

# **Mergex.io**

**technical sheet**

# Table of contents

Table of contents.....	2
About.....	3
Order .....	4
Deposit and withdrawals.....	5

# About

Mergex.io is a platform for decentralized trading (exchange) of ERC20 tokens and nonnative ERC20<sup>1</sup> tokens (more on this later) via a smart contract system developed on the Ethereum network.

The premise of having a smart contract in handle trading of tokens is for a more trust-less system where a network and computer code are employed as the mechanism for this to happen. Because no one can change the smart contract once it is up and running on the blockchain.

Mergex.io is based on this premise, but with some added features and benefits. Mainly, the benefit of having the ability to support trading of nonnative ERC20 tokens (other blockchain coins like Bitcoin, Litecoin etc).

This is achieved by having a hybrid system, where the main trading is still contract based (trust-less), but the input (conversion) of coins from other blockchains to an ERC20 one is done by a trusted third party.

This is not the first attempt and building a decentralized trading platform. There is already a working one called Etherdelta (<https://etherdelta.com>). But the main differences between Mergex and Etherdelta is that Etherdelta support only ERC20 tokens, while Mergex will support all ERC20 tokens but also can add support for virtually any coins build on another blockchain (cross chain ERC20 conversion).

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<sup>1</sup> A **nonnative ERC20** token is a ERC20 token which is used as a link between the smart contract and the other blockchain. The value of that new ERC20 token is the same as the value of the real coin (i.e. 1 XBTC is equal to 1 BTC), and the naming is similar (with a prefix to indicate that it is a token representation of a coin).

# Order

The main purpose of an exchange is to fill orders. There are buy and sell order which come in different amounts and at different prices.

The job of the exchange is to enable users to set buy and sell order, but also to ensure that if a sell order is at a price bellow a buy order, that it first fills that buy order before setting a sell order at that particular price. This is done to keep the price going up and down depending on the current market trends, and not making a mess of it.

For example, we have a buy order for 100 Xcoins at 0.1 Ycoins. and the current price is at 0.11 Ycoins, and a user wants to sell 150 Xcoins but doesn't want to wait (for a sell order to fill or a new higher priced buy order to appear) and instead he places a sell order for those 150 Xcoins at 0.1 Ycoins. The system needs to see this and fill the buy order for 100 Xcoins at 0.1 Ycoins, and then make a sell order for 50 Xcoins at a price of 0.1 Ycoins. Now the current market price is at 0.1 Ycoins, as opposed to the previous price of 0.11 Ycoins (before this example trading occurred).

This type of not letting the users make a mess of the sell and buy orders by not giving them and change to make overlapping orders we'll call auto-filling orders.

Mergex.io will store all it's order on the smart contract itself, so that all orders are visible to everyone, and that all orders are accessible to everyone.

# Deposit and withdrawals

## Depositing tokens:

In order for users to be able to place buy or sell order, they first need to be able to deposit the tokens which they want to trade for other tokens.

For ERC20 tokens this is more straightforward than for nonnative ERC20 tokens.

## ERC20 tokens:

For native ERC20 tokens a user needs to select which token they want to trade and then approve the amount of coins that they want to deposit to Mergex.io (which is a smart contract). When they approve the coins, there will be an event which will be registered by the Mergex.io smart contract and the funds will be deposited (transferred) to the exchange. This way the user has the control of their coins.

## Nonnative ERC20 coins:

As for the nonnative ERC20 tokens, they are based on a blockchain that is not Ethereum's which the smart contract (Mergex.io) uses. Because the smart contract can only interface with native ERC20 tokens, we need to make a bridge token that has the same value of the other blockchain coin<sup>2</sup> as shown below.



The Xcoin depicted is a coin like Bitcoin, Litecoin or any other coins that is not Ethereum or a Token on the Ethereum blockchain. Because of that we can't use it with our smart contract (which is on the Ethereum network). We need an "interface"/"bridge" coin to bridge the gap between blockchains. For those reasons we need to make a copy of the Xcoin as an ERC20 token.

