Device Pulse.AI

User Manual

SENZMATE

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Introduction to Device Pulse.AI

In the rapidly advancing Internet of Things (IoT) landscape, delivering high-quality and reliable devices is key for companies to remain competitive, especially those offering IoT solutions to make the day today work easily. Hence proper Maintenance of these devices is vital as it directly affects their performance, safety, and client satisfaction. Without rigorous continuous monitoring devices are more likely to have defects, perform unreliably, and fail to meet consumer expectations. To address the challenges faced by IoT companies in delivering high-quality and reliable devices, we present our AI-driven DevicePulse.AI Platform. This platform provides a comprehensive solution that integrates seamlessly with IoT technology, enhancing testing and monitoring capabilities. The solution consists of the following seven steps:

- **Step 1 - Connect Data Stream**
  - ❖ Devices connected to various IoT platforms such as SenzMatica, Azure IoT and AWS IoT can be integrated with this DevicePulse.AI platform, allowing for streamlined data collection and analysis.
- **Step 2 - Define success criteria**
  - ❖ Users can define test cases according to their specific needs. Each test case can have a unique main test case name and multiple sub-test cases under several success criteria. This flexibility ensures thorough testing of all device functionalities.
- **Step 3 - Start monitoring**
  - ❖ This step enables users to perform two types of testing. They are production feasibility testing and continuous testing. For production feasibility testing, users must set a start and end time, and the testing will be conducted within that specified time frame. For continuous testing, based on defined test cases, users

need to schedule a time for report generation and notifications.

- **Step 4 - Device Health report**
    - ❖ The platform generates detailed reports indicating which sub-test cases have passed or failed, including failure data counts and a graph showing when each device encountered issues. This section provides a clear, organized view of device performance, highlighting specific areas that require attention for each testing process individually.

- **Step 5 - Root cause analysis**
    - ❖ Leveraging AI algorithms, the platform performs a root cause analysis of the identified issues. This step provides insights into the underlying causes of defects, enabling more effective troubleshooting and resolution.
- **Step 6 - Humanoid notification system**
    - ❖ The platform offers real-time conversational notifications about the status of the devices. This feature ensures that users are promptly informed of any issues, allowing for immediate action and resolution.To establish this communication, users need to complete the configuration in this step, specifying the analysis name, uploading device-related knowledge, and providing API links to access data from the test devices for creating the required bot.
- **Step 7 - Results dashboard**
    - ❖ The final step is the results dashboard, which provides a real-time overview of the testing outcomes. It prominently displays all failed

devices with the root causes, allowing users to quickly identify and address any issues through the chat system.

Dependencies

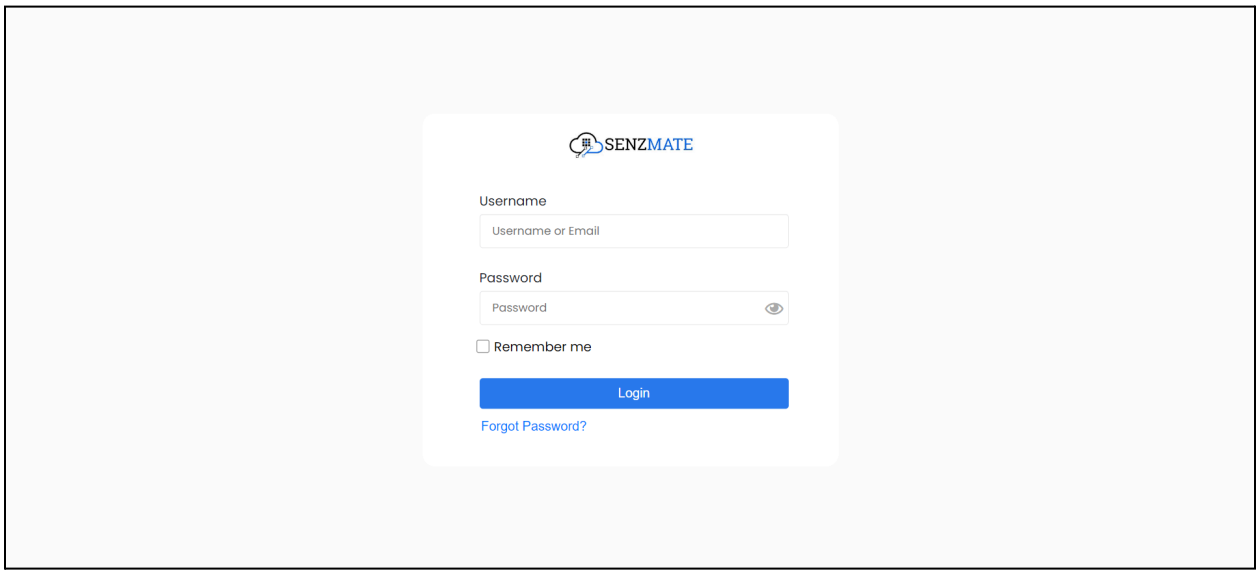
- If you are expecting to use the SenzMatica platform to onboard the devices and do the tests through device pulse.AI platform,follow these steps to onboard the devices.
  Onboarding devices to the SenzMatica platform .After onboarding the devices you need the exact batch number , base url for senzmatica platform and API key/tocken to connect your devices to test through Device pulse.AI platform.

- If you are connected your devices with Azure IoT platform ,you should provide the details of IoT Hub connection string , script files where all the details of devices are include such as sensors,interval,protocol etc to connect the devices with Device Pulse.AI platform.Also when you are getting device data which are connected to Azure,if those devices are connected to CosmosDB you need to provide URI,primary key,database name, container name and codec file to change the data format of the devices.(Important: When creating a script file both class name and file name should be the same. The method should be “Convert”. The parameters passing to the method should be “Object” . Only java.util library can be used.No outside libraries can be used.)

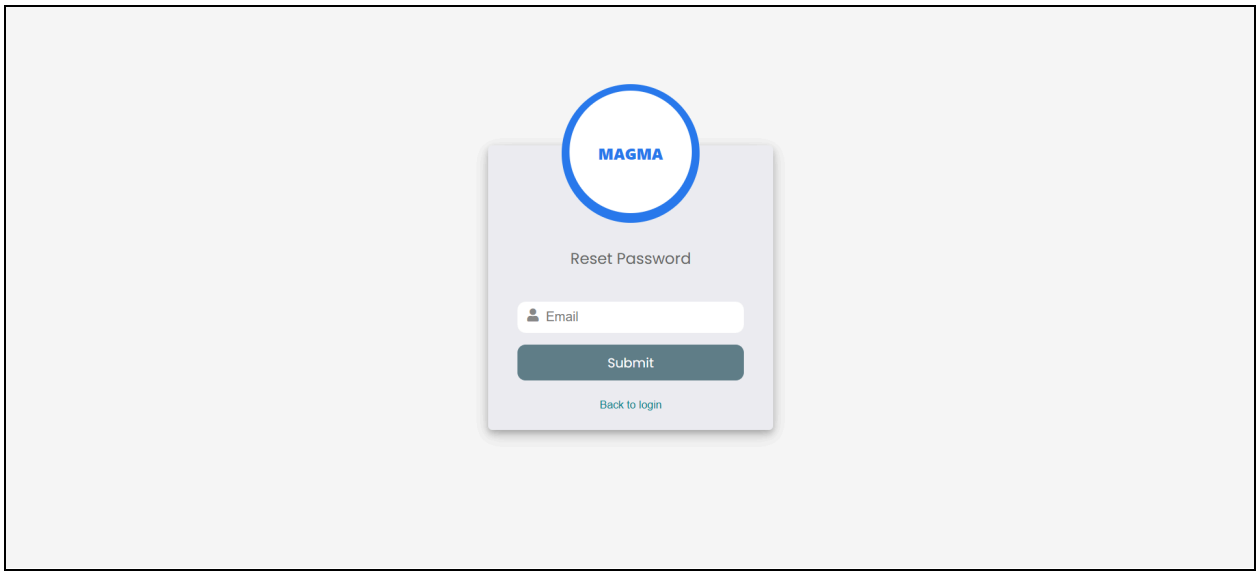
- If you wish to follow Root cause analysis step (step 5) you need historical data set (Device data) and Error logs to train the models to find out the root cause for device failures.
- If you wish to follow Huamnoid Notification System(step 6) you need device technical Catalog and Error troubleshooting guidelines related to your devices to upload as knowledge based documents there.It can be either text file or Pdfs.Also users need to provide access to data APIs.

