# Release Notes

## Samsung Health Sensor SDK

## Release Date

September 22, 2024

## Release Version

v1.3.0

## Target Device

The Samsung Health Sensor SDK's APIs are supported on the following watch devices that run on Wear OS Powered by Samsung.

- Galaxy Watch4 series and later models

## SDK Content

| Content | Content description |
|---|---|
| Documents | API Reference<br>Programming Guide |
| Library | Samsung Health Sensor SDK's library. Import it in your app project.<br>- `samsung-health-sensor-api.aar` |
| Sample apps | Measure blood oxygen<br>Measure blood oxygen and heart rate<br>Transfer measured heart rate to a connected phone<br>Measure skin temperature |

## Features

The tracking APIs of the Samsung Health Sensor SDK enable partner application to register an event for tracking health sensor data and to retrieve that data while tracking on a Galaxy Watch.

### Capabilities

The Samsung Health Sensor SDK provides the available tracker types on the watch.

## Measuring Watch's Health Sensor Data

A partner application using the SDK can measure health-sensor data of a Galaxy Watch. The following tracker types are supported:

**[Continuous Tracker Types]**

The following tracker types can be measured continuously until unsetting the tracker type's event listener. Continuous tracker types operate with low battery consumption of the Galaxy Watch.

- Accelerometer
- Heart rate including IBI (inter-beat interval)
- Photoplethysmogram (PPG) green, Infrared (IR), and red
- Skin temperature

**[On-demand Tracker Types]**

The following tracker types are on-demand tracker types. Use only one on-demand tracker type at a time and only when needed.

- Bioelectrical impedance analysis (BIA)
- Electrocardiogram (ECG)
- PPG green, IR, and red
- Skin temperature
- SpO2 (blood oxygen)

**[Other]**

Measuring the user's sweat loss amount after a running is available with the following tracker type.

- Sweat loss

## Developer Mode

A developer mode is supported for testing and debugging. See the developer guide for more information.

# Limitations

- The emulator is not supported.
- Data measured by the Samsung Health Sensor SDK is for fitness and wellness information only, not for the diagnosis or treatment of any medical condition.

# Changes

## September 22, 2024

- Rebranding the SDK name to "Samsung Health Sensor SDK".

## 1.3.0 - August 22, 2024

**[New]**

- Continuous and on-demand enum constant names of `HealthTrackerType` have been defined.
  - `ACCELEROMETER_CONTINUOUS`
  - `BIA_ON_DEMAND`
  - `ECG_ON_DEMAND`
  - `HEART_RATE_CONTINUOUS`
  - `PPG_CONTINUOUS`
  - `PPG_ON_DEMAND`
  - `SKIN_TEMPERATURE_ON_DEMAND`
  - `SPO2_ON_DEMAND`
- An application can track one or more `PpgTypes` with PPG_CONTINUOUS or PPG_ON_DEMAND. The following API has been added.
  - `HealthTrackingService.getHealthTracker(HealthTrackerType, Set<PpgType>)`
- The following PPG types have been added.
  - `PpgType.GREEN`
  - `PpgType.IR`
  - `PpgType.RED`
- `ValueKey.PpgSet` has been added. It includes PPG Green, IR, Red data.
- The following fields for BIA's raw data have been added in `ValueKey.BiaSet`.
  - `BODY_IMPEDANCE_DEGREE`
  - `BODY_IMPEDANCE_MAGNITUDE`

**[Deprecated]**

- The following enum constant names of `HealthTrackerType` have been deprecated.
  - `ACCELEROMETER`
    : Use `ACCELEROMETER_CONTINUOUS`.
  - `BIA`
    : Use `BIA_ON_DEMAND`.
  - `ECG`
    : Use `ECG_ON_DEMAND`.

  - HEART_RATE
    : Use HEART_RATE_CONTINUOUS.
  - PPG_GREEN
    : Use PPG_CONTINUOUS.
  - PPG_IR
    : Use PPG_ON_DEMAND.
  - PPG_RED
    : Use PPG_ON_DEMAND.
  - SKIN_TEMPERATURE
    : Use SKIN_TEMPERATURE_ON_DEMAND.
  - SPO2
    : Use SPO2_ON_DEMAND.

- The following PPG data set of ValueKey have been deprecated.
  Use ValueKey.PpgSet instead of them.

  - ValueKey.PpgGreenSet
  - ValueKey.PpgIrSet
  - ValueKey.PpgRedSet

**[Removed]**

- The following fields of ValueKey.EcgSet have been removed. Use alternative fields.

  - ValueKey.EcgSet.ECG
    : Use ValueKey.EcgSet.ECG_MV.
  - ValueKey.EcgSet.MAX_THRESHOLD
    : Use ValueKey.EcgSet.MAX_THRESHOLD_MV.
  - ValueKey.EcgSet.MIN_THRESHOLD
    : Use ValueKey.EcgSet.MIN_THRESHOLD_MV.

- The following fields of ValueKey.HeartRateSet have been removed. Use alternative fields.

  - ValueKey.HeartRateSet.HEART_RATE_IBI
    : Use ValueKey.HeartRateSet.IBI_LIST.
  - ValueKey.HeartRateSet.STATUS
    : Use ValueKey.HeartRateSet.HEART_RATE_STATUS and
    ValueKey.HeartRateSet.IBI_STATUS_LIST.

