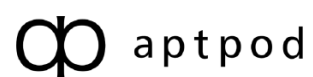


intdash Motion

Quick Start Guide

intdash Motion v2.2.0

2022Q1R1



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01 Introduction (intdash Motion)

intdash Motion is an application that acquires data from the camera, microphone, 9-axis sensor (gyro, acceleration, geomagnetic sensor) and GPS sensor built into the iOS device and sends it to the intdash server. By using intdash Motion, the iOS device serves as the data-sending edge of intdash.

Note: Hereafter in this guide, intdash Motion will be referred to as "Motion".

Motion can be used in the following use cases.

- Installed in a vehicle to measure vehicle behavior in a simplified manner.
- Wear the device on your body to measure your physical activity.
- Relay data from third-party sensor devices (requires development of a plug-in app to send sensor device data to Motion).



Fig. 1 Example of a simple measurement in a vehicle

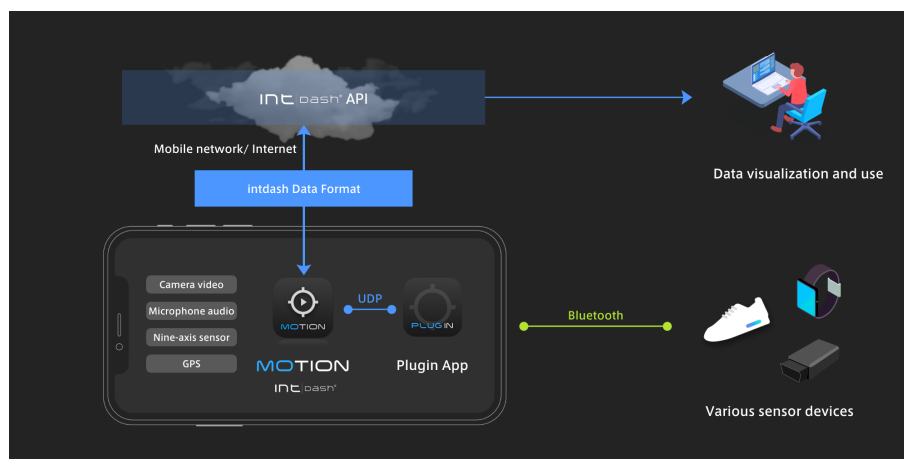


Fig. 2 Get data from third-party sensor devices and send them to the intdash server

02 Motion tutorial - Sending acceleration data from an iOS device

This chapter describes the basic usage of Motion.

As an example, we will use Motion to acquire acceleration data and send it to the intdash server. Then, check the data in real time with Data Visualizer.

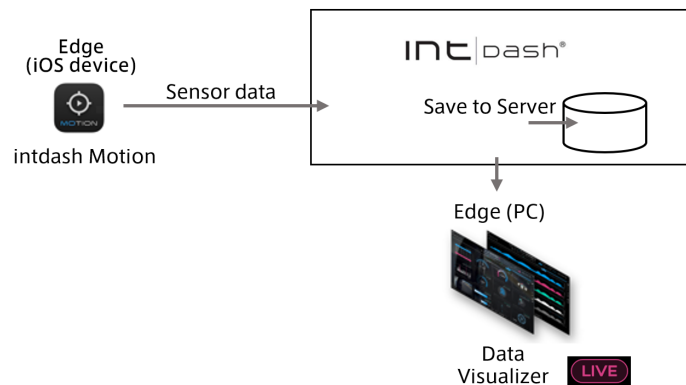


Fig. 3 Tutorial overview

2.1 Install Motion

Install Motion on your iOS device.

1. Use the QR code below to open the Motion app page on the App Store.



Alternatively, search for "intdash Motion" in the App Store.

2. Tap [Get].

2.2 Sign in to intdash with Motion

1. Launch the Motion application.
2. When the sign-in screen appears, enter the URL of your intdash server (varies for each customer, e.g. `https://example.vm2m.jp`) and tap [Next].

