BLOCKiT
Blockchain Based Technologies

LANA Smart Contracts

USE GUIDE

The product consists of two smart contracts for the Ethereum Blockchain:

1. The ***LANA Contract*** contains the definition of the LANA token, in accordance to the ERC-20 standard.

2. The ***ICO Contract*** provides functionality for an Initial Coin Offering for the LANA token. It interacts with the LANA Contract to allow the purchase of LANA with ETH.

OVERVIEW

The ***LANA Contract*** allows for the transfer of LANA Tokens between users.
It generates 100,000,000 LANA tokens when first deployed, and does *not* allow further minting of tokens.

The ***ICO Contract*** sells LANA Tokens for ETH at a fixed rate set by the owner of the ICO Contract.

DEPLOYING THE CONTRACTS

First, the LANA Contract must be compiled and deployed into the Ethereum Network using any interface application (such as MetaMask, Go Ethereum, *et cetera*). It will generate the total supply of 100,000,000 LANA tokens and give them all to the *owner* (the address that was used to deploy the LANA Contract, in this case Blacksheep's wallet).

Next, the ***ICO Contract*** must be deployed, for which the Address of the deployed LANA Contract will be required.

The ***ICO Contract*** owner must then call the *setPrice( )* function to define the exchange rate between ETH and LANA. The rate is defined as the price of a single LANA Token in *Wei* (Ethereum's minimum transaction unit, equal to 10^{-18} ETH).

Lastly, the ***ICO Contract*** needs to be founded by making a transfer of LANA Tokens to the deployed ICO Contract's address, so that it may begin selling those tokens for ETH.

USE OF THE CONTRACTS

The LANA Contract implements all mandatory and optional functions from the ERC-20 standard (for a detailed description of all functions provided, see function details below).

The LANA Contract keeps track of token balances and provides functionality to transfer tokens between accounts.

In Back-end operations, LANA token balances and transfers are registered in minimum transaction units of 10^{-18} LANA. Front-end applications take care of conversions in order to express quantities in LANA units, with up to 18 decimals as required.

The LANA Contract also tracks allowances, enabling a user to approve a certain amount of tokens from their account to be spent by a different user.
For example, if user A approves an amount of X tokens for user B, then user B can spend up to X tokens from user A's balance.

As this contract operates LANA only, any attempt to send ETH to the LANA Contract will be reverted automatically.

The ICO Contract provides an interface for users to purchase LANA tokens. It holds LANA Tokens on its own balance, and distributes them to users who pay ETH to it.

The initial stock of LANA tokens for the ICO must be transferred from Blacksheep's wallet as mentioned earlier, and the price must be set by the contract owner before any LANA can be sold.

In order to purchase LANA tokens from the ICO contract, a user simply needs to send ETH to the ICO Contract's address, and will receive in return as much LANA as can be afforded with the amount of ETH sent. The ETH paid will be automatically sent to the ICO contract's owner.

An exception to this is when the contract owner sends ETH. In this case no LANA will be purchased, and the ETH sent will be left in the ICO Contract's wallet to pay any gas necessary for LANA transfers.

Both contracts also include a function to send any ERC-20 compliant tokens from the contract's account to the contract's owner.
This provides a mechanism to recover any tokens accidentally sent to the contract's account.

Function details

The ***LANA Contract*** provides the following functions:

- name()

Returns the token's name, "LANA token".

- symbol()

Returns the token's symbol, "LANA".

- decimals()

Returns the number of decimals the tokens uses, 18, meaning the contract is able to register transactions of as little as 10^{-18} LANA tokens.
This is the same decimal precision used by ETH.

- totalSupply()

Returns the total amount of tokens in existence, 100,000,000.

- balanceOf(address)

Receives the address of a wallet or contract, returns the amount of tokens owned by that address.

- transfer(address, amount)

Receives the address to transfer tokens to and the amount to send, and attempts to transfer the specified amount from the user calling the function to the specified address.
Returns true if the transfer was successful, or false if there was a problem (such as the amount to transfer being larger than the caller's balance).

- approve (spender, amount)

Sets the allowance of the specified spender address to the specified amount, allowing the spender to spend up to the specified amount of tokens from the caller's balance.
When this function is called, any remaining allowance will be ignored, and the specified amount will replace the spending limit, rather than adding to it.

- allowance(holder, spender)

Returns the allowance the specified holder address has approved for the specified spender address. That is to say, the amount the spender is allowed to spend from the holder's account.

- transferFrom(holder, receiver, amount)

Receives a holder address to transfer tokens from, a receiver address to transfer to, and an amount to transfer, and attempts to make the transaction.
Returns true if the transfer was successful, or false if there was a problem (such as the amount to transfer being larger than the caller's allowance for the holder's account).

- reclaimERC20(address, amount) [**not defined in the ERC-20 standard**]

Receives the address of a ERC-20 token contract, and attempts to transfer the specified amount of tokens of the type defined by that contract, from the LANA contract's balance to the balance of the LANA contract's owner.
Returns true if the transfer was successful, false otherwise.
Only the LANA contract's owner may call this function.

The ***ICO Contract*** provides the following functions:

These three functions are accessible only by the contract's owner:

- setLANA_address(address)

Changes the registered address of the LANA token contract.

- setPrice (price)

Receives the price in WEI of one LANA token, registers it, and enables the sale of tokens.

- reclaimERC20(address, amount)

receives the address of a ERC-20 token contract, and attempts to transfer the specified amount of tokens of the type specified by that contract, from the ICO contract's balance to the balance of the ICO contract's owner.
Returns true if the transfer was successful, false otherwise.

There is also a function available to anyone:

- getPrice()

Returns the last registered price for LANA tokens.

When receiving a transaction of ETH, the ICO Contract responds as follows:

- If the address sending the transaction is the contracts owner, the contract receives the ETH and does nothing else.
  This is to allow the owner to send ETH for gas without having to purchase LANA tokens.

- If the sell price of tokens has not been set, the transaction will be reverted.

- In any other case, the transaction will be interpreted as a purchase:

The contract will determine the amount of tokens that can be bought with the received ETH, transfer them to the buyer from the ICO contract's own balance in the LANA token contract's ledger, and transfer the ETH to the ICO contract's owner.

If the purchased amount exceeds the ICO contract's balance, all the tokens remaining in the ICO contract's possession will be sold, and the remaining ETH from the transaction will be returned to the buyer.