

SPYWOLF

Security Audit Report



Audit prepared for

Signum

Completed on

November 21, 2024



OVERVIEW

This goal of this report is to review the main aspects of the project to help investors make an informative decision during their research process.

You will find a a summarized review of the following key points:

- ✓ Contract's source code
- ✓ Owners' wallets
- ✓ Tokenomics
- ✓ Team transparency and goals
- ✓ Website's age, code, security and UX
- ✓ Whitepaper and roadmap
- ✓ Social media & online presence

The results of this audit are purely based on the team's evaluation and does not guarantee nor reflect the projects outcome and goal

- SPYWOLF Team -







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Autopay Contract

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Tipping/Rewards

Decimals

Unavailable

TAXES

Buy Tax **0%**

Sell Tax

0%



Our Contract Review Process

The contract review process pays special attention to the following:

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- Thorough line-by-line manual review of the entire codebase by industry experts.

Blockchain security tools used:

- OpenZeppelin
- Mythril
- Solidity Compiler
- Hardhat



VULNERABILITY ANALYSIS

ID	Title	
SWC-100	Function Default Visibility	Passed
SWC-101	Integer Overflow and Underflow	Passed
SWC-102	Outdated Compiler Version	Passed
SWC-103	Floating Pragma	Passed
SWC-104	Unchecked Call Return Value	Passed
SWC-105	Unprotected Ether Withdrawal	Passed
SWC-106	Unprotected SELFDESTRUCT Instruction	Passed
SWC-107	Reentrancy	Passed
SWC-108	State Variable Default Visibility	Passed
SWC-109	Uninitialized Storage Pointer	Passed
SWC-110	Assert Violation	Passed
SWC-111	Use of Deprecated Solidity Functions	Passed
SWC-112	Delegatecall to Untrusted Callee	Passed
SWC-113	DoS with Failed Call	Passed
SWC-114	Transaction Order Dependence	Passed
SWC-115	Authorization through tx.origin	Passed
SWC-116	Block values as a proxy for time	Passed
SWC-117	Signature Malleability	Passed
SWC-118	Incorrect Constructor Name	Passed







VULNERABILITY ANALYSIS

ID	Title	
SWC-119	Shadowing State Variables	Passed
SWC-120	Weak Sources of Randomness from Chain Attributes	Passed
SWC-121	Missing Protection against Signature Replay Attacks	Passed
SWC-122	Lack of Proper Signature Verification	Passed
SWC-123	Requirement Violation	Passed
SWC-124	Write to Arbitrary Storage Location	Passed
SWC-125	Incorrect Inheritance Order	Passed
SWC-126	Insufficient Gas Griefing	Passed
SWC-127	Arbitrary Jump with Function Type Variable	Passed
SWC-128	DoS With Block Gas Limit	Passed
SWC-129	Typographical Error	Passed
SWC-130	Right-To-Left-Override control character (U+202E)	Passed
SWC-131	Presence of unused variables	Passed
SWC-132	Unexpected Ether balance	Passed
SWC-133	Hash Collisions With Multiple Variable Length Arguments	Passed
SWC-134	Message call with hardcoded gas amount	Passed
SWC-135	Code With No Effects	Passed
SWC-136	Unencrypted Private Data On-Chain	Passed

02-B





VULNERABILITY ANALYSIS NO ERRORS FOUND

03





High Risk

No high risk-level threats found in this contract.

Medium Risk

No medium risk-level threats found in this contract.

Low Risk

No low risk-level threats found in this contract.

04

T

Governance Contract

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Governance

Decimals

Unavailable

TAXES

Buy Tax **0%**

Sell Tax

0%



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High Risk

No high risk-level threats found in this contract.

Medium Risk

No medium risk-level threats found in this contract.

Low Risk

No low risk-level threats found in this contract.



