



# Security Assessment **RED TOKEN**

Vital Block Security **Verified** on October 13<sup>th</sup>, 2023

 @Vital-Block

 @VB\_Audit

 info@vitalblock.org




 www.vitalblock.org



PREPARED FOR:  
**RED TOKEN**



## INTRODUCTION

<b>Auditing Firm</b>	 <b>VITAL BLOCK SECURITY</b>
<b>Client Firm</b>	 <b>RED TOKEN</b>
<b>Methodology</b>	Automated Analysis, Manual Code Review
<b>Language</b>	Solidity
<b>Contract</b>	<b>0xE1240ac7Bb51333510cbF37efD678cA46137f84B</b>
<b>Source Code Light</b>	<b>Verified</b>
<b>License</b>	MIT
<b>Centralization</b>	Active ownership
<b>Compiler Version</b>	v0.4.24+commit.e67f0147
<b>Blockchain</b>	 <b>Ethereum</b>
<b>Website</b>	<a href="https://red-token.org/">https://red-token.org/</a>
<b>Telegram</b>	<a href="https://t.me/portalRedTokenn">https://t.me/portalRedTokenn</a>
<b>Twitter</b>	<a href="https://twitter.com/redshibaerc">https://twitter.com/redshibaerc</a>
<b>Medium</b>	<a href="https://medium.com/@redtokenerc">https://medium.com/@redtokenerc</a>
<b>Prelim Report Date</b>	October 12 <sup>th</sup> 2023
<b>Final Report Date</b>	October 13 <sup>th</sup> 2023

 Verify the authenticity of this report on our GitHub Repo: <https://www.github.com/vital-block>

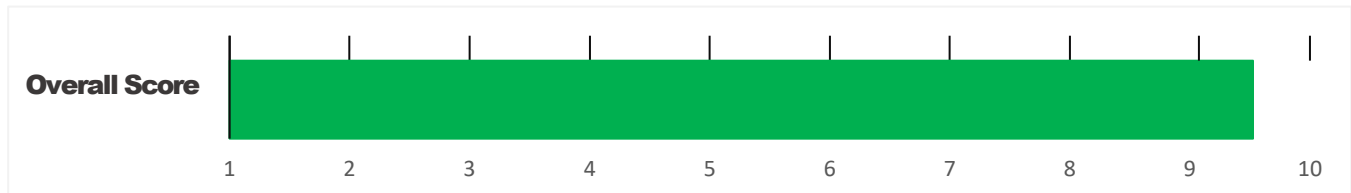


## EXECUTIVE SUMMARY

Vital Block Security has performed the automated and manual analysis of the REDTOKEN Sol code. The code was reviewed for common contract vulnerabilities and centralized exploits. Here's a quick audit summary:

Status	Critical ! 🔴	Major " 🟡	Medium # 🟡	Minor \$ 🟢	Unknown % 🟤
Open	0	0	1	3	0
Acknowledged	0	0	1	2	0
Resolved	0	0	0	0	0
Noteworthy OnlyOwner Privileges	Set Taxes and Ratios, Airdrop, Set Protection Settings, Set Reward Properties, Set Reflector Settings, Set Swap Settings, Set Pair and Router				

**REDTOKEN** Smart contract has achieved the following score: **95.0**



**i** Please note that smart contracts deployed on blockchains aren't resistant to exploits, vulnerabilities and/or hacks. Blockchain and cryptography assets utilize new and emerging technologies. These technologies present a high level of ongoing risks. For a detailed understanding of risk severity, source code vulnerability, and audit limitations, kindly review the audit report thoroughly.

**i** Please note that centralization privileges regardless of their inherited risk status - constitute an elevated impact on smart contract safety and security.



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## SCOPE OF WORK

Vital Block was consulted by REDTOKEN to conduct the smart contract audit of its. Sol source code. The audit scope of work is strictly limited to mentioned .Sol file only:

0.redtoken.sol

 External contracts and/or interfaces dependencies are not checked due to being out of scope.

