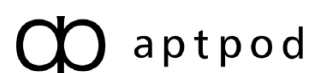


# **intdash Tutorial 2: Visualizing Data from Your Smartphone Sensors (For intdash All-in-One Users)**

intdash All-in-One Version 202209

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In this tutorial, you will learn how to use your iPhone to send sensor data to intdash and visualize the data. The following are the main contents of the tutorial.

1. Send smartphone sensor data and video data using **intdash Motion** and visualize the data with **Visual M2M Data Visualizer** (hereinafter referred to as Data Visualizer)  
→ [Tutorial 2A: Visualize sensor data of your smartphone in real time](#) (p. 7)
2. Send sensor data and video data (M-JPEG) to intdash using intdash Motion on your smartphone and download the data to your PC using **intdash SDK for Python** (hereafter referred to as intdash SDK)  
→ [Tutorial 2B: Save the data sent from your smartphone to your PC](#) (p. 13)
3. Use your PC to receive data sent from a smartphone to intdash, process the data in real time, and return to intdash  
→ [Tutorial 2C: Process data acquired from your smartphone in real time](#) (p. 14)

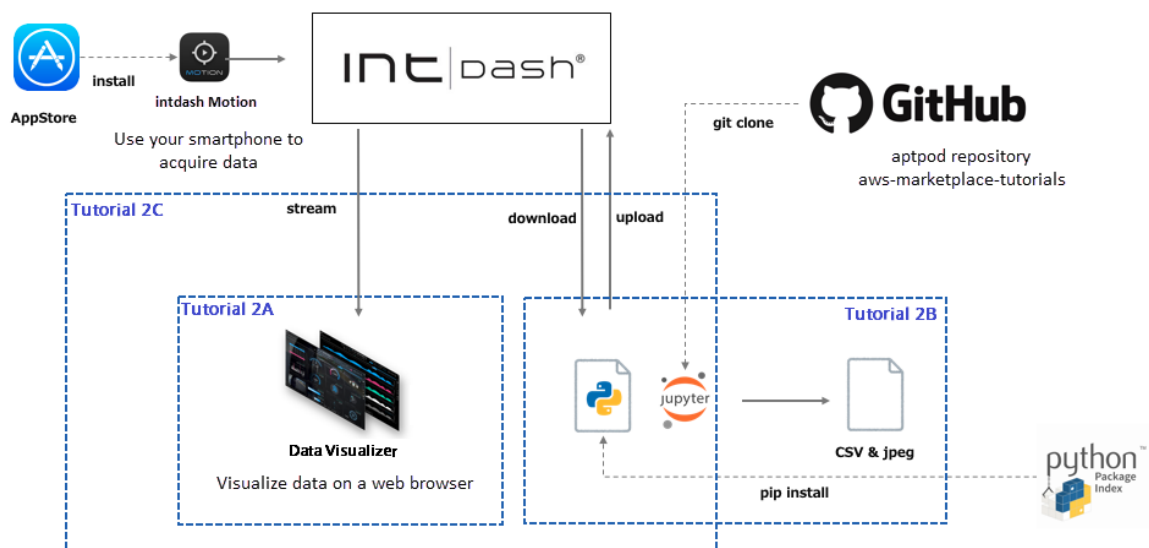


Fig. 1 System overview

**Important:**

- Specifications in this document are subject to change without notice. This document is for informational purposes only and does not guarantee the specifications.
- The screens used in the explanation are examples. Depending on your environment and application version, some of the displays and procedures may differ.

**Note:** Company names, service names, product names, etc. described in this manual are registered trademarks or trademarks of each company. "™" and "®" are not specified in the text and figures.

**Attention:** This document has been translated using machine translation services and may contain inaccuracies and translation errors. Please also refer to the official version in Japanese.

# 01 Preparation

Before starting this tutorial, you will need the following as preparation:

- Set up intdash server
- Install intdash Motion and sign in
- Install intdash SDK
- Prepare a Jupyter Notebook runtime environment

## 1.1 Set up intdash environment

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Set up your intdash environment as per [Setting up intdash server using AMI](#).

## 1.2 Create an edge account

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In intdash, "edges" transmit time series data.