Informational

'teamMultisig' address can change the 'privateFactoryAddress'.

```
function updatePrivateFactoryAddress(address _privateFactoryAddress) external {
    require(msg.sender == teamMultisig, "only the team can update the factory deploy address");
    privateFactoryAddress = _privateFactoryAddress;

emit PrivateFactoryUpdated(_privateFactoryAddress);
}
```

'privateFactoryAddress' can add addresses to the 'privateOracleAddresses' mapping

```
function addPrivateOracle(address _privateOracleAddress) external {
    require(msg.sender == privateFactoryAddress, "only the factory can add oracles to be governed");
    privateOracleAddresses[_privateOracleAddress] = true;
    emit PrivateOracleAdded(_privateOracleAddress);
}
```

06-B



Informational

Private disputes can be opened only by addresses mapped as 'privateOracleAddresses'.

```
function beginDisputePrivate(IOracle _oracle, bytes32 _queryId, uint256 _timestamp) external {
   require(privateOracleAddresses[address(_oracle)], "Oracle address must be a private signum oracle.");
   address _reporter = _oracle.getReporterByTimestamp(_queryId, _timestamp);
   require(_reporter != address(0), "no value exists at given timestamp");
   bytes32 _hash = keccak256(abi.encodePacked(_queryId, _timestamp));
   uint256 _disputeId = voteCount + 1;
   uint256[] storage _voteRounds = voteRounds[_hash];
   _voteRounds.push(_disputeId);
   Vote storage _thisVote = voteInfo[_disputeId];
   Dispute storage _thisDispute = disputeInfo[_disputeId];
   _thisDispute.queryId = _queryId;
   _thisDispute.timestamp = _timestamp;
   _thisDispute.disputedReporter = _reporter;
   _thisVote.identifierHash = _hash;
   _thisVote.initiator = msg.sender;
   _thisVote.blockNumber = block.number;
   _thisVote.startDate = block.timestamp;
    _thisVote.voteRound = _voteRounds.length;
   disputeIdsByReporter[_reporter].push(_disputeId);
```



SignumFlex PrivateFactory

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Factory

Decimals

Unavailable

TAXES

Buy Tax

O%

Sell Tax

0%



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High Risk

No high risk-level threats found in this contract.



Medium Risk

No medium risk-level threats found in this contract.

Low Risk

Owner can self destruct the contract.

Depending on the EVM version, this may render the contract unusable/unreadable.

If contract is self destructed, some of the 'SignumFlexPrivate' deployments' functions which relies on state variables 'stakeAmount' and 'stakeLockTime' may revert.

```
function selfDestruct() external onlyOwner {
   selfdestruct(payable(owner()));
```



Informational

Owner can set creation fee and fee receiver.

```
function updateFeeSettings(uint256 _creationFee, address _feeReceiver) external onlyOwner {
    creationFee = _creationFee;
    feeReceiver = _feeReceiver;
}
```

Owner can set 'stakeAmount' and 'stakeLockTime'. These variables are read and used by the SignumFlexPrivate contracts.

```
function updateStakeRequirements(uint256 _stakeAmount, uint256 _stakeLockTime) external onlyOwner {
    stakeAmount = _stakeAmount;
    stakeLockTime = _stakeLockTime;
    emit StakeRequirementsUpdated(_stakeAmount, _stakeLockTime);
}
```

08-B



Informational

Users can deploy new SignumFlexPrivate contracts. SignumFlexPrivate contracts are added in 'privateOracleAddresses' mapping in the governance contract, allowing them to use the 'beginDisputePrivate' functionality.

```
function deploySignumFlexPrivate() external payable returns (address newContractAddress) {
    // Transfer creationFee
    if (creationFee > 0) {
        IERC20(feeToken).transferFrom(msg.sender, feeReceiver, creationFee);
    }

    // Deploy a new instance of the SignumFlexPrivate contract
        SignumFlexPrivate newContract = new SignumFlexPrivate(address(this));

    // Store the address of the new contract in the deployedContracts array
        deployedContracts.push(address(newContract));
        isPrivateOracle[address(newContract)] = true;
        governance.addPrivateOracle(address(newContract));

        // Emit the ContractDeployed event
        emit PrivateOracleDeployed(address(newContract), msg.sender);

        // Return the address of the newly deployed contract
        return address(newContract);
}
```



Informational

Users can deploy new SignumFlexPrivate contracts. SignumFlexPrivate contracts are added in 'privateOracleAddresses' mapping in the governance contract, allowing them to use the 'beginDisputePrivate' functionality.

```
function deploySignumFlexPrivate() external payable returns (address newContractAddress) {
    // Transfer creationFee
    if (creationFee > 0) {
        IERC20(feeToken).transferFrom(msg.sender, feeReceiver, creationFee);
    }

    // Deploy a new instance of the SignumFlexPrivate contract
    SignumFlexPrivate newContract = new SignumFlexPrivate(address(this));

    // Store the address of the new contract in the deployedContracts array
    deployedContracts.push(address(newContract));
    isPrivateOracle[address(newContract)] = true;
    governance.addPrivateOracle(address(newContract));

    // Emit the ContractDeployed event
    emit PrivateOracleDeployed(address(newContract), msg.sender);

    // Return the address of the newly deployed contract
    return address(newContract);
}
```



