



# EthermonToken Smart Contract Audit Report

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# AUDITED DETAILS

## Audited Project

Project name	Token ticker	Blockchain
EthermonToken	EMON	Ethereum

## Addresses

Contract address	0xd6a5ab46ead26f49b03bbb1f9eb1ad5c1767974a
Contract deployer address	0x7777777bB1a74a0efDC12F304ADbC3d13940BA781

## Project Website

<https://ethermon.io/>

## Codebase

<https://etherscan.io/address/0xd6a5ab46ead26f49b03bbb1f9eb1ad5c1767974a#code>

# SUMMARY

Launched in 2017, Ethermon is one of the first Ethereum-based blockchain games to create interactive non-fungible tokens (NFTs), allowing players to own, improve, use, and profit from their in-game virtual assets.

## Contract Summary

### Documentation Quality

EthermonToken provides a very poor documentation with standard of solidity base code.

- The technical description is provided unclear and disorganized.

### Code Quality

The Overall quality of the basecode is poor.

- Solidity basecode and rules are unclear and disorganized by EthermonToken.

### Test Coverage

Test coverage of the project is 100% ( Through Codebase )

## Audit Findings Summary

- SWC-103 | Pragma statements can be allowed to float when a contract is intended on lines 5.
- SWC-107 | It is recommended to use a reentrancy lock, reentrancy weaknesses detected on lines 1437, 1152, 1153, 1438, 1410, 1422, 1270, 1152 and 1153.
- SWC-110 SWC-123 | It is recommended to use of revert(), assert(), and require() in Solidity, and the new REVERT opcode in the EVM on lines 1422.
- SWC-113 SWC-128 | It is recommended to implement the contract logic to handle failed calls and block gas limit on lines 1438.

## CONCLUSION

We have audited the EthermonToken project released on January 2023 to discover issues and identify potential security vulnerabilities in EthermonToken Project. This process is used to find technical issues and security loopholes which might be found in the smart contract.

The security audit report provides a satisfactory result with some low-risk issues.

The issues found in the EthermonToken smart contract code do not pose a considerable risk. The writing of the contract is close to the standard of writing contracts in general. The low-risk issues found are some arithmetic operation issues, a floating pragma being set, multiple calls executed in the same transaction, write/read of persistent state following the external call, and Requirement violation. This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase). The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

# AUDIT RESULT

Article	Category	Description	Result
Default Visibility	SWC-100 SWC-108	Functions and state variables visibility should be set explicitly. Visibility levels should be specified consciously.	PASS
Integer Overflow and Underflow	SWC-101	If unchecked math is used, all math operations should be safe from overflows and underflows.	PASS
Outdated Compiler Version	SWC-102	It is recommended to use a recent version of the Solidity compiler.	PASS
Floating Pragma	SWC-103	Contracts should be deployed with the same compiler version and flags that they have been tested thoroughly.	ISSUE FOUND
Unchecked Call Return Value	SWC-104	The return value of a message call should be checked.	PASS
Unprotected Ether Withdrawal	SWC-105	Due to missing or insufficient access controls, malicious parties can withdraw from the contract.	PASS
SELFDESTRUCT Instruction	SWC-106	The contract should not be self-destructible while it has funds belonging to users.	PASS
Reentrancy	SWC-107	Check effect interaction pattern should be followed if the code performs recursive call.	ISSUE FOUND
Uninitialized Storage Pointer	SWC-109	Uninitialized local storage variables can point to unexpected storage locations in the contract.	PASS
Assert Violation	SWC-110 SWC-123	Properly functioning code should never reach a failing assert statement.	ISSUE FOUND
Deprecated Solidity Functions	SWC-111	Deprecated built-in functions should never be used.	PASS
Delegate call to Untrusted Callee	SWC-112	Delegatecalls should only be allowed to trusted addresses.	PASS