Login & Registration

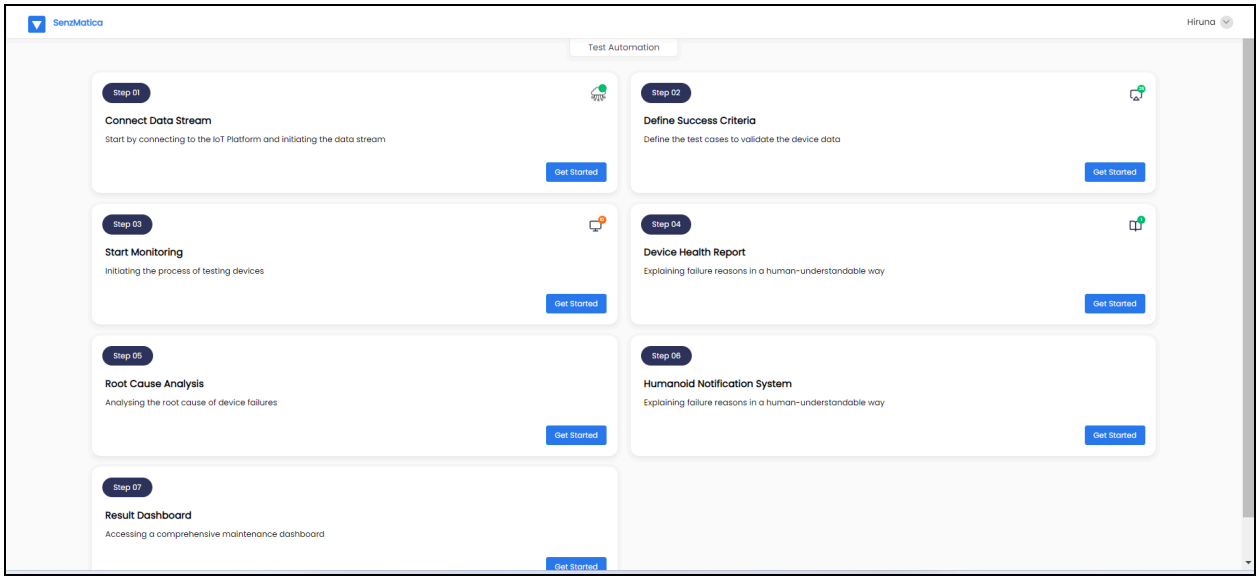
1. On your PC, go to https://device.agro.senzmate.com/ in your web browser. This will open the Device Pulse.AI login page.
2. There you can add the username/email and the password and click the Login button. Then both username/email and password are correct, you can successfully log in.



3. If you forget the password, you can click “forget the password? **click here**” and enter the email, and then click the submit button. If your email is correct then they will let you enter a valid password there.

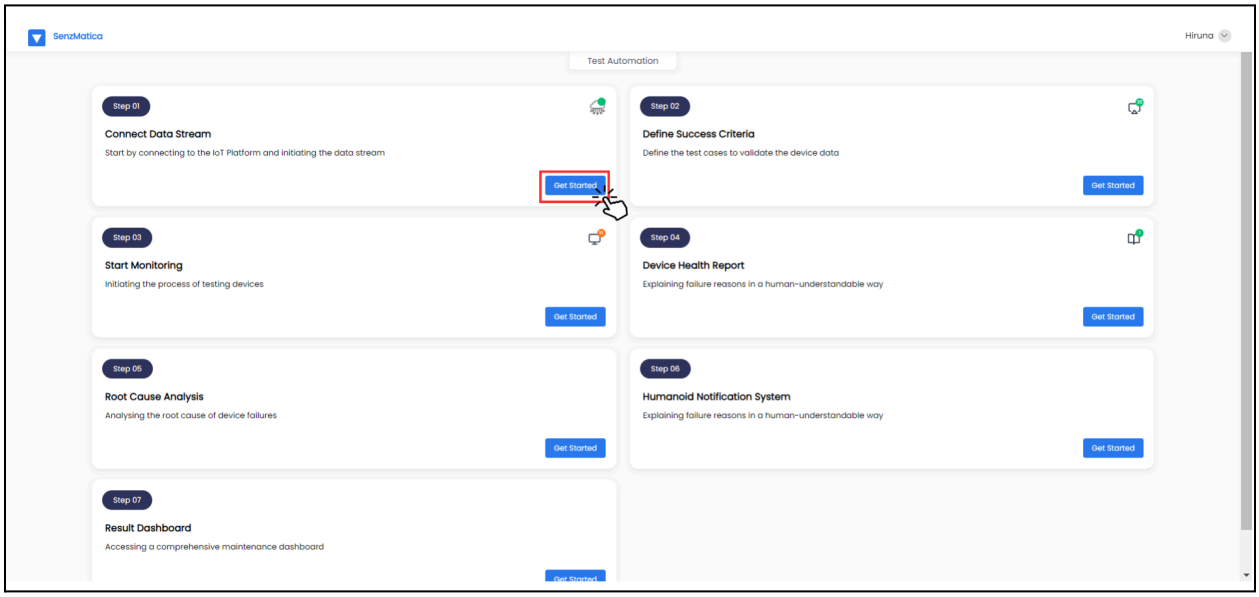


After a successful login, the following overview will be displayed.



Connecting devices with Device Pulse.AI

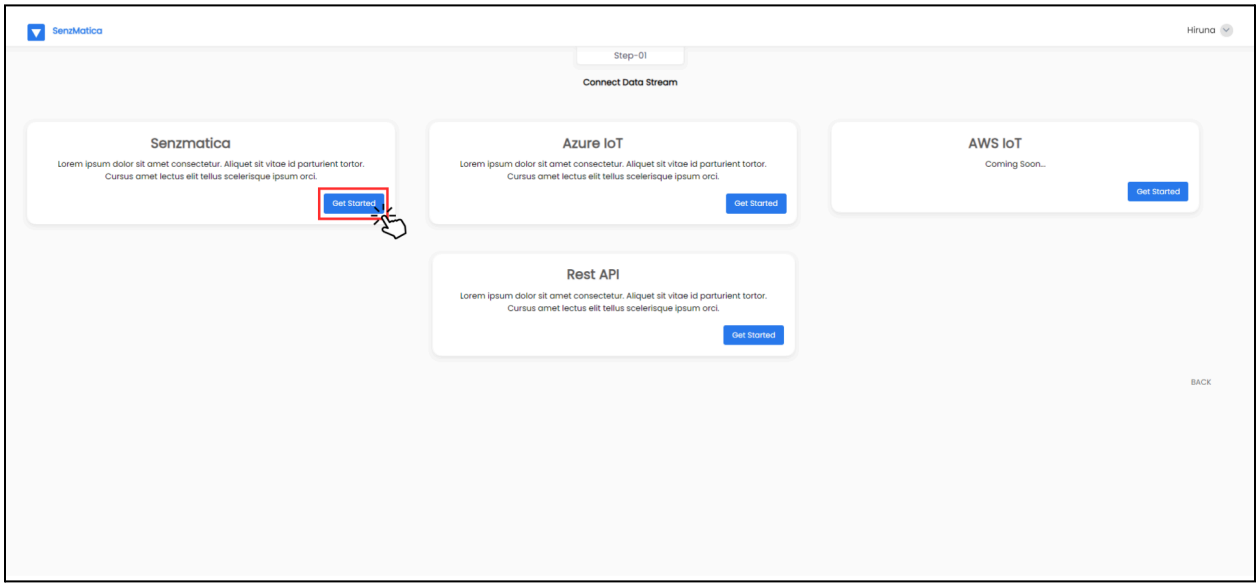
1. Click the “Get Started” button on step 1.(Important: To connect with Device Pulse.AI and test your devices, ensure that they are onboarded to either our SenzMatica platform or the Azure IoT platform.)



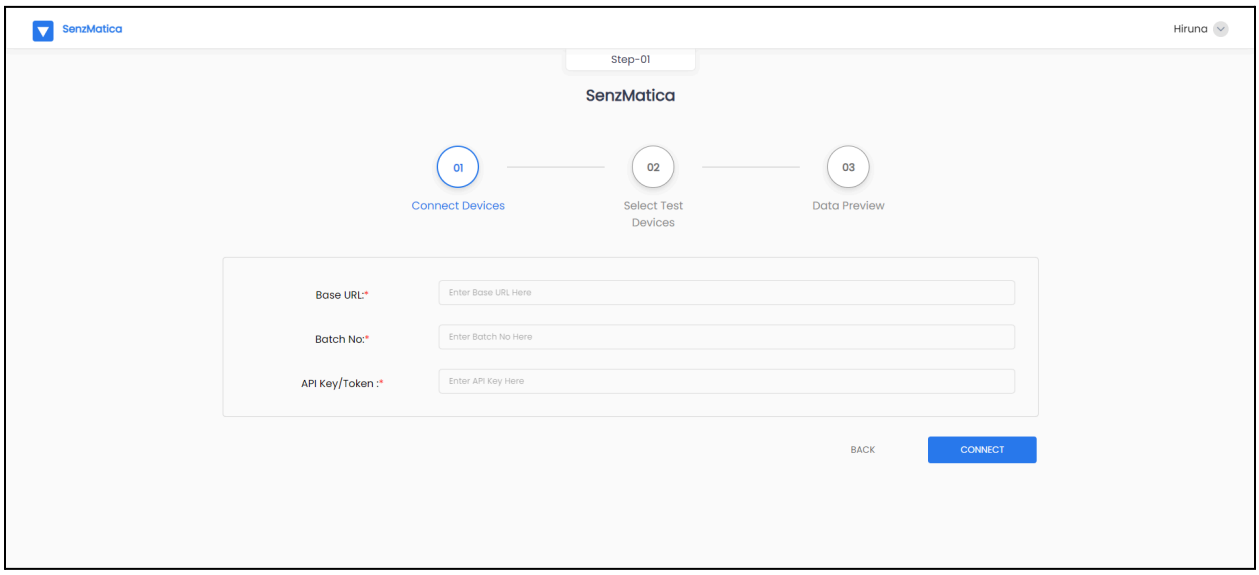
Connecting through SenzMatica

If your devices are connected to SenzMatica then follow the below steps.