SignumFlex PrivateFactory

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Factory

Decimals

Unavailable

TAXES

Buy Tax

O%

Sell Tax

0%



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Medium Risk

If IFactory(factory).stakeAmount() is higher than _lockedBalance overflow will occur, causing the transaction to revert.

Overflow also might occur if factory's 'stakeAmount' state variable is changed to inappropriate number.

```
function slashReporter(address _reporter)
   returns (uint256 _slashAmount)
else if ( lockedBalance + stakedBalance >= IFactory(factory).stakeAmount()) {
   _slashAmount = IFactory(factory).stakeAmount();
   _updateStakeAndPayRewards(
       _stakedBalance - (IFactory(factory).stakeAmount() - lockedBalance)
   toWithdraw -= _lockedBalance;
   _staker.lockedBalance = 0;
```

- Recommendation:
 - Consider using another formula in production.



Informational

Owner can whitelist reporter addresses to submit specific data set. Eligible reporters can submit new data records to the contract. Once set, the data that whitelisted reporter can submit cannot be changed.

```
function updateWhitelist(address _reporter, bytes32 _queryId, bool _status) external {
    require(msg.sender == owner, "only owner can update whitelist");
    whitelist[_reporter] = _status;

    if (stakerDetails[_reporter].reporterQueryId == 0) {
        stakerDetails[_reporter].reporterQueryId = _queryId;
    }

    emit WhitelistUpdated(_reporter, _status);
}
```

Governance address can self destruct the contrat.

Depending on the EVM version, this may render the contract unusable/unreadable.

```
function selfDestruct() external {
    require(msg.sender == governance, "Only governance can destruct the test deploy.");
    selfdestruct(payable(governance));
}
```

10-B

Informational

Governance address can remove reported data (nullify already created reports).

```
function removeValue(bytes32 _queryId, uint256 _timestamp) external {
    require(msg.sender == governance, "caller must be governance address");
    Report storage _report = reports[_queryId];
    require(!_report.isDisputed[_timestamp], "value already disputed");
    uint256 _index = _report.timestampIndex[_timestamp];
    require(_timestamp == _report.timestamps[_index], "invalid timestamp");
    _report.valueByTimestamp[_timestamp] = "";
    _report.isDisputed[_timestamp] = true;
    emit ValueRemoved(_queryId, _timestamp);
}
```



SignumPresale Contract

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Factory

Decimals

Unavailable

TAXES

Buy Tax **0%**

Sell Tax

0%



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- Hardhat





Low Risk

Owner can withdraw contract's native currency balances (ETH, BNB, etc.). Function may not be used if the owner is multi sig wallet. .transfer is limiting the function call to 2300 gas.

```
function withdraw() public onlyOwner {
   uint256 balance = address(this).balance;
   payable(msg.sender).transfer(balance);
```

If multi sig wallet usage is desired use .call instead.



Low Risk

Owner can add purchase rounds.

Beware for token's decimals when _tokenCost is set, depending on each chain. This may cause undesired misspricing and/or revert in buy() functionality.

```
function addRound(uint256 _tokensAvailable, uint256 _tokenCost) public onlyOwner {
    rounds.push(Round(_tokensAvailable, _tokenCost));
```

Example: USDT stable coin is with 6 decimals in Ethereum mainnet but with 18 decimals in Binance smart chain mainnet.



Low Risk

Owner can set payment token that will be used to purchase the presale tokens.

Beware for payment token's decimals. If token that have inappropriate decimals (different than 18), this may result in mispricing delivered from the ExchangeHelper contract.