Here we will create an edge account `edge1` to be used in the tutorials that follow.

1. Sign-in to intdash with your username and password and open My Page ( [https://<hostname\\_of\\_intdash\\_server>/users/me/](https://<hostname_of_intdash_server>/users/me/) ).

**Note:** The URL scheme (http or https) and hostname, as well as the user name and password, will vary depending on the configuration. If you are unsure of any of this information, please check with the person responsible for setting up your intdash server.

2. Click [Edges] > [Create Edge] and create an edge account named `edge1`.

The UUID and client secret are displayed, but it is not necessary to copy the UUID and client secret in this tutorial scenario.

## 1.3 Install intdash Motion

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Install the iOS application intdash Motion on your smartphone.

1. Launch the App Store.
2. Use the on-screen search box to search for "intdash Motion" and tap [GET].

## 1.4 Sign in with intdash Motion

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After installing intdash Motion, sign in to intdash using your user account.

1. Launch the intdash Motion application from the home screen of your smartphone.

**Note:** If you see instructions about collecting usage information, choose whether or not you agree.

2. When the sign in screen appears, enter the intdash server URL (e.g. [https://<hostname\\_of\\_intdash\\_server>](https://<hostname_of_intdash_server>)), and then tap [Next].

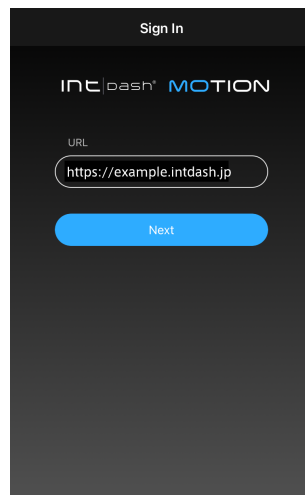


Fig. 2 Enter the URL of the intdash server

When "'Motion' Wants to Use ... to Sign In" is displayed, tap [Continue].

**Note:** The URL, the name of the user account, and the password will vary depending on the environment. If you do not know the URL, user account name or password, check with the person in charge of the environment setup.

3. Then, enter your user name (or the email address registered in your user account) and password, and tap [Sign In].

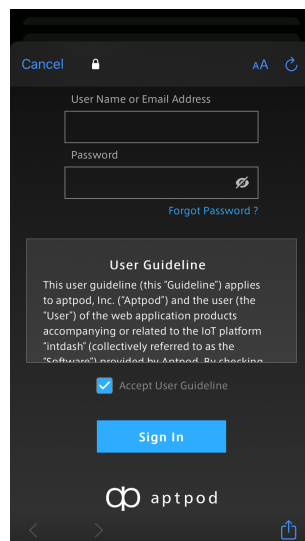


Fig. 3 Sign in with a user account

4. When you're prompted for permission to use your location, tap [Allow While Using App]. (Note that if you tap [Don't allow] here, you will not be able to send GPS data.)
5. When a message appears asking for access to the microphone and camera, tap [OK] respectively.

If the sign-in is successful, the measurement start screen will be displayed.

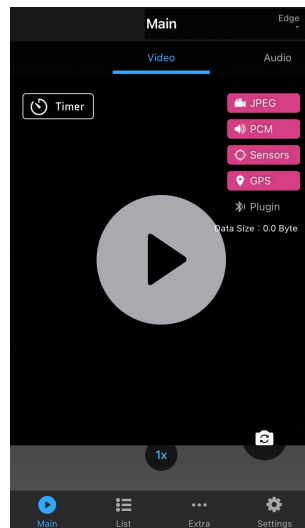


Fig. 4 Measurement start screen

6. If you are using Motion for the first time, you will be prompted to choose a project. Here you should select `Global Project`.

You will then be shown how to set which edge to retrieve and send data as. Here, select `edge1`.

(For the second and subsequent launches, tap [Settings], then select `Global Project` under "Project" and `edge1` under [Send Data As]).

The selected edge is displayed at the top of the Main screen.