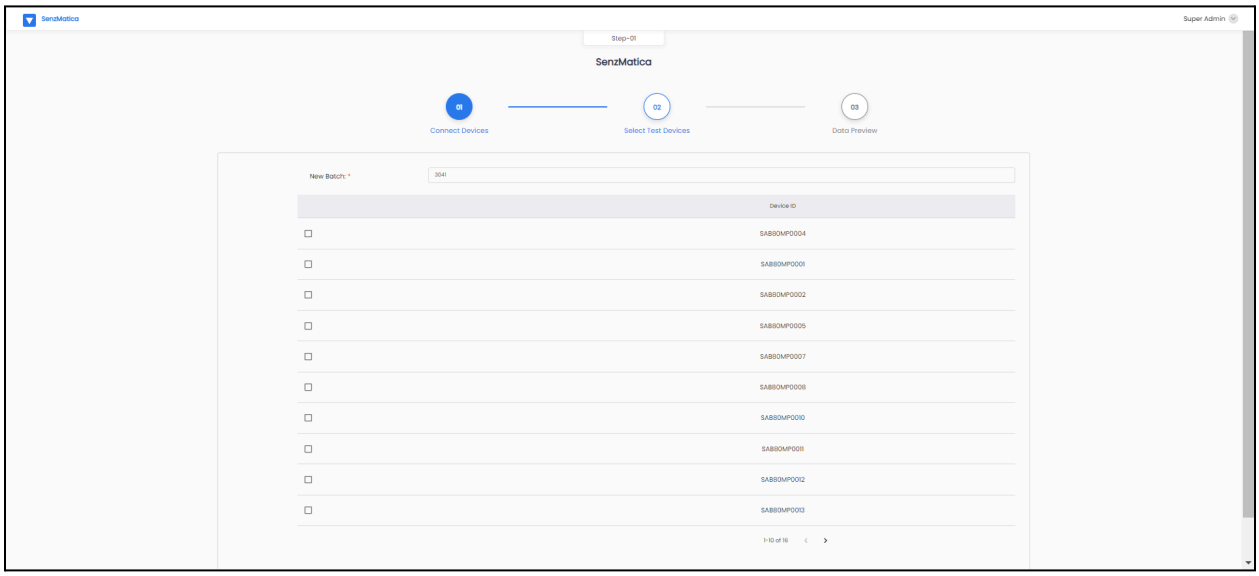
1. Click the “Get started” button in the SenzMatica option.



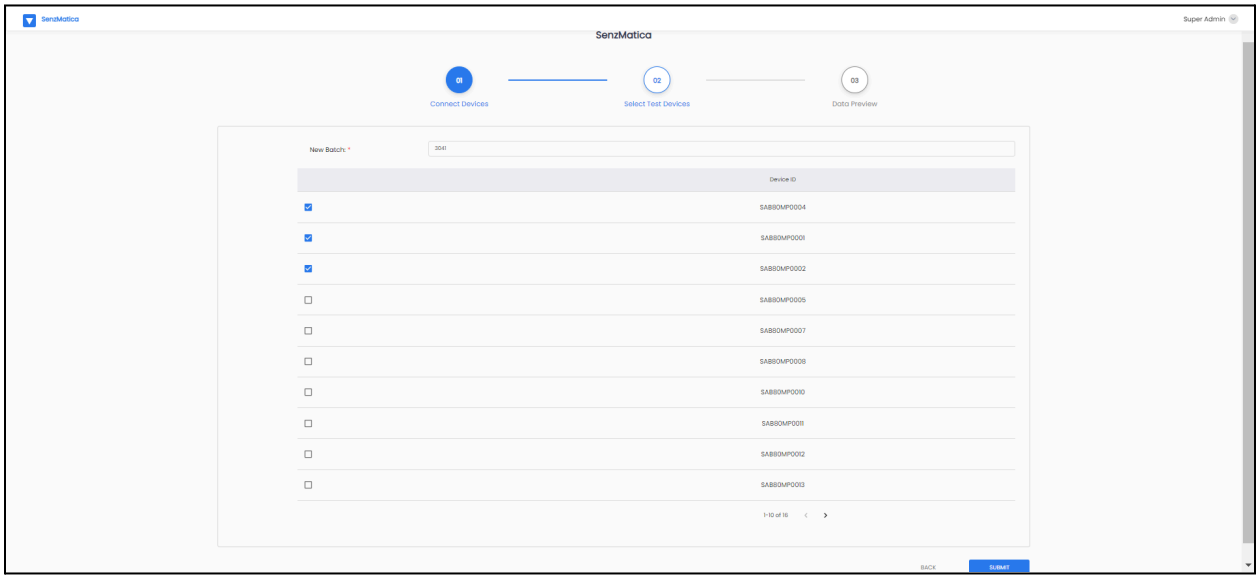
2. It will appear as follows, with three sub-steps. Enter the Base URL, Batch number(In the SenzMatica platform, devices are assigned to a specific batch), and API key/token associated with the SenzMatica platform where testing devices are connected with.



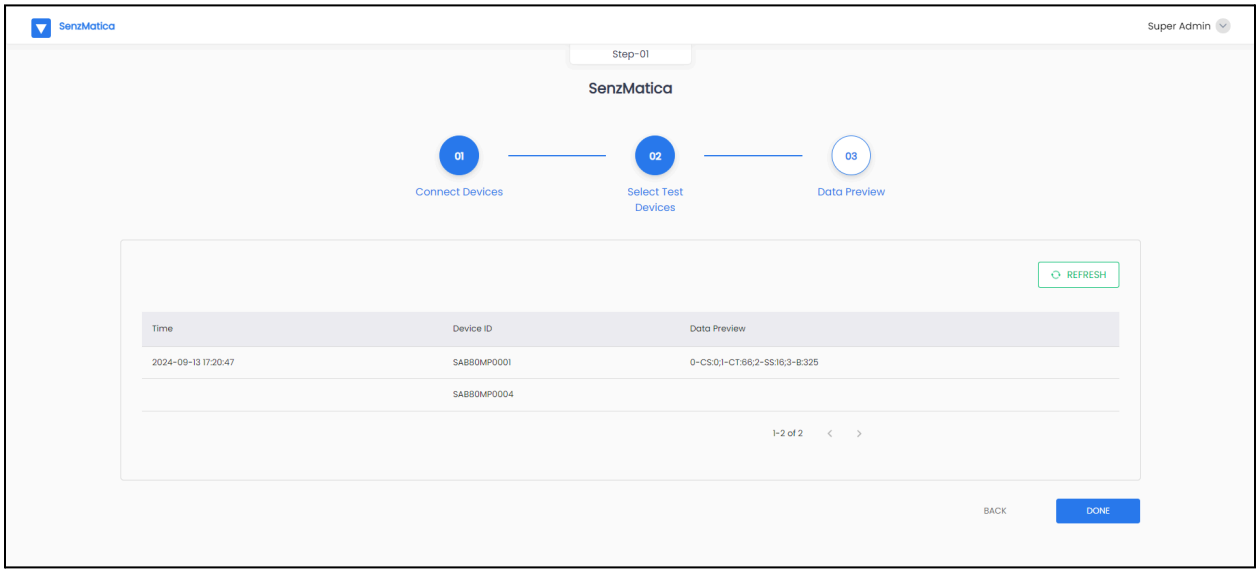
3. If all the entered details are correct, then in sub-step 2, all the devices under the previously defined batch will be listed.



4. You can select the devices you wish to test and rename them with a new batch number to identify that specific set. This batch number will be used in all subsequent steps to reference the selected devices.



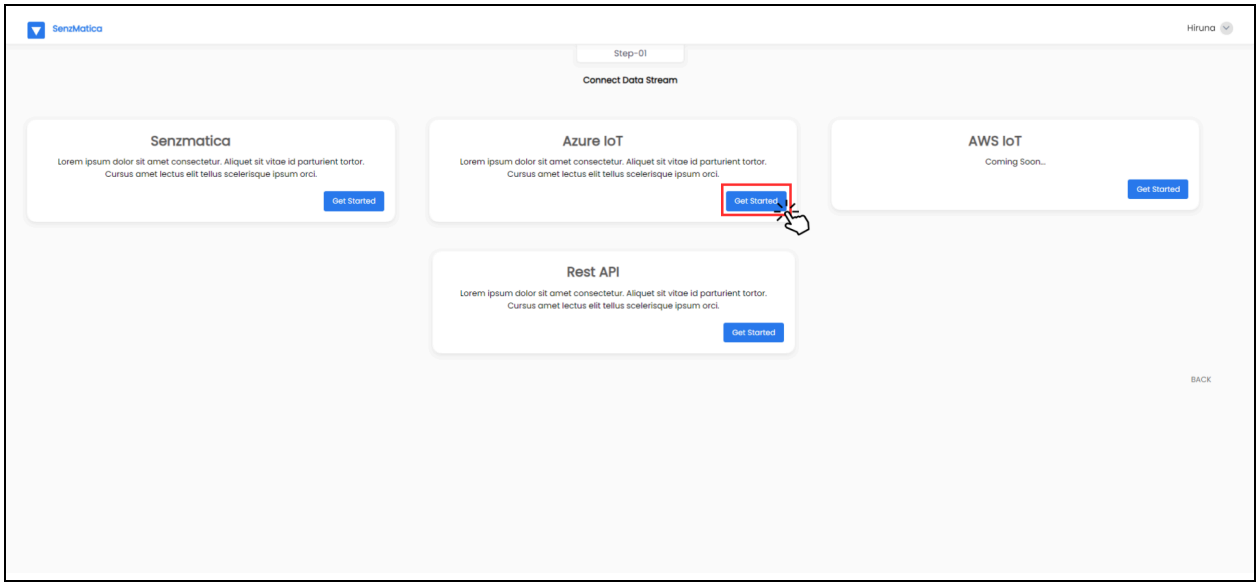
5. After submission, sub-step 3 will display the latest data for the selected devices, indicating that your test devices have successfully connected to the Device Pulse.AI platform.