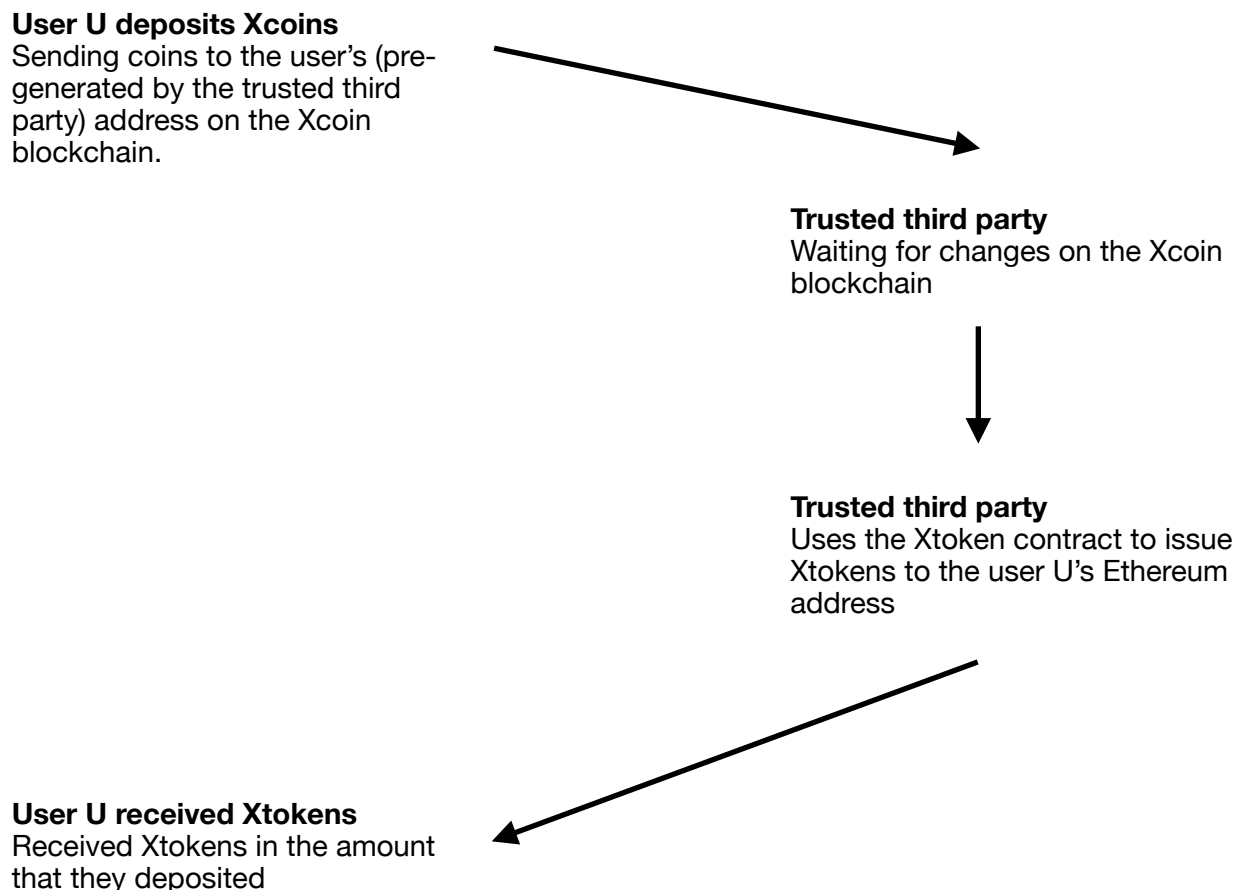
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<sup>2</sup> "Tokens" are referred to as the value stores on the Ethereum blockchain, and "coins" are referred as values stores on other blockchains like Bitcoin, Litecoin etc... Bridge tokens and nonnative tokens are the same thing.

The conversion from coin to token is handled by a trusted third party which issues the token and insures that the value of the token and the coins is the same (i.e. 1BTC is equal to 1xBTC, where xBTC is a token based on Bitcoin).

The way that a user deposits their coins to the exchange (smart contract) is by depositing coins to a predefined address of the non Ethereum blockchain (generated when the user first used the exchange with their Ethereum wallet, because all of their data is verified by their Ethereum wallet address, so there is no need for an username and password in order to use the exchange).

Then the trusted third party will check all addresses to see if there were any new incoming transactions. If there are, then the trusted third party issues new tokens for that specific coin and user (issuing coins is done by only the trusted third party and is done on the token contract made for that bridge token). When the coins are issued to the users address, they can then proceed to the exchange and trade freely.



## **Withdrawing tokens:**

Withdrawing token from the Mergex.io (smart contract) exchange is the reverse process of depositing.

### **ERC20 tokens:**

For native ERC20 tokens, withdrawing is as simple as setting the token you wish to withdraw, the amount of tokens and to click on the withdraw button. All of this is achieved on the Mergex.io exchange website.

### **Nonnative ERC20 coins:**

As for nonnative ERC20 tokens, it's similar to the deposit process. The user first needs to submit a request on the exchange website. Select the token, amount and non Ethereum blockchain address to which they wish to withdraw and clicking the submit button. This will send the user's tokens to the trusted third party and put the user's request in a queue to be processed.

The third party, watching the token smart contract, will see the change (tokens received) on the token smart contract that is associated to that withdraw request. Then they will hold on to the tokens and then proceed to release the coins on the non Ethereum blockchain to the user specified non Ethereum blockchain address.

