**Product Authentication System - User Manual**

**Introduction**

The Product Authentication System is a blockchain-based solution designed to verify and authenticate the ownership and legitimacy of products. Leveraging Ethereum smart contracts, users can register products, authenticate them, and transfer ownership securely. This system aims to increase consumer trust by providing an unalterable product ownership and authenticity record.

**System Requirements**

* Browser: Chrome, Firefox, or any modern browser supporting MetaMask.
* MetaMask Extension: Required for Ethereum blockchain transactions.
* Ethereum Network: Must have an Ethereum account with ETH to cover transaction gas fees.
* Internet Connection: A stable connection to facilitate smooth blockchain interactions.

**Getting Started**

* Installing MetaMask

Visit the MetaMask website and install the extension compatible with your browser.

Create a new MetaMask wallet or import an existing one by following the on-screen

instructions.

* Opening the Frontend

Navigate to the application’s URL (provided by the administrator or developer).

Ensure that MetaMask is unlocked and connected to the Ethereum network specified by the application.

* Connecting to MetaMask

Upon opening the frontend, you will be prompted to connect MetaMask to the application.

Click Connect Wallet and select your Ethereum account in MetaMask.

Confirm any prompts to authorize the application’s access to your wallet for transaction purposes.

**User Functions**

* Registering a Product

Go to the Register Product section in the application.

Enter product details such as name and serial number.

Click Submit to initiate the registration.

MetaMask will prompt you to confirm the transaction. Review the gas fees and click Confirm to finalize the registration.

After confirmation, your product will be securely registered on the blockchain.

* Viewing the Registered Product

Navigate to the View Products section to see a list of products you have registered.

Each entry includes product details and a unique blockchain-based identifier.

* Transferring Product Ownership

In the Transfer Ownership section, select the product you wish to transfer.

Enter the Ethereum address of the new owner and click Initiate Transfer.

MetaMask will prompt you to confirm the transfer, displaying the gas fees associated with the transaction.

Upon successful transaction confirmation, the ownership will be transferred to the specified address. The new owner can now view the product under their account.

**Troubleshooting**

Here are some common issues and their solutions:

* MetaMask Connectivity Issues

Issue: Unable to connect MetaMask to the application.

Solution: Ensure MetaMask is unlocked and the correct network is selected. Refresh the page and try reconnecting.

* Insufficient ETH for Gas Fees

Issue: Error due to insufficient funds in MetaMask for gas fees.

Solution: Top up your wallet with ETH through a trusted exchange. Make sure to check gas fees as they vary based on network activity.

* Transaction Stuck or Pending

Issue: Transaction appears pending or stuck on MetaMask.

Solution: Wait a few minutes, as network congestion can cause delays. Alternatively, you can speed up the transaction in MetaMask by selecting the “Speed Up” option.

* Error During Product Registration or Transfer

Issue: Error message displayed when attempting to register or transfer a product.

Solution: Ensure that all fields are filled correctly and that you have enough ETH for the transaction. Contact support if issues persist.