

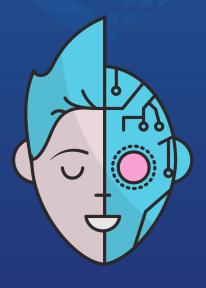
**Blockchain Security | Smart Contract Audits | KYC** 

MADE IN GERMANY

# Audit

Security Assessment 28. July, 2021

For



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#### **Disclaimer**

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Version	Date	Description
1.0	26. July 2021	Layout project
	27. July 2021	Automated- /Manual-Security Testing
	28. July 2021	Summary

#### **Network**

Binance Smart Chain (BEP20)

#### Website

https://robotoken.app/

#### **Telegram**

https://t.me/robotokenofficial

#### **Twitter**

https://twitter.com/tokenrobo?lang=en

#### **Github**

https://github.com/roboapp

#### Medium

https://medium.com/@RoboToken

#### Instagram

https://www.instagram.com/tokenrobo/

#### **Description**

RoboToken is a modern eco-system with a BNB reward system, autoclaim, buy back, dex swap, and launchpad all under one token \$ROBO.

#### **Project Engagement**

During the 26th of July 2021, **RoboToken Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. **RoboToken Team** provided Solidproof.io with access to their code repository and whitepaper.



## **Vulnerability & Risk Level**

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon aspossible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

# Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

#### Methodology

The auditing process follows a routine series of steps:

- 1. Code review that includes the following:
  - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
  - ii) Manual review of code, which is the process of reading source code line-byline in an attempt to identify potential vulnerabilities.
  - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
- 2. Testing and automated analysis that includes the following:
  - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
  - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
- 3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
- 4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

## **Used Code from other Frameworks/Smart Contracts (direct imports)**

#### Imported packages:

- OpenZeppelin
  - Address
  - Ownable
  - SafeMatch
- Uniswap
  - UniswapV2Factory
  - UniswapV2Pair
  - UniswapV2Router01
  - UniswapV2Router02

#### **Tested Contract Files**

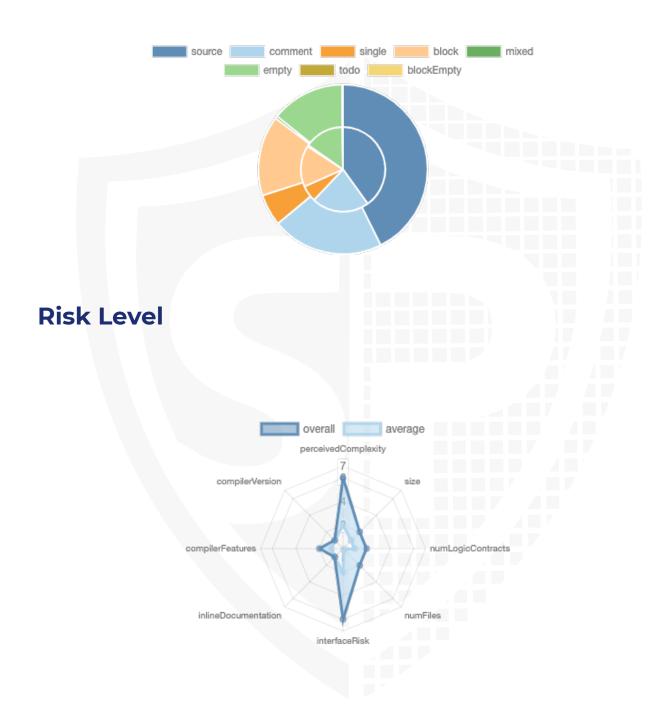
This audit covered the following files listed below with a SHA-1 Hash.

A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

File Name	SHA-1 Hash
contracts/DividendPayingToken.sol	633b4dff40098943e3725845028b7987be72ee83
contracts/IUniswapV2Pair.sol	05e647da1a2fa7934af97a8db4c9f78ad2c9d8d9
contracts/SafeMathUint.sol	7808353a4a6fe523b1c744e2572fe77582579725
contracts/Context.sol	3c3bf995d75c7830097481749c3bd2f6696d3026
contracts/IUniswapV2Factory.sol	91cbb4ccec3b151becf39e1dfe36c51c8907e791
contracts/DividendPayingTokenInterface.sol	e6bfbae79ab8cac72fcfea1813bf576a232543b8
contracts/IERC20Metadata.sol	538888ee2b512d81e4bc2e666d10ac9a2e3d499d
contracts/SafeMathInt.sol	3e72493239b14328c296eb20404dfa0de3a324c3
contracts/SafeMath.sol	96fc1b5e5afbed1c85e0c9b9b4edf61364b4e77b
contracts/Robo.sol	3d170a9c5ac19a07979a4145fb161aca8c4df607
contracts/IUniswapV2Router.sol	587ae175ab043b78a9bec57b3df8d315d2cf494c
contracts/Ownable.sol	f4e27b795348c1bbc5ee8055d19b7dd8cfe5ff70
contracts/IterableMapping.sol	c5a0c8df26c889d8003190632a9157210dd92619
contracts/ERC20.sol	280344751f8c458bd6b61586bb45a090b73f0eb7
contracts/DividendPayingTokenOptionalInterface.sol	145167f2f8b9ec0fb5b33f0a1dd9b268c9bb6cc2
contracts/IERC20.sol	71ce18b11f2db4fd80a99dc8acc7782beb9d69b7
contracts/ROBODividendTracker.sol	82abf804f3455566a786697c2d95dc7c42f53f20