Verify audited contract's contract address and deployed link below:

### Public Contract Address

<https://etherscan.io/token/0xe1240ac7bb51333510cbf37efd678ca46137f84b#code>

Contract Name	REDTOKEN
Token Symbol	RED
Decimals	18
Total Supply	750460.26896072546



## AUDIT METHODOLOGY

Smart contract audits are conducted using a set of standards and procedures. Mutual collaboration is essential to performing an effective smart contract audit. Here's a brief overview of Vital Block

**Security auditing process and methodology:**

### CONNECT

- The onboarding team gathers source codes, and specifications to make sure we understand the size, and scope of the smart contract audit.

### AUDIT

- Automated analysis is performed to identify common contract vulnerabilities. We may use the following third-party frameworks and dependencies to perform the automated analysis:
  - Remix IDE Developer Tool
  - Open Zeppelin Code Analyzer
  - SWC Vulnerabilities Registry
  - DEX Dependencies, e.g., Pancakeswap, Uniswap
- Simulations are performed to identify centralized exploits causing contract and/or trade locks.
- A manual line-by-line analysis is performed to identify contract issues and centralized privileges.

We may inspect below mentioned common contract vulnerabilities, and centralized exploits:

Centralized Exploits	<ul style="list-style-type: none"><li>○ Token Supply Manipulation</li><li>○ Access Control and Authorization</li><li>○ Assets Manipulation</li><li>○ Ownership Control</li><li>○ Liquidity Access</li><li>○ Stop and Pause Trading</li><li>○ Ownable Library Verification</li></ul>
----------------------	---

### Common Contract Vulnerabilities

- Integer Overflow
- Lack of Arbitrary limits
- Incorrect Inheritance Order
- Typographical Errors
- Requirement Violation
- Gas Optimization
- Coding Style Violations
- Re-entrancy
- Third-Party Dependencies
- Potential Sandwich Attacks
- Irrelevant Codes
- Divide before multiply
- Conformance to Solidity Naming Guides
- Compiler Specific Warnings
- Language Specific Warnings

### REPORT

- The auditing team provides a preliminary report specifying all the checks which have been performed and the findings thereof.
- The client's development team reviews the report and makes amendments to the codes.
- The auditing team provides the final comprehensive report with open and unresolved issues.

### PUBLISH

- The client may use the audit report internally or disclose it publicly.

 It is important to note that there is no pass or fail in the audit, it is recommended to view the audit as an unbiased assessment of the safety of solidity codes.



## RISK CATEGORIES

Smart contracts are generally designed to hold, approve, and transfer tokens. This makes them very tempting attack targets. A successful external attack may allow the external attacker to directly exploit. A successful centralization-related exploit may allow the privileged role to directly exploit. All risks which are identified in the audit report are categorized here for the reader to review:

Risk Type	Definition
<b>Critical</b> 🚫	These risks could be exploited easily and can lead to asset loss, data loss, asset, or data manipulation. They should be fixed right away.
<b>Major</b> 🟡	These risks are hard to exploit but very important to fix, they carry an elevated risk of smart contract manipulation, which can lead to high-risk severity.
<b>Medium</b> 🟠	These risks should be fixed, as they carry an inherent risk of future exploits, and hacks which may or may not impact the smart contract execution. Low-risk re-entrancy-related vulnerabilities should be fixed to deter exploits.
<b>Minor</b> 🟢	These risks do not pose a considerable risk to the contract or those who interact with it. They are code-style violations and deviations from standard practices. They should be highlighted and fixed nonetheless.
<b>Unknown</b> 🟤	These risks pose uncertain severity to the contract or those who interact with it. They should be fixed immediately to mitigate the risk uncertainty.

All statuses which are identified in the audit report are categorized here for the reader to review:

Status Type	Definition
<b>Open</b>	Risks are open.
<b>Acknowledged</b>	Risks are acknowledged, but not fixed.
<b>Resolved</b>	Risks are acknowledged and fixed.