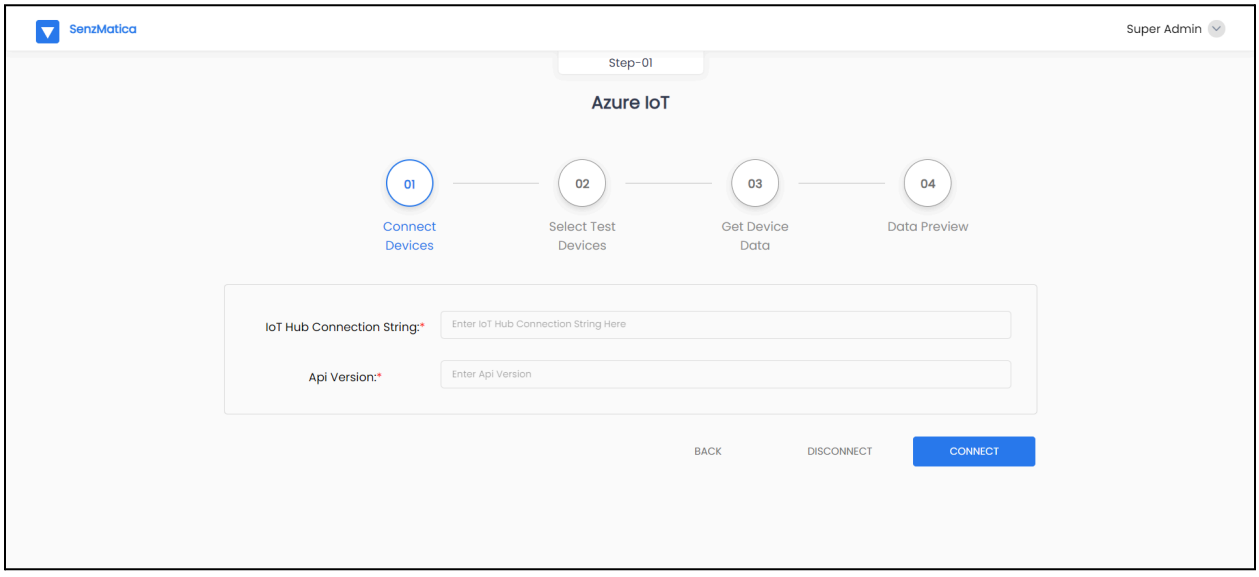
Connecting through the Azure IoT platform

If your devices are connected to Azure IoT then follow the below steps.

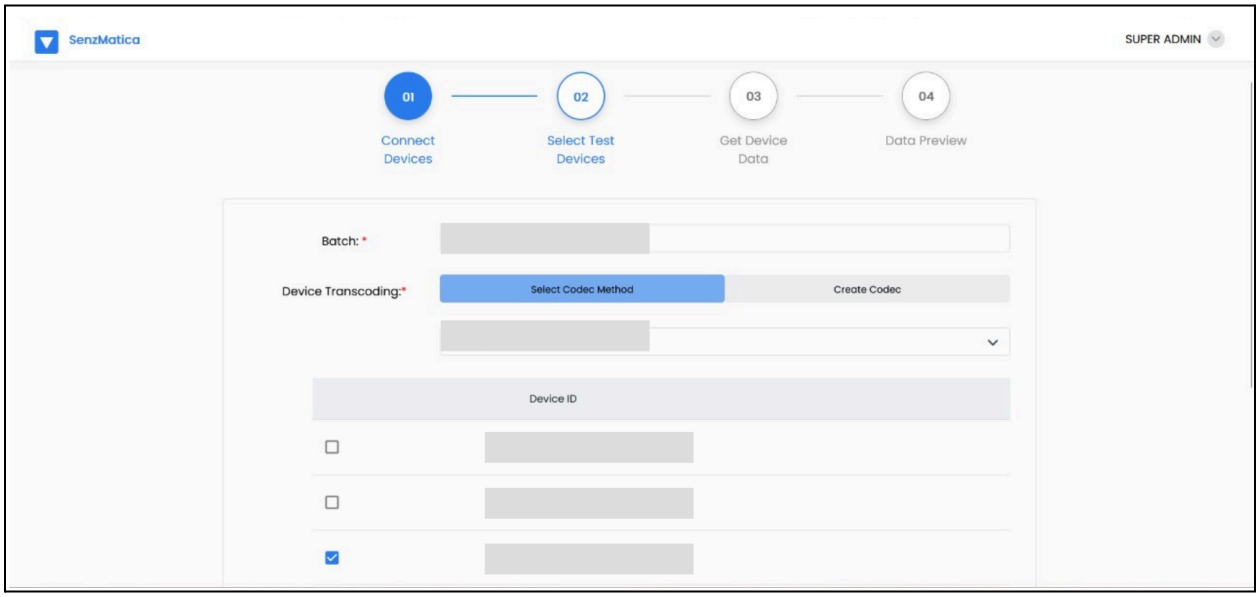
1. Click the “Get Started” button in the Azure IoT option.



2. It will show as follows with four sub-steps. In the first sub-step you need to enter the IoT hub connection string and API version where your testing devices are connected in Azure. Then click the “Connect” button.



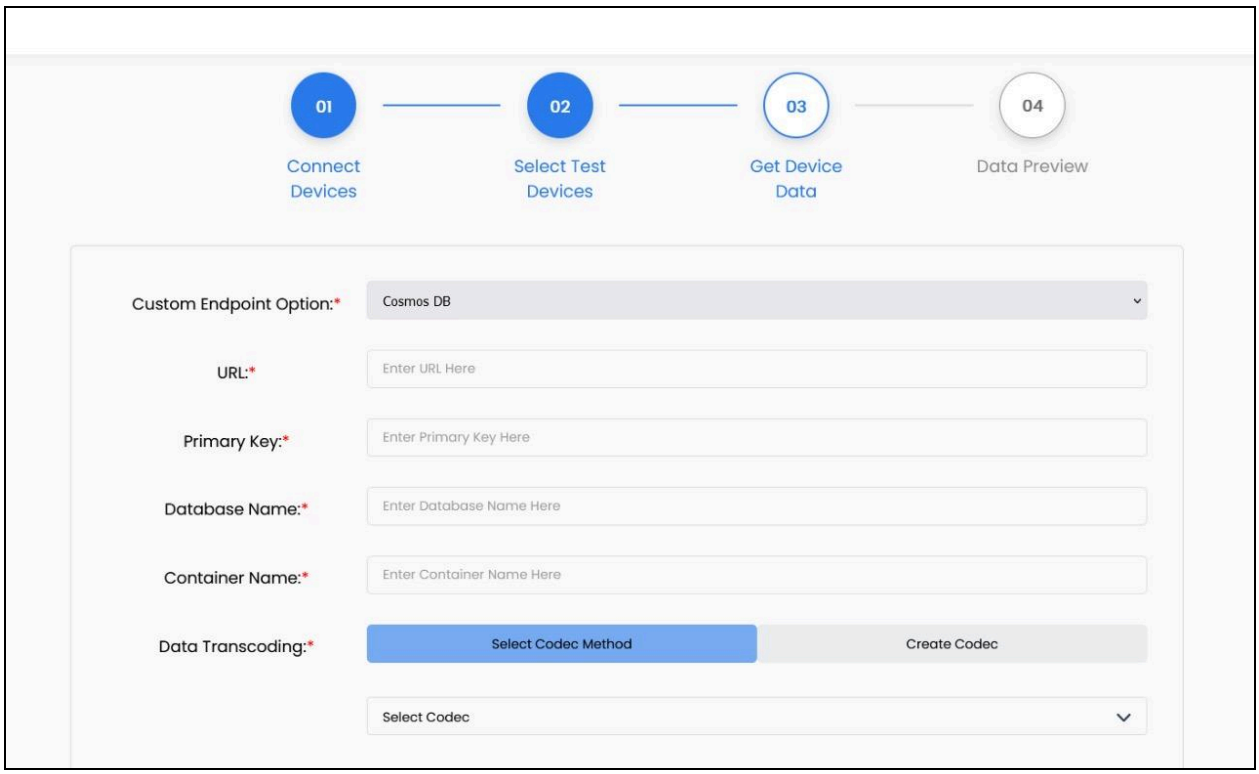
3. In sub-step 2 you need to select the exact test devices you are going to test through our platform, Device PulseAI. Enter a unique number for the test batch to identify the testing devices.Importantly here you should select a script file that is already created earlier or you need to upload a script file here including all the details of the test device category such as interval , persistence , sensors, actuators and connectivity protocol.(Important: When creating a script file both class name and file name should be the same. The method should be “Convert”. The parameters passing to the method should be “Object” . Only java.util library can be used.No outside libraries can be used.)