## **Metrics**

#### **Source Lines**



#### **Capabilities**

#### Components

Contracts	Libraries	Interfaces	Abstract
5	4	8	1

### **Exposed Functions**

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.

Public		Payable	
	154		8

External	Internal	Private	Pure	View
104	125	9	25	63

#### **State Variables**

Total	Public
45	29

#### **Capabilities**

Solidity Versions observed	Experiment al Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
^0.6.2 0.6.12		Yes	**** (0 asm blocks)	

Transfers ETH	Low- Level Calls	Delegate Call	Uses Hash Function s	ECRecov er	New/ Create/ Create2
------------------	------------------------	------------------	-------------------------------	---------------	----------------------------

yes					yes → NewCo ntract: ROBODiv idendTr acker
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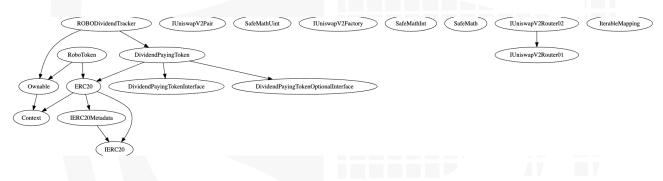
#### **Scope of Work**

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

- 1. Correct implementation of Token standard
- 2. Deployer cannot mint any new tokens
- 3. Deployer cannot burn or lock user funds
- 4. Deployer cannot pause the contract
- 5. Overall checkup (Smart Contract Security)

#### **Inheritance Graph**



## **Verify Claims**

## **Correct implementation of Token standard**



Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	$\checkmark$	<b>√</b>	<b>√</b>
BalanceOf	provides account balance of the owner's account	$\checkmark$	<b>√</b>	<b>√</b>
Transfer	executes transfers of a specified number of tokens to a specified address	<b>√</b>	<b>√</b>	<b>√</b>
TransferFrom	executes transfers of a specified number of tokens from a specified address	<b>√</b>	<b>√</b>	<b>√</b>
Approve	allow a spender to withdraw a set number of tokens from a specified account	<b>√</b>	<b>√</b>	<b>√</b>
Allowance	returns a set number of tokens from a spender to the owner	<b>√</b>	<b>√</b>	<b>√</b>

## **Optional implementations**

Function	Description		Tested	Verified
renounceOwnership	Owner renounce ownership for more trust	$\checkmark$	<b>√</b>	$\checkmark$