DoS (Denial of Service)	SWC-113 SWC-128	Execution of the code should never be blocked by a specific contract state unless required.	<b>ISSUE FOUND</b>
Race Conditions	SWC-114	Race Conditions and Transactions Order Dependency should not be possible.	<b>PASS</b>
Authorization through tx.origin	SWC-115	tx.origin should not be used for authorization.	<b>PASS</b>
Block values as a proxy for time	SWC-116	Block numbers should not be used for time calculations.	<b>PASS</b>
Signature Unique ID	SWC-117 SWC-121 SWC-122	Signed messages should always have a unique id. A transaction hash should not be used as a unique id.	<b>PASS</b>
Incorrect Constructor Name	SWC-118	Constructors are special functions that are called only once during the contract creation.	<b>PASS</b>
Shadowing State Variable	SWC-119	State variables should not be shadowed.	<b>PASS</b>
Weak Sources of Randomness	SWC-120	Random values should never be generated from Chain Attributes or be predictable.	<b>PASS</b>
Write to Arbitrary Storage Location	SWC-124	The contract is responsible for ensuring that only authorized user or contract accounts may write to sensitive storage locations.	<b>PASS</b>
Incorrect Inheritance Order	SWC-125	When inheriting multiple contracts, especially if they have identical functions, a developer should carefully specify inheritance in the correct order. The rule of thumb is to inherit contracts from more /general/ to more /specific/.	<b>PASS</b>
Insufficient Gas Griefing	SWC-126	Insufficient gas griefing attacks can be performed on contracts which accept data and use it in a sub-call on another contract.	<b>PASS</b>
Arbitrary Jump Function	SWC-127	As Solidity doesnt support pointer arithmetics, it is impossible to change such variable to an arbitrary value.	<b>PASS</b>

<b>Typographical Error</b>	<b>SWC-129</b>	A typographical error can occur for example when the intent of a defined operation is to sum a number to a variable.	<b>PASS</b>
<b>Override control character</b>	<b>SWC-130</b>	Malicious actors can use the Right-To-Left-Override unicode character to force RTL text rendering and confuse users as to the real intent of a contract.	<b>PASS</b>
<b>Unused variables</b>	<b>SWC-131 SWC-135</b>	Unused variables are allowed in Solidity and they do not pose a direct security issue.	<b>PASS</b>
<b>Unexpected Ether balance</b>	<b>SWC-132</b>	Contracts can behave erroneously when they strictly assume a specific Ether balance.	<b>PASS</b>
<b>Hash Collisions Variable</b>	<b>SWC-133</b>	Using <code>abi.encodePacked()</code> with multiple variable length arguments can, in certain situations, lead to a hash collision.	<b>PASS</b>
<b>Hardcoded gas amount</b>	<b>SWC-134</b>	The <code>transfer()</code> and <code>send()</code> functions forward a fixed amount of 2300 gas.	<b>PASS</b>
<b>Unencrypted Private Data</b>	<b>SWC-136</b>	It is a common misconception that private type variables cannot be read.	<b>PASS</b>



# SMART CONTRACT ANALYSIS

Started	Saturday May 07 2022 05:20:15 GMT+0000 (Coordinated Universal Time)
Finished	Sunday May 08 2022 17:07:18 GMT+0000 (Coordinated Universal Time)
Mode	Standard
Main Source File	EthermonToken.sol

## Detected Issues

ID	Title	Severity	Status
SWC-113	MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.	medium	acknowledged
SWC-103	A FLOATING PRAGMA IS SET.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.	low	acknowledged
SWC-107	A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.	low	acknowledged
SWC-107	READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-107	WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL.	low	acknowledged
SWC-123	REQUIREMENT VIOLATION.	low	acknowledged

## SWC-113 | MULTIPLE CALLS ARE EXECUTED IN THE SAME TRANSACTION.

LINE 1438

### medium SEVERITY

This call is executed following another call within the same transaction. It is possible that the call never gets executed if a prior call fails permanently. This might be caused intentionally by a malicious callee. If possible, refactor the code such that each transaction only executes one external call or make sure that all callees can be trusted (i.e. they're part of your own codebase).

### Source File

- EthermonToken.sol

### Locations

```
1437     if (address(locker) != address(0)) {
1438         locker.lockOrGetPenalty(sender, recipient);
1439     }
1440     return ERC20._transfer(sender, recipient, amount);
1441 }
1442
```

## SWC-103 | A FLOATING PRAGMA IS SET.

LINE 5

### low SEVERITY

The current pragma Solidity directive is ""^0.7.0"". It is recommended to specify a fixed compiler version to ensure that the bytecode produced does not vary between builds. This is especially important if you rely on bytecode-level verification of the code.