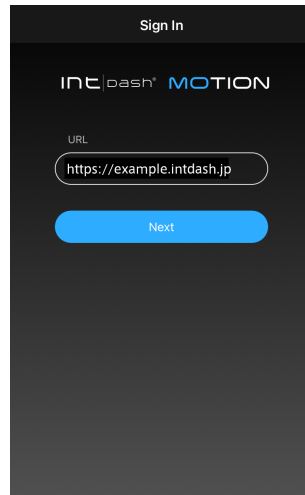


Fig. 4 Enter the URL of the intdash server

When you see '"Motion" Wants to Use ... to Sign In', tap [Continue].

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



Fig. 5 Sign in

Note: Use a "user" account to sign in.

- If you have only one user account, there is no problem using the same user account for Motion and other applications such as Data Visualizer.
If you have a user account for Motion, separate from the one for the web applications, use it to sign in.
- If you wish to use Motion on multiple iOS devices at the same time, please prepare user accounts for the number of devices.
- The time series data is saved in association with the edge from which the data was obtained.

Although you sign in to Motion using your user account, the time-series data retrieved is treated as data from the "edge with the same name as the user". For example, if you acquire data as user "user1", the data will be sent to the intdash server as data from the edge named "user1".

4. When you're prompted for permission to use your location, tap "Allow While Using App". (Please note that if you tap [Don't allow] here, you will not be able to send GPS data.)
 5. When prompted for access to the microphone and camera, tap [OK] for each.
- If you sign in successfully, the measurement start screen will be displayed.

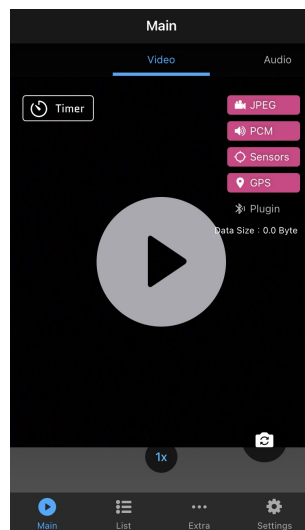


Fig. 6 Measurement start screen

2.3 Configure settings for data to be sent

Set what data to send to the intdash server. In this tutorial, we will configure it to send accelerometer values as an example.

1. In Motion, tap [Settings].

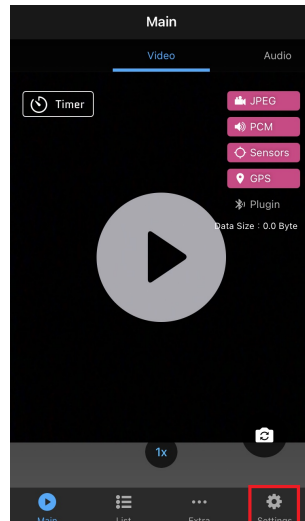


Fig. 7 Open the settings screen

2. Turn on [Sensors].

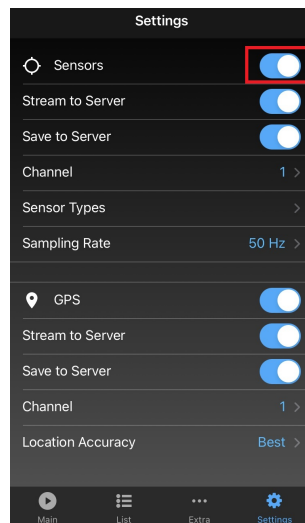


Fig. 8 GPS setting screen

3. Set as follows.

- Stream to Server: On
- Save to Server: On
- Channel: 1
- Sensor Types > Acceleration: On

Note: When [Save to Server] is turned on, all data sent by the iOS device will be saved on the server. If you do not want to save data to the server, turn [Save to Server] off.

2.4 Set up Data Visualizer

Prepare Data Visualizer to display data.

2.4.1 Sign in to view the Data Visualizer

1. Open the Data Visualizer application in your Chrome web browser (URL is different for each customer, e.g. <https://example.vm2m.jp/vm2m/>).
2. When the sign-in screen is displayed, enter the user name (or the email address registered in the user account) and password, and then click [Sign In].