Overflow may also occur if token's decimals are above 18 in ExchangeHelper's getRateFromDex() functionality.

```
function setPaymentToken(address _paymentToken, bool _allowed) public onlyOwner {
    paymentTokens[_paymentToken] = _allowed;
function getRateFromDex(address _tokenAddress) public view returns (uint256) {
    PriceRecord storage priceRecord = priceRecords[_tokenAddress];
    if (priceRecord.active) {
       uint256 rawTokenAmount = IERC20Extended(priceRecord.token).balanceOf(
           priceRecord.lpToken
       uint256 tokenDecimalDelta = 18 -
           uint256(IERC20Extended(priceRecord.token).decimals());
       uint256 tokenAmount = rawTokenAmount.mul(10**tokenDecimalDelta);
       uint256 rawBaseTokenAmount = IERC20Extended(priceRecord.baseToken)
           .balanceOf(priceRecord.lpToken);
       uint256 baseTokenDecimalDelta = 18 -
          uint256(IERC20Extended(priceRecord.baseToken).decimals());
       uint256 baseTokenAmount = rawBaseTokenAmount.mul(
           10**baseTokenDecimalDelta
       uint256 baseTokenPrice = getBaseTokenPrice();
       uint256 tokenPrice = baseTokenPrice.mul(baseTokenAmount).div(tokenAmount);
       return tokenPrice;
     else {
       return 0;
```



Informational

Owner can withdraw any ERC20 token from the contract.

```
function withdrawTokens(address _tokenAddress, uint256 _amount)
   public
   onlyOwner
{
    require(
        _amount <= IERC20(_tokenAddress).balanceOf(address(this)),
        "Insufficient token balance in contract."
    );

    IERC20(_tokenAddress).transfer(address(msg.sender), _amount);
}</pre>
```

Owner can set presale's start and end time.

```
function setStartAndStopTime(uint32 _startTime, uint32 _stopTime) public onlyOwner {
    require(_stopTime > _startTime, "Stop time must be after startTime.");
    startTime = _startTime;
    stopTime = _stopTime;
}
```

Owner can set minimum and maximum amount of tokens that can be purchased by user.

```
function setMinAndMaxAmount(uint256 _minAmount, uint256 _maxAmount) public onlyOwner {
    minAmount = _minAmount;
    maxAmount = _maxAmount;
}
```

12-C

7



FOUND THREATS

1 Informational: 2

Owner can set payment tokens receiver.

```
function setReceiver(address _newReceiver) public onlyOwner {
    receiver = _newReceiver;
}
```

General information:

When users participate in the presale with the buy() function, no actual tokens are distributed. Their buy share is saved into 'totalBoughtByuser' mapping.





ExchangeHelper Contract

Token Name

Unavailable

Symbol

Unavailable

Contract Address

Unavailable

Network

Unavailable

Deployment Date

Not deployed yet

Total Supply

Unavailable

Language

Solidity

Contract Type

Factory

Decimals

Unavailable

TAXES

Buy Tax 0%

Sell Tax 0%

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- **Solidity Compiler**
- Hardhat



Low Risk

Owner can set new record for a token.

Beware for the newly set token's decimals as overflow will occur in 'getRateFromDex()' if the token have more than 18 decimals.

```
function setDexPriceRecord(
   address _token,
   address _baseToken,
   address _lpToken
) external onlyAdmin {
   PriceRecord storage priceRecord = priceRecords[_token];
   priceRecord.token = _token;
   priceRecord.baseToken = _baseToken;
   priceRecord.lpToken = _lpToken;
   priceRecord.active = true;
   emit PriceRecordUpdated(_token, _baseToken, _lpToken);
function getRateFromDex(address _tokenAddress) public view returns (uint256) {
    PriceRecord storage priceRecord = priceRecords[_tokenAddress];
    if (priceRecord.active) {
       uint256 rawTokenAmount = IERC20Extended(priceRecord.token).balanceOf(
           priceRecord.lpToken
       uint256 tokenDecimalDelta = 18 -
            uint256(IERC20Extended(priceRecord.token).decimals());
       uint256 tokenAmount = rawTokenAmount.mul(10**tokenDecimalDelta);
       uint256 rawBaseTokenAmount = IERC20Extended(priceRecord.baseToken)
           .balanceOf(priceRecord.lpToken);
       uint256 baseTokenDecimalDelta = 18 -
           uint256(IERC20Extended(priceRecord.baseToken).decimals());
       uint256 baseTokenAmount = rawBaseTokenAmount.mul(
            10**baseTokenDecimalDelta
       uint256 baseTokenPrice = getBaseTokenPrice();
       uint256 tokenPrice = baseTokenPrice.mul(baseTokenAmount).div(tokenAmount);
       return tokenPrice;
```