## 1.2.0 - August 30, 2023

**[New]**

- The skin temperature tracker type and data point set have been added. Skin temperature can be measured on-demand or as a batching event. For more information, see the API Reference.

  - HealthTrackerType.SKIN_TEMPERATURE
  - HealthTrackerType.SKIN_TEMPERATURE_CONTINUOUS
  - ValueKey.SkinTemperatureSet

- The following interfaces for values in millivolts have been added to the ECG data point set:
  - `ECG_MV`
  - `MAX_THRESHOLD_MV`
  - `MIN_THRESHOLD_MV`
- The following interfaces for heart rate status and IBI-related information have been added to the heart rate data point set:
  - `ValueKey.HeartRateSet.HEART_RATE_STATUS`
  - `ValueKey.HeartRateSet.IBI_LIST`
  - `ValueKey.HeartRateSet.IBI_STATUS_LIST`
- The status interface has been added to the following data point sets:
  - `ValueKey.AccelerometerSet.STATUS`
  - `ValueKey.PpgGreenSet.STATUS`
  - `ValueKey.PpgIrSet.STATUS`
  - `ValueKey.PpgRedSet.STATUS`

**[Change]**

- The error description of the first bit in the `1 ~ 127` value for `ValueKey.SweatLossSet.STATUS` has been updated.

**[Deprecated]**

- The following interfaces in the ECG data point set have been deprecated.
  - `ValueKey.EcgSet.ECG`, replaced by `ValueKey.EcgSet.ECG_MV`.
  - `ValueKey.EcgSet.MAX_THRESHOLD`, replaced by `ValueKey.EcgSet.MAX_THRESHOLD_MV`.
  - `ValueKey.EcgSet.MIN_THRESHOLD`, replaced by `ValueKey.EcgSet.MIN_THRESHOLD_MV`.
- The following interfaces in the heart rate data point set have been deprecated.
  - `ValueKey.HeartRateSet.HEART_RATE_IBI`, replaced by `ValueKey.HeartRateSet.IBI_LIST`.
  - `ValueKey.HeartRateSet.STATUS`, replaced by `ValueKey.HeartRateSet.HEART_RATE_STATUS` and `ValueKey.HeartRateSet.IBI_STATUS_LIST`.

The following values of ValueKey.SweatLossSet.STATUS have been deprecated.

| STATUS value | Description |
|---|---|
| -10 | A PPG signal is too weak. An accuracy is very low. |
| -8 | A PPG signal is weak. An accuracy is low. |
| -3 | A Galaxy wearable is detached. |
| -1 | Sweat loss sensor's accelerometer data accuracy is low. |

**[Removed]**

- ValueKey.HeartRateSet.FLAG has been removed.

## 1.1.0 - March 31, 2022

- Minor stability improvements have been made to the SDK library.

## 1.1.0 Alpha - March 17, 2022

**[New]**

- The SpO2 tracker type and its data point set have been added. It is supported by Health Platform v1.3.0.
  - `HealthTrackerType.SPO2`
  - `ValueKey.Spo2Set`
- The `ValueKey.HeartRateSet.STATUS` has been added, which replaces the `ValueKey.HeartRateSet.FLAG`.

**[Changes]**

- The `TrackingSampleApp` application code has been updated.

**[Deprecated]**

- The `ValueKey.HeartRateSet.FLAG` has been deprecated.

## 1.0.0 - Feb 25, 2022

- The values of the `SweatLossSet.STATUS` have changed. For more information, see API Reference.

## 1.0.0 beta1 - Dec 31, 2021

- Minor issues related to the sweat loss feature have been fixed.

## 1.0.0 alpha3 - Dec 17, 2021

**[New]**

- The sweat loss tracker type has been added. It measures how much sweat is lost from a running. The following class, enums, and APIs have been added:
  - `DataType`
  - `ExerciseState`
  - `ExerciseType`
  - `HealthTrackerType.SWEAT_LOSS`
  - `HealthTrackingService.getHealthTracker(HealthTrackerType healthTrackerType, TrackerUserProfile userProfile, ExerciseType type)`
  - `ValueKey.SweatLossSet`

**[Known Issue]**

- The following issues are to be solved in February 2022 watch software update:
  - A timestamp period variation issue in received sensor data for `AccelerometerSet`, `HeartRateSet`, and `PpgGreenSet`.
  - The `HealthTracker.TrackerEventListener.onFlushCompleted()` is not received.

## 1.0.0 alpha2 - July 28, 2021

**[Changes]**

- The partner application's SDK policy has been applied. Tracking watch sensor data with the SK is available only for the registered tracker type scope.
  If `SDK_POLICY_ERROR` occurs, ask to your Samsung contact point.
- The following tracking data point sets have added more interfaces.
  - `ValueKey.BiaSet.STATUS`
    : The BIA status has been defined Check this value after the BIA measurement. If it indicates an error guide the user with a proper UI and a message.
  - `ValueKey.EcgSet.LEAD_OFF`
    : The ECG's lead on/off values have been defined.
  - `ValueKey.HeartRateSet.FLAG`
    : The flag for heart rate measurement has been added.
- In `HealthTracker.TrackerError`:
  - The following unused errors have been removed.

 

        - `LOW_SIGNAL`
        - `MOVEMENT_DETECTED`
        - `NOT_WEARING`
        - `TIME_OUT`
    - A new error has been added.
        - `SDK_POLICY_ERROR`
- Measurement guides for each sensor data have been added. See Programing Guide.