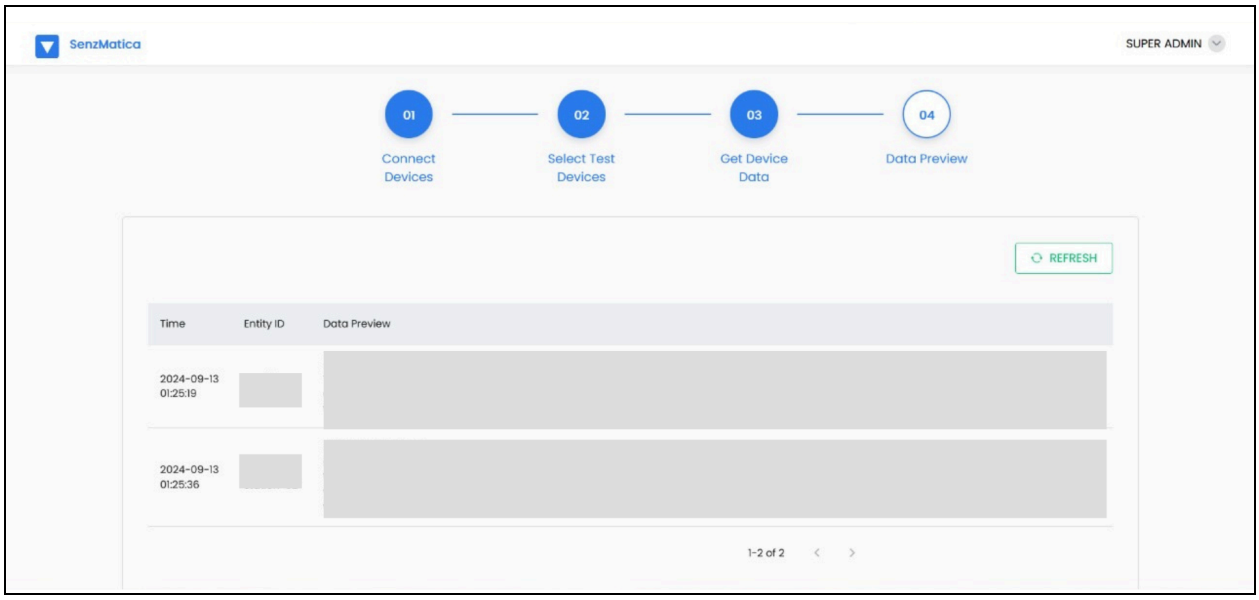
4. Then click the “Submit” button there and it will navigate to the sub-step 3(Get Device Data). It will appear as below. You need to choose the custom endpoint option. Here we (Important: When creating a script file both class name and file name should be the same. The method should be “Convert”. The parameters

passing to the method should be “Object” . Only java.util library can be used.No outside libraries can be used.)

5. are using Cosmos DB for now and enter URL, primary key, database name, and container name and again select a codec file which is already created earlier or create a new codec to change the data format of the devices.



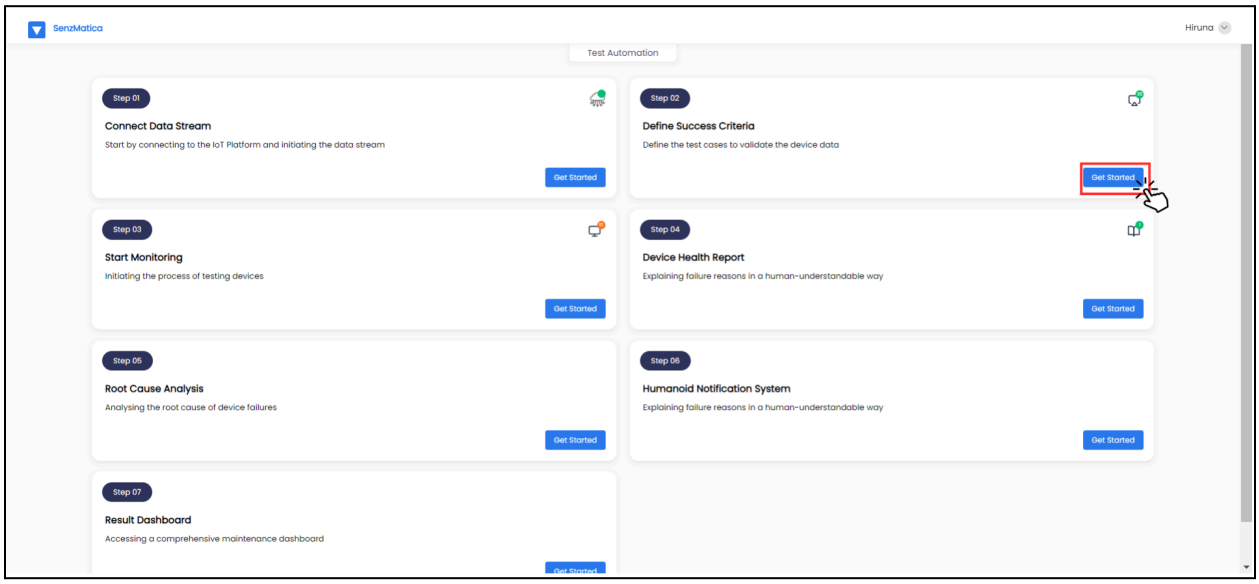
6. Click the “Connect” button thereafter adding the above details. If those details are correct, it will show the latest data of the selected devices as below.


SenzMatica
SUPER ADMIN
01
Connect Devices
02
Select Test Devices
03
Get Device Data
04
Data Preview
REFRESH
Time
Entity ID
Data Preview
2024-09-13 01:25:19
2024-09-13 01:25:36
1-2 of 2

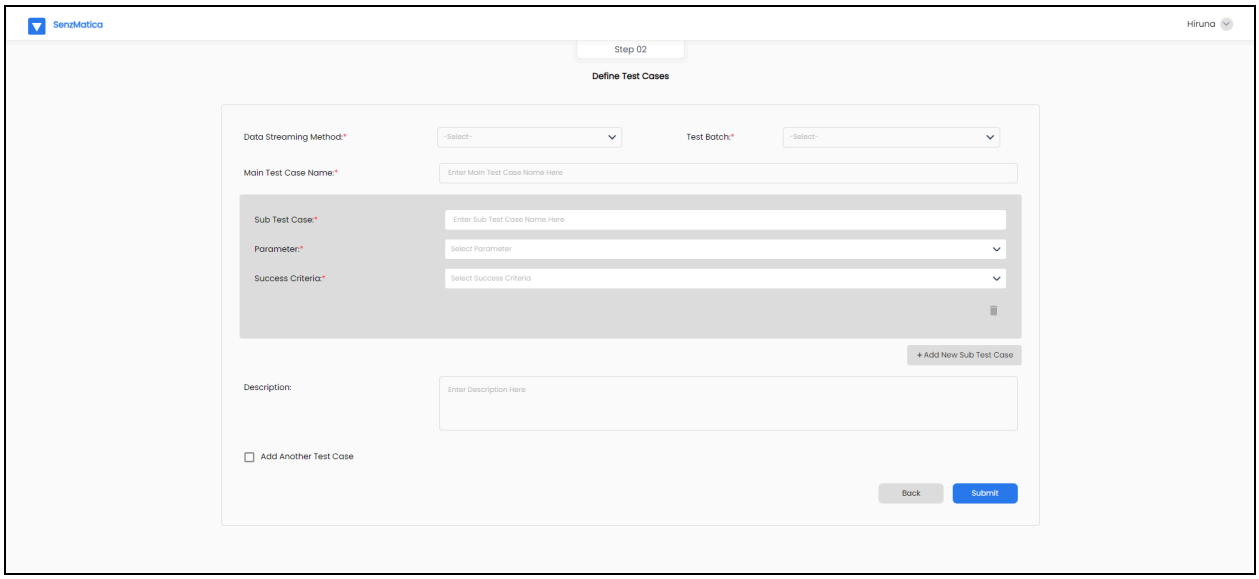
Defining Test cases and success criteria

Testing areas will vary depending on your device categories. Our platform allows you to create fully customizable test cases with success criteria tailored to your devices. Follow the steps below.

