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Abstract

This document outlines the various functions and operations of an IoT device dashboard, which enables the user to manage and monitor multiple meters and machines on a network. The document covers essential use cases such as user login/logout, adding meters and machines, monthly and yearly analysis, adding other users, changing credentials, adding/removing devices, viewing instant load and analysis, and device management. Each use case is presented in a table format with detailed pre and post-conditions, which give us an overview of the system's functions and interactions. Overall, this document serves as a comprehensive guide for users, administrators, and developers of the IoT device dashboard.

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Din Rail Meter

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# Overall use cases For Din Rail meters

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| --- | --- | --- |
| **Case** | **Use Case** | **Description** |
| 1 | User Login/Logout | The user should be able to log in to the dashboard with their credentials, and log out when finished using the dashboard. |
| 2 | Add Meters | The user should be able to add new meters to the network, specifying details such as the type of meter and its location. |
| 3 | Add Machines and Meters to Network Tree | The user should be able to organize the meters into a network tree, with machines at the top level and meters nested below them. |
| 4 | View Monthly and Yearly Analysis | The user should be able to view summary data for each meter, including energy usage and costs, for a given month or year. |
| 5 | Add Other Users | The user should be able to add additional users to the dashboard, with different access levels and permissions. |
| 6 | Change User Credentials | The user should be able to update their own login credentials, including their username and password. |
| 7 | Add/Remove Devices | The user should be able to add new devices to the network, and remove devices that are no longer needed. |
| 8 | View Instant Load and Analysis | The user should be able to view real-time data for each meter, including energy usage, load, and other relevant parameters, in the form of graphs and charts. |
| 9 | Device Management | The user should be able to manage the devices connected to the network, including performing maintenance tasks such as firmware updates and troubleshooting issues. |

# Individually Details for each of the use cases

## Use Case: Login

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| **Use Case Name** | **Login** |
| Actors | User |
| Description | User logs in to access the dashboard |
| Pre-conditions | User is registered and has valid login credentials |
| Post-conditions | User is authenticated and redirected to the dashboard |
| Normal Flow | 1. User navigates to the login page 2. User enters valid login credentials 3. User clicks on the login button 4. System verifies the credentials 5. System authenticates the user 6. System redirects the user to the dashboard. |
| Alternate Flows | 4a. System does not verify the credentials.   1. System displays an error message to the user |

## Use Case: Logout

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| **Use Case Name** | **Logout** |
| Actors | User |
| Description | User logs out from the dashboard |
| Pre-conditions | User is logged in |
| Post-conditions | User is logged out and redirected to the login page |
| Normal Flow | 1. User clicks on the logout button 2. System logs out the user 3. System redirects the user to the login page |
| Alternate Flows | None |

## Use Case: Add Meters

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| **Use Case Name:** | **Add Meters** |
| Preconditions: | User is logged in and has access to the dashboard. |
| Actor: | User |
| Basic Flow: | 1. User selects the "Add Meters" option from the dashboard. 2. The system displays a form to add new meters, requesting the unique number of the meter(s). 3. User enters the unique number of the meter(s) they want to add. 4. The system verifies the uniqueness of the entered meter numbers. 5. The system adds the new meter(s) to the network tree. |
| Postconditions: | 1. The meter(s) is/are successfully added to the network tree. 2. The user can view the new meter(s) in the network tree. 3. The unique number(s) of the meter(s) are saved in the system's database. |

## Use Case Add Machines and Meters to Network Tree"

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| **Use Case Name:** | **Add Machines and Meters to Network Tree** |
| Pre-Condition: | User is logged in and on the Dashboard page |
| Post-Condition: | Network tree is updated with added machine/meter |
| Actor(s): | User |
| Description: | User adds a machine and/or meter to the network tree |
| Flow of Events: | 1. User clicks on "Add Machine/Meter" button 2. System displays form to input machine/meter information:   2a. Machine/Meter name  2b. Unique identifier number  2c. Parent machine (if applicable)  2d. Location (if applicable)   1. User enters information and clicks "Add" 2. System validates information and adds machine/meter to the network tree 3. System displays success message and updates network tree |
| Alternate Flows: | 1. User enters invalid information:  a. System displays error message and prompts user to correct information  2. User cancels operation:  a. System discards entered information and returns to previous page |
| Exceptions: | None |

## Use Case Add Other Users

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| **Use Case Name:** | **Add Other Users** |
| **Description:** | This use case describes how a user can add other users to the system. |
| **Actors:** | Admin User |
| **Precondition:** | The Admin User must be logged in. |
| **Postcondition:** | The new user is added to the system. |
| **Main Scenario:** | 1. The Admin User navigates to the user management section of the dashboard. 2. The Admin User selects the "Add User" option. 3. The system prompts the Admin User to enter the new user's details, such as name, email address, and password. 4. The Admin User enters the new user's details. 5. The system validates the new user's details and adds the new user to the system. 6. The system displays a success message to the Admin User. |
| **Alternate Scenarios:** | 3a. If the system detects that the email address entered by the Admin User is already associated with an existing user, the system displays an error message and prompts the Admin User to enter a different email address.  5a. If the system is unable to add the new user due to an error, the system displays an error message to the Admin User. |
| **Exceptional Scenarios:** | N/A |

## Use Case: Change User Credentials

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| **Use Case Name** | **Change User Credentials** | |
| Description | The user wants to change their login credentials | |
| Precondition | User is logged in | |
| Postcondition | User's login credentials are updated | |
| **Steps** | **Actors** | **System** |
| 1. User selects "Change Credentials" option | User | System displays "Change Credentials" form |
| 2. User enters current password and new credentials | User | System validates current password and new credentials |
| 3. System updates user's login credentials | System | System displays success message to the user |

## Use Case: Add/Remove Devices

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| **Use Case Name** | **Add/Remove Devices** | |
| Description | The user wants to add or remove a device from the network tree | |
| Precondition | User is logged in | |
| Postcondition | Device is added or removed from the network tree | |
| **Steps** | **Actors** | **System** |
| 1. User selects "Add/Remove Devices" option | User | System displays list of currently connected devices |
| 2. User selects "Add" or "Remove" option | User | System displays appropriate form |
| 3. User fills out the form with device details | User | System validates form data |
| 4. System adds or removes the device from the network tree | System | System displays success message to the user |

## Use Case: View Instant Load and Analysis

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| **Use Case Name** | **View Instant Load and Analysis** | |
| Description | The user wants to view the current load and analysis of the device | |
| Precondition | User is logged in and device is connected | |
| Postcondition | User can see the current load and analysis of the device | |
| **Steps** | **Actors** | **System** |
| 1. User selects "Instant Load and Analysis" option | User | System displays current load and analysis of the device |
| 2. User can view the current load and analysis | User | System updates load and analysis in real-time |

## Use Case: Device Management

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| **Use Case Name** | **Device Management** | |
| Description | The user wants to manage the connected devices | |
| Precondition | User is logged in | |
| Postcondition | Connected devices are managed | |
| **Steps** | **Actors** | **System** |
| 1. User selects "Device Management" option | User | System displays list of currently connected devices |
| 2. User selects a device to manage | User | System displays device management form |
| 3. User can manage device settings, configuration, and data | User | System updates device settings, configuration, and data |