Informational

Admin can set exchange rate price for a token.

```
function setDirectPrice(address _token, uint256 _price) external onlyAdmin {
    emit DirectPriceUpdated(_token, assetPrices[_token], _price);
    assetPrices[_token] = _price;
}
```

Admin can transfer authorization to another address.

```
function setAdmin(address newAdmin) external onlyAdmin {
   address oldAdmin = admin;
   admin = newAdmin;
   emit NewAdmin(oldAdmin, newAdmin);
}
```

14-B

Signum TestToken

Token Name

Signum Test Token

Symbol

STT

Contract Address

Unavailable

Network

Unavailable

Language

Solidity

Deployment Date
Not deployed yet

Contract Type
Standard token

Total Supply

Assigned at deployment

Decimals

18

TAXES

Buy Tax **0%**

Sell Tax

0%



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Low Risk

Owner can self destruct the contract. Depending on the EVM version, this may render the contract unusable/unreadable.

```
function selfDestruct() external onlyOwner {
   selfdestruct(payable(owner));
```





Informational

'_EIP_SLOT' variable does not match the hash from keccak256(abi.encodePacked(_EIP_SLOT)) value.

16-B



Website URL:

Unavailable

Domain Registry https://www.godaddy.com

Domain Expiration Unavailable

Technical SEO Test

Passed

Security Test
Passed. SSL certificate present

Design Unavailable

Content

Unavailable

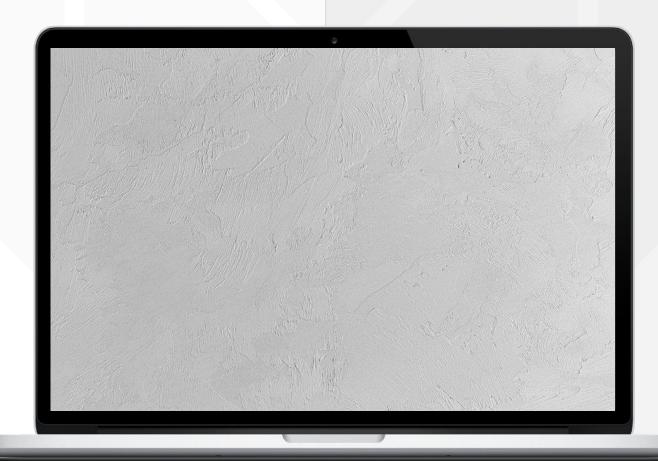
Whitepaper Unavailable

Roadmap

Unavailable

Mobile-friendly?

Unavailable



Under Construction

SPYWOLF.CO

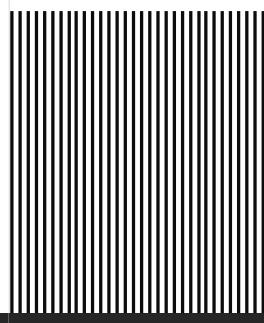
SOCIAL MEDIA

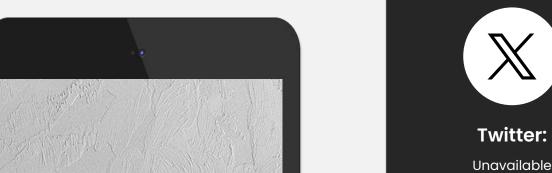
Social Score: 0%



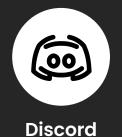
Unavailable







•



Unavailable

A

Telegram:

Unavailable

Medium
Unavailable

18



SPYWOLF CRYPTO SECURITY

Audits | KYCs | dApps Contract Development

ABOUT US

We are a growing crypto security agency offering audits, KYCs and consulting services for some of the top names in the crypto industry.

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- ✓ MORE THAN 1000 SCAMS EXPOSED
- ✓ MILLIONS SAVED IN POTENTIAL FRAUD
- ✓ PARTNERSHIPS WITH TOP LAUNCHPADS, INFLUENCERS AND CRYPTO PROJECTS
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Disclaimer

This report shows findings based on our limited project analysis, following good industry practice from the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, overall social media and website presence and team transparency details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report.

While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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No applications were reviewed for security. No product code has been reviewed.



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