## CENTRALIZED PRIVILEGES

**Centralization risk is the most common cause of cryptography asset loss. When a smart contract has a privileged role, the risk related to centralization is elevated.**

**There are some well-intended reasons have privileged roles, such as:**

- **Privileged roles can be granted the power to `pause()` the contract in case of an external attack.**
- **Privileged roles can use functions like, `include()`, and `exclude()` to add or remove wallets from fees, swap checks, and transaction limits. This is useful to run a presale and to list on an exchange.**






**Authorizing privileged roles to externally-owned-account (EOA) is dangerous. Lately, centralization-related losses are increasing in frequency and magnitude.**

- **The client can lower centralization-related risks by implementing below mentioned practices:**
- **Privileged role's private key must be carefully secured to avoid any potential hack.**
- **Privileged role should be shared by multi-signature (multi-sig) wallets.**
- **Authorized privilege can be locked in a contract, user voting, or community DAO can be introduced to unlock the privilege.**
- **Renouncing the contract ownership, and privileged roles.**
- **Remove functions with elevated centralization risk.**

 **Understand the project's initial asset distribution. Assets in the liquidity pair should be locked. Assets outside the liquidity pair should be locked with a release schedule.**



## AUTOMATED ANALYSIS

Symbol	Definition
	Function modifies state
	Function is payable
	Function is internal
	Function is private
	Function is important

```

**REDTOKEN** | Interface | |||
| L | totalSupply | External | ! | NO |
| L | decimals | External | ! | NO |
| L | symbol | External | ! | NO |
| L | name | External | ! | NO |
| L | getOwner | External | NO |
| L | balanceOf | External | ! | NO |
| L | transfer | External | " ! ! | NO |
| L | allowance | External | ! | NO |
| L | approve | External | " ! ! | NO |
| L | transferFrom | External | " | NO |
|||||
**IFactoryV2** | Interface | |||
| L | getPair | External | NO | |
| L | createPair | External | " | NO |
|||||
**IV2Pair** | Interface | |||
| L | factory | External | NO | |
| L | getReserves | External | NO |
| L | sync | External | " | NO |

```



|||||

| **\*\*IRouter01\*\*** | Interface | |||

| L | factory | External ¶ | |NO¶|

| L | Sol | External ¶ | |NO¶|

| L | addLiquidityETH | External ¶ | # |NO¶|

| L | addLiquidity | External ¶ | " |NO¶|

| L | swapExactETHorTokens | External ¶ | # |NO¶|

| L | getAmountsOut | External ¶ | |NO¶|

| L | getAmountsIn | External ¶ | |NO¶|

|||||

| **\*\*IRouter02\*\*** | Interface | IRouter01 |||

| L | swapExactTokensForETHSupportingFeeOnTransferTokens | External ¶ | " |NO¶|

| L | swapExactETHForTokensSupportingFeeOnTransferTokens | External ¶ | # |NO¶|

| L | swapExactTokensForTokensSupportingFeeOnTransferTokens | External ¶ | " ! 🔴 |NO¶|