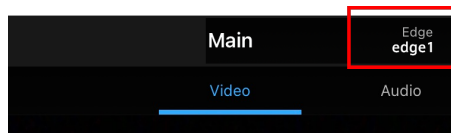


Fig. 5 Selected edge (the app sends data as this edge)

**Note:** Hereafter, Global Project will always be used in this tutorial.

## 1.5 Install intdash SDK

To get data from the intdash server and process it, use a developer tool called intdash SDK. See [intdash SDK documentation](#) for installation instructions.

## 1.6 Prepare Jupyter Notebook environment

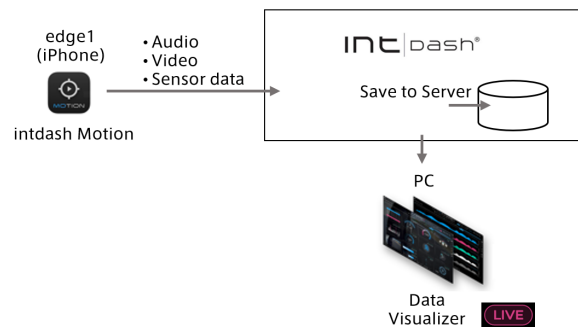
This tutorial uses Jupyter Notebook as the Python execution environment.

1. Clone the repository of Jupyter Notebook used in this tutorial, [aws-marketplace-tutorials](#).
2. Prepare the environment to run Jupyter Notebook according to the README.

## 02 Tutorial 2A: Visualize sensor data of your smartphone in real time

In this tutorial, you will stream your smartphone's sensor data and video data to the intdash server and visualize that data in real time on your PC. By following this tutorial, you will learn:

- How to send sensor data and video data from intdash Motion
- How to display data from smartphone on Data Visualizer



### 2.1 Set up intdash Motion

First, on intdash Motion, select the data you want to send. On the measurement start screen of intdash Motion, tap [Settings].

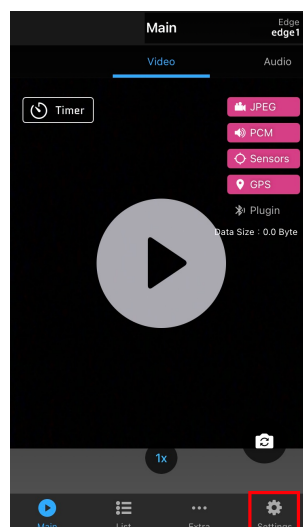


Fig. 6 Open the settings screen

On the settings screen, you can make data transmission settings for each data type.

**Attention:** If you turn on [Save to Server], the measurement data will be saved on the server.

### 2.1.1 Video data settings

1. Turn on [Video].

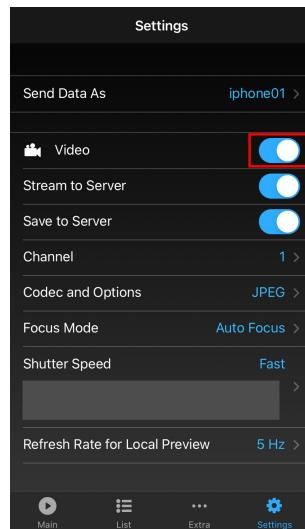


Fig. 7 Video settings screen

2. Set as follows.

- Stream to Server: On
- Save to Server: On
- Channel: 1
- Codec and Options: JPEG

### 2.1.2 Sensor data settings

1. Turn on [Sensors].

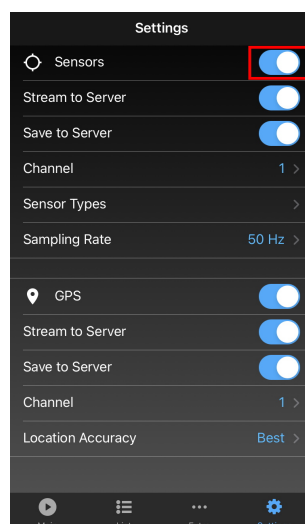


Fig. 8 GPS settings screen



2. Set as follows.

- Stream to Server: On
- Save to Server: On
- Channel: 1
- Sensor Types: Turn all on

### 2.1.3 GPS data settings

1. Turn on [GPS].

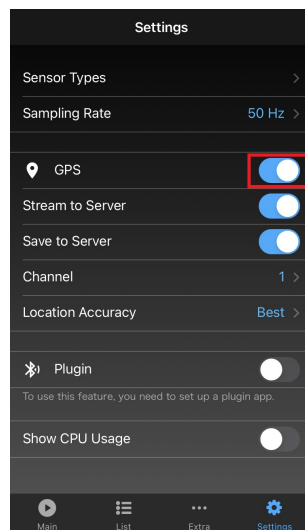


Fig. 9 GPS settings screen

2. Set as follows.

- Stream to Server: On
- Save to Server: On
- Channel: 1

3. On the Main screen, tap ►.

As the measurement begins, the elapsed time display increases.