The Data Visualizer is displayed.

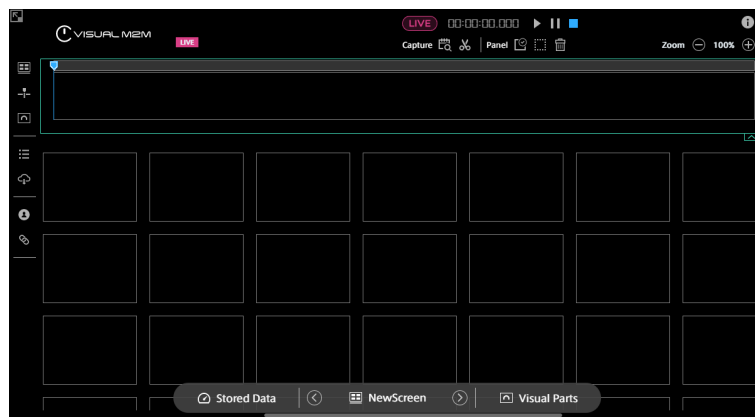


Fig. 9 Data Visualizer

2.4.2 Import a data settings (.dat) file to display the data

Get the data settings file from the dedicated download page in order to view data from iOS devices.

1. Click Links (🔗) on the left side of the Data Visualizer screen.
2. Click [Download DAT File]. A list of downloadable DAT files (files in .dat format) is displayed.

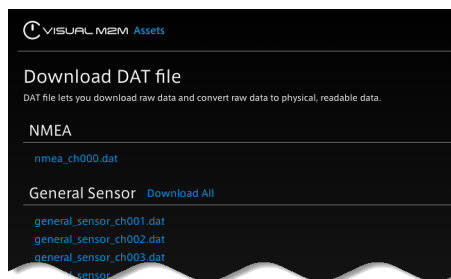


Fig. 10 List of DAT files

3. Download the following DAT file.
General Sensor > general_sensor_ch001.dat
4. On the left side of the Data Visualizer screen, click [Data Settings] (⋮) > [Add Group] > [Import] to import the DAT file.

This completes the import of the data settings file.

2.4.3 Place visual parts on the screen

1. Click any empty panel and select [2 x 2].



Fig. 11 Select a panel

2. Select [Line Graph] as the visual part.

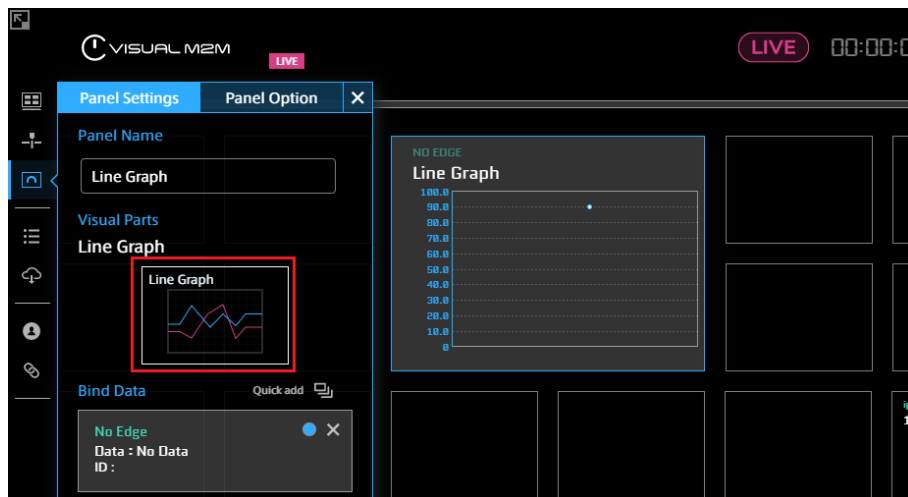


Fig. 12 Select Line Graph

3. Select the data source you want to visualize. In this tutorial, we will visualize the data acquired by Motion, so select the username you used to sign in with Motion.