| L | swapExactTokensForTokens | External ¶ | " |NO¶|

|||||

| **\*\*Protections\*\*** | Interface | |||

| L | checkUser | External ¶ | " ! 🔴 |NO¶|

| L | setLaunch | External ¶ | " |NO¶|

| L | setLpPair | External ¶ | " |NO¶|

| L | **RED** | External ¶ | " |NO¶|

| L | removeSniper | External ¶ | " |NO¶|

|||||

| **\*\*Cashier\*\*** | Interface | |||

| L | setRewardsProperties | External ¶ | " |NO¶|

| L | tally | External ¶ | " |NO¶|

| L | load | External ¶ | # |NO¶|

| L | cashout | External ¶ | " |NO¶|

| L | giveMeWelfarePlease | External ¶ | " |NO¶|

| L | getTotalDistributed | External ¶ | |NO¶|

| L | getUserInfo | External ¶ | |NO¶|

| L | getUserRealizedRewards | External ¶ | |NO¶|



```

| L | getPendingRewards | External | | | NO |
| L | initialize | External | | " | NO |
| L | getCurrentReward | External | | | NO |
|||||
| **SOL** | Implementation | SafeMath | |||
| L | <Constructor> | Public | | # | NO |
| L | transferOwner | External | | " | onlyOwner |
| L | renounceOwnership | External | | " | NO |
| L | setOperator | Public | | | NO |
| L | renounceOriginalDeployer | External | | " | NO |
| L | <Receive ETH> | External | | # | NO |
| L | totalSupply | External | | | NO |
| L | decimals | External | | | NO |
| L | symbol | External | | | NO |
| L | name | External | | | NO |
| L | getOwner | External | | ! | NO |
| L | balanceOf | Public | | ! | NO |
| L | allowance | External | | ! | NO |
| L | approve | External | | " ! | NO |
| L | _approve | Internal | $ | " | NO |
| L | approveContractContingency | Public | | " ! | onlyOwner |
| L | transfer | External | | | NO |
| L | transferFrom | External | | | NO |
| L | setNewRouter | External | | " | onlyOwner |
| L | setLpPair | External | | | onlyOwner |
| L | setInitializers | External | | " | onlyOwner |
| L | isExcludedFromFees | External | | | NO |
| L | isExcludedFromDividends | External | | | NO |
| L | isExcludedFromProtection | External | | | NO |
| L | setDividendExcluded | Public | | " | onlyOwner |
| L | setExcludedFromFees | Public | | " | onlyOwner |

```

## BTV-01 POSSIBLE OVERFLOW

Category	Severity ●	Location	Status
Suboptimal	Minor	Contract/code/REDTOKEN	Acknowledged

### Description

In **updateForToken**, the following equation is used inside an unchecked block

```
function _burn(address account, uint256 amount) internal virtual {
    require(account != address(0),

    _beforeTokenTransfer(account, address(0), amount);

    uint256 accountBalance = _balances[account];
    require(accountBalance >= amount,);
    unchecked {
        _balances[account] = accountBalance - amount;
    }
    _totalSupply -= amount;
```

Where parameters. Block **Token** Out Used is a this and override In is a this.  
As these two are multiplied together in an unchecked block, they may overflow.

### Recommendation

We recommend either checking for overflow in this case, or ensuring that the PairsIn is close enough it will never cause an overflow

## BST-02 POSSIBLE OVERFLOW

Category	Severity ●	Location	Status
Status Mathematical Operations	Minor	Contract/code/REDTOKEN	Acknowledged

### Description

In `updateForMinter`, the following equation is used inside an unchecked block

```
*/
function rebase(uint256 epoch, int256 supplyDelta)
    external
    onlyMonetaryPolicy
    whenRebaseNotPaused
    returns (uint256)
{
    if (supplyDelta == 0) {
        emit LogRebase(epoch, _totalSupply);
        return _totalSupply;
    }
}
```

Minter can not issue more **RED** tokens indefinitely.

Note that as of the date of publishing, the above review reflects the current understanding of known security patterns as they relate to the **RED** contract.

### Recommendation

We recommend either checking for overflow in this case, or ensuring that the `PairsIn` is close enough it will never cause an overflow.

## FZT-03 POSSIBLE OVERFLOW

Category	Severity ●	Location	Status
Inconsistency	Informational	Contract/code/REDTOKEN	Acknowledged

### Description

In `updateForaddress`, the following equation is used inside an unchecked block






```
function _transferOwnership(address newOwner) internal {
    require(newOwner != address(0));
    emit OwnershipTransferred(_owner, newOwner);
    _owner = newOwner;
}
```

The function `address()` does not have the override specifier. It should be noted that since `price0 > a` function that overrides only a single interface function does not require the override specifier (see doc). However, all other instances of this in the code base contain the override specifier.

### Recommendation

We recommend either checking for overflow in this case, or ensuring that the `PairsIn` is close enough it will never cause an overflow.

## OPTIMIZATIONS | REDTOKEN

ID	Title	Category	Status
RTV	Logarithm Refinement Optimization	Gas Optimization	Acknowledged 
ROP	Checks Can Be Performed Earlier	Gas Optimization	Acknowledged 
RDP	Unnecessary Use Of SafeMath	Gas Optimization	Acknowledged 
RWY	Struct Optimization	Gas Optimization	Acknowledged 
RGT	Unused State Variable	Gas Optimization	Acknowledged 



## General Detectors

### Public Functions Should be Declared External

Some functions in this contract should be declared as external in order to save gas.









































Attention  
Required

### Missing Zero Address Validation

Some functions in this contract may not appropriately check for zero addresses being used.