#### Deployer cannot mint any new tokens

Tested	Verified	File	Comment
<b>√</b>	<b>√</b>	Main	Line: -

Max / Total Supply: 1.000.000.000

}

```
constructor() public ERC20("RoboToken", "ROBO") {
  uint256 _BNBRewardsFee = 10;
   uint256 _liquidityFee = 2;
   uint256 _buyBackFee = 4;
   // Rewards Pool is to store BNB in case of low volume. This can be adjusted at a later date.
 uint256 _rewardsPoolFee = 0;
  BNBRewardsFee = _BNBRewardsFee;
   liquidityFee = liquidityFee;
   buyBackFee = _buyBackFee;
  rewardsPoolFee = _rewardsPoolFee;
totalFees = BNBRewardsFee.add(liquidityFee).add(buyBackFee).add(rewardsPoolFee);
dividendTracker = new ROBODividendTracker();
liquidityWallet = owner();
IUniswapV2Router02 _uniswapV2Router = IUniswapV2Router02(0xD99D1c33F9fC3444f8101754aBC46c52416550D1);
   // Create a uniswap pair for this new token
   address _uniswapV2Pair = IUniswapV2Factory(_uniswapV2Router.factory())
   .createPair(address(this), _uniswapV2Router.WETH());
   uniswapV2Router = _uniswapV2Router;
 uniswapV2Pair = _uniswapV2Pair;
_setAutomatedMarketMakerPair(_uniswapV2Pair, true);
 // Exclude from receiving dividends
   dividendTracker.excludeFromDividends(address(dividendTracker));
   dividendTracker.excludeFromDividends(address(this));
   dividendTracker.excludeFromDividends(owner()):
   dividendTracker.excludeFromDividends(deadAddress);
  dividendTracker.excludeFromDividends(address(_uniswapV2Router));
// Exclude from paying fees or having max transaction amount
   excludeFromFees(liquidityWallet, true);
   excludeFromFees(address(this), true);
       _mint is an internal function in ERC20.sol that is only called here,
       and CANNOT be called ever again
   _mint(owner(), 1000000000 * (10**18));
function _mint(address account, uint256 amount) internal virtual {
            require(account != address(0), "ERC20: mint to the zero address");
           _beforeTokenTransfer(address(0), account, amount);
           _totalSupply = _totalSupply.add(amount);
           _balances[account] = _balances[account].add(amount);
           emit Transfer(address(0), account, amount);
```

#### Deployer cannot burn or lock user funds

Name	Tested	Exist	Verified
No Lock function	$\checkmark$	<b>√</b>	$\checkmark$
No Burn function	<b>√</b>	<b>√</b>	<b>√</b>



#### Deployer cannot pause the contract

Tested	Verified	No pause function
$\checkmark$	<b>√</b>	✓



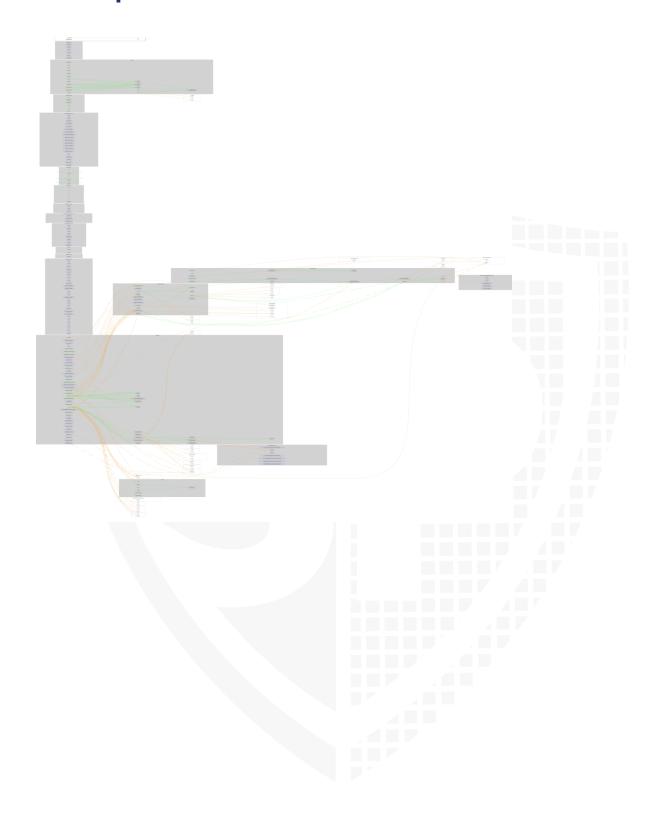
#### **Overall checkup (Smart Contract Security)**



#### Legend

Attribute	Symbol
Verfified / Checked	$\checkmark$
Partly Verified	
Unverified / Not checked	X

#### **CallGraph**



## **Source Units in Scope**

Туре	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
9	contracts/DividendPayingToken.sol	1		187	187	88	65	80	. <u>Š</u>
Q	contracts/IUniswapV2Pair.sol		1	55	9	5	1	55	
<b>\(\rightarrow\)</b>	contracts/SafeMathUint.sol	1		16	16	8	5	3	
<b>©</b>	contracts/Context.sol	1		25	25	10	12	1	
Q	contracts/IUniswapV2Factory.sol		1	20	8	4	1	17	
Q	contracts/DividendPayingTokenInterface.sol		1	42	13	3	20	10	. <u>Š</u>
Q	contracts/IERC20Metadata.sol		1	28	16	4	15	9	*
<b>E</b>	contracts/SafeMathInt.sol	1		93	93	33	47	16	
<b>E</b>	contracts/SafeMath.sol	1		147	147	39	93	10	*
2	contracts/Robo.sol	1		585	563	390	45	390	. <u>Š</u> .♣.⊚
Q	contracts/IUniswapV2Router.sol		2	143	7	4	2	64	.8
2	contracts/Ownable.sol	1		58	58	27	21	25	
<b>\(\rightarrow\)</b>	contracts/IterableMapping.sol	1		64	64	49	2	19	
2	contracts/ERC20.sol	1		311	295	85	178	82	
Q	contracts/DividendPayingTokenOptionalInterface.sol		1	26	13	3	14	7	
Q	contracts/IERC20.sol		1	82	27	17	57	13	*
<b>&gt;</b>	contracts/ROBODividendTracker.sol	1		222	204	145	2	94	
<b>∌≧Q%</b>	Totals	10	8	2104	1745	914	580	895	. <u>&amp;</u> . <u>&amp;</u> .