4. Tap ■ to end the measurement.

This completes the setup of your smartphone.

## 2.2 Set up Data Visualizer

To visualize the measurement, you can use Data Visualizer.

Here, we will create a dashboard by importing a pre-prepared dashboard definition file.

### 2.2.1 Open Data Visualizer

1. Using the Chrome browser, go to `https://<hostname_of_intdash_server>/`. A sign-in screen will appear. Enter your username and password to sign in.

Once you sign in, the Project Console application will appear.

2. Click on [Details] of "Global Project" in the list of projects.

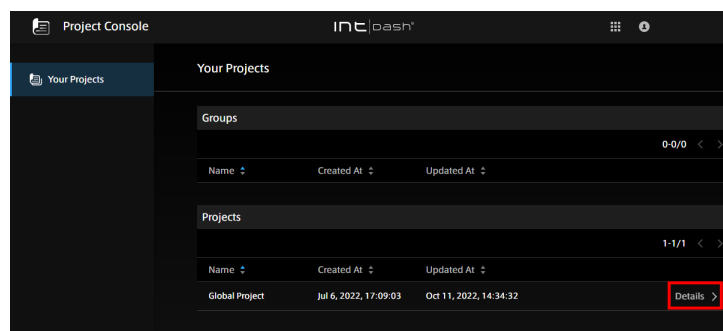


Fig. 10 Select Global Project

3. From the list of applications, select Data Visualizer.

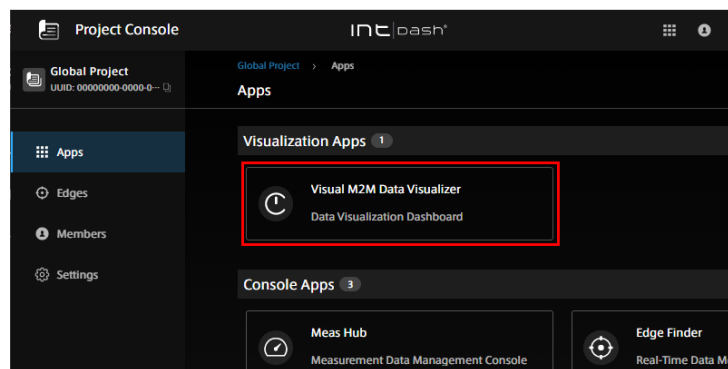



Fig. 11 Open Data Visualizer

### 2.2.2 Import the data setting (.dat) file

Obtain the data settings file from the dedicated download page provided by Data Visualizer.

1. Click [Links] (  ) on the left side of the Data Visualizer screen.
2. Click [Download DAT File].

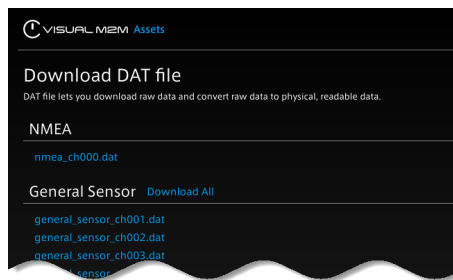




Fig. 12 List of DAT files


- Download the following DAT files.
  - General Sensor > general\_sensor\_ch001.dat
  - Video > video\_ch001.dat
- On the left side of the Data Visualizer screen, click [Data Settings] (  ) > [Add Group] to create a group.
- In the group created, click on [Import] to import the two DAT files downloaded above.