02. Motion tutorial - Sending acceleration data from an iOS device

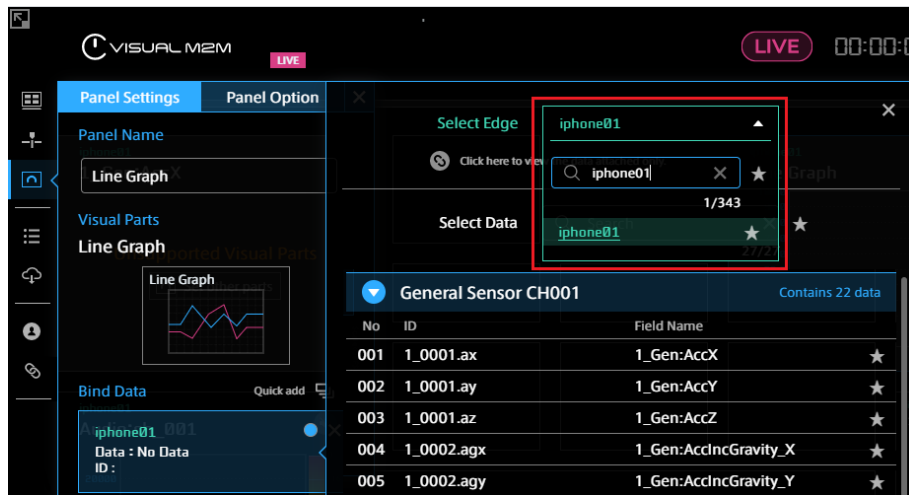


Fig. 13 Select an edge

4. Select "1_0001.ax" (acceleration in the X-axis direction) as the data to be visualized.

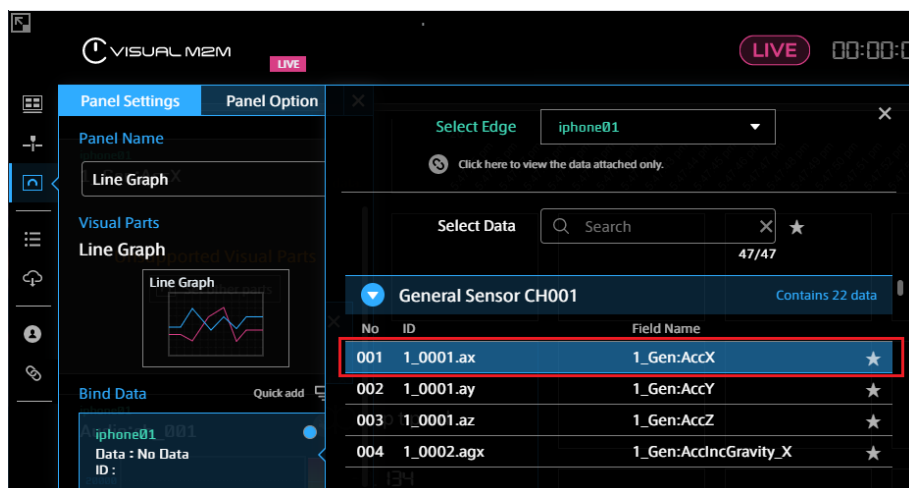


Fig. 14 Bind acceleration data

2.5 Start measurement and visualize data

After setting up Motion and Data Visualizer, send the data from the iOS device to intdash.