Attention  
Required

- |  |  |
|--|--|
|  No compiler version inconsistencies found      |  No tautologies or contradictions found                       |
|  No unchecked call responses found              |  No faulty true/false values found                            |
|  No vulnerable self-destruct functions found    |  No inaccurate divisions found                                |
|  No assertion vulnerabilities found            |  No redundant constructor calls found                        |
|  No old solidity code found                   |  No vulnerable transfers found                              |
|  No external delegated calls found            |  No vulnerable return values found                          |
|  No external call dependency found            |  No uninitialized local variables found                     |
|  No vulnerable authentication calls found     |  No default function responses found                        |
|  No invalid character typos found             |  No missing arithmetic events found                         |
|  No RTL characters found                      |  No missing access control events found                     |
|  No dead code found                           |  No redundant true/false comparisons found                  |
|  No risky data allocation found               |  No state variables vulnerable through function calls found |
|  No uninitialized state variables found       |  No buggy low-level calls found                             |
|  No uninitialized storage variables found     |  No expensive loops found                                   |
|  No vulnerable initialization functions found |  No bad numeric notation practices found                    |
|  No risky data handling found                 |  No missing constant declarations found                     |
|  No number accuracy bug found                 |  No missing external function declarations found            |
|  No out-of-range number vulnerability found   |  No vulnerable payable functions found                      |
|  No map data deletion vulnerabilities found   |  No vulnerable message values found                         |



## Vulnerability Scan

### REENTRANCY

✓ No reentrancy risk found

Severity Minor

Confidence Parameter Certain

## Vulnerability Description

✗ **Not Mintable:** A large amount of this token can not be minted by a private wallet or contract.

## Scanning Line:

```
function rebase(uint256 epoch, int256 supplyDelta)
    external
    onlyMonetaryPolicy
    whenRebaseNotPaused
    returns (uint256)
{
    if (supplyDelta == 0) {
        emit LogRebase(epoch, _totalSupply);
        return _totalSupply;
    }

    if (supplyDelta < 0) {
        _totalSupply =
        _totalSupply.sub(uint256(supplyDelta.abs()));
    } else {
        _totalSupply =
        _totalSupply.add(uint256(supplyDelta));
    }

    if (_totalSupply > MAX_SUPPLY) {
        _totalSupply = MAX_SUPPLY;
    }
}
```



## Contract Owner Address:

<https://etherscan.io/address/0x7017f11e1f6b1a690da56ad439a16930a1159d90>

## Audited Files

REDTOKEN.SOL

## Contracts:

Contract

REDTOKEN: :0xE1240ac7Bb51333510cbF37efD678cA46137f84B



## Vulnerability Run check

RED / RED

13/10/2023 10:40 PM UTC+8

### Contract Info

Total supply	750460.2689607254
Transaction Tax	Buy 0.00% / Sell 0.00%
Dex 1	UniswapV2
Dex 2	UniswapV3

### Risk Analysis

#### ✔ Contract source code verified

This token contract is open source. You can check the contract code for details. Unsourced token contracts are likely to have malicious functions to defraud their users of their assets.

#### ✔ No Proxy

There is no proxy in the contract. The proxy contract means contract owner can modify the function of the token and possibly effect the price.

#### ✔ No mint function

Mint function is transparent or non-existent. Hidden mint functions may increase the amount of tokens in circulation and effect the price of the token.

#### ✔ No function to retrieve ownership

If this function exists, it is possible for the project owner to regain ownership even after relinquishing it.

#### ✔ Owner cant change balance

The contract owner does not have the authority to modify the balance of tokens at other addresses.



### Honeypot Risk

#### ✔ This does not appear to be a honeypot

We are not aware of any code that prevents the sale of tokens.

#### ✔ No trading cooldown

The token contract has no trading cooldown function. If there is a trading cooldown function, the user will not be able to sell the token within a certain time or block after buying.

#### ✔ No Anti Whale

There is no limit to the number of token transactions. The number of scam token transactions may be limited (honeypot risk).