### Legend

<u> </u>	
Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces,)

## **Audit Results**

## **AUDIT PASSED**

#### **Critical issues**

- no critical issues found -

## **High issues**

- no high issues found -

#### **Medium issues**

- no medium issues found -

#### Low issues

- no low issues found -

Issue	File	Type	Line	Description
#1	Main	Call with hardcoded gas amount.	396	rewardsPool.transfer(address (this).balance.div(2)) forwards a fixed amount of gas. This is discouraged as the gas cost of EVM instructions may change in the future, which could break this contract's assumptions.
#2	Main	Call with hardcoded gas amount.	513	rewardsPool.transfer(reward BNB) forwards a fixed amount of gas. This is discouraged as the gas cost of EVM instructions may change in the future, which could break this contract's assumptions.
#3	Main	Call with hardcoded gas amount.	575	rewardsPool.transfer(reward BNB) forwards a fixed amount of gas. This is discouraged as the gas cost of EVM instructions may change in the future, which could break this contract's assumptions.

#### Informational issues

- no informational issues found -

#### **Audit Comments**

27. July 2021: Wrong Routeraddress were used (Testnet router address: 0xD99D1c33F9fC3444f8101754aBC46c52416550D1)



## **SWC Attacks**

ID	Title	Relationships	Status
<u>SW</u> <u>C-13</u> <u>6</u>	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
<u>SW</u> <u>C-13</u> <u>5</u>	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
<u>SW</u> <u>C-13</u> <u>4</u>	Message call with hardcoded gas amount	CWE-655: Improper Initialization	NOT PASSED
<u>SW</u> <u>C-13</u> <u>3</u>	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
<u>SW</u> <u>C-13</u> <u>2</u>	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
<u>SW</u> <u>C-13</u> <u>1</u>	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
<u>SW</u> <u>C-13</u> <u>O</u>	Right-To-Left- Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
<u>SW</u> <u>C-12</u> <u>9</u>	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
<u>SW</u> <u>C-12</u> <u>8</u>	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

<u>SW</u> <u>C-12</u> <u>7</u>	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
<u>SW</u> <u>C-12</u> <u>5</u>	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
<u>SW</u> <u>C-12</u> <u>4</u>	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
<u>SW</u> <u>C-12</u> <u>3</u>	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
<u>SW</u> <u>C-12</u> <u>2</u>	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-12 1	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
<u>SW</u> <u>C-12</u> <u>0</u>	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
<u>SW</u> <u>C-11</u> <u>9</u>	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	PASSED
<u>SW</u> <u>C-11</u> <u>8</u>	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
<u>SW</u> <u>C-11</u> <u>7</u>	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

<u>SW</u> <u>C-11</u> <u>6</u>	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
<u>SW</u> <u>C-11</u> <u>5</u>	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
<u>SW</u> <u>C-11</u> <u>4</u>	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
<u>SW</u> <u>C-11</u> <u>3</u>	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
<u>SW</u> <u>C-11</u> <u>2</u>	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
<u>SW</u> <u>C-111</u>	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
<u>SW</u> <u>C-11</u> <u>O</u>	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
<u>SW</u> <u>C-10</u> <u>9</u>	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
<u>SW</u> <u>C-10</u> <u>8</u>	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
<u>SW</u> <u>C-10</u> <u>7</u>	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
<u>SW</u> <u>C-10</u> <u>6</u>	Unprotected SELFDESTRUC T Instruction	CWE-284: Improper Access Control	PASSED

<u>SW</u> <u>C-10</u> <u>5</u>	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
<u>SW</u> <u>C-10</u> <u>4</u>	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
<u>SW</u> <u>C-10</u> <u>3</u>	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	PASSED
<u>SW</u> <u>C-10</u> <u>2</u>	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
<u>SW</u> <u>C-10</u> <u>1</u>	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
<u>SW</u> <u>C-10</u> <u>0</u>	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED



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