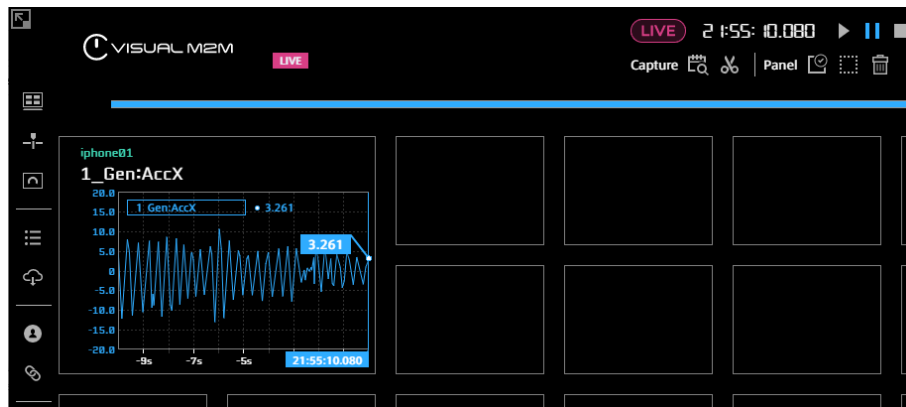
1. Put the Data Visualizer in live mode for real-time visualization. If you see the pink live mode icon (), you are currently in live mode. If you see a gray icon (), click the icon to switch to live mode.






Fig. 15 Live mode display

2. Tap  in the center of the Motion Main screen to start the measurement.
3. Click the play button  in Data Visualizer. The data sent from your iOS device is displayed on the dashboard.



As you shake or move your iOS device, you can see that the value displayed in the Data Visualizer fluctuate.

5. Tap  in Motion to end the measurement.

This completes one measurement. The measurement data from tapping  to tapping  in Motion is saved in the server as one measurement.

This completes the measurement and visualization of acceleration with Motion.

In addition to acceleration, Motion can acquire various sensor data, video, audio, and GPS data. See [Acquire data with Motion](#) (p. 14) for settings to retrieve these data.

Note: Pressing and holding (long tap) the Main screen will lock the screen to prevent accidental operation. To unlock the screen, press and hold the screen again.

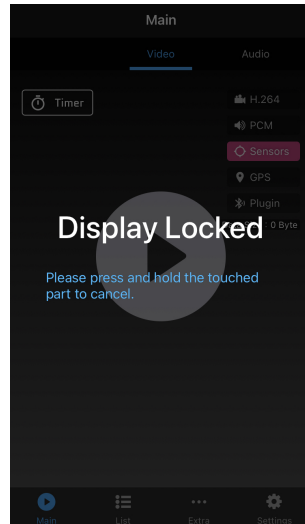


Fig. 16 Locked screen (Press and hold the screen to unlock.)

03 Acquire data with Motion

When you perform a measurement using Motion, the following data can be sent to the intdash server

- [Video](#) (p. 15)
- [Audio](#) (p. 16)
- [Sensor data \(Sensors\)](#) (p. 17)
- [GPS data \(GPS\)](#) (p. 18)
- [Plugin app data \(Plugin\)](#) (p. 18)

Turn on the item you want to acquire.

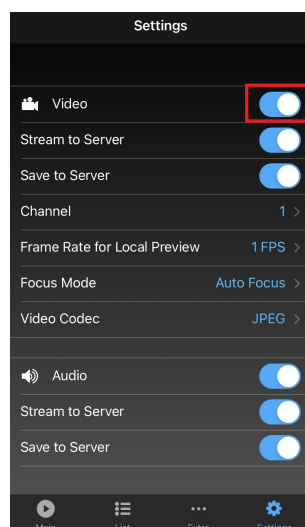


Fig. 17 Settings screen

See below for settings for each data type.

Attention: Both the Motion sending the data and the application receiving the data (e.g., Data Visualizer) must be properly configured to visualize the data.

Attention: Check the orientation of the screen when starting the measurement. After the measurement starts, the screen orientation is locked and cannot be changed. If you make measurements with the device in landscape orientation while the screen display is in portrait orientation (or vice versa), you may not be able to make correct measurements.