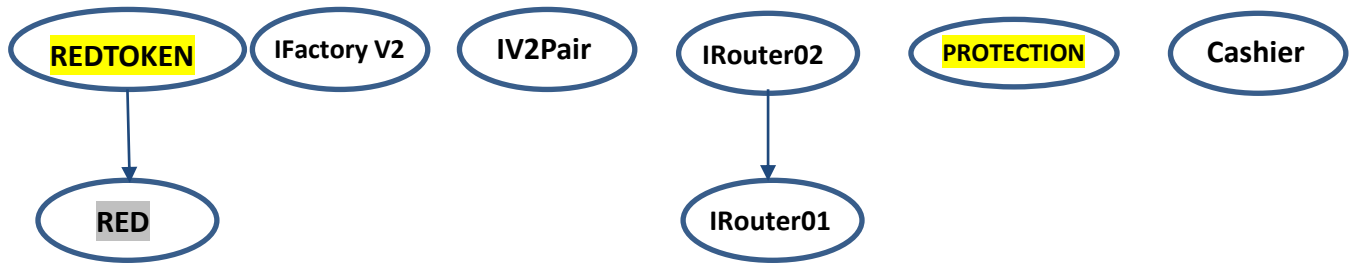
#### ✔ No blacklist function

No blacklist function is included.

#### ✔ No whitelist function

Whitelist function found

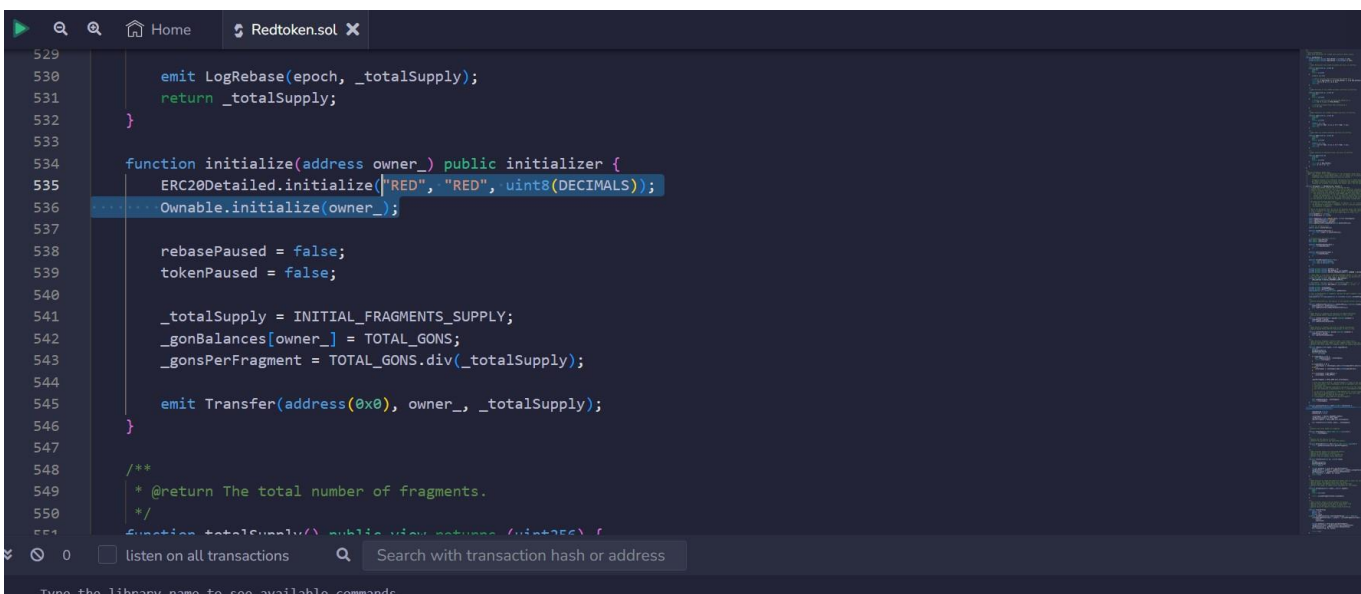
## INHERITANCE GRAPH



Identifier	Definition	Severity
CEN-12	Centralization privileges of <b>REDTOKEN</b>	Medium # 🟡

Vulnerability 0 : No important security issue detected.