### 2.2.3 Import dashboard definition files (.scrn)

- Download the dashboard definition file [2\\_1\\_smartphone.scrn](#).
- At the bottom of the Data Visualizer screen, click the Screen list (  ) button > [Import] to import the dashboard definition file (.scrn). The imported dashboard will be added to the rightmost side of the list.
- Open the imported dashboard "SmartPhone Screen".



- Set up the dashboard to display data from edge1.

The imported dashboard is set to display data from "Unknown Edge". Click  (Replace Edge) at the top of the screen to replace the source edge setting "Unknown Edge" with "edge1".

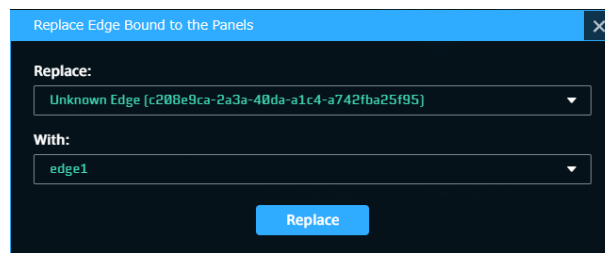


Fig. 13 Replace Unknown Edge with edge1

## 2.3 Visualize intdash Motion data on Data Visualizer

After setting up intdash Motion and Data Visualizer, you can send data from your smartphone to intdash.

1. Set Data Visualizer to live mode for real-time data visualization. If you see the pink live mode icon ( **LIVE** ), you are currently in live mode. If you see the gray icon ( **LIVE** ), click the icon to switch to live mode.



Fig. 14 Live mode display

2. In intdash Motion on your smartphone, tap [Main] in the menu at the bottom.
3. Tap **▶** in the center of the intdash Motion screen to start a measurement.
4. Click the play button **▶** in Data Visualizer. The data sent from your smartphone will be displayed on the dashboard.



Now you can see on your PC that the data from your smartphone is flowing to intdash.

You can see that the numbers displayed in Data Visualizer fluctuate as you shake or move your smartphone.

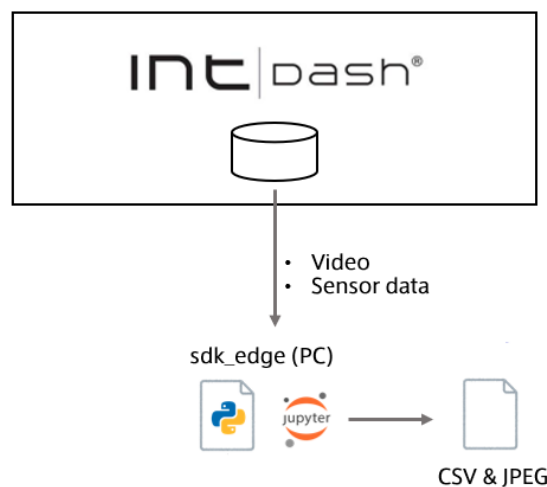
5. Tap **■** in intdash Motion to end the measurement.

The data acquired from the time you tap **▶** to the time you tap **■** is saved to the server as one measurement.

## 03 Tutorial 2B: Save the data sent from your smartphone to your PC

In this tutorial, data stored on the intdash server is downloaded using the intdash SDK and saved on the local PC. Sensor data will be saved as CSV files and video as M-JPEG files. With this tutorial, you will learn:

- How to download video data stored on the intdash server to your local PC
- How to retrieve sensor data from the intdash server and save it as a CSV file



It is assumed that you have run [Tutorial 2A: Visualize sensor data of your smartphone in real time](#) (p. 7) beforehand and the data is stored on the server.

### 3.1 Retrieve sensor data and save as a CSV file

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Run the Jupyter Notebook file [3\\_save-data-as-csv](#).

### 3.2 Retrieve video data and save as M-JPEG

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Run the Jupyter Notebook file [4\\_acquisition-image-data.ipynb](#).