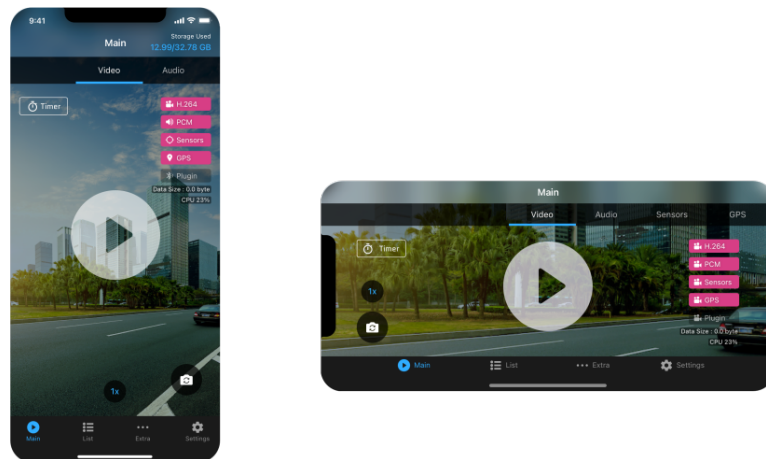


Fig. 18 Correct display when the device is in portrait and landscape orientations

3.1 Acquire video data (Video)

To acquire video data, turn on [Video] on the Settings screen.

The setting items related to video are as follows.

Stream to Server

Send video data to the intdash server.

Save to Server

Save video data on the server. If this is turned off, the video data will not be saved on the server (even if it is turned off, real-time display in Data Visualizer is possible).

Channel

Specify the channel for transmission.

Codec and Options

Set the codec, resolution, frame rate, image quality, etc. Select the codec from the following. Use a codec supported by the playback software.

- JPEG: Send each frame as a JPEG image. There is no video compression between frames.
- H.264: This method performs inter-frame compression and can transmit video more efficiently than JPEG.
- H.265: A video compression method with a higher compression rate than H.264.

Options vary depending on the codec. Please note that setting a higher resolution or bit rate may result in larger data volume and may not allow smooth real-time playback.

Focus Mode

If you select [Auto Focus], the focus will always be set automatically. Set to [Near] if you want to focus closer, or [Far] if you want to focus far away. If you select [Near] or [Far], the focus will be fixed once the focus is adjusted.

Shutter Speed

If you are shooting at night or in a dark place, you can make the video brighter by selecting [Medium] or [Slow]. However, this increases the possibility of blurring.

Refresh Rate for Local Preview

Sets the refresh rate of the preview displayed on the Motion Main screen. This setting changes the preview on the device and does not affect the frame rate of the data sent and saved to the intdash server.

Save as MP4 File

When turned on, video data in MP4 format will be stored in the iOS device separately (if the audio data is also acquired, the audio is also saved in the MP4 data). Turn this on if you want to watch the video on your iOS device after shooting. The saved MP4 file can be played on the Motion List screen (it cannot be played on the iOS photo app).

Even if [Save as MP4 File] is turned off, the data will be saved in the iOS device in the intdash proprietary format as usual. Therefore, it is possible to upload data later if the connection is interrupted during measurement.

Attention: Settings on Data Visualizer

- When using Data Visualizer to play back video acquired with Motion, Data Visualizer must have data settings for video data. Download `video_chNNN.dat` (where NNN is the channel) from [Links] > [Download DAT File] on Data Visualizer and import it.
- When playing videos on Data Visualizer, you need to use the appropriate visual parts depending on the codec.
 - When using JPEG (Motion JPEG), use Image Viewer.
 - When using H.264, use Video Player.
 - Currently, Data Visualizer(Ver.3.0.0) does not support H.265.



Fig. 19 Visual parts to use

3.2 Acquire audio data (Audio)

To acquire audio data, turn on [Audio] in Settings.

The setting items related to audio are as follows.

Stream to Server

Sends audio data to the intdash server.

Save to Server

Saves audio data in the intdash server. If this is turned off, audio data will not be stored on the server (even if it is turned off, real-time playback in the Data Visualizer is possible).

Channel

Specify the channel for transmission.