Threat level: Low



```

529
530     emit LogRebase(epoch, _totalSupply);
531     return _totalSupply;
532 }
533
534 function initialize(address owner_) public initializer {
535     ERC20Detailed.initialize("RED", "RED", uint8(DECIMALS));
536     Ownable.initialize(owner_);
537
538     rebasePaused = false;
539     tokenPaused = false;
540
541     _totalSupply = INITIAL_FRAGMENTS_SUPPLY;
542     _gonBalances[owner_] = TOTAL_GONS;
543     _gonsPerFragment = TOTAL_GONS.div(_totalSupply);
544
545     emit Transfer(address(0x0), owner_, _totalSupply);
546 }
547
548 /**
549  * @return The total number of fragments.
550  */
551 function totalSupply() public view returns (uint256) {
  
```

## MANUAL REVIEW

**Red Token:** embodies Ryoshi's vision for a decentralized world, countering the profit-driven era's concentration of power. Rooted in the Shiba community, we champion decentralization and self-sustainability, uniting supporters from all walks of life in a common purpose: restoring the spirit of true decentralization for a brighter, fairer future. Join us on this promising journey.

**TOKEN NAME:** REDTOKEN

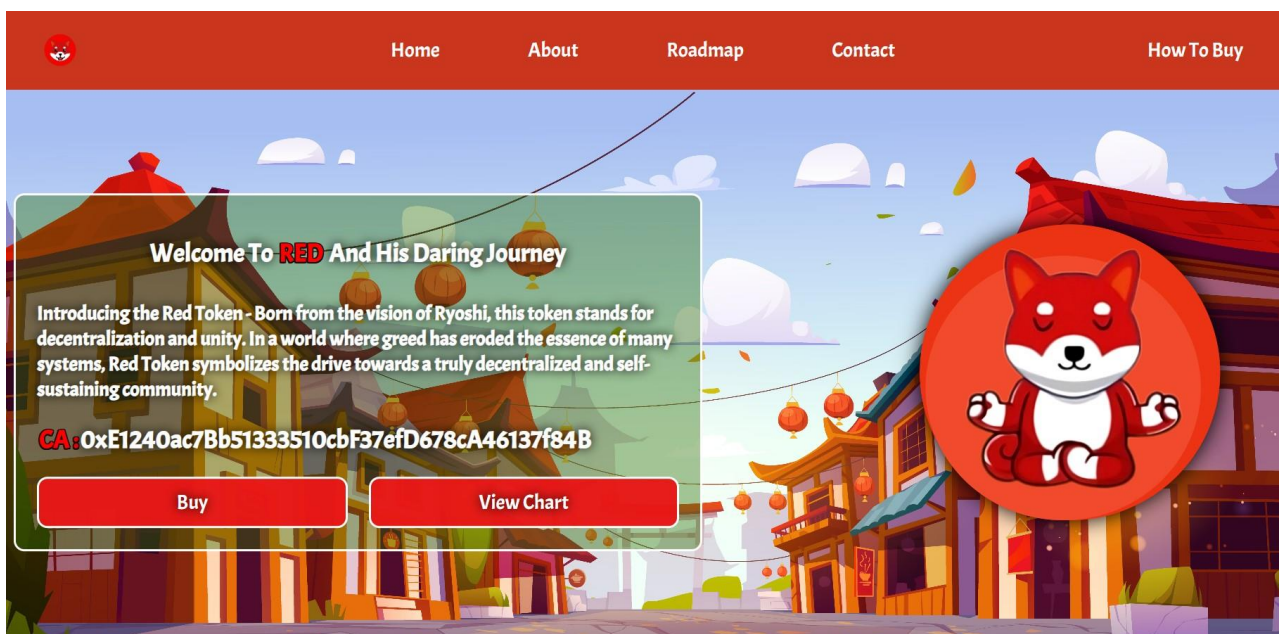
**Ticker:** RED

**Chain/Standard:** Ethereum Network

**LAUNGE:** Solidity



**The REDTOKEN Platform Is Launched On the Ethereum Network**





# ISSUES CHECKING STATUS

Issue Description

Checking Status

1.	Compiler errors.	PASSED
2.	Race Conditions and reentrancy. Cross-Function Race Conditions.	PASSED
3.	Possible Delay In Data Delivery.	PASSED
4.	Oracle calls.	PASSED
5.	Front Running.	PASSED
6.	SOL Dependency.	PASSED
7.	Integer Overflow And Underflow.	PASSED
8.	DoS with Revert.	PASSED
9.	Dos With Block Gas Limit.	PASSED
10.	Methods execution permissions.	PASSED
11.	Economy Model of the contract.	PASSED
12.	The Impact Of Exchange Rate On the sol Logic.	PASSED
13.	Private use data leaks.	PASSED
14.	Malicious Event log.	PASSED
15.	Scoping and Declarations.	PASSED
16.	Uninitialized storage pointers.	PASSED
17.	Arithmetic accuracy.	PASSED
18.	Design Logic.	PASSED
19.	Cross-Function race Conditions	PASSED
20.	Save Upon Move contract Implementation and Usage.	PASSED
21.	Fallback Function Security	PASSED