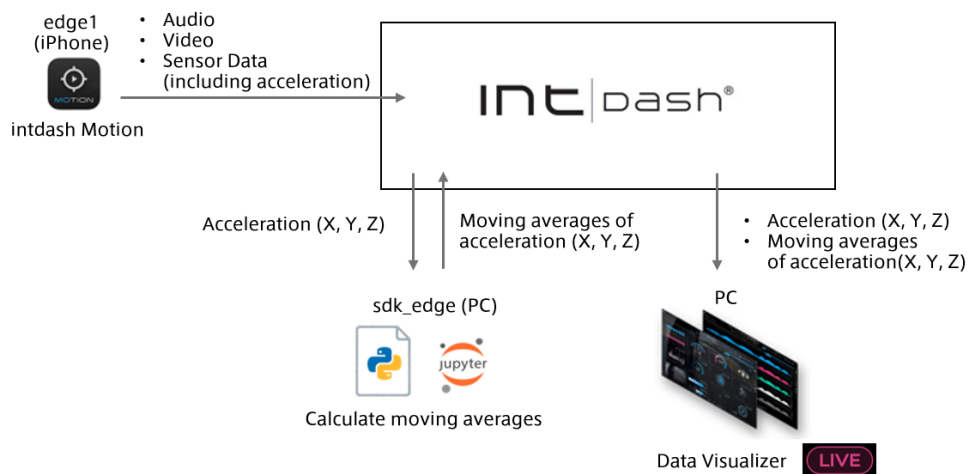
Now you have saved the sensor data from your smartphone to your PC. The saved data can be analyzed and processed using common Python libraries for analysis.

## 04 Tutorial 2C: Process data acquired from your smartphone in real time

This tutorial explains how to use the intdash SDK to retrieve and process data from a smartphone in real time.

By sending the processed data again to intdash, you can visualize the data from your smartphone and the processed data at the same time. With this tutorial, you will learn:

- Get real-time data from intdash Motion using intdash SDK
- Process the retrieved data (use moving averages as an example of processing)
- Send the processed data back to intdash and display it with Data Visualizer



### 4.1 Prepare an edge account to be used with intdash SDK

In preparation, create an edge account for real-time data transmission.

1. Sign in to intdash with your username and password, and open My Page ([https://<hostname\\_of\\_intdash\\_server>/users/me/](https://<hostname_of_intdash_server>/users/me/)).
2. Click [Edges] > [Create Edge] and create an edge account named `sdk_edge`.

You will see the UUID and the client secret, but you do not need to copy them for this tutorial scenario.

## 4.2 Set up Data Visualizer

Create a visualization dashboard on Data Visualizer.

### 4.2.1 Import a dashboard

1. Download the data settings file and the screen file from the links below. (If you are viewing this PDF in your web browser, right-click on the following links and click [Save Link As]).
  - [Data settings file "GeneralSensor\\_signal.dat"](#)
  - [Screen definition file "realtime\\_processing.scrn"](#)
2. After importing the data settings file and the screen definition file into Data Visualizer, the following dashboard will be displayed.