1. Click the “Get started” button in step 2(Define success criteria).



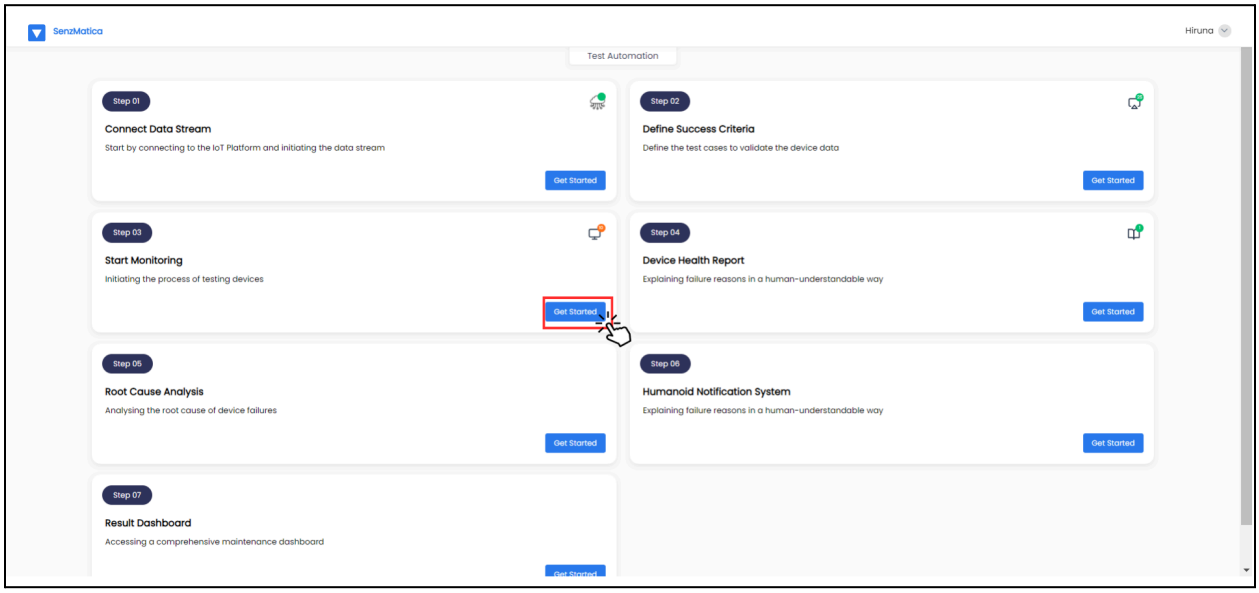
2. You will then see the following overview.



3. Select the data streaming method and the batch to which the testing devices belong. Next, define a main test case and any sub-test cases that fall under it. Multiple sub-test cases can be created under a single main test case. For example, if you need to test the battery and temperature of 'Category A' devices, you can create the main test case as 'Category A devices' and sub-test cases like 'Battery measurement' and 'Temperature measurement.' For each sub-test case, select the parameter where the device passes the value and define the success criteria.(Important: Under success criteria you can select anyof according to the devices and test cases.)

Start Monitoring

To begin testing or monitoring the performance of your devices, proceed with step 3.

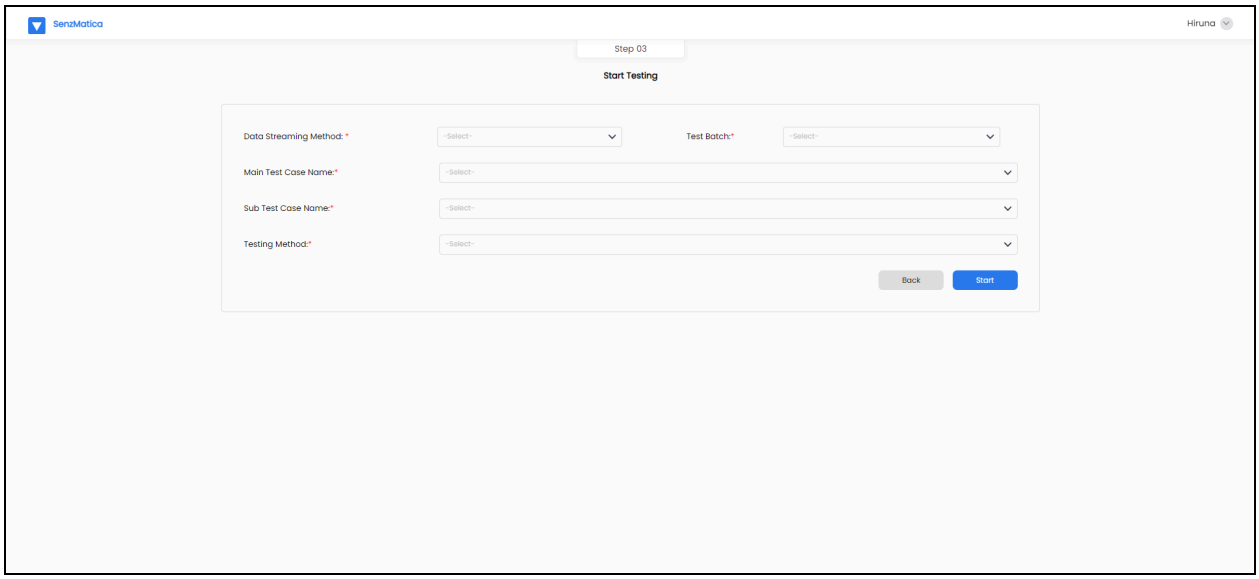


Our Device Pulse.AI platform supports two types of testing.They are production feasibility testing and continuous testing.

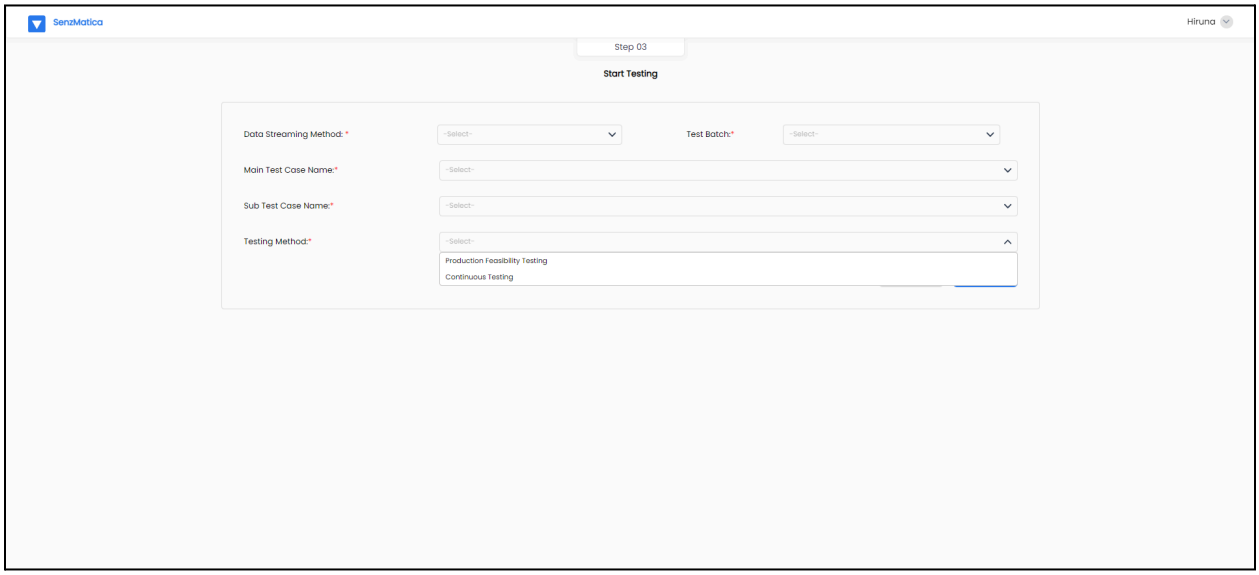
Production Feasibilty Testing

Production feasibility testing refers to the testing process conducted over a specified period, typically before deploying devices. To perform production feasibility testing, follow these steps

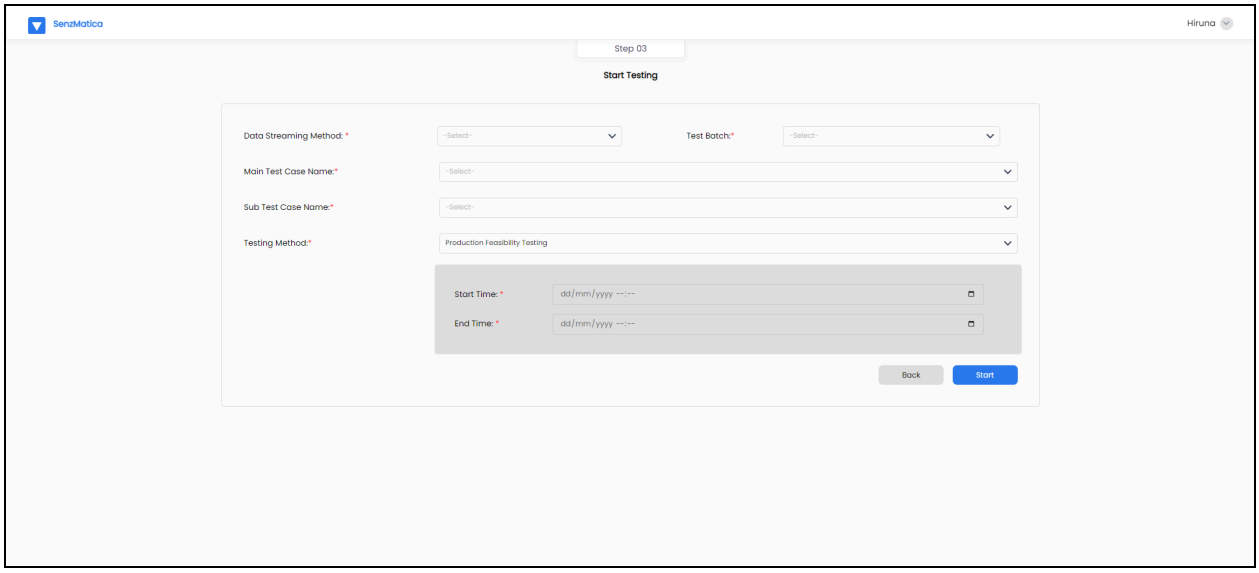
1. After clicking “Get started” button , you can see thye following page.



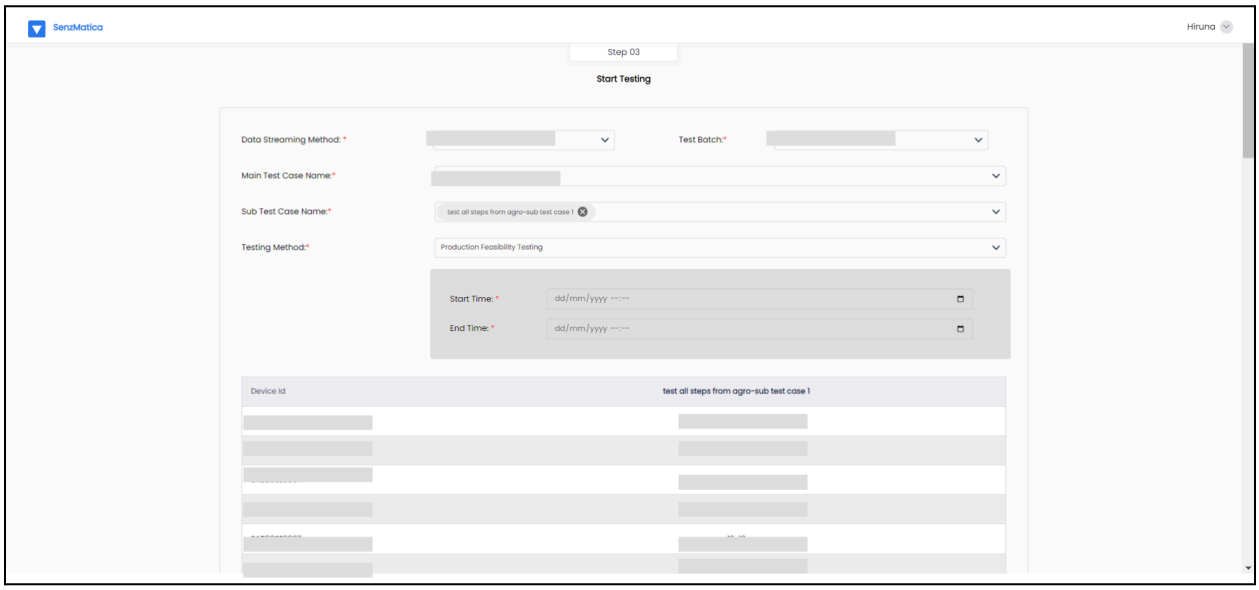
2. Select the data streaming method, test batch, main test case, and sub-test cases defined in the previous steps. You can choose multiple sub-test cases simultaneously. Then, under the testing method, select 'Production feasibility testing.



3. Next, enter the start time and end time for the period during which you want to test your devices



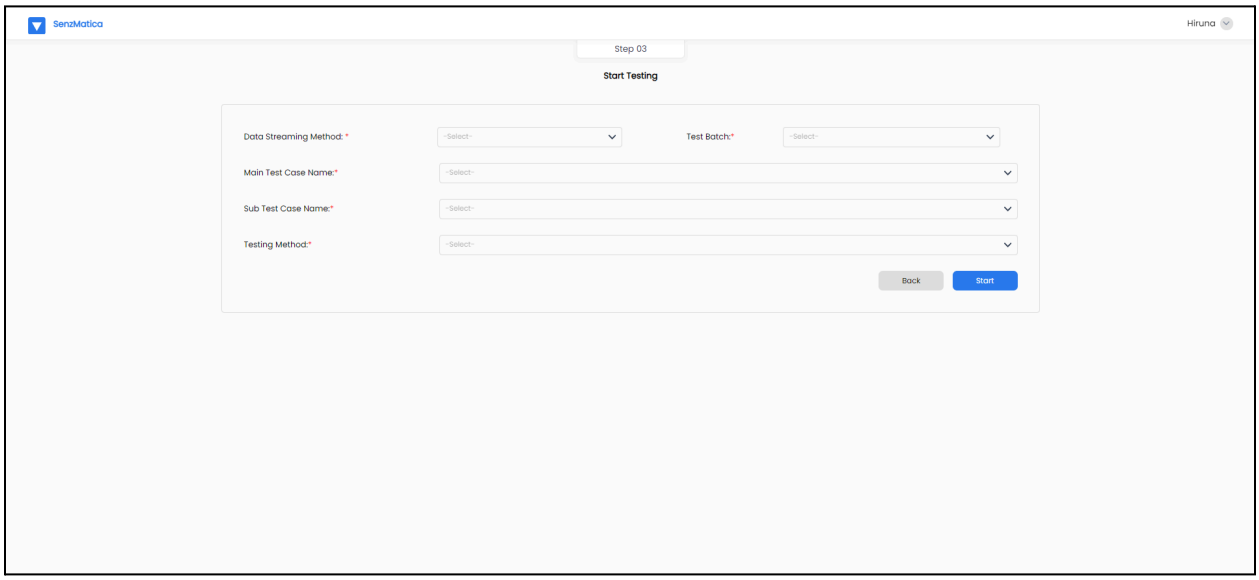
4. Then, for the selected sub-test cases and devices, you will see the defined parameter ranges.



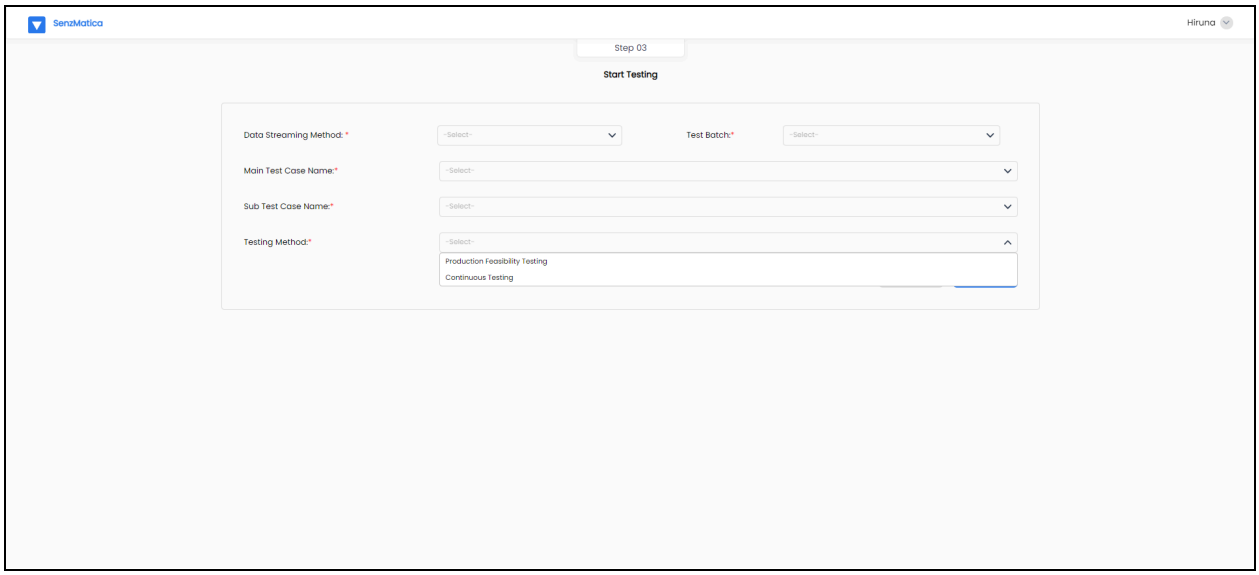
Continuous Testing

Continuous testing refers to an ongoing testing process where users receive reports and notifications at scheduled intervals. This type of testing is typically performed after device deployment to ensure they function correctly over time. To conduct continuous testing, follow these steps.

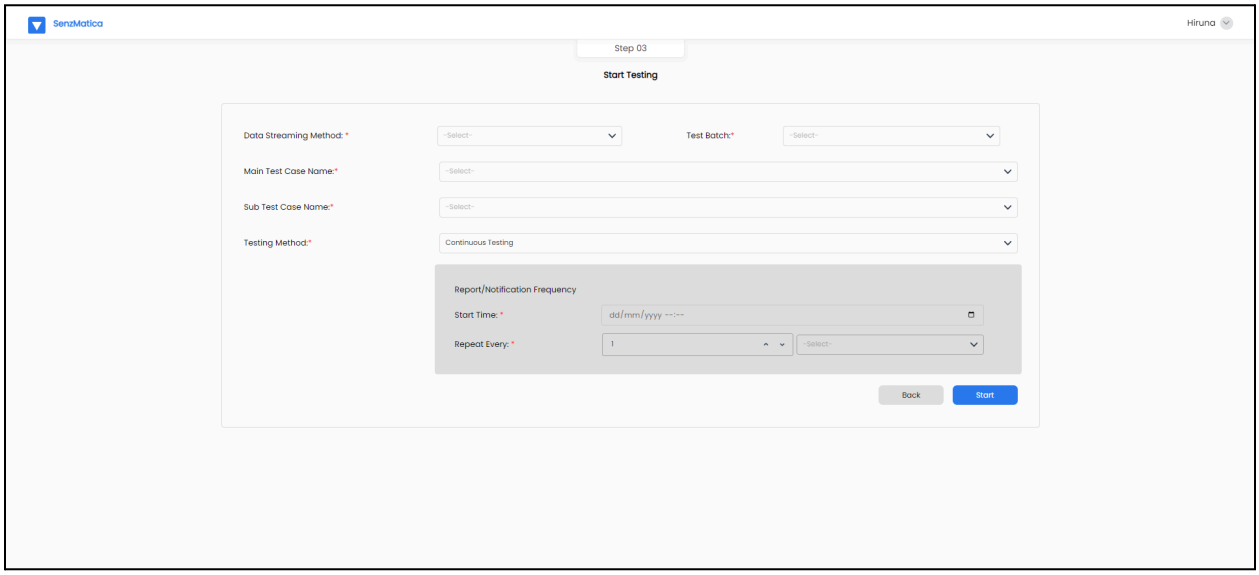
1. After clicking “Get started” button , you can see thye following page.