Codec and Options

Set the codec and options. Select the codec from the following. Use a codec supported by the playback software.

- PCM: Transmitted as uncompressed audio data.

- AAC: Lossy compression, allowing transmission with smaller data size than PCM. Suitable for real-time transmission.

Microphone

Set which microphone on your iOS device to use. If you select [Auto], the microphone is automatically selected depending on the camera used (front camera / rear camera).

However, if an external microphone is attached, the external microphone is always used.

3.3 Acquire sensor data (Sensors)

If you want to get the data from 9-axis sensor (gyro, acceleration, geomagnetic sensor), turn on [Sensors] in Settings.

The setting items for 9-axis sensor data are as follows.

Stream to Server

Sends the 9-axis sensor data to the intdash server.

Save to Server

Saves sensor data in the intdash server. If this is turned off, the sensor data will not be stored on the server (even if it is turned off, real-time display in the Data Visualizer is possible).

Channel

Specify the channel for transmission.

Sensor Types

Set which sensor data to send.

See [\(Appendix\) Data sent by Motion](#) (p. 19) for compatibility with iSCP (intdash Stream Control Protocol) and Data Visualizer settings.

Sensor Types	Data to be acquired
Acceleration	X-axis acceleration
	Y-axis acceleration
	Z-axis acceleration
Gravity	X-axis acceleration (including gravity acceleration)
	Y-axis acceleration (including gravity acceleration)
	Z-axis acceleration (including gravity acceleration)
	Gravitational acceleration in X-axis direction
	Gravitational acceleration in Y-axis direction
	Gravitational acceleration in Z-axis direction
Rotation Rate	Rotational speed (yaw rate) centered on the front upward direction
	Rotation speed (pitch rate) centered on the front right direction
	Rotation speed (roll rate) centered on the front direction
Orientation Angle	Rotation angle (yaw angle) centered on the front upward direction
	Rotation angle (pitch angle) centered on the front right direction
	Rotation angle (roll angle) centered on the front direction

Sampling Rate

Set how often the data for each Sensor Type is retrieved.

3.4 Acquire GPS data (GPS)

To get GPS data, turn on [GPS] in Settings.

The data sent from Motion is as follows. See [\(Appendix\) Data sent by Motion](#) (p. 19) for compatibility with iSCP (intdash Stream Control Protocol) and Data Visualizer.

- Latitude
- Longitude
- Altitude
- Coordinate accuracy
- Altitude accuracy
- Direction (North is 0)
- Moving speed

The setting items related to GPS are as follows.

Stream to Server

Send GPS data to the intdash server.

Save to Server

Save GPS data on the intdash server. If this is turned off, GPS data will not be stored on the server (even if it is turned off, real-time display in the Data Visualizer is possible).

Channel

Specify the channel for transmission.

Location accuracy

Set the accuracy of GPS data. Higher accuracy will consume more battery.

3.5 Acquire data from the plug-in application (Plugin)

When using a Motion plug-in app, the following settings are possible.

Stream to Server

Send data from the plugin app to the intdash server.

Save to Server

When this is turned off, data is sent to the server but not stored on the server side.

3.6 Other settings: Show CPU Usage

If you turn on [Show CPU Usage], the CPU usage will be displayed on the Main screen.

04 (Appendix) Data sent by Motion

4.1 iSCP data type used by Motion and the Data Visualizer settings

Motion uses iSCP (intdash Stream Control Protocol) to send data to the intdash server.

The table below shows which iSCP data types are used and which DAT files (data settings) and visual parts are used in Data Visualizer.

Motion app send settings	iSCP data type	DAT file used for Data Visualizer	Visual parts used in Data Visualizer
Video (H.264)	H.264	video_chNNN.dat	Video Player
Video (JPEG)	JPEG	video_chNNN.dat	Image Viewer
Audio (PCM)	PCM	audio_chNNN.dat	Audio Player
Audio (AAC)	AAC	audio_chNNN.dat	Audio Player
Sensors	General Sensor	general_sensor_chNNN.dat	Any visual part that displays numerical values.
GPS	General Sensor	general_sensor_chNNN.dat	You can plot the location by using Map. ¹ The values of latitude, longitude, altitude, coordinate accuracy, altitude accuracy, direction, and moving speed can be displayed in various other visual parts that display numerical values.

