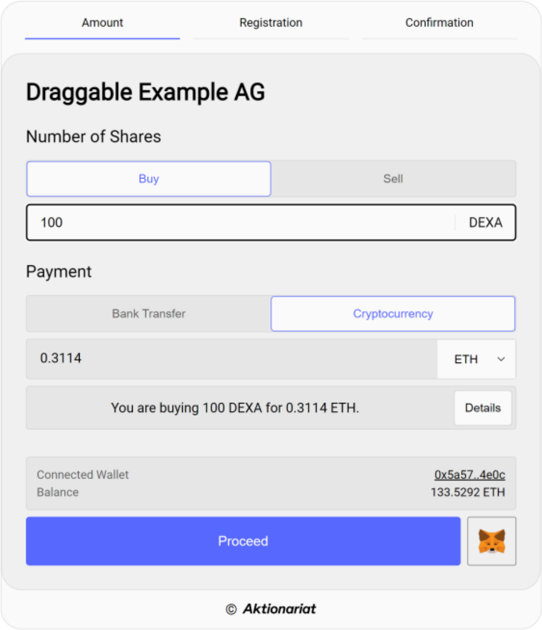
The core functionality of the Brokerbot resides in a smart contract deployed on the Ethereum blockchain. The source code is open and the latest version can be found on github.com/aktionariat/contract/brokerbot/Brokerbot.sol

The Brokerbot contract is owned by the issuer and can be equipped with shares and capital in the form of blockchain-based tokens. A Brokerbot can only enable the trading of one token. If multiple tokens (e.g. two different share classes) ought to be traded, two separate Brokerbots must be setup. Regarding the means of payment, the Brokerbot is more flexible in in principle capable of accepting any means of payment. All the assets stored in a Brokerbot belong to the issuer.

The Brokerbot contains a pricing mechanism that can be configured by the issuser. The issuer can set the price to an arbitrary value and can also define how the price changes over time. This is done through two parameters, the "increment" and the "drift". The increment defines by how much the price is adjusted upwards or downwards for each share sold or repurchased. The drift allows the issuer to make the price automatically change over time, e.g. 10% per year. This latter feature has not been used in practice so far. There is only one price that is applied to both, the sale and the repurchase of shares.

Brokerbot Widget

The Brokerbot widget is a web component that can be embedded on any website – typically this is the investor relations page of the issuer. It provides a convenient frontend to interact with the Brokerbot Contract. It exchanges configuration data and registration data with the Corporate Dashboard. The configuration includes language settings, information about the offered means of payment, and registration requirements. Further, it collects shareholder names and addresses and forwards that registration data to the Corporate Dashboard in order to automatically registers buyers of share tokens in the shareholder registry of the issuer. It also tell the Corporate Dashboard to send out trade receipts and other notification emails to its users and the issuer.



Draggable Example AG

Number of Shares

100 DEXA

Payment

0.3114 ETH

You are buying 100 DEXA for 0.3114 ETH.

Connected Wallet 0x5a57..4e0c
Balance 133.5292 ETH

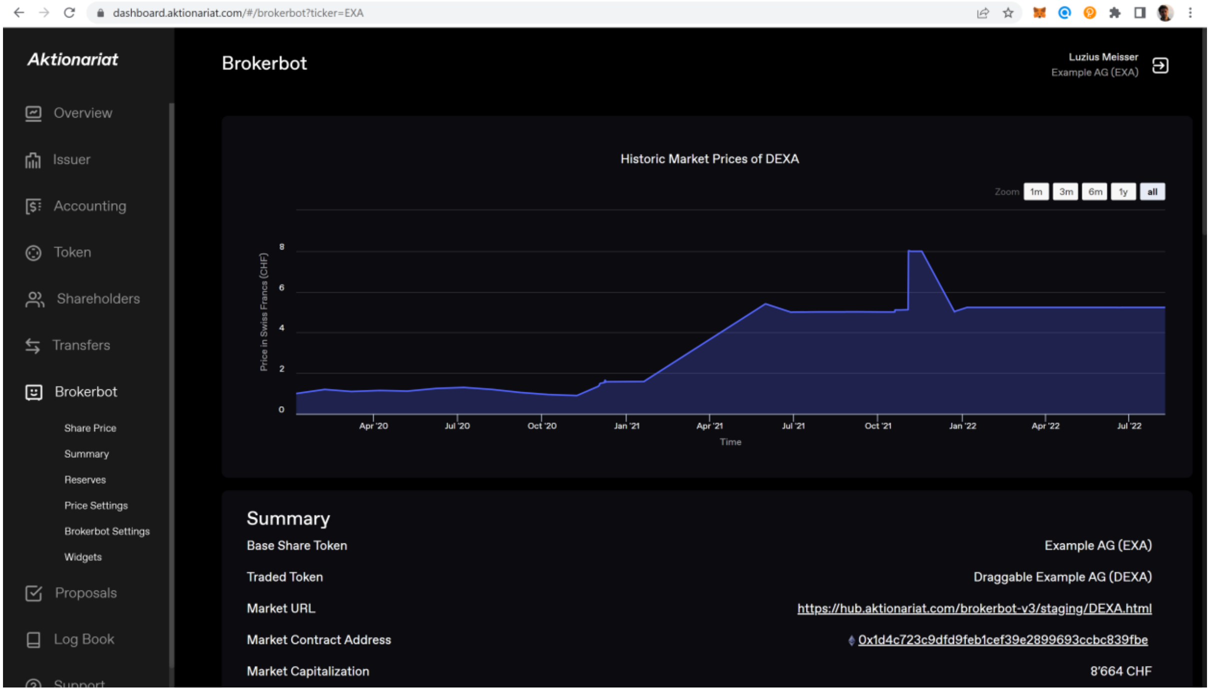
Figure 2 Screenshot of the Brokerbot Widget