**AUDIT RESULT**

**PASSED**

SMART CONTRACT AUDIT OF REDTOKEN

Identifier	Definition	Severity
CEN-02	Initial asset distribution	Minor 

```
function initialize(address owner_) public initializer {  
    ERC20Detailed.initialize("RED", "RED", uint8(DECIMALS));  
    Ownable.initialize(owner_);  
}
```

## Description:

Floating point calculations can vary across different architectures.

## Alleviation:

This exhibit was acknowledged and ultimately discarded by the **REDTOKEN** team due to low severity. We consider the exhibit fully attended to as it doesn't impose any meaningful security concerns.

## RECOMMENDATION

**Project stakeholders should be consulted during the initial asset distribution process.**





## RECOMMENDATION

**Deployer and/or contract owner private keys are secured carefully.**

**Please refer to PAGE-09 CENTRALIZED PRIVILEGES for a detailed understanding.**

## ALLEVIATION

**The REDTOKEN project team understands the centralization risk. Some functions are provided privileged access to ensure a good runtime behavior in the project**



Identifier	Definition	Severity
COD-10	Third Party Dependencies	Minor 

Smart contract is interacting with third party protocols e.g., Pancakeswap router, cashier contract, protections contract. The scope of the audit treats third party entities as black boxes and assumes their functional correctness. However, in the real world, third parties can be compromised, and exploited. Moreover, upgrades in third parties can create severe impacts, e.g., increased transactional fees, deprecation of previous routers, etc.

## RECOMMENDATION

Inspect and validate third party dependencies regularly, and mitigate severe impacts whenever necessary.



## CERTIFICATE BY VITAL BLOCK SECURITY



## DISCLAIMERS

Vital Block provides the easy-to-understand audit of Solidity, Move and Raw source codes (commonly known as smart contracts).

The smart contract for this particular audit was analyzed for common contract vulnerabilities, and centralization exploits. This audit report makes no statements or warranties on the security of the code. This audit report does not provide any warranty or guarantee regarding the absolute bug-free nature of the smart contract analyzed, nor do they provide any indication of the client's business, business model or legal compliance. This audit report does not extend to the compiler layer, any other areas beyond the programming language, or other programming aspects that could present security risks. Cryptographic tokens are emergent technologies, they carry high levels of technical risks and uncertainty. You agree that your access and/or use, including but not limited to any services, reports, and materials, will be at your sole risk on an as-is, where-is, and as-available basis. This audit report could include false positives, false negatives, and other unpredictable results.

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**Vital Block provides intelligent blockchain Security Solutions. We provide solidity and Raw Code Review, testing, and auditing services. We have Partnered with 15+ Crypto Launchpads, audited 50+ smart contracts, and analyzed 200,000+ code lines. We have worked on major public blockchains e.g., Ethereum, Binance, Cronos, Doge, Polygon, Avalanche, Metis, Fantom, Bitcoin Cash, Aptos, Oasis, etc.**

**Vital Block is Dedicated to Making Defi & Web3 A Safer Place. We are Powered by Security engineers, developers, UI experts, and blockchain enthusiasts. Our team currently consists of 5 core members, and 4+ casual contributors.**

**Website:** <https://Vitalblock.org>

**Email:** [info@vitalblock.org](mailto:info@vitalblock.org)

**GitHub:** <https://github.com/vital-block>

**Telegram (Engineering):** [https://t.me/vital\\_block](https://t.me/vital_block)

**Telegram (Onboarding):** [https://t.me/vitalblock\\_cmo](https://t.me/vitalblock_cmo)





**vital-block**



**info@vitalblock.org**



**www.Vitalblock.org**



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