### Source File

- EthermonToken.sol

### Locations

```
4
5  pragma solidity ^0.7.0;
6
7  abstract contract Context {
8  function _msgSender() internal view virtual returns (address payable) {
9
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1437

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1436 ) internal virtual override {
1437   if (address(locker) != address(0)) {
1438     locker.lockOrGetPenalty(sender, recipient);
1439   }
1440   return ERC20._transfer(sender, recipient, amount);
1441 }
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1152

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1151
1152  _balances[sender] = _balances[sender].sub(amount, "ERC20: transfer amount exceeds
balance");
1153  _balances[recipient] = _balances[recipient].add(amount);
1154  emit Transfer(sender, recipient, amount);
1155  }
1156
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1153

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1152  _balances[sender] = _balances[sender].sub(amount, "ERC20: transfer amount exceeds
balance");
1153  _balances[recipient] = _balances[recipient].add(amount);
1154  emit Transfer(sender, recipient, amount);
1155  }
1156
1157
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1438

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1437     if (address(locker) != address(0)) {  
1438         locker.lockOrGetPenalty(sender, recipient);  
1439     }  
1440     return ERC20._transfer(sender, recipient, amount);  
1441 }  
1442
```

## SWC-107 | A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.

LINE 1410

### low SEVERITY

An external message call to an address specified by the caller is executed. Note that the callee account might contain arbitrary code and could re-enter any function within this contract. Reentering the contract in an intermediate state may lead to unexpected behaviour. Make sure that no state modifications are executed after this call and/or reentrancy guards are in place.

### Source File

- EthermonToken.sol

### Locations

```
1409     if (approve(_spender, _value)) {
1410         spender.receiveApproval(msg.sender, _value, address(this), _extraData);
1411     return true;
1412     }
1413     }
1414
```



## SWC-107 | A CALL TO A USER-SUPPLIED ADDRESS IS EXECUTED.

LINE 1422

### low SEVERITY

An external message call to an address specified by the caller is executed. Note that the callee account might contain arbitrary code and could re-enter any function within this contract. Reentering the contract in an intermediate state may lead to unexpected behaviour. Make sure that no state modifications are executed after this call and/or reentrancy guards are in place.

### Source File

- EthermonToken.sol

### Locations

```
1421     TokenConvertor convertor = TokenConvertor(_convertor);
1422     convertor.convertToOld(_amount, msg.sender);
1423     _transfer(_msgSender(), _convertor, _amount);
1424     return true;
1425 }
1426
```

## SWC-107 | READ OF PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1270

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1269     function paused() public view virtual returns (bool) {  
1270         return _paused;  
1271     }  
1272  
1273     /**  
1274
```

## SWC-107 | WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1152

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1151
1152  _balances[sender] = _balances[sender].sub(amount, "ERC20: transfer amount exceeds
balance");
1153  _balances[recipient] = _balances[recipient].add(amount);
1154  emit Transfer(sender, recipient, amount);
1155  }
1156
```

## SWC-107 | WRITE TO PERSISTENT STATE FOLLOWING EXTERNAL CALL.

LINE 1153

### low SEVERITY

The contract account state is accessed after an external call. To prevent reentrancy issues, consider accessing the state only before the call, especially if the callee is untrusted. Alternatively, a reentrancy lock can be used to prevent untrusted callees from re-entering the contract in an intermediate state.

### Source File

- EthermonToken.sol

### Locations

```
1152  _balances[sender] = _balances[sender].sub(amount, "ERC20: transfer amount exceeds
balance");
1153  _balances[recipient] = _balances[recipient].add(amount);
1154  emit Transfer(sender, recipient, amount);
1155  }
1156
1157
```

## SWC-123 | REQUIREMENT VIOLATION.

LINE 1422

### low SEVERITY

A requirement was violated in a nested call and the call was reverted as a result. Make sure valid inputs are provided to the nested call (for instance, via passed arguments).

### Source File

- EthermonToken.sol

### Locations

```
1421 TokenConvertor convertor = TokenConvertor(_convertor);
1422 convertor.convertToOld(_amount, msg.sender);
1423 _transfer(msgSender(), _convertor, _amount);
1424 return true;
1425 }
1426
```

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This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the 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 below disclaimer below – please make sure to read it in full.

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