Note: The NNN in the above DAT filename indicates the channel. For example, the DAT file for channel 1 video is video_ch001.dat.

Note: When acquiring data from the Motion plugin app, the data type depends on each plugin.

¹ Bind the field names "lat" (latitude), "lng" (longitude), and "head" (direction) of the General Sensor data type to the Map. See also the Data Visualizer operation manual for how to use Map visual parts.

4.2 Definition of General Sensor

Sensor data and GPS data are sent to the intdash server as "General Sensor" type data of iSCP.

The definition of the data type General Sensor is as follows. For details, refer to the description of General Sensor in [iSCP 1.0 Essentials](#).

Data ID	Field name	Meaning	Unit
0x0001	ax	Acceleration X	m/s ²
0x0001	ay	Acceleration Y	m/s ²
0x0001	az	Acceleration Z	m/s ²
0x0002	agx	Acceleration including Gravity X	m/s ²
0x0002	agy	Acceleration including Gravity Y	m/s ²
0x0002	agz	Acceleration including Gravity Z	m/s ²
0x0003	gx	Gravity X	m/s ²
0x0003	gy	Gravity Y	m/s ²
0x0003	gz	Gravity Z	m/s ²
0x0004	rra	Rotation Rate Alpha (Yaw Rate)	deg/s
0x0004	rrb	Rotation Rate Beta (Pitch Rate)	deg/s
0x0004	rrg	Rotation Rate Gamma (Roll Rate)	deg/s
0x0005	oaa	Orientation Angle Alpha (Yaw)	deg
0x0005	oab	Orientation Angle Beta (Pitch)	deg
0x0005	oag	Orientation Angle Gamma (Roll)	deg
0x0006	lat	Latitude	deg
0x0006	lng	Longitude	deg
0x0007	alt	Altitude	m
0x0008	aoc	Accuracy of Coordinate	m
0x0008	aoa	Accuracy of Altitude	m
0x0009	head	Heading (North is 0)	deg
0x000A	speed	Speed	km/h

The "field name" (ax, ay, etc.) is displayed at the end of the "ID" on the Data Visualizer data binding screen.

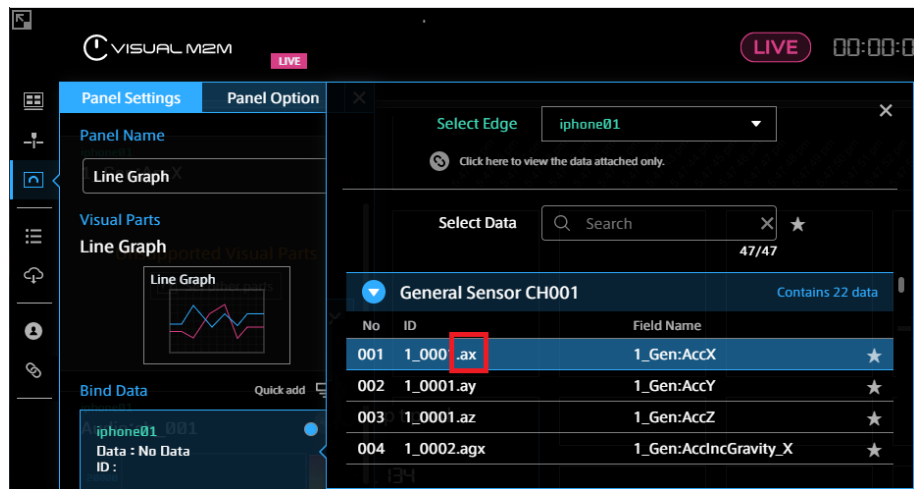


Fig. 20 Field names in Data Visualizer