User Browser and Wallet

In order to interact with the Brokerbot, users need to have a Web Browser and an Ethereum Wallet. Aktionariat itself offers a Portfolio App that can serve as such a wallet, but users can also choose MetaMask or any other wallet that supports the WalletConnect standard that is used to connect to the Brokerbot Widget. When a user clicks the buy or the sell button, the Brokerbot Widget prepares the transaction in the Web Browser of the user and then sends it to the Wallet App. The Wallet App presents the transaction to the user and if the user confirms it, it is signed and sent to the Ethereum network for processing.

Corporate Dashboard

The Corporate Dashboard is hosted by Aktionariat on dashboard.aktionariat.com . It provides issuers with a convenient interface to manage their shareholders, tokens, and their Brokerbot. In the background, the Corporate Dashboard obtains the displayed data from two sources, the Ethereum blockchain and a database operated by Aktionariat in a Swiss datacenter. This database contains all registration data of shareholders, configuration data, and other useful pieces of information. The Corporate Dashboard constructs the shareholder registry of the issuer by combining token data found on the Ethereum blockchain with the registration data found in the database. It can also be used to initiate proposals to withdraw assets from the Brokerbot and to change its configuration. Typically, this is done through multisignature transactions that require the approval of multiple administrators (collective signature).



Summary

Base Share Token	Example AG (EXA)
Traded Token	Draggable Example AG (DEXA)
Market URL	https://hub.aktionariat.com/brokerbot-v3/staging/DEXA.html
Market Contract Address	0x1d4c723c9dfd9feb1cef39e2899693ccbc839fbe
Market Capitalization	8'664 CHF

Figure 3 Screenshot of the Corporate Dashboard

Admin Browser and Wallet

To access the corporate dashboard, the issuer needs a Web Browser and the Aktionariat Portfolio App. Unlike the Brokerbot, the Corporate Dashboard currently does not support any other Ethereum wallet. (Nonetheless, any Ethereum wallet could be used when bypassing the Corporate Dashboard and interacting with the Brokerbot Contract directly.)

Functions

Buying with Crypto Currencies

The primary function of the Brokerbot is to allow users to buy the offered tokens with crypto currencies. The default currency when doing so is the Cryptofranc (XCHF), a Swiss franc based stablecoin issued by Bitcoin Suisse. The Swiss franc is also the accounting currency and the currency in which the price is defined. Users can also pay with other supported crypto currencies, in which case the issuer can configure the Brokerbot to either automatically convert them into Cryptofrancs or to keep them in their original form. Conversions are automatically done in the background through the decentralized Uniswap exchange. When the issuer decided to keep the original currency (for example Ether), the applied exchange rate is fetched from Chainlink and the currency added to the Brokerbot's reserves. The latest version of the Brokerbot Widget does not allow users to buy tokens without providing shareholder registration data.

Buying by Bank Transfer

The majority of buyers prefer paying with a traditional bank transfer. In these cases, the Brokerbot Widget does not interact with the Brokerbot Contract. Instead, it tells the Corporate Dashboard to send out an offer to the buyer by email. This email contains the banking information of the issuer. To handle this type of transfer, the issuer must monitor their bank account and once the payment arrives, they can login to the corporate dashboard to confirm the arrival of the payment, which in turn generate a transaction to tell the Brokerbot to release the purchased amount of shares to the buyer. As soon as the required quorum of administrators have signed the transaction using their wallets, the transaction is sent to the Brokerbot Contract, which in turn sends the purchased shares to the wallet of the buyer.

Selling

Selling is only supported against Cryptofrancs. It is the reverse operation of buying with Crypto. The user sends share tokens to the Brokerbot and gets the according amount of Cryptofrancs in return.

Pricing Mechanism

The issuer controls the Brokerbot and perform the following operations using blockchain-based transactions:

- Deposit and withdraw shares from the Brokerbot
- Deposit and withdraw CryproFrancs and other supported means of payment
- Set the current price
- Set the price adjustment per share sold or repurchased
- Set the price drift
- Enable and disable buying
- Enable and disable selling

For example, if the price is set to 5.00 CHF and the price adjustment is set to 0.01 CHF per share, buying 10 shares would push the price to 5.10 CHF, with the buyer having to pay 5.05 CHF at average. A subsequent seller selling 6 shares would get an average price of 5.07 CHF and push the price down to 5.04 CHF. If another seller shows up an sells 4 shares, we that seller would get 5.02 CHF per share and we would be back at 5.00 CHF and the initial number of shares in the Brokerbot. Regardless of the price path, the Brokerbot will always be back again at the same number of shares and the same amount of capital when it reaches the same price again. This property is commonly referred to as path-independence and protects the issuer from being exploited by clever traders.

Other Admin Functions

Besides the pricing, the issuer can also invoke a set of other functions on the Brokerbot contract using blockchain-based transactions:

- Deposit and withdraw shares from the Brokerbot
- Deposit and withdraw CryproFrancs and other supported means of payment
- Enable and disable buying
- Enable and disable selling
- Configure whether received Ether should be automatically converted
- Configure which helper contract (“payment hub”) should be used to receive payments