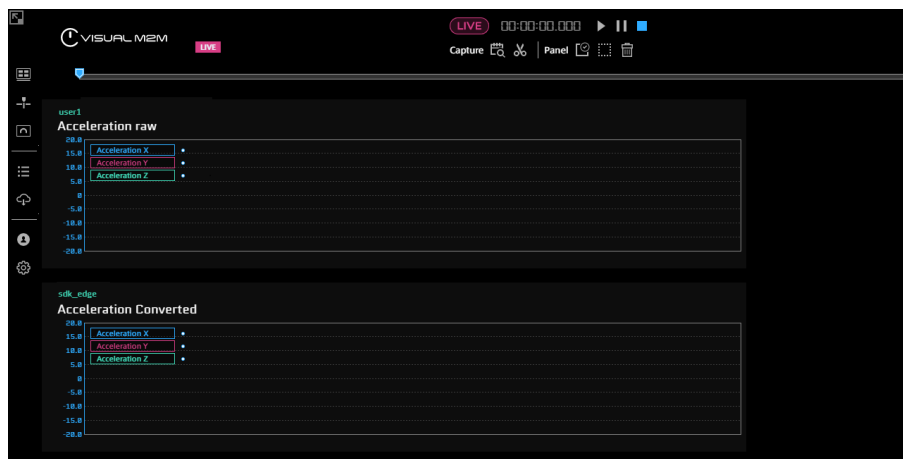


Fig. 15 Dashboard

### 4.2.2 Displaying intdash Motion (edge1) data in "Acceleration raw"

1. Right-click on the panel "Acceleration raw" and open [Panel Settings].
2. Click the bound data "1\_sp\_ACCX".

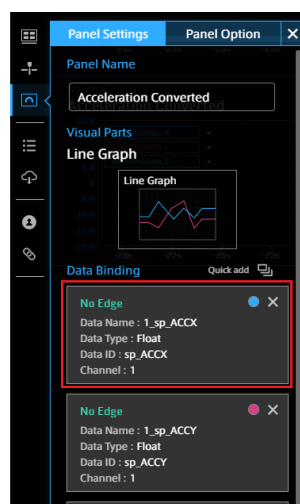


Fig. 16 Bound data

3. In [Select Edge], specify `edge1` (the edge name of the intdash Motion app).

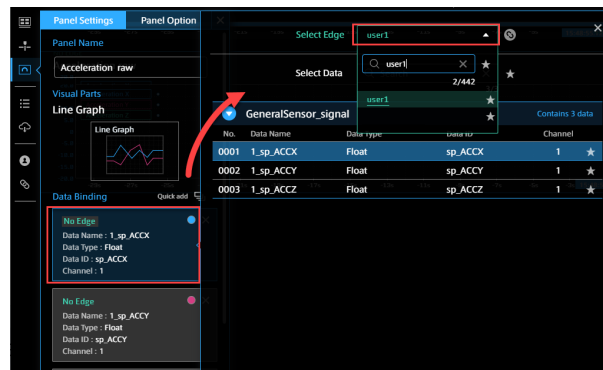


Fig. 17 Set the data source on the panel

**Note:**

- If the edge name does not appear, reload the Data Visualizer in your browser.
- Since [Select Data] is already set, you do not need to change it.

4. Similarly, for "1\_sp\_ACCY" and "1\_sp\_ACCZ", specify `edge1` (the edge name of the intdash Motion app).
5. When you have finished setting the data source edge, click [x] to close Panel Settings.

### 4.2.3 Display moving average (`sdk_edge`) on "Acceleration Converted"

1. Similarly, right-click on the panel "Acceleration Converted" and open [Panel Settings].
2. For each of all bound data, specify `sdk_edge` in [Select Edge].

## 4.3 Process data from intdash Motion in real time using intdash SDK

1. Run the Jupyter Notebook file [5\\_realtime-streaming-execution-processing](#).
2. Follow the same procedure as [Visualize intdash Motion data on Data Visualizer](#) (p. 12) to set Data Visualizer to live mode and start measurement using intdash Motion (`edge1`).
3. View the data in the Data Visualizer.

You can see that the acceleration data being sent from intdash Motion and the data processed by intdash SDK (moving average) are displayed without significant delay.



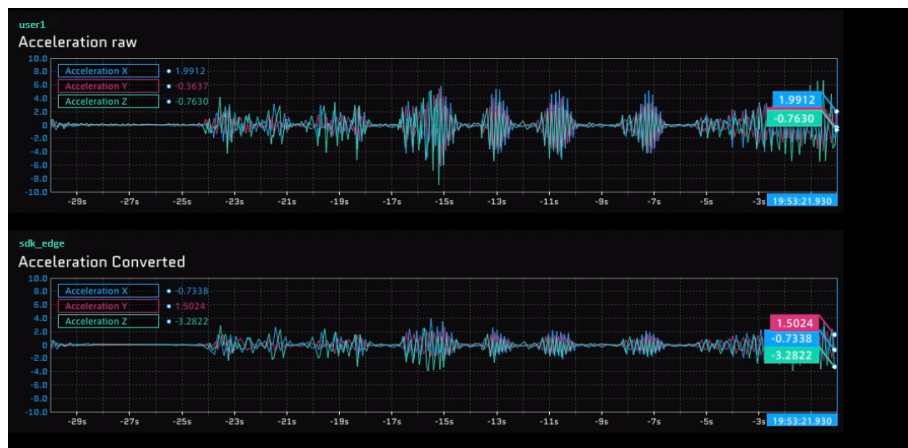


Fig. 18 Dashboard showing acceleration and its moving average