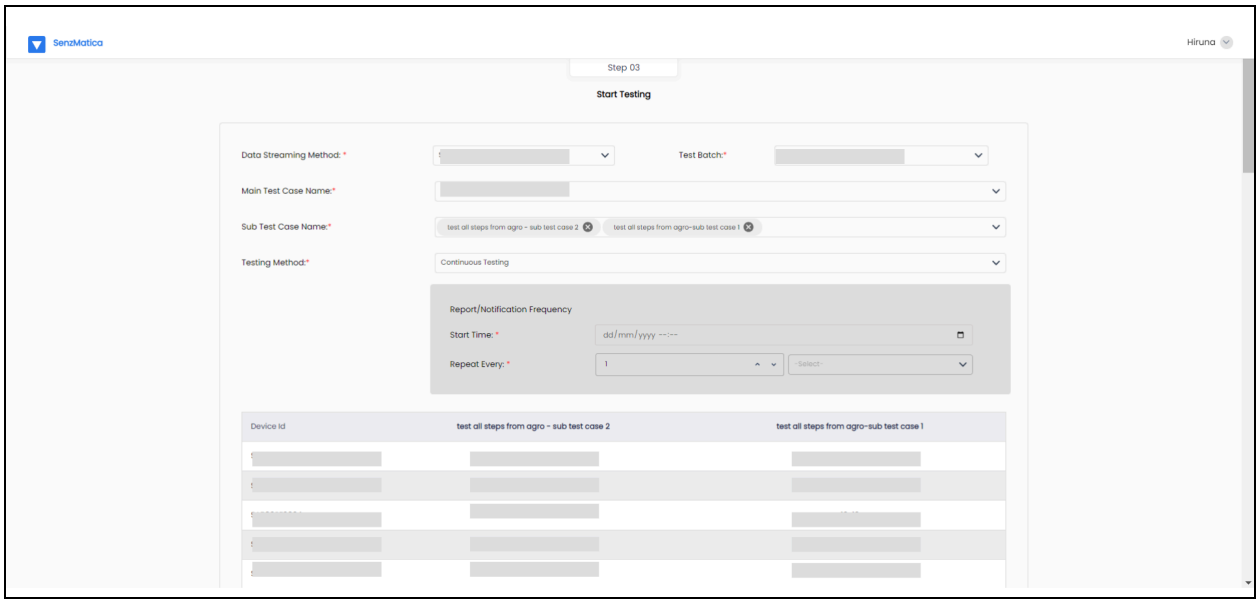
2. Select the data streaming method, test batch, main test case, and sub-test cases defined in the previous steps. You can choose multiple sub-test cases simultaneously. Then, under Testing Method, select 'Continuous testing.'



3. Next, enter the start time and the time range during which you want to receive reports and notifications.



4. Then, for the selected sub-test cases and devices, you will see the defined parameter ranges.



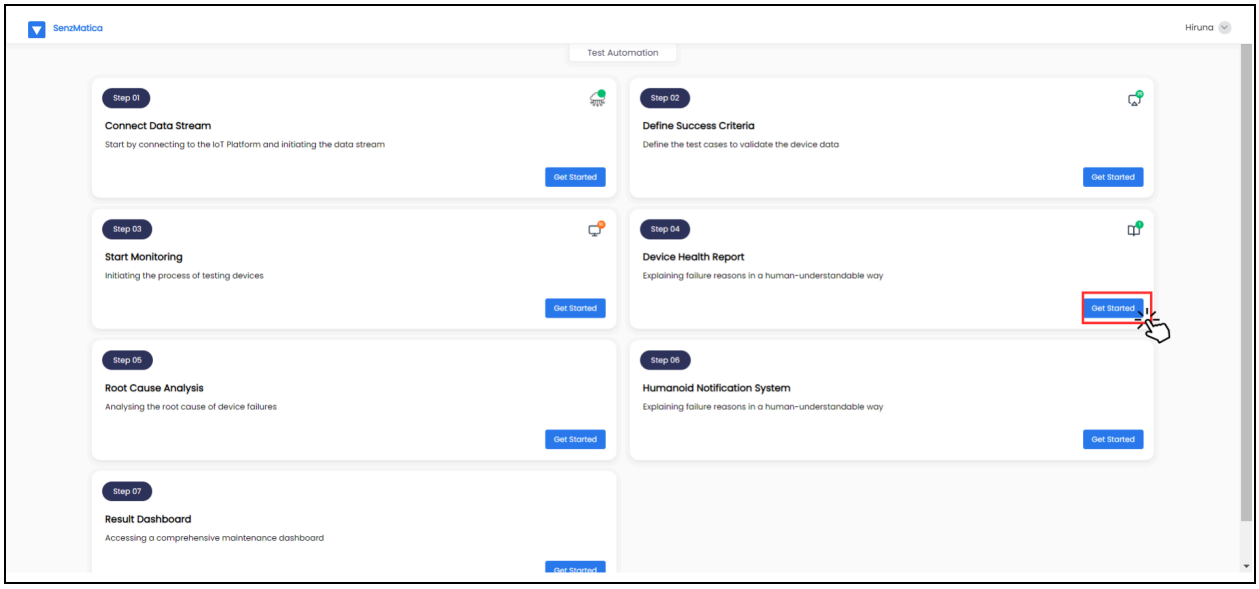
Device health report

Once the specified time period for production feasibility testing concludes, detailed reports will be generated, showing which sub-test cases have failed or succeeded. This section provides a clear, organized view of device performance and highlights areas that require attention.

For continuous testing, detailed reports will also be generated according to the scheduled time. Once the time period ends, you can view the report.

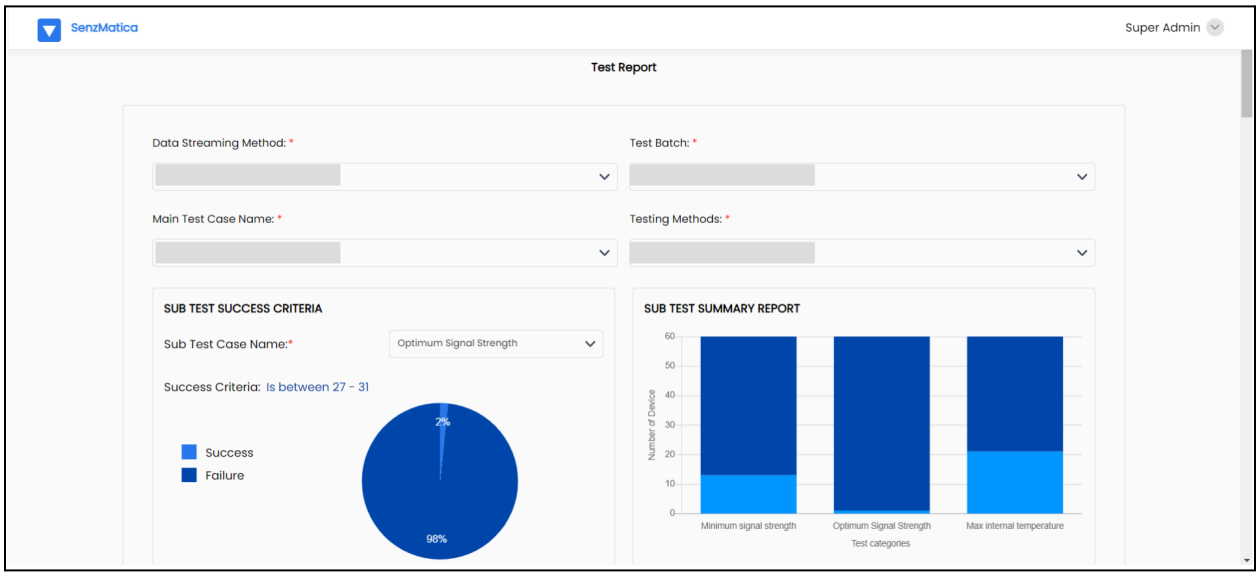
To view those reports separately follow the below steps.

1. Click “Get started “ button.



2. Then, you will see the following page. Here, you can select the data stream, test batch, main test case, and testing method to view the report according to your preferences.
   (Important: You can view reports for both testing methods in this same step. You only need to do select the exact testing method you need to review here.)

3. Next, you'll see a report featuring two graphs as shown below. If you selected sub-test cases, the report will display the success criteria for each sub-test case in a pie chart.



4. This report will show which sub-test cases failed for each device, with the failure count in brackets. Click the graph icon under 'Actions'.

5. Then you can view the specific times of failure and the parameter values, as